

# PSJ

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Policy Studies Journal

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## Public Policy Yearbook 2014

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## Policy Studies Journal

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The primary focus of the Policy Studies Journal (PSJ) is the study of public policy. Published on behalf of the Policy Studies Organization and the American Political Science Association's Public Policy Section, PSJ publishes individually submitted articles and symposia of exceptional quality by social scientists and other public policy researchers and leaders. The journal addresses a wide range of public policy issues at all levels of government, and welcomes a comparative approach. We accept a variety of manuscript types.

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## 2014 Public Policy Yearbook: Recent Developments in Public Policy Research

Sarah Trouset, Hank C. Jenkins-Smith, and Christopher Weible

We are pleased to present the sixth edition of the *Public Policy Yearbook*. Each year, dating back to its launch in 2009, we have used the content of the *Yearbook* to develop indicators for tracking developments in public policy scholarship. While we recognize that trends we can identify are only representative of the sample of *Yearbook* scholars, the patterns of scholarly focus have remained quite stable despite a more than doubling of our membership over the 2009–2014 period. In this introductory article, following a brief description of the *Yearbook*, we take a comparative look at how research trends in the *Yearbook* have evolved over the last six years.

### What Is the *Yearbook*?

The *Yearbook* was initiated as a hard-copy special edition of the *Policy Studies Journal* in 2009, and then migrated to an open-access, web-based format ([www.psjyearbook.com](http://www.psjyearbook.com)) in 2011. Each year, through our fall campaign we contact scholars and ask them to provide us with their most recent contact information, fields of specialization, research publications, and a brief summary stating their research interests. This information is verified and presented in a format that provides users with easy access to the *Yearbook's* content via the Internet.

The mission of the *Yearbook* falls primarily into two categories. We designed the *Yearbook* to allow users to have a systematic way to identify the broader public policy research community. The multidisciplinary nature of public policy research can make it challenging to identify the experts studying various policy problems, and the *Yearbook* provides a convenient and helpful instrument to do so. The *Yearbook* is a broadly inclusive international listing of experts in various public policy domains, identifying individuals working on public policy problems in over 47 countries. By assembling this content, the *Yearbook* also provides an excellent tool for public policy scholars to increase and broaden the visibility of their work, and to provide the means to network with other researchers, scholars, and graduate students. In addi-



**Begin Your Search**

The Yearbook contains a detailed international listing of policy scholars with contact information, fields of specialization, research references, and an individual scholar's statements of current and future research interests.

The intent is to provide a reasonably comprehensive and accessible reference to the most recent scholarship on all aspects of public policy, as well as indications of future research directions. For public policy scholars, inclusion in the Yearbook is a great way to gain visibility and facilitate networking within the policy research community. Listing in the Yearbook is free of charge to all scholars (including graduate students) who do research in public policy. The on-line version of the Yearbook is made in searchable form and provides links to abstracts, articles and scholar bios.

There are several options available to you as you begin your search:

- Search by name
- Search by institution
- Search by keywords
- Search by focus area(s)

**Browse by Location**

An interactive map, showing the location of Yearbook members, is available.

[Browse Map »](#)

**Get Listed**

For public policy scholars, inclusion in the Yearbook is a great way to gain visibility and facilitate networking within the policy research community. Listing in the Yearbook is free of charge to all scholars (including graduate students) who do research in public policy.

[Manage Profile »](#)

**Make a Connection**

Our search results return more. Possible connections, based on shared interests identified by our scholars, are displayed in the results sidebar when viewing member profiles.

**Browse Directory**

[Click here to view all members. 0](#)

**Search Directory**

Individual:  [Search 0](#)

Institution:  [Search 0](#)

Keywords:  [Search 0](#)

**Search by Area(s) of Focus 0**

**Substantive Focus**

- Law and Policy
- Economic Policy
- Education Policy
- Energy & Natural Resource Policy
- Environmental Policy
- Governance
- Health Policy
- Defense and Security
- International Relations
- Science and Technology Policy
- Social Policy
- Comparative Public Policy
- Urban Public Policy

**Theoretical Focus**

- Policy History
- Policy Process Theory
- Agenda-Setting, Adoption, & Imp.
- Policy Analysis and Evaluation
- Public Opinion

[Search](#)

**Figure 1.** The Yearbook's website provides users with several different options for searching for experts. Access this page at: <http://www.psjyearbook.com/person/search>

tion, the Yearbook allows those who seek to use policy research (students, policy makers, interest groups, and interested citizens) to quickly identify scholars whose work is focused on particular policy problems.

Yearbook scholars are asked to complete an online form covering a broad range of information, including: contact information and institutional and departmental affiliations, most recent publications, a brief paragraph summarizing current and future research agendas, and public policy specializations (across a number of theoretical and substantive policy subfields).<sup>1</sup> By using the website, readers can search for an expert through a range of search criteria options, which include: a scholar's first or last name, geographic location, institution, or primary research interests (see Figure 1).

The Yearbook website also provides links to scholars' bios, websites, published articles and their abstracts, and review articles (see Figure 2). To the right of a scholar's profile, the Yearbook generates a list of individuals with similar scholarly

Home / Directory Search / Deven Carlson

## Deven Carlson

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Education policy and social policy comprise the substantive focus of my research agenda. My research within the realm of education policy focuses broadly on school choice, the achievement-related effects of data-driven reform efforts, and the effects of education policy and practices on democratic citizenship. My research within the domain of social policy focuses primarily on the effect of Section 8 voucher receipt on a variety of social and labor market outcomes. The contents of my substantive research agenda reflect many of my theoretical interests, which reside primarily in the in the area of policy analysis and evaluation. Specifically, I am interested in causal inference, policy evaluation, and benefit-cost methodology.

**Citation:** Carlson, Deven, Robert Haveman, Tom Kaplan, and Barbara Wolfe. 2011. "The Benefits and Costs of the Section 8 Housing Subsidy Program: A Framework and Estimates of First-Year Effects." *Journal of Policy Analysis and Management* 30 (2): 233-255.

### Individuals With Similar Interests

[Juan Zornoza](#)  
*National University of Colombia*

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[Michelle Feder](#)  
*University at Albany*

[Sarah Reckhow](#)  
*Michigan State University*

### Browse Directory

[Click here to view all members.](#)

**Figure 2.** This is an example of a scholar's profile. Depending on how much information a scholar provides, each profile may vary in the amount of detail presented.

interests. The list of similar scholars is generated using an algorithm that matches the scholar's listed interests with those of other scholars across theoretical and substantive focus areas. For example, individuals listed at the top of the list have the most common overlap of focus areas.

A key function of the *Yearbook* is to provide an instrument for individuals to quickly access the current state of public policy research. As part of our aim to promote public policy research, we solicit and publish two-year retrospective review articles (<http://psjyearbook.com/content/notes>) that summarize the most recent scholarship within the policy subfields listed in the *Yearbook*. The online version of the *Yearbook* includes in-text citations for each review article, taking readers directly to cited scholars' bios, and provides listings of other scholars with related research interests (see Figure 3). These articles are simultaneously published in a special issue of the *Policy Studies Journal*. By providing a snapshot of scholarship in specific subfields of public policy, the *Yearbook* provides a quick and accessible reference to the current state of public policy scholarship. Our intent is that the *Yearbook* reviews will aid seasoned scholars in keeping track of important developments, and at the same time will provide a way for students and scholars new to the field with a ready means to familiarize themselves with the current state of literature in subfields of interest.

The figures included here introduce only a few of the capabilities of the *Yearbook*. We invite you to visit the website for further exploration ([www.psjyearbook.com](http://www.psjyearbook.com)).<sup>2</sup>

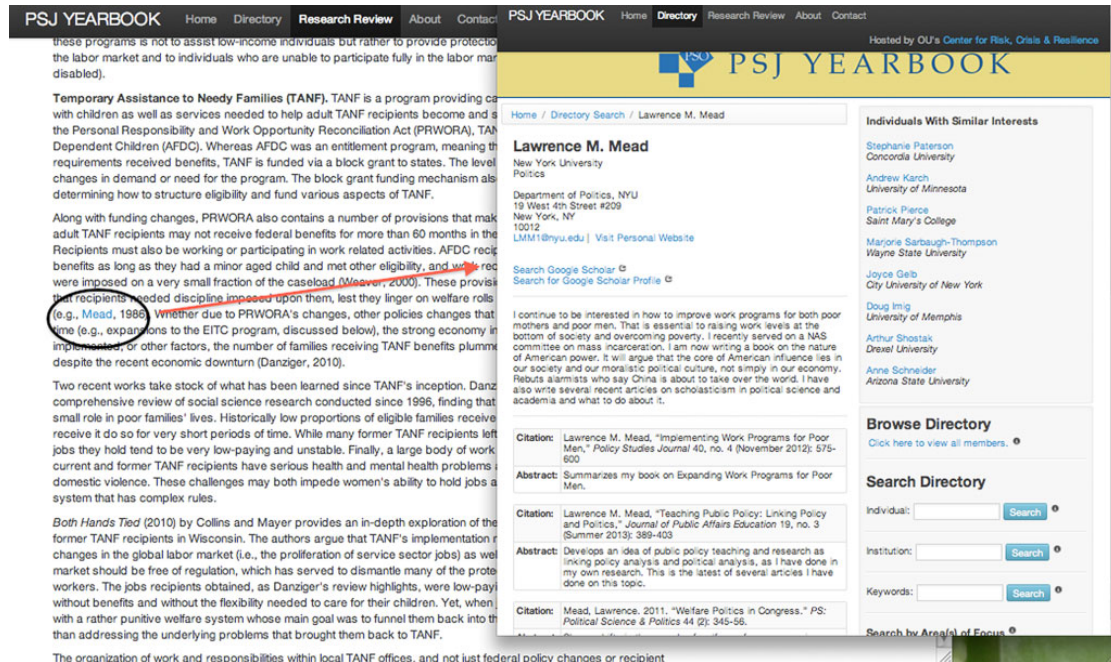


Figure 3. A snapshot of a section in a 2013 review article by Guzman, Pirog, and Seefeldt, titled, "Social Policy: What Have We Learned?" Cited authors are listed with links that directs readers to the authors' profiles. This allows readers to quickly access additional research in the substantive domain.

### The Yearbook Participant Community

The 2014 *Yearbook* has 771 members, representing a broad cross-section of public policy scholars in many countries, and a growth of approximately 10% over that of 2013. The 2014 *Yearbook* scholars reside in 47 different countries, increasing our global representation by an additional 16 countries over the past year. While the number of non-U.S. members has not yet reached the levels we would like to see, their inclusion has been improving each year. In short, we are continuing to make headway toward broad inclusion of a global cross-section of public policy scholars and practitioners. Figure 4 shows the global distribution of participating *Yearbook* scholars in the 2014 edition.

### Policy Scholarship: New Developments, Snapshots, and Trends

The *Yearbook* is designed to provide insight into recent developments in policy scholarship through the use of several different indicators.<sup>3</sup> One of the primary contributions are the two-year retrospective research reviews on each of the substantive and theoretical subfields listed within the *Yearbook*. These articles are then published in the *Policy Studies Journal*, as well as online on the *Yearbook* website. Review articles of this type offer readers quick access to recent developments within the field, because they can provide both a basic introduction and a coherent current

### Distribution of 2014 *Yearbook* Scholars

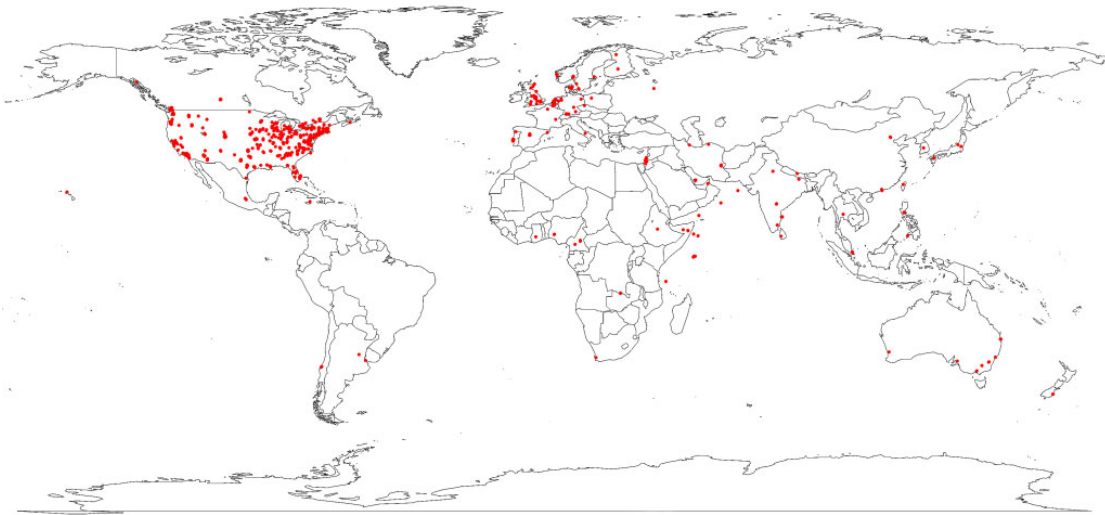


Figure 4. The *Yearbook's* geographic representation has grown substantially.

perspective on the field to emerging scholars interested in understanding various policy problems. The articles will be refreshed, with new authors, every three years to assure continuity in tracking the evolution of policy scholarship.

Each year we solicit recommendations for advanced graduate students, working under the guidance of (and often as co-authors with) leading public policy scholars to write the review articles. Previous essays covered topics including: agenda-setting (Pump, 2011), policy analysis (Carlson, 2011), policy history (deLeon & Gallagher, 2011), policy process theories (Nowlin, 2011), public opinion (Mullinix, 2011), defense and security (Ripberger, 2011), education policy (Conner & Rabovsky, 2011), governance (Robichau, 2011), comparative public policy (Gupta, 2012), economic policy (Pump, 2012), environmental policy (Niles & Lubell, 2012), health policy (Haeder, 2012), social policy (Guzman, Pirog, & Seefeldt, 2013), law and public policy (Kreis & Christensen, 2013), and international relations and policy (Redd & Mintz, 2013). This year's special issue includes the first of our review articles to be in the second iteration for their theoretical issue areas in the *Yearbook*. In addition, it includes a review on science and technology policy, and a special topic paper that examines published scholarship in policy journals more generally. These articles contain key developments in the following:

- **Policy Process Theories:** Evangelina Petridou examines recent developments in theoretical research on policy processes. In particular, Petridou highlights research on the Advocacy Coalition Framework, Institutional Analysis and Development, Social Construction and Design, Punctuated Equilibrium Theory, Policy Diffusion, and Multiple Streams. In addition, she discusses several new developments that have emerged in recent years such as the Narrative Policy Framework and the Collective Learning Framework.



- **Policy Analysis:** In their review on policy analysis, Grant Blume, Tyler Scott, and Maureen Pirog summarize and discuss the latest empirical innovations to emerge in the field. In particular, the authors examine the various types of data that are available and being utilized for empirical policy analysis. These data streams include: state and system-wide administrative data, geographic information systems and spatial data, and “Big Data.” Two examples of Big Data discussed in this article include Google search data and data from federal agencies. These trends in shifting data sources provide a unique perspective on the evolution of the capabilities of policy analysis scholarship.
- **Public Opinion:** Jennifer Bachner and Kathy Hill provide readers with a review of recently published research on public opinion and policy attitudes. They focus their review on several important factors that shape mass public opinion including the influence of elites, mass partisanship, political trust, and risk perceptions. They also discuss scholarship examining the role of information processing and biological traits of individuals that influence mass opinion. Along the same lines of policy analysis research, Bachner and Hill point out that public opinion research has seen a major introduction of new data sources, including Big Data.
- **Agenda Setting, Adoption and Implementation:** Rebecca Eissler, Annelise Russell, and Bryan Jones discuss recent developments in agenda setting research in three specific areas of study. First, they examine scholarship on agenda setting at the state and local levels. Second, they discuss scholarship analyzing the role and influence of the media in agenda-setting processes. Finally, they examine and compare agenda-setting studies in cross-national contexts.
- **Science and Technology Policy:** Sarah Trouset summarizes and discusses recent trends in the subfield of science and technology policy. By analyzing keywords in published science and technology scholarship, the author finds that most recent research focuses on university issues, patenting and innovation policy models more broadly. In particular, scholars are interested in understanding the influence of collaboration among government, university, and industry partners on technological outcomes.
- **Special Topic: Comparing Published Scholarship in Policy Journals:** William Adams, Donna Infeld, Laura Minnichelli, and Michael Ruddell analyze publication trends in two of the leading public policy journals: the *Journal of Policy Analysis and Management* and the *Policy Studies Journal*. Their in-depth comparison of published works from the 1980s through 2010 yields some interesting insight into the evolution of these journals and public policy scholarship over time. Both journals have seen an increase in more rigorous methodology. However, the *PSJ* reflects a political science perspective on public policy, while *JPAM* has tended to focus more on econometric and program analyses.

The *Yearbook* also provides insight into the developments in public policy scholarship through several descriptive indicators that are self-reported by individual scholars. These indicators summarize and characterize scholars’ evolving research



**Figure 5.** The relative size of each term denotes the frequency with which key terms appear in the listing of “current and future research expectations” section of the *Yearbook*.

agendas. First, *Yearbook* scholars are asked to provide a paragraph describing their ongoing research agenda. Second, scholars are asked to categorize their research as falling primarily within five theoretical and thirteen substantive focus areas. By examining these indicators we can provide an interesting snapshot of recent research developments.

First, for the past several years, we’ve illustrated current trends among policy scholars’ work by creating a word cloud populated by the key terms found through scanning the “current research and future directions” summaries in the *Yearbook* entries (see Figure 5). Each year, *Yearbook* scholars are asked to provide a short paragraph that details their current research agendas and future research projects. Scholars may be as brief or as specific as they choose. By using these summaries of public policy scholarship as data, we have been able to track over-time variations in the aggregate foci of scholars’ substantive and theoretical work. Figure 5 captures the primary words employed in the summaries of current research for *Yearbook* entries in 2014.<sup>4</sup> This provides us with a comparative perspective of the evolution of research agendas. The word cloud illustrates that the relative prominence of research interests continues to be in the areas of politics, environment, development, governance, education, health, management and science, social issues, as well as in analysis and process-oriented research. Despite the substantial growth in our membership in the last six years, the word clouds seem to indicate that the proportion of scholarly research has mostly stayed the same.

The word cloud depiction is also consistent with *Yearbook* members’ self-identifications across 18 subfields of public policy.<sup>5</sup> The five theoretical categories include: policy process theory; policy analysis and evaluation; agenda-setting, adop-

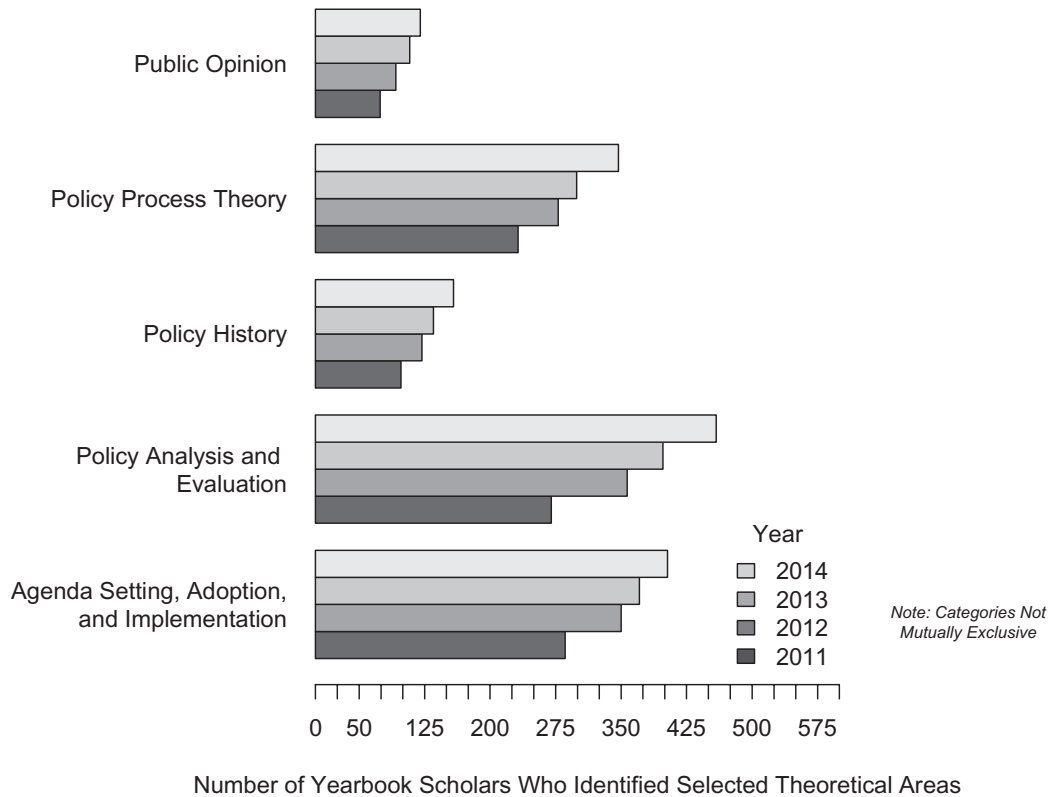


Figure 6. Theoretical Focus Areas.

tion, and implementation; public opinion; and policy history. In addition, scholars are also asked to categorize their research interests across thirteen substantive areas, including: comparative public policy, defense and security, economic policy, education policy, energy and natural resource policy, environmental policy, governance, health policy, international relations, law and policy, science and technology policy, social policy, and urban public policy.

Figures 6 and 7 show the proportion of *Yearbook* scholars who list each of the theoretical and substantive specializations. For the second year running, the largest fraction of *Yearbook* members identified the policy analysis and evaluation specialization. Furthermore, among the substantive domains, governance, environmental policy, social policy, and comparative public policy topped the list.

### Expanding the Scope of the *Yearbook* and Scholar Updates

We are committed to further expanding participation in the *Yearbook* to ensure that it remains the most broadly representative source for information on current public policy scholars and practitioners. We are looking forward to increasing collaboration between the *Yearbook* and the Association for Public Policy Analysis and Management (APPAM). As we work with APPAM leadership to adjust the scope of the *Yearbook's* theoretical and substantive focus areas, we expect the appeal of the *Yearbook* to policy analysts and practitioners will grow.

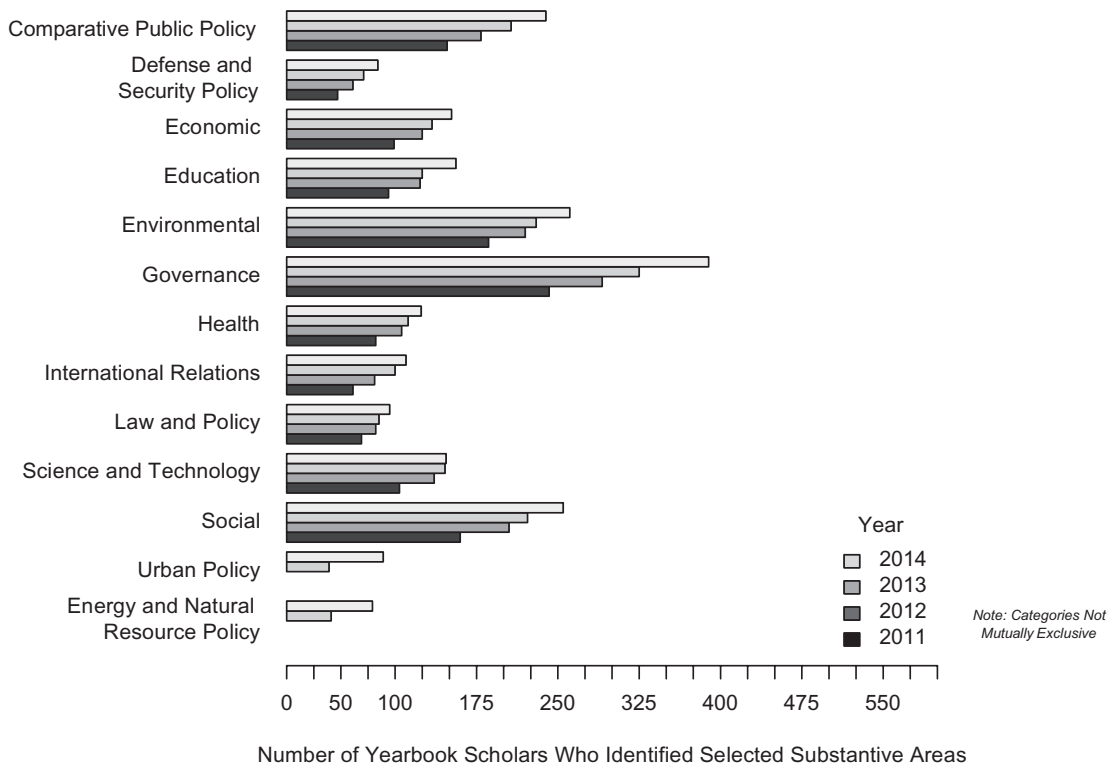


Figure 7. Substantive Focus Areas.

To ease the process of updating *Yearbook* profiles, we have made several improvements to our member updating system. Scholars are able to access their profiles at any time and make direct changes to their listings on the *Yearbook* website (<http://www.psjyearbook.com/person/update>). However, we will continue running a full fall recruitment and updating campaign by sending invitations to current and new policy scholars to update their entries in the *Yearbook*. We do this to ensure that *Yearbook* content stays as up to date as possible. We will continue our efforts to include faculty from public policy and public management schools and departments across the globe, as well as reaching out to graduate students, post-docs, and practitioners in public policy that make up the next generation of leaders in public policy research and analysis. We ask that current members assist in this effort by forwarding our invitations to affiliate policy scholars, practitioners, and graduate students.

The production and operations of the *Yearbook* could not have been accomplished without the help of many hands. We would like to thank Matthew Henderson for the design and implementation of the online survey that is essential for data collection, as well as the online website, web-tools, and data graphics. In addition, we thank Haley Scott for her assistance with checking and editing entries. Furthermore, we extend particular thanks to David Merchant and Daniel Gutierrez Sandoval from the Policy Studies Organization and appreciation for the people at Wiley-Blackwell, especially Joshua Gannon and Kris Bishop. Finally, we are especially grateful for the continuing financial support and encouragement by Dr. Paul Rich, President of the Policy Studies Organization.



We hope that you will find the 2014 *Yearbook* to be a useful resource in your work on public policy, and that you will continue to update your entries for publication in future issues. We apologize for any errors that may have escaped our quality control processes.

Sarah Troussset  
Hank C. Jenkins-Smith  
Christopher Weible  
*Yearbook* Editors

### Notes

1. *Yearbook* membership is free of charge and open to all policy scholars and practitioners, worldwide. Since the *Yearbook's* inception in 2009, we have sought to broaden the participation of public policy scholars across disciplines, organizations, and nations. The challenge is that, given the nature of public policy research, the domain of public policy scholars and practitioners is highly varied. Public policy research is multidisciplinary in nature, and policy scholars and practitioners inhabit a wide range of institutional settings (universities, governmental agencies, research labs, nonprofit organizations, think tanks, and many others). Initially our invitations were sent to the listed members of the Public Policy Section of the American Political Science Association, as well as members of the Policy Studies Organization. We worked with editors of public policy journals to reach policy scholars globally. More recently we sent electronic and printed invitations to public policy and public administration departments across the United States and Europe, asking each department to forward the invitation to their public policy faculty members, graduate students, and affiliates. Lastly, our online member updating system allows for current and new members to offer contact information for fellow colleagues and graduate students who should be included. We are currently seeking to expand the scope of invitations to include major practitioner and scholarly organizations focused on public policy, such as the Association for Policy Analysis and Management (APPAM). In all cases, we undertake an active recruitment and update effort in the fall of each year to be sure our content is up to date and as broadly inclusive as possible.
2. Though the online version of the *Yearbook* was initiated quite recently (2011), utilization of the page has grown substantially. Over the past year (March 2013–Feb 2014), the *Yearbook* had 7,137 visitors (which includes 5,734 unique visitors) with access originating in 136 countries. The greatest number of visitors (3,717) came from the United States. In addition to the United States, the top ten countries identified with visitors to the *Yearbook* include: United Kingdom (349), Canada (249), Germany (150), India (149), Australia (129), Sweden (99), China (93), Kenya (86), and the Netherlands (85). Finally, the greatest proportion of page views came from users searching for scholars by focus areas or reading research reviews on our content page (<http://www.psjyearbook.com/content/notes>).
3. These data show trends in the research of those public policy scholars who participate in the *Yearbook*. The geographic changes in *Yearbook* members were described above.
4. This word cloud was constructed using the R-package "wordcloud" (accessed at: <http://cran.r-project.org/web/packages/wordcloud/index.html>). We included the complete text from each of the "current research and future directions" paragraphs from all 2013 *Yearbook* profiles. The relative size of each term represents the frequency with which that term appeared. For the final analysis, we excluded non-substantively relevant words; for example, "Dr.," "professor," "significantly," "currently," etc.
5. When updating their profiles, scholars are asked to check off as many categories as they choose to describe their research agenda.

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## Theories of the Policy Process: Contemporary Scholarship and Future Directions

**Evangelia Petridou**

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*The object of policy research is the understanding of the interaction among the machinery of the state, political actors, and the public. To facilitate this understanding, a number of complementary theories have developed in the course of more than two decades. This article reviews recent scholarship on the established theories of the policy process, mostly published in 2011 and 2012. Additionally, scholarship extending these theories is identified and new theories of policy process are discussed. This review finds that the established theories have generated substantive scholarship during the period under review and have also been the springboard for much of the recent thinking in policy research.*

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**KEY WORDS:** established theories of policy process, new theories of policy process, policy subsystems, policy networks, policy entrepreneurs

### Introduction

The object of policy research is the understanding of the interactions among the machinery of the state, political actors, and the public. Being broadly defined, political actors can hold formal or informal positions in all governance levels. Their actions frequently produce pervasive public action; that is, action not solely limited to legislation, rules and regulations, and executive orders (John, 2012; Theodoulou & Cahn, 1995). To understand and explain this complex “. . . vast, turgid, self-centered, and highly emotional process” (George Kennan quoted in Gaddis, 2011, p. 308), scholars employ a large number of tools in the form of theories, models, and frameworks,<sup>1</sup> a great number of which have been developed and refined over the past three decades. Due to the plethora and complexity of the questions raised, these tools tend to be more complementary than contending (Peters & Pierre, 2006; Schlager & Weible, 2013).

The theoretical development and empirical investigation of some of the more established theories of the policy process have resulted in the refinement of frameworks, theories, and models; the sharpening of dependent and independent variables; and the broadening of contextual applicability. The prolificacy of the scholarship produced and the evolution and maturity of new theories over time necessitates that we pause regularly to map the topography of the literature. This is

the aim of the current review, which updates Nowlin's work (2011) and is guided by the following questions: first, what is the character of contemporary research engendered by the established theories of the policy process—does it remain within the given theoretical delimitations, does it extend the theory or framework in new directions, or is it differentiated enough to constitute a new theory? Second, what constitutes an evolving trend and in what ways are these trends novel?

In order to answer these questions peer-reviewed scholarship published mostly<sup>2</sup> in 2011 and 2012 was surveyed in journals including the *American Journal of Political Science*, *American Political Science Review*, *American Review of Public Administration*, *European Journal of Public Policy*, *Journal of Policy Analysis and Management*, *Journal of Politics*, *Journal of Public Administration Theory and Practice*, *Journal of Public Policy*, *Policy Studies Journal*, and *Political Research Quarterly*. In addition, web searches were conducted with each of the frameworks and theories as keywords in Wiley Online Library, Sage, Google Scholar, and Web of Knowledge. Articles were chosen for their relevance in terms of theory development, because they addressed criticism previously leveled against the theory or framework such as a narrow scope and limited spatial applicability, and/or for their innovative methodology. Scholarship from policy-specific journals<sup>3</sup> emerging from the database searches was used only if it met the requirements above.

The work reviewed for this article suggests the following: first, the established theories of the policy process continue to generate meaningful research in the form of diverse case studies; there is also ongoing conceptual development through the investigation of a component of a theory or the synthesis of two or more theories, even with a comparative purpose. Second, the structure of established theories allows for theoretical extension either through fusion with other frameworks or by developing a new theory closely based on an established one. Third, the timing seems to be ripe to report on new theories of policy process signaled by a 2013 *Policy Studies Journal* issue. Finally, the vast majority of the work reviewed in this article, including the new theories, is the result of the collective effort by teams of researchers.

This article is divided into two sections. First I discuss research pertaining to the established theories of policy process, namely the Advocacy Coalition Framework, Institutional Analysis and Development, Social Construction and Design, Punctuated Equilibrium, Policy Diffusion, and Multiple Streams, and eventual conceptual extensions to these theories. Next I discuss evolving trends in the literature.

## Established Theories

### *Advocacy Coalition Framework*

The Advocacy Coalition Framework (ACF) (Jenkins-Smith, 1990; Sabatier & Jenkins-Smith, 1988, 1993; Sabatier & Weible, 2007) has been used as an analytical tool in numerous publications (at least 100 by 2007). Its synthetic nature lends itself to be parsed and studied with a focus on each individual component, including the rationale behind the formation of coalitions, policy learning, policy change, and the



role of policy brokers in the policymaking process. ACF-related scholarship published in the years 2011 and 2012 fell in two broad types: first, researchers applied ACF to diverse spatial and policy area contexts. Second, there was research with theory development ambitions mostly focusing on one component of the framework. Some drew from other theories to address shortcomings and criticisms, which is in line with the suggestions Weible et al. (2011) put forth in the introductory article to the 2011 *Policy Studies Journal* special issue on the Advocacy Coalition Framework. Weible et al. (2011) further suggest that future research use ACF in comparative policy research; investigate further policy-oriented learning; develop the role of coalition resources; use ACF in conjunction with other theories or frameworks (a statement supported also by Sotirov & Memmler, 2012); and finally, explore issues remaining largely unexplored, including coalition defection, public opinion, self-interest, political opportunity structures, multiple events contributing to policy change, negotiated agreements, and use the framework as a policy analysis tool.

More specifically, Pierce (2011) applies the framework to U.S. foreign policy and the creation of Israel, a subsystem very different to ones dealing with environmental or energy issues. He finds that its tenets hold and more specifically that certain heterogeneity of beliefs exists within advocacy coalitions, while “belief systems of advocacy coalitions may converge to share multiple beliefs with a single advocacy coalition while maintaining their stability” (p. 431). This may indicate the kind of beliefs a future policy change will reflect since the entire subsystem moves in one direction.<sup>4</sup>

ACF has recently been applied to understanding policy dynamics in a variety of country contexts. Maturity of the energy policy advocacy coalition and knowledge management through policy-oriented learning are suggested to be the drivers behind climate policy change in China. Nonetheless the influence of these coalitions on governmental action is a matter of degree (Stensdal, 2012). Policy learning and the dynamic interplay between belief systems and resources are shown to influence Kenya’s biosafety regulatory policy, further broadening the geographies of ACF applicability (Kingiri, 2011). Conversely, in the Irish context, Adshead (2011) points out that it is the “coupling” (p. 77) of internal and external shocks that precipitates policy change. Adshead also highlights the importance of ACF as a comparative public policy tool, thus enabling a national context to be considered at the international level. Winkel and Sotirov (2011) take this further by comparing the national forest programs of Germany and Bulgaria in terms of the effect of such programs in policy core beliefs, policy learning, and the way powerful actors of diverging beliefs used such programs to gain power.

As mentioned earlier, several research articles take up components of the framework with theory development ambitions. The issue of coalition resources, a hitherto less developed aspect of the framework, is investigated by Nohrstedt (2011), who suggests some resources are more important than others thus pointing out the need for thinking vertically when it comes to resource salience. Nohrstedt also highlights the instrumentality of policy entrepreneurs in venue shopping and their part in achieving policy change. Policy entrepreneurs in the form of policy brokers and the role in policy change are investigated by Ingold and Varone (2011). They find that

policy brokers act as mediators seeking compromise between competing coalitions (see also Henry, Lubell, & McCoy, 2011) at times by attempting to prevent coalitions activating veto points; furthermore, self-interest factors in their calculus if they don't have strong beliefs regarding a particular policy.

Beliefs are a central theme of ACF. Methodological insights from policy network research are used to investigate beliefs and their relationship to the formation, structure, and stability of coalitions. Combining ACF with Resource Dependency Theory (RDT), Henry (2011a) finds that people prefer to network with people of similar beliefs while they avoid doing so with people of dissimilar beliefs. However, it appears that the avoidance effect among actors of divergent beliefs is of greater salience than the desire to network with actors of similar beliefs (Henry et al., 2011). Additionally, people do not network with others solely because they seek power, but also because they enjoy networking with people of the same ideology; nonetheless, power seems to be a predictor of network formation among coalitions with similar goals. Matti and Sandström (2011) also find that similarity of beliefs and not the perception of influence has a significant effect on the formation of coalitions.

Individual actors with dissimilar "core" values experience belief polarization when information is exchanged between them (biased assimilation) and that contributes to the emergence—and persistence over time—of polarized networks (Henry, 2011b). What is more, scientists may be more divided than other subsystem participants (Montpetit, 2011). Indeed, Montpetit argues that the scientific world and the world of politics are highly interconnected. This is evidenced in the fact that controversy in a subsystem generated scientific uncertainty. But what if the individuals fall outside the formal subsystem? In other words, how do, for example, citizen advocates structure their thinking about policy issues? ACF's focus is on formal actors and scientists, but Henry and Dietz (2011, p. 248) recognize the importance of individual actors ("the organic gardener, the volunteer wildlife educator . . .") and use it in conjunction with Values-Beliefs-Norms to investigate how individuals form environmental cognition.

Understanding the architecture of beliefs and how they affect the structure of coalitions is a very important aspect of ACF (Ingold 2011), but the interaction among coalitions is not the only driver of policy change. External shocks can alter the course of policy. Albright (2011) argues for the adjustment of the framework to allow for the combination of external shocks (such as a flood) *and* internal shocks (such as democratization in Hungary) to provide the impetus for policy change through policy-oriented learning.

### *Institutional Analysis and Development*

The Institutional Analysis and Development (IAD) framework has its origins in the work of Kiser and E. Ostrom (1982) and seeks to understand the influence of institutions on the behavior of individuals (E. Ostrom, 2007). More specifically, it is a multi-scalar map (E. Ostrom, 2011), which provides common linguistic components necessary to facilitate communication across diverse disciplines including political science, economics, anthropology, geography, law, and social psychology. Additional

features of the framework include multiple, self-governed decision points interconnected by “nestedness”; the importance of rules in incentivizing the actions of individuals; the fallible nature of people and learning through mistakes; and the centrality of choice in institutional change and policymaking arrangements (E. Ostrom, 2007, 2011). Considerable IAD research is devoted to common pool resource theory but that body of work is not within the scope of this article and therefore only articles relating to institutions are included in this review.

The issue of trust is central in IAD as it is in ACF and a great deal of research has already focused on different aspects of it, though Henry (2011c) points out that most of the extant research on trust in highly complex polycentric arrangements that concern sustainability issues has been *trust in actions*. He identifies the need for research in *trust in information*, a very important feature of sustainability debates, where trust in scientific information is crucial. Henry draws from the ACF literature to incorporate research on belief structures in an effort to lay the groundwork for a more robust theory of trust. Such a coupling of frameworks is in line with calls for future research by Weible et al. (2011) as well as Blomquist and deLeon (2011).

Bushouse (2011) asks “what is childcare” (Blomquist & deLeon, 2011, p. 2) and with that as a departure point, moves beyond issues of common pool resources—the most frequent application of the IAD—to examine the delivery of club goods, for example enterprises providing child-care services. By applying IAD, Bushouse attempts to disentangle the many and nested decision-making processes; she goes beyond the sectoral classification (public, private, non-profit) and argues that different constitutional-level choice environments constitute different governance structures. Such a classification is the first step toward a better understanding of the delivery of goods (Bushouse, 2011).

Several articles extend the analytical leverage of the IAD by fusing it with other approaches such as the Local Public Economies (LPE) approach and Social-Ecological Systems (SES) as well as by developing distinct analytical concepts and tools firmly based on IAD (McGinnis, 2011a; E. Ostrom & Basurto, 2011).

*Extending the Institutional Analysis and Development Framework.* Wilderness is the basic good provided in one of two recent articles investigating contextual structural complexity using the IAD in conjunction with an LPE approach. LPE is a research program preceding the onset of the development of the IAD framework, but is underpinned by the same inspirations (McGinnis, 2011b), including the concept of polycentric governance (Oakerson & Parks, 1999; V. Ostrom, Tiebout, & Warren, 1961). First, Oakerson and Parks (2011) focus on the complexity of the regional governance of wilderness areas by conducting a meso-level analysis as an extension of the micro-level work of the IAD. They posit that the added value of conceptualizing protected areas as LPEs is a better understanding of multi-jurisdictional, multi-organizational arrangements comprising the common pool resource contexts.

Polycentric governance and the logic of LPEs also underpin the article by McGinnis (2011a) that introduces the concept of Network of Adjacent Situations (NAAS) as a means of theoretically extending the IAD framework. McGinnis focuses on the core

concept of the framework—the action situation—by exploring the horizontal complexity and interactions among these action situations. In other words, an action situation affects the workings of another at the same level of analysis thus forming a network with polycentricity as a main component (McGinnis, 2011a).

Conversely, E. Ostrom and Basurto (2011) develop a diagnostic and measuring tool to study the evolution of norms and rules. Drawing from the concept of evolution in natural sciences, the authors recognize that change is an integral part of institutions. This tool creates the language to describe the structure of rules at a hypothetical time zero and a later point time in order to track the processes and nature of institutional change. They create a rule classification system based on IAD and game theory exemplified in the relatively small and well-studied milieu of Nepalese irrigation systems with the underline assumption that seven components comprise all human interactions: actors, positions, actions, control, information, outcomes, and costs and benefits. E. Ostrom and Basurto point out that change does not always mean change for the better; understanding how rules change within an institution through conscious and unconscious processes, trial and error, and conflict might combat the top-down, one-size-fits-all rule structure imposition to institutions in developing countries, thus addressing the normative “so what” question.

Conversely, Heikkila, Schlager, and Davis (2011) contribute to the theoretical advancement of IAD by investigating cross-scale linkages with data from 14 interstate river settings in the United States. They envision these settings as social-ecological systems (see Anderies, Janssen, & E. Ostrom, 2004; E. Ostrom, 2007, 2009) and the linkages formed across diverse actors in different levels of analysis are sorted out, analyzed, and assessed using E. Ostrom’s design principles (2007). The authors find that in basins where states faced more severe challenges the linkages were more extensive, whereas compacts with fewer challenges invested less in linkages. What is more, compacts with more constitutional linkages tended to have more linkages established by collective choice bodies. More “quality” linkages were identified around monitoring and collective choice decision-making but less around enforcement and conflict resolution. Indeed there are limits as to the applicability of the Common Pool Resource (CPR) quality criteria in vertical linkages and enforcement and monitoring linkages usually occur vertically.

### *Social Construction and Design*

Normative aspects of policymaking were addressed by the social construction of target population and policy design framework, originally by Anne Schneider and Helen Ingram (1993). Policymakers manipulate, respond to, and perpetuate social constructions of target groups; that is, portions of the population receiving benefits or being burdened by costs, partially because it reinforces the policymakers’ gains of political capital (Ingram, Schneider, & deLeon, 2007). A positively constructed group, for example the military, is deserving of benefits, whereas a welfare queen (single mother, usually of color) is unequivocally undeserving of benefits.



In a recent article, Schneider (2012) applies social construction to analyze patterns of change of punishment policy in American states from 1890 to 2008, a policy area which lends itself to the negative construction of a target population—criminals. The study found that policy change was synchronous and not convergent, meaning that states changed their punishment policy toward the same direction but they kept their relative position vis-à-vis other states. Change in policy happened roughly at about the same time triggered by shocks at the federal level, but not all states have punishment policies of the same level: western and southern states, for example tend to be the most punitive. States' relative position remained the stable over time, which indicates high levels of "feed-forward" effects. Finally, policy learning was not based on rational choices on the bases of policy efficacy, but rather based on the efficacy of political capital stemming from the increasing incarceration rates of the demonized population (Schneider, 2012).

Hudson and Gonyea (2012) apply the social construction of target populations to the aged. They map the shift of the Baby Boomer generation from Dependent to Advantaged and most recently to Contender status. The authors contend that as the image of the Baby Boomer generation fractures, the aged will no longer be a singular political constituency. As the Contenders will continue fight for their benefits, the vulnerability of the Dependents will be reinforced as a group relying on charity for their well being.

The social construction of groups is used together with ACF to understand change in intergroup perceptions over time. More specifically, Weible, Siddiki, and Pierce (2011) ask "to what extent do intergroup perceptions change as contexts change from adversarial to collaborative?" (p. 500). With questionnaire data from the Lake Tahoe Basin spanning over two decades, the authors conducted a quantitative study on social construction of groups, which is part of the added value of this article as most of the research in this field tends to be qualitative. They find that groups will be perceived more positively and more powerfully in collaborative contexts but perceptions take at least a decade to change and they change for all groups, not just the disadvantaged ones. In terms of ACF, the authors find a decrease in the devil shift, meaning that the groups are not as vilified as an earlier point in time, but this is not accompanied by an increase in the angel shift.

### *Punctuated Equilibrium*

Punctuated equilibrium theory (PET) seeks to explain the observation that political processes comprise long periods of stability spiked by points of disequilibrium. The grounding of PET is that the continuity of institutions creates policy stability (Baumgartner & Jones, 1991, 1993; True, Jones, & Baumgartner, 2007), which over time creates a gap between the status quo and observed policy outcomes. The system bursts when exogenous shocks (such as new information) cause dynamic change and throw the system into a positive feedback loop creating a new equilibrium (Breunig & Koski, 2012).

A key question PET seeks to answer is how policymakers prioritize issues they address (vis-à-vis preferences in other frameworks) based on the flow of information

they receive and process. In other words, “PET centers on the collective allocation of attention to disparate aspects of the policy process, and how shifts in attention can spawn large changes in policymaking (Jones & Baumgartner, 2012, p. 17). In applying PET to the allocation of presidential attention, Larsen-Price (2012) finds that when presidents shift their attention toward a specific policy, they often do so using more than one policy tool available to them, *inter alia* executive orders, presidential messages, hearings on proposals, executive orders, and amicus briefs.

PET was developed as a response to the limitations of both the rational and the incremental models of policymaking. Its essence is a trope inspired by the natural sciences (paleontology), which provides an explanatory framework on which to ground empirical observations (Howlett & Migone, 2011; Prindle, 2012). In order to rid the framework from the pitfalls of the metaphor, Prindle (2012) suggests renaming it “punctuated incrementalism”; indeed Howlett and Migone (2011) find incrementalism to be very much a salient component of PET. There is a binary quality in Punctuated Equilibrium as its space is occupied by either incrementally occurring change or bursts. Breunig and Koski (2012) explore both in an attempt to extend PET to state-level decision-making processes. In investigating distributions of state budgets from 1984 to 2009, they find that budget categories that received consistent attention are more likely to show incremental changes, whereas those that are more punctuated show smaller growth in the long run. At the congressional level, Wolfe (2012) similarly finds that media attention contributes to stability and slows down policy-making.

Though theorization and original empirical testing of PET was rooted in American politics, it is increasingly being applied beyond the United States. John and Bevan (2012) create a three-point typology of punctuation comprising procedural changes, high and low salience punctuations using the case of the UK from 1911 to 2008, whereas Alexandrova, Carammia, and Timmermans (2012) confirm that PET applies to the agenda of the European Council. Jensen (2011) integrates it into the Danish setting by exploring how party competition informs the impact of attention shifts that lead to punctuations.

### *Innovation and Policy Diffusion*

Innovation and policy diffusion research focuses on the processes through which a government adopts innovative (new to this particular government) policies. Diffusion literature recognizes that different policy jurisdictions do not exist in a vacuum but instead are influenced by the choices of other jurisdictions. Three main tenets undergird diffusion: first, governmental jurisdictions learn from each other and from policies and programs implemented elsewhere. Second, they compete with each other in adopting policies to gain an economic advantage or avoid being disadvantaged compared to other governmental jurisdictions. Finally, if all these jurisdictions are part of a national context, there is pressure on all of them to conform to national standards (Berry & Berry, 2007). Rather than a single theory, diffusion comprises a set of theories of government innovation sharing common features with theories seeking to explain innovative behavior in individuals as well as organiza-

tional innovation (Berry & Berry, 2007). The related but distinct body of literature on policy transfer is not taken up in this review.

Building on Berry and Berry (2007), Shipan and Volden (2012) identify several points regarding diffusion, salient to both scholars and practitioners. In addition to the claim that governments compete as well as learn from one another, the authors recognize that diffusion is a function of more than geographical proximity, that policy diffusion is not always a good thing, that decentralization is crucial, that politics and government capabilities matter, and that policy diffusion is contingent on the nature of policies. Recent papers have focused on intergovernmental competition, policy attributes, and government capabilities.

Assuming a polycentric environment, the question is not *whether* policies diffuse through intergovernmental competition, but *why*. Drawing from Tiebout's (1956) idea that people vote with their feet, Baybeck, Berry, and Siegel (2011) go beyond the idea that policies from one state spill over to neighboring states because the latter assume a defensive posture (i.e., engage in a "race to the bottom" in welfare policies to avoid attracting low-income people) by constructing a spatially explicit, strategic theory of diffusion. This allows for the conceptualization of a more sophisticated, proactive, and aggressive state competition aiming at attracting "the right kind" of resident.

Interestingly, the intergovernmental competition argument can be turned on its head—policies with measures not easily observable and not likely to diffuse among governmental entities with a high degree of competitiveness (van der Heiden & Strebel, 2012). This leads to an important point in policy diffusion literature, the idea that *what* gets diffused matters. In other words, policy attributes are important when it comes to their adoption by other governmental jurisdictions. Drawing from earlier work by Rogers (2004), Makse and Volden (2011) explore the following five attributes in criminal justice policy in the United States: "relative advantage, compatibility, complexity, observability and trialability" (p. 110). They find that policies diffuse in expected ways contingent to these attributes; "policies with high relative advantages, high compatibility, low complexity, high observability, and high trialability all spread across the states at a higher rate" (p. 122).

Similar are the findings by Taylor, Lewis, Jacobsmeier, and Shapiro (2012) who argue that the dynamics of diffusion are contingent upon the contents of the policy at hand. In investigating gay rights policies, they call for special focus to individual components of complex policies, since they find inconsistencies in their rate of adoption. For example, educational components concerning LGBT education were less adopted than health insurance components, highlighting the need for disaggregated policy analysis. The research of a different kind of morality politics (stem cell research) further reveals that national government intervention during the agenda-setting process can increase the salience of the policy at hand, even if the controversy at the national level remains unresolved (Karch, 2012).

Policy venues and their interaction with policy images are explored by Boushey (2012), who sets forth a new theoretical perspective about diffusion based on ecological models. Theoretically, he fuses research from punctuated equilibrium to address the time component of diffusion and to explain processes leading to "punc-

tuated diffusion dynamics." Methodologically, he draws from management science; using Bass's (1969) mixed influence diffusion parameters, Boushey does a comparative analysis of internal and external influences in 81 policies that have spread across the United States. He finds that "[t]he considerable variation in the speed and scope of diffusion can be explained by the disproportionate allocation of political attention across policy making institutions in federalism" (p. 142). What is more, when issues which are normally the states' prerogative move to the national arena, policy diffusion can take place very rapidly due to federal mandates (Boushey, 2012).

Regardless of the attributes of the policy being diffused, the assumption is, as mentioned earlier, that it is new to the administrative entity at hand—an innovation. Two recent articles investigate the diffusion of innovations, one from a governmental capabilities angle and the second by examining the privatization of government services. More specifically, Bhatti, Olsen, and Pedersen (2011) find that a high concentration of administrative professionals increases the possibility of adoption of innovation as evidenced in the case of Danish Citizen Service Centers (CSC). Additionally, the authors find that municipalities emulate their neighbors and that the more affluent the municipality the higher the adoption rate. Evidence also suggests that the greater the need for an innovation, the greater the possibility for its adoption, but not that the size of a municipality or ideology play any role.

Innovation as an idea is often associated with market competition. Bouché and Volden (2011) compare privatized and government-provided foster care services. They find that there is innovation in both instances, but in different ways; the innovation engendered in the private sector by market competition is counterbalanced by learning across governmental jurisdictions. Additionally, the authors shed light on the fact that a mix of public-private arrangements seems to bring about more innovativeness than any system wholly private or wholly public.

#### *Multiple Streams and the Evolution of Policy Entrepreneurship*

Developed by Kingdon (1984) and synthesized by Zahariadis (2007), Multiple Streams (MS) is based on the garbage-can logic of Cohen, March and Olsen (1972). It seeks to "[explain] how policies are made by national governments under conditions of ambiguity" (Zahariadis, 2007, p. 65). The "lens" as it is mostly referred to by Zahariadis (2007), has five structural components: three distinct streams: policy, problems, and politics; policy entrepreneurs; and policy windows. MS theorizes that policy change occurs when policy entrepreneurs couple the streams during short-lived, propitious moments in time—policy windows.

MS has mostly been applied to U.S. policy making (though see Khayesi & Amekudzi [2011] for an application in Brazil). A recent article by Ackrill and Kay (2011) addresses points perceived to have been theoretically underdeveloped when MS was applied to European policymaking. The authors' departure point is the structure of the Commission, which consists of thematically arranged Directorate Generals (DGs), in the sense that each DG oversees a particular policy area. Ackrill and Kay (2011) argue that ambiguity in the EU context is institutional ambiguity that is, a policymaking environment comprising overlapping institutions lacking a clear



institutional hierarchy. This overlap is conducive to spillovers; even though each DG is responsive for a policy area, policy issues spread across areas and thus across institutional arrangements, DGs in this case. In such an environment the role of policy entrepreneurs goes beyond the traditional role of the “coupler” (Kingdon, 1984), because “skillful entrepreneurs may use endogenous spillover effects to further a certain agenda of policy proposal elsewhere” (Ackrill & Kay, 2011, p. 76). An additional innovative contribution of this article regarding the theorizing of policy entrepreneurs (PEs) is that it explicitly considers them to not only be selling solutions, but also as actors having the power to implement them.<sup>5</sup> The concept of policy entrepreneurs enables MS to explore the role of ideas—which policy entrepreneurs advance—in policymaking without altogether discounting the role of self-interest, which is part of the policy entrepreneurs’ calculus. There has been an explosion in interest in policy entrepreneurship, which has resulted in substantial advances in literature.

The policy entrepreneur emerged as a complementary component of broader theories of policy change including the ones reviewed in this article (Mintrom & Norman, 2009). PE has suffered from conceptual imprecision because the term “entrepreneur” has traveled across disciplines, because it has been used with many modifiers (policy, public, political etc.), and also because PE is as much about the individual actor (entrepreneur) as it is for the process (entrepreneurship). Christopoulos and Ingold (2011) attempt to pinpoint the conceptual differences between a political broker and a political entrepreneur based on the interactions each has with its network based on the hypothesis that brokers promote overall stability whereas entrepreneurs focus on policy outputs.

In most research PE is treated as the independent variable, which means the focus is on its explanatory role in policy change. However, Blavoukos and Bourantonis (2011) explore the structural features affecting the entrepreneurial potential of Chairs in multilateral negotiations in international settings such as the UN, EU, and the WTO. The authors find that the political entrepreneurs perform a cost-benefit analysis based on the mandate and the resources they have, as well as constraints placed upon them.

Two recent articles examine policy entrepreneurship in England and the Netherlands. At the subnational level, Oborn, Barrett, and Exworthy (2011) investigate the role of the individual expert actor in London health-care reform. Highlighting the importance of individual agency, the authors find that the dominant entrepreneur forges alliance between actors and policy communities and works with other actors in multiple levels. One important finding is that though in PE research tends to focus on the individual, entrepreneurial actions are carried out by teams and not just one heroic, lonely individual.

Strategies are the focus of Brouwer and Biermann (2011). How do policy entrepreneurs manage commons resources? Brouwer and Biermann (2011) identify four types of strategies in their research of Dutch water management: attention and support seeking strategies, linking strategies, relational management strategies, and arena (venue) strategies. They argue that use of these strategies by policy entrepreneurs at the right timing could influence the development of policy streams. But

what happens when policy entrepreneurs fail? Hays (2012) outlines Reagan's failure to establish school prayer in the United States. Reagan created the Office of Legal Policy and the Committee on Federal Judicial Selection, which prioritized philosophical and ideological issues in the selection of Supreme Court judges ensuring the appointment of conservative judges. He also established a political deputy in the Office of the Solicitor General thus ensuring "greater advocacy before the Supreme Court" (Hays, 2012, p. 412). The author argues that despite these innovations, the legal system proved too resilient and Reagan's intended change did not pass.

### **Evolving Trends<sup>6</sup>**

The following articles represent evolving trends in the literature. I use "evolving" instead of "emergent" because these theories have been developing by teams of researchers for some time. Institutional Grammar is a methodological tool based on IAD, but versatile enough to be used as an independent method. A drawback of both Institutional Grammar and the Narrative Policy Framework is that the methodological work is time and labor intensive and requires the reconciliation of the work of more than one coder. The Collective Learning Framework and the Policy Regimes Perspective draw on extensive literature to conceptually sharpen policy learning and policy regimes, respectively. Finally, the Robustness Framework, the Institutional Collective Action Framework, and The Ecology of Games Framework all deal—in different ways—with complexity and uncertainty in governance.

#### *Institutional Grammar*

In order to better understand action situations, Crawford and E. Ostrom (1995) devised an institutional grammar, which "provides the means to partition the content of regulation into single statements or directives and then, to identify the major constitutive components of these statements" (Siddiki, Basurto, & Weible, 2012, p. 168). Institutional grammar was revised by Basurto, Kingsley, McQueen, Smith, and Weible (2010) and is the focus of two recent articles. Siddiki, Weible, Basurto, and Calanni (2011) revise the institutional grammar tool (IGT) to include an additional coding component, the oBject. This addition helps separate the action (aIm) from its receiver (oBject). Additionally, in statements where there are two animate actors, oBject can differentiate the one who is doing the action from the one to whom the action is directed. Siddiki et al. (2011) also revise the guidelines for applying the institutional grammar tool and they apply this modified tool to four Colorado State Aquaculture policies. In a later article, Siddiki et al. (2012) test the modified grammar tool further using the same four Colorado State Aquaculture policies seeking to understand regulatory compliance. They find that levels of compliance vary across the interviewees and also within the same interviewee. Additional findings include that compliance levels are influenced by the actors' perceptions of the appropriateness of regulations, feelings of guilt, and feelings of social disapproval (Siddiki et al., 2012). An important statement by Siddiki et al. (2011) regarding the versatility of the IGT was that even though the logic behind it

stemmed from the IAD framework, as it is developed in its present form it is a methodological tool and could be utilized in conjunction with other policy process frameworks and theories, such as ACF.

### *Narrative Policy Framework*

The Narrative Policy Framework is an evolving theory of the policy process investigating the empirical role of policy narratives in the policy process and whether policy narratives influence policy outcomes.

Policy narratives are strategic stories with a plot, villains and good guys, and a moral lesson (Jones & McBeth, 2010; Shanahan, McBeth, & Hathaway, 2011). They can also include adjuvant components such as a plot and a causal mechanism (CM), and narrative strategies, such as the distributions of costs and benefits and policy beliefs (Shanahan, Jones, McBeth, & Lane, 2013). The framework operates at the micro-, meso-, and macro- levels and has three main assumptions: first, it recognizes the centrality of policy narratives on policy processes, especially in light of new media; second, a broad set of actors generate policy narratives; and third, “policies and programs are translations of beliefs that are communicated through policy narratives, the vehicle for conveying and organizing policy information” (Shanahan, Jones, & McBeth, 2011, p. 540). Though the theoretical underpinnings of NPF are interdisciplinary and draw heavily from post positivists like Debra Stone as well as social construction theory, Shanahan, McBeth and Hathaway (2011) move the construct of policy narratives away from post-positivistic research—methodologically speaking—in asking whether policy narratives influence public opinion. They conduct a quantitative study using a quasi-experimental design, the findings of which suggest the following: first, policy narratives can reinforce and galvanize existing opinions held by coalition members, and second, policy narratives have enough influence to convert people who previously held divergent opinions.

ACF has also influenced the architecture of NPF and the two frameworks are most congruent at the meso level, though NPF addressed the lack of attention in “the politics of constructing public policy” evidenced in the established theories of policy process (Shanahan et al., 2013, p. 455). The beliefs that glue advocacy coalitions together are embedded in policy narratives (Shanahan, McBeth et al., 2011); what is more, NPF can identify ways to measure the role of endogenous and exogenous public opinion on the structure of these policy narratives.

In further developing the framework at the meso level, Shanahan et al. (2013) investigate the importance of the devil shift—and its opposite narrative strategy, the angel shift—in the case study of a proposed wind farm off the coast of Nantucket. The authors set out to investigate inter—as well as intra—coalition differences in the use of narrative elements, narrative strategies, and policy beliefs. They find significant intercoalitional differences between the narrative elements of the competing policy narratives. Additionally, they found that the winning side used the angel shift as part of an overall winning policy narrative with prevalent solutions. Whether this was a psychological effect or a purposive strategy was not clear, and the authors identify this issue as an avenue for further research.

*The Collective Learning Framework*

In two recent articles, Gerlak and Heikkila (2011) and Heikkila and Gerlak (2013) build a conceptual approach to define and understand learning at the collective level, a concept which remains fuzzy despite the amount of literature devoted to it. First, Gerlak and Heikkila (2011) used the extreme case of the Everglades restoration program to define the different aspects of learning in policy making and unpack the factors which inform it. Their 2013 work refines this approach. Heikkila and Gerlak (2013) address three main challenges: first, they define and distinguish between the process of learning and the products of learning; second, they investigate the differences between individual and group learning; and third, they identify factors fostering or inhibiting learning.

The authors recognize that the internal characteristics of a collective environment, namely the institutional structure, social dynamics, and the technological and functional domain (all influenced by rules and norms) in conjunction with individual learning and exogenous factors (political, economic, and social changes) influence the collective learning process. This process consists of acquiring, translating and disseminating information and leads to cognitive and/or behavioral learning products. A decentralized, flat structure with open social dynamics featuring trust would be more conducive to learning than a centralized structure with social dynamics characterized by suspicion, for example. However, learning in the policy environment is not a linear process, it does not automatically lead to change and even if it does, it does not mean that change is good. This is a conceptual framework; Heikkila and Gerlak (2013) call for more work refining operationalization and developing tools to measure change.

*Beyond Subsystems: Policy Regimes*

The regimes approach centers on the interplay between policies and politics (May & Jochim, 2013) rather than being a tool aimed at measuring (policy) change. Moving beyond subsystems, policy regimes are conceptualized as “the governing arrangements for addressing policy problems” and may include “institutional arrangements, interest alignments, and shared ideas” (May & Jochim, 2013, p. 428). Ideas are the glue that holds the regimes together, much like beliefs are the glue of subsystems. The policy regimes perspective starts with the policy problem; as a descriptive lens it works backwards to map the governing arrangements for addressing this problem. As an analytical lens, the policy regimes proposes that the stronger the regime, the greater the levels of policy legitimacy, coherence, and durability.

May, Jochim, and Sapotichne (2011) find that the homeland security policy regime is weak, contributing to policy uncertainties and instability. Strength in boundary spanning (ones crossing traditional subsystems) regimes like this one is desired, but it has to be noted that strength does not mean “good” policy in normative terms, just like policy change is not always “good.”

Worsham and Stores (2012) illustrate the flexibility of boundary-spanning regimes. Drawing from PET, subsystem theory, and the policy regimes approach, they explain the elasticity of the subsystem and its ability to absorb demands giving the appearance of stability by investigating how the agriculture policy subsystem in the United States had been able to resist the civil rights policy regime and effectively discriminate against African American farmers.

Finally it has to be noted that the regimes perspective requires authoritative (governmental) action and is not an appropriate tool to analyze private governing arrangements. What is more, at this time it is used in the American policy environment and more work is needed to advance methodological aspects of the framework.

### *Robustness of Social-Ecological Systems*

Anderies and Janssen (2013) ask how we can reconcile a policy process mostly understood as fairly stable and static over time with constructs such as globalization, fluidity, lack of fixity over time and space, and complexity of systems. They argue that current policy contexts, especially ones related to environmental and common pool resource (CPR) problems, change far too rapidly. To accommodate this flux, they develop the Robustness of Social-Ecological Systems. This framework builds on IAD premises and moves SES forward by focusing on the understanding of fundamental feedback mechanisms that promote the robustness of a system, thus allowing it to be flexible in order to withstand uncertainty and change. An SES is more robust when there is a good “fit” between institutional arrangements and ecological dynamics. This makes the translation of legal rules to rules-in-use more efficient and alleviates monitoring problems. What is more, comparative analyses of systems reveal that redundancy of regulatory mechanisms, modularity of a system, and diversity in agents and connections (all understood in a polycentric governing arrangement) promotes robustness. Such scalability and flatness promotes that idea of policy experimentation—policies can be tried first in a simpler system and if they succeed can be adopted by a more complex one. What is more, a key lesson from this framework is that much like when striving for sustainability, there are always trade-offs; a system cannot be robust in its entirety and making policies to increase robustness implies that a decision be made about which vulnerabilities to address in the short or long term.

### *Institutional Collective Action Framework*

Why do overlapping jurisdictions choose (or not) to cooperate and what does that mean for the efficient provision of public goods? The Institutional Collective Action framework (ICA) draws heavily from collective action literature and from a variety of theoretical backgrounds to address the externalities of choice in fragmented and overlapping jurisdictions. Without mechanisms facilitating cooperation, local actors will act with their short-term interest in mind and these decisions will be collectively inefficient. Feiock (2013) maps the relationship between dilem-



mas of collective institutional action with the mechanisms that mitigate those dilemmas and provides a taxonomy of collaborative mechanisms on a scale of how formally they are structured—socially embedded, contracts, delegated authority—and in terms of the their institutional scope—bilateral, multilateral, collective. Transaction cost related to entering and exiting collective arrangements are higher when participation is mandated by a governmental authority and lowest when participation is voluntary. At the same time, the more encompassing and authoritative the collaborative mechanism, the more effective it is; ICA argues that “participation incentives are determined by the net expected benefits from the mechanism” (Feiock, 2013, p. 408). Recent empirical work in American and international settings (see for example Andersen & Pierre, 2010; Park, 2012; Tavares & Camões, 2007) has demonstrated the versatility of the framework including work on the non-profit and volunteer sectors.

### *Ecology of Games Framework*

Lubell (2013) addresses complexity by tackling more than one policy game (venue) at the same time. Drawing from Long’s (1958) “ecology of games” concept, Lubell presents a cumulative, synthetic, hybrid theory extending IAD and LPE and more broadly the idea of polycentric governance. The Ecology of Games framework (EG) contributes to the concept of polycentric governance by producing testable hypotheses, by analyzing the causal mechanisms of institutional change, and by taking a systems view in the understanding of how different institutional arrangements link to policy outcomes. Similar to ICA, Lubell addresses fragmentation in governance and externalities imposed on one entity by decisions made by another. Lubell (2013) highlights the positive aspects of this fragmentation by noting that it creates “an evolutionary niche” (p. 547) in which institutions can take advantage of positive externalities and ameliorate the negative ones.

### **Conclusions**

This article reviewed research relating to established theories of policy process largely published in 2011 and 2012. It included new theories published in 2013. The reviewed literature suggests that the established theories of the policy process continue to generate scholarship moving these theories forward at times by synthesizing them. It also suggests that the structure of these theories allow for theoretical and methodological extensions. Finally, most of the trends evolving into new theories have their intellectual roots in the established theories and are the product of teamwork.

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## Notes

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1. Here the terms are used largely interchangeable, notwithstanding the conceptual differences among them.
2. I included the 2013 PSJ special issue outlining six new theories of the policy process because of its timing and subject matter even though technically speaking it was outside the time frame of the review.
3. I included a report from a research institute because I judged it to be an interesting application.
4. Pierce touches on social construction theory, but this article is mainly a study of ACF.
5. In the economic literature, McCaffrey and Salerno (2011) argue for an ideal type of political entrepreneur who owns the resources instead of mobilizing them; that is, possesses all decision-making authority.
6. Note that this is not an exclusive list of evolving trends in the literature.

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## Empirical Innovations in Policy Analysis

Grant Blume, Tyler Scott, and Maureen Pirog

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*In this article we survey the field of policy analysis from two perspectives. First, we discuss recent arguments made for and against the use of random assignment in social experimentation and policy analysis. Second, we argue that data, not methods, are driving policy analysis innovation. We review the benefits and drawbacks of three types of data—administrative data, spatial data, and Big Data—and discuss the role, or potential role, each plays in extant policy analysis. We end with a comment on what we believe are the future directions and areas of growth for the field of policy analysis in coming years.*

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**KEY WORDS:** policy analysis, random assignment, administrative data, GIS, Big Data

### Introduction

The study and analysis of public policy continues to mature in the United States and around the world. Public policy as a field of study has been the only new academic discipline added to the National Research Council in the past 25 years. Close to 300 programs in public policy, public affairs, and public administration are currently offered at American colleges and universities (NASPAA, 2012). The Association of Public Policy Analysis and Management (APPAM) at present has over 2,000 individual members from countries worldwide (personal correspondence with APPAM Executive Director, 10/22/2013). In the past year, the contact authors for roughly one-third (32.5 percent) of over 500 submissions to the *Journal of Policy Analysis and Management* (JPAM), a journal focused on policy analysis and policy research, were from authors in foreign countries, with this percentage sharply higher if the residence of co-authors is taken into account. The discipline of policy analysis is clearly recognized globally.

The scholarly dissemination of research is a critical aspect of public policy's development as a discipline. Much of the applied research on public policy falls under the broad category of *policy analysis*. Textbooks and "how to" guides on the topic of policy analysis have been used in the training of students and practitioners for decades. Academic journals such as the *Policy Studies Journal* and JPAM provide outlets for high-quality empirical policy analysis. Government agencies, foundations, nonprofits, and advocacy groups also generate a wealth of policy analysis although the quality varies widely.

A distinction exists between the empirically oriented analyses conducted by scholars of public policy and management, which are typically published in academic journals and books, and the types of public policy analysis regularly conducted by practitioners and policymakers themselves (which are generally found in white papers, agency reports, and other organizational publications). Weimer (2009) distinguishes between “policy research,” which has the “express purpose of informing . . . policy,” and “policy analysis,” the purpose of which is to “assess systematically the alternative policy choices that could be made to address any particular problem” (p. 93). In light of these definitions, the research we discuss in this review could be labeled “policy research.” On the other hand, the focus of our analysis is not on the research itself but rather we focus on the broader changes in how public policies are analyzed. Applied policy analysis and policy research are evolving in concert in terms of the sources and means of acquiring data and developing methodologies. Thus, since we intend to speak to new developments in the analysis of public policies, whether to test prevailing theory or to identify the best policy alternative, we hereafter use the term “policy analysis” to connote this broader field of both policy research and analysis.

Conventional discussions of policy analysis trends often discuss the emerging econometric techniques used to tease out causal relationships between a policy and its effect on an outcome of interest. We take a different approach here by first looking at how our understanding of randomization is evolving, and then at how new types of data used in policy analysis have the potential to disrupt and transform the status quo. In light of the diverse sources and types of nonexperimental data we highlight in this paper, we base our analysis of data trends on the following question: *What data are available to carry out empirical policy analysis and what are the trade-offs of such data?*

We consider the topic of randomized experiments relevant to any discussion about trends in policy analysis driven by the proliferation and development of data. The issue of experimentation and random assignment typically frames the discussion and understanding of experimental and nonexperimental methods alike, and shapes how we assess the validity and usefulness of all data. Thus, any discussion of data is largely indivisible from that of social experimentation and random assignment. To that end we first summarize a recent debate waged in the pages of *JPAM* on the role of social experimentation and policy analysis. We then segue to our discussion on three types of data that are driving innovation in policy analysis: state and system-wide administrative data, spatial data (particularly related to the use of geographic information systems [GIS]), and Big Data. Finally, we conclude with a discussion of future directions and areas of growth in the field of policy analysis and policy research.

### Policy Analysis and Random Assignment

Experiments and random assignment are not new to policy analysis. What is new, however, is the increasingly heated debate over the extent to which randomized controlled trials (RCT) ought to take precedence over other research designs using

either quasi-experimental or observational approaches. This debate is rather complex; most scholars agree that randomized controlled trials constitute the “gold standard” for identifying causal effects but take issue with one another over the extent to which: (1) scholars should prioritize the use of random assignment; (2) credence should be given to analyses based upon observational data; and (3) the collective focus on random assignment may neglect important research questions for which randomization is not feasible.

The debate over random assignment in policy research was recently hashed out in “Point/Counterpoint” exchanges between Robinson Hollister and Richard Nathan and subsequent reader responses published in *JPAM* over two issues (27[4] and 28[1]). The framework for the debate was based on four questions posed at the outset of the “Point/Counterpoint” exchange:

1. What is the proper role for random assignment social experiments, and how widely should they be used?
2. Are there alternatives to random assignment that are nearly as good?
3. What are the best and worst experiences in applying random assignment to social policy?
4. Looking ahead, what are priority areas for social experiments?

Initially, Hollister argued in favor of random assignment while Nathan took a more nuanced approach, essentially concluding random assignment as a “proper, but limited role” in policy research (Nathan, 2008a, p. 410). We summarize a few of the most salient points about randomization made in the “Point/Counterpoint” exchange here and encourage readers to review articles in the debate for a more in-depth discussion on the topic (e.g., Berlin & Solow, 2009; Cook & Steiner, 2009; Greenberg, 2009; Hollister, 2008, 2009; Nathan, 2008a, 2008b, 2009; Pirog, Buffardi, Chrisinger, Singh, & Briney, 2009; Wilson, 2009).

Fundamental disagreements emerged in the Hollister-Nathan debate on the use of random assignment and experiments. One of the main areas of disagreement revolved around the extent to which random assignment ought to take precedence over other methods of policy analysis. Hollister argued that random assignment experiments should be the “method of first resort” whenever “one wishes to assert that the estimated impact is caused by the policy or institution” (Nathan, 2008a, p. 402). Nathan (2008b) countered that an “over-reliance on randomization” has “crowded out valuable nonexperimental types of public policy research” including implementation research, process evaluation, and policy analysis concerned more with societal trends carried out by demographers, political scientists, historians, and sociologists (p. 608).

Another point of discord was the perceived cost of conducting randomized experiments. Of claims that experiments are more expensive than nonexperimental methods, Hollister notes “that this simply is *not true*” (Nathan, 2008a, p. 404, emphasis his). Nathan (2008b) responds to this contention with unease and points out that Institutional Review Board processes, managing treatment and control groups, and

collecting in-program and post-program data are all processes which are “time consuming and expensive” (p. 609). Greenberg (2009) also weighs in on this question of costs associated with policy experiments and concludes that “the experimental approach would not usually be much more expensive than nonexperimental estimation” (p. 174) although he cites no evidence to support this point. These unsubstantiated claims about experiments’ costs on both sides of the debate demonstrate that an empirically driven study of experiments’ costs and benefits would make a valuable contribution to our field.

Hollister and Nathan agree on little but a few points emerge on which they concur. Both agree that the much-exalted Perry preschool experiment is one of the worst examples of random assignment due to design flaws and unreliable estimates (Nathan, 2008a, 2008b). The authors also agree that most statistical alternatives to random assignment are problematic with the exception of regression discontinuity designs, which they consider “a promising alternative to random assignment” (Nathan, 2008b, p. 608). Others (Cook & Steiner, 2009; Pirog et al., 2009) also respond to this question of viable alternatives to random assignment. Cook, Shadish, and Wong (2008) and Cook and Steiner (2009) identify ways in which carefully designed analysis can furnish valid causal conclusions from observational data. However, in the Point/Counterpoint section, Cook and Steiner (2009) also note that the requisite conditions for such approaches “are not common” (p. 165), require “more numerous and more opaque suggestions” (p. 166), and that most observational analyses do not use such approaches. Pirog and colleagues (2009) find that “regression discontinuity designs can replicate some random assignment studies” but statistical corrections in general “do not uniformly and consistently reproduce experimental results” (p. 171). Finally, Hollister and Nathan agree that the Institute for Education Sciences’ (IES) focus on empirical policy analysis (a topic discussed by Carlson, 2011) is valuable although Nathan (2008b) expresses concern that a focus on randomized experiments comes at the expense of nonexperimental research in education.

Berlin and Solow (2009) astutely point out that a debate on the merits of random assignment misses the key question, “What do policymakers need to know and what methods are most appropriate for answering their questions?” (p. 175). In other words, scholars designing and carrying out policy analysis should employ the best method available, whether random assignment or a statistical correction thought to closely approximate random assignment (see Cook et al., 2008; Shadish, Clark, & Steiner, 2008), to address important and interesting policy-relevant questions. We agree with Berlin and Solow’s stance, but we would modify this question to instead ask, “What do policymakers need to know, what methods are most appropriate for answering their questions, and *what data are available to carry out empirical analysis?*” We turn now and focus on this third point, the question of what data are available for policy analysis, for the remainder of this article.

### Data Matter in Policy Analysis

In this article we examine an ongoing shift in policy analysis from an emphasis on how we analyze data to a focus on how we create, gather, and manage data. The



basic goal of policy analysis is to examine the “true” effect of a given policy intervention. The fundamental challenge, however, is that unlike laboratory test tubes or other traditional experimental mediums, no two individuals, households, wetlands, cities, schools, or any other object of policy analysis can be considered identical. Thus, policy analysis must always contend with unobserved counterfactuals: (1) what would have happened had the untreated subject received the policy intervention? and (2) what would have happened had the treated subject not received the policy intervention? Holland (1986) famously refers to this as the issue of counterfactuals as the fundamental problem of causal inference.

In the traditional policy analysis paradigm, analysts and policy scholars have sought to answer these questions using methodological strategies intended to remedy the flaws and shortcomings of existing data. Thus, various econometric techniques and other complex statistical methodologies have proliferated in recent decades as means by which to deal with incomplete, insufficient, or potentially biased data. For instance, imputation techniques have been developed to address incomplete or missing observations (Allison, 2001; Enders, 2010; Rubin, 2004). Likewise, econometricians have put forth methods such as instrumental variable (IV) models and propensity score matching (PSM) to deal with estimation problems related to selection bias, nonrandom treatment assignment, and other violated model assumptions. Policy analysts continue to hone and use such techniques. The recent policy analysis literature continues to produce state-of-the-art examples of this (Dahan & Strawczynski, 2013; Frumkin et al., 2009; Kim, 2013; Yörük, 2012).

However, while IV models, PSM, and other techniques attempt to compensate for nonrandom selection, there is little evidence that these advanced methods, for all of their complexity, are able to compensate for flawed research designs (Couch & Bifulco, 2012; Pirog, 2009; Pirog et al., 2009). It is important to distinguish in this case between *issues pertaining to data* and *issues pertaining to research design*. Imputation techniques, for instance, are intended to account for problematic data (i.e., data that are missing, incomplete, or inaccurate). In the case of methods such as PSM, the data are not necessarily flawed in the sense of being incomplete or inaccurate; rather, these research methods are not necessarily able to mitigate the potential of endogeneity amongst treatment and response variables even with the most accurate and complete data. In this way, we observe that data and research design are intimately related, as policies and programs are increasingly implemented with a careful focus on the data that will be produced and how it will be analyzed. Scholars are also striving to leverage data more effectively by making them more accessible and more compatible, and using new types of data to measure policy outcomes of interest. As we describe in this paper, these efforts take many forms.

First, many scholars and analysts are taking advantage of advances in data storage and accessibility in ways that even a few years ago were unfeasible. Researchers from across the country and the world are able to remotely access data held by state agencies and even county and city governments. In many cases, these data contain identifiers that allow analysts to combine data from different sources. Further, analysts and administrators alike increasingly design and implement poli-

cies and programs with policy analysis in mind. Thus, policies and programs are producing data that are more extensive, accurate, and accessible.

The policy analysis community has also begun to recognize that many—if not all—policies have a significant spatial component. In other words, the distribution and location of subsidized housing, schools, or animal preserves matters greatly; simply treating each observation as independent of one another can thus prove misleading. In particular, neighboring schools, jurisdictions, property owners, or even neighborhoods themselves greatly affect each other's outcomes. Thus, policy analysts are increasingly using geographic information systems (GIS), spatial data, and spatial modeling approaches to analyze policies. These analyses are better able to account for effects related to space and place that elude traditional statistical analysis. In what follows, we discuss these trends in greater detail. We also discuss a new type of data, Big Data, as well as its associated methods, which we believe will become a critical tool for policy analysts in future years.

### **Data, Not Methods, Are Driving Policy Analysis Innovation**

In this section we first examine the use of state and system-wide administrative data in policy analysis. State efforts to collect detailed records for all program participants in areas such as healthcare, education, and social services provide researchers with a vast store of data. Second, we examine the use of spatial data and geographic information systems (GIS), which enable analysts to link diverse data sets and better account for spatial relationships. Third, we tackle the topic of Big Data, the U.S. government's initiatives to promote Big Data, and its potential role in policy analysis. We present these three types of data in the order for which we find the greatest amount of existing policy analysis. In other words, we find the most examples of policy analysis using administrative data, far fewer examples of policy analysis using geographic information systems, and no policy analysis that yet leverages Big Data. We include Big Data, however, because we are certain that policy analysts are on the cusp of harnessing its significant potential.

#### *Administrative Data*

The use of administrative data is not new *per se*. Administrative records from state and federal agencies have been a data source of policy analysis for decades. What is new, however, is the growing effort by states to collect vast amounts of data, link records across multiple data sources, and provide these data to researchers for policy analysis. This innovation in administrative data collection answers the call made long ago by Jabine and Scheuren (1985) for public agencies to design internal "data systems [that] facilitate links with other systems" (p. 387).

Statewide longitudinal data linked across multiple agencies remedy a primary challenge relative to the use of national data for policy analysis. Whereas national data sets rely on a representative sample of the population, a statewide longitudinal data set typically contains records for either: (1) all residents in the state where program participation is the variable of interest; or (2) all participants in a program

where program characteristics are the variables of interest. Longitudinal data provide a significant advantage in that they track outcomes for a given set of observations over time, allowing researchers to identify long-term effects and thus provide a more comprehensive understanding of policy impacts. Current efforts to create and maintain longitudinal datasets are focused at the state level; in fact, federal funding is often provided to state agencies to support development of administrative datasets at the state level. This is why, though Ha and Meyer (2010) acknowledge that their study of child care credits in Wisconsin is limited by using data from only one state, they argue that “state administrative data are the most reliable type of data to examine the dynamics of subsidy use and factors associated with it” and go on to note that, “no national survey data exists that include detailed individual-level information about families’ monthly receipt of subsidies, employment patterns, and earnings in a longitudinal form” (p. 348).

Efforts to link individual-level records are increasingly common in education and workforce-related research. This trend is largely attributable to the Statewide Longitudinal Data Systems (SLDS) Grant Program authorized by the Educational Technical Assistance Act of 2002 (ETA) and later bolstered by the American Recovery and Reinvestment Act of 2009 (ARRA). In 2005 the Institute for Education Sciences (IES) began awarding competitive grants to states. All states by 2013 had received an SLDS grant except Wyoming, New Mexico, and Alabama (NCES, 2013a). A similar effort to encourage states to collect administrative data across agencies was introduced in 2009 by the U.S. Department of Labor. The Workforce Data Quality Initiative (WDQI) focuses primarily on workforce longitudinal data systems although efforts include matching individual records to education data. WDQI is a smaller program than SLDS: By 2013, 31 states had received a total of \$31 million in WDQI grants whereas more than \$300 million in SLDS grants has been awarded to 47 states (NCES, 2013c). Additionally, the U.S. Department of Health and Human Services’ Administration for Children and Families (ACF) program has provided funding to enhance states’ TANF and related administrative data for operational, administrative, policy development, and research purposes (Wheaton, Durham, & Loprest, 2012).

Washington State provides a representative case study in examining how data are linked across agencies. Washington received approximately \$23 million in SLDS funds in 2009 and a \$1 million WDQI grant in 2012 to design and implement a data sharing system across the state’s agencies (NCES, 2013b). Housed in the state’s newly created Education Research and Data Center, these data linked records across eleven state agencies (Table 1). The resulting data from this collaboration across agencies provides a rich set of variables for analysts to use in measuring policy effects in Washington.

Unfortunately, Washington’s relatively recent receipt of federal support for longitudinal data systems means there is little published policy analysis using these data.

Policy analysis using administrative data is common (Mueser, Troske, & Gorislavsky, 2007) but to highlight the extent to which researchers leverage the potential of states’ administrative records we turn to recent policy analysis con-

**Table 1.** Agencies Contributing Administrative Data to Washington's Longitudinal Data System

State Agency	Type of Information
Administrative Office of the Courts	Name change
Department of Corrections	Incarceration
Department of Early Learning	Pre-kindergarten program participation
Department of Health	Incarceration, marriage, divorce, and death
Department of Licensing	Driver's license
Department of Labor and Industries	Wages, participation in apprenticeship programs
Department of Retirement Systems	Retirement status (for public employees)
Employment Security Department	Unemployment insurance wage data, unemployment insurance claimants, workforce program participation
Office of the Superintendent of Public Instruction	K-12 student demographics, school enrollment, and learning outcomes; various teacher-level data
State Board for Community and Technical Colleges	Student-level enrollment, achievement, and outcomes data for all community colleges
Washington Student Achievement Council	Student-level enrollment, achievement, and outcomes data for all public universities

Source: ERDC, 2013.

ducted by Colman and Joyce (2011). In their study of the effects of a Texas law (the Woman's Right to Know Act) on abortion rates after 16 weeks' gestation, Colman and Joyce (2011) collected individual-level abortion records from the Texas Department of State Health Services and the states surrounding Texas from 2001 to 2006 to determine the law's effect. The data involved in this analysis were staggering; the authors collected 451,174 records of Texas residents and to those data added information on the number of abortions obtained by Texas residents in Arkansas, Kansas, New Mexico, Oklahoma, Colorado, Mississippi, Missouri, and Tennessee (p. 781). Census data were also used to provide population estimates by year, state, age, and gender. The authors concluded that the law led to an 88 percent drop in abortions at or after 16 weeks and a quadrupling of the number of residents who left Texas to obtain the procedure in neighboring states (p. 775). These findings, with clear implications for state and federal policymaking, demonstrate the value of empirical policy analysis based on vast stores of administrative data.

### *Geographic Information Systems*

Geo-spatial data are another way in which increased data accessibility and capabilities are motivating the evolution of policy analysis. Analysts and policymakers increasingly recognize that location—both place-specific context and spatial relationships amongst places—play a highly significant role in policy effects and outcomes (Wise & Craglia, 2008). Perhaps more importantly, analysts increasingly have access to data, resources, and tools that can address such issues. While geographic information systems, or GIS, are certainly not new, mobile technology, web applications, and data storage advances have served to make GIS a tool that policy analysts can leverage without needing access to certified GIS technicians or expensive personal software licenses. Further, increased spatial data production and availability enables

analysts to conduct spatial analyses such as geographically weighted regression and use geocoding to spatially link observations and covariates. This latter effect is where we observe recent growth. Many policy analyses take advantage of geocoding to incorporate disparate databases and leverage this additional information. This follows the wider trend noted by Masser (2010), that current emphasis on spatial data within the realm of policy analysis is primarily related to making spatial data accessible to a wider range of users and enabling linkage between different databases and different types of data.

As an example, consider Nelson's (2010) analysis of the relationship between credit scores and residential sorting. The residential sorting model used in this study requires that individual household and property data be linked to local neighborhood attributes. Nelson (2010) accesses a mortgage data set of 16,805 observations from a Southern California bank. Traditionally, Nelson might have used the census tract code associated with each mortgage and simply linked observations to tract-level attributes. However, tract-level data would be suboptimal considering the kinds of highly localized, neighborhood-specific effects attributes that are hypothesized to influence residential sorting.

Armed with the actual address of each house, however, Nelson uses GIS software to link each mortgage to neighborhood-specific socioeconomic data. These covariates in turn truly tell the story of how spatial data (and GIS software) have transformed the way we do policy analysis. Nelson (2010) links each mortgage to: (1) local school quality metrics from the California Board of Education Datasets (CBEDS), (2) private school availability data from the California Private School Directory, (3) school-district specific home data from the School District Data Book, (4) aggregate property-type data from observed mortgages, (5) racial composition data from CBEDS, (6) land use data from the California Fire and Resource Assessment Program, (7) crime incidence data from the California Crime Index, and (8) weather and air quality data from RAND Corporation. In the end, Nelson (2010) is able to demonstrate that credit scores are a major driver of residential sorting "over and above income" (p. 64). Credit scoring practices "disparately impact racial minorities" (p. 64), thus heightening residential segregation. This level of analysis is only feasible due to the geo-code identifiers associated with each observation. These data enable Nelson to link observation to specific on-the-ground place and to account for the relative geographic location of each observation. (We also note that these data are another salient example of the extent that researchers leverage administrative data from multiple sources.)

Enabling a finer spatial scale is not the inherent value presented by GIS data; in fact, many of the datasets from which Nelson fits covariates into the model are of a scale greater than census tracts. Rather, the benefit of this approach is in using the spatial location of each observation to account for the spatial distribution and relative location of each observation (as opposed to linking each data point to a unique nominal identifier of any scale, such as by school district or street corner). In particular, given that residential sorting is itself a spatial process in that the composition of adjoining neighborhoods are not independent of one another, analyzing these data in a spatial framework is key to understanding policy effects.



The ability to model the spatial distribution of observations and use geocoding to link disparate datasets is a powerful development but the type of data contained in GIS is an additional tool which enhances the capacity of policy analysis. Whereas traditional datasets represent information using numbers (e.g., age, test score, tons of carbon released) or perhaps character strings (e.g., city, college, species), GIS store data as points, lines, and polygons. For instance, houses or high schools are stored as points (each with an associated geocode reflecting its physical location) with associated attributes (e.g., population, number of students) attached. Rivers, highways, or public transit routes are stored as lines. States, watersheds, or school districts are then stored as polygons, representing their spatial extent. This is a completely different way of representing the world and thus enables new dimensions to policy analysis.

Andersson and Gibson (2007) represent this new dimension in spatial policy analysis by using GIS to analyze how decentralized governance impacts deforestation in Bolivia. Andersson and Gibson (2007) compare satellite land cover and land use imagery from different time periods, overlaying these images on a polygonal representation of local jurisdictions to examine how municipal governance characteristics (property rights, technical capacity, field presence) drive—or prevent—deforestation. Since the Landsat<sup>1</sup> data are images, it simply would not be feasible to conduct this analysis using a traditional municipal dataset, which might simply contain an indicator for each municipality and associated covariates such as land size, governance type, etc.; thus, GIS—and their ability to represent the spatial extent of various phenomenon—are critical. GIS is used to develop several different dependent variables for this analysis, including a measure of all deforestation between 1993 and 2000, a measure of deforestation on lands specifically designated for other allowed usages (using an overlay of land ownership and land use zoning), and a measure of deforestation on protected lands (using as similar overlay). Since GIS enables Andersson and Gibson to treat municipalities as polygons, instead of simple observations, they are thus able to examine how cities perform on each of these measures. This allows Andersson and Gibson to conclude that local institutional structure and performance affects unauthorized deforestation, but has little effect on either permitted (i.e., authorized) or total deforestation (Andersson & Gibson, 2007, p. 99). These findings highlight the critical role that GIS plays in this analysis. Since *total deforestation* was largely invariant across localities and unauthorized deforestation obviously does not show up in standard administrative data, Andersson and Gibson would not have been able to analyze the role of local institutions without the ability to map and account for deforestation using remote sensing and GIS analysis. In this vein, it is important to note that using GIS does not mean that analyses are limited to presenting maps and figures; GIS enables analysts to conduct robust statistical analyses. In fact, the Andersson and Gibson (2007) example above does not present a single figure, instead using statistical features available within GIS to produce quantitative metrics representing spatial outcomes, which Andersson and Gibson then use within a series of two-stage least-squares regressions.

These examples demonstrate that GIS is enabling policy analysts to address questions using analyses that previously were not feasible. We may not think of

public policy as “spatial” but in reality virtually all policy interventions are affected both by specific place-related contextual factors as well as factors related to neighboring places. Thus, we observe similar analyses related to land-use regulation and rental housing (Schuetz, 2009), job creation and business enterprise zones (Kolko & Neumark, 2010), traffic congestion pricing (Hårsman & Quigley, 2010), mapping jobs to urban ethnic enclaves (Liu, 2009), spatial regression of mortgage assistance program effects (Di, Ma, & Murdoch, 2010), and hazardous waste enforcement in low-income and higher minority locations (Konisky, 2009).

The use of GIS and spatial data are highly prevalent in disciplinary journals. GIS-based policy analyses are published frequently in geography-related journals, such as the *Journal of Transport Geography*; for instance, Macharis and Pekin (2009) analyze how transportation regulations and related policies in Belgium affect the intermodal transportation market. Such analyses are by no means limited to geographically oriented journals, however. In the *Journal of Forest Policy and Economics*, Gaither et al. (2011) use GIS to mesh spatial data concerning social vulnerability and wildland fire vulnerability in the southeastern United States to identify “hot spots” of vulnerability and assess how mitigation programs compare inside and outside of these particularly vulnerable areas.

Also worth noting is the development of journals specifically oriented towards the use of spatial data in policy analysis, such as the *Journal of Applied Spatial Analysis and Policy*, first published in 2008. In a recent article, Buckner, Croucher, Fry, and Jasinska (2013) examine how demographic change in Northern England will impact existing infrastructure for housing and health care (such as long-term care facilities and assisted living homes). A more traditional analysis might assess the number of “beds” or “rooms” available in comparison to projected demographic numbers. However, the location of services also plays a considerable role in determining policy sufficiency and effectiveness. The use of spatial data allow Buckner et al. (2013) to compare the spatial distribution of social services and care facilities with the spatial distribution of people who need—or are projected to need—such services, thus providing a more nuanced picture of capacity and infrastructure challenges.

### *Big Data*

The term “Big Data” represents multidimensional information, often on a massive scale, that is difficult to process or analyze using conventional empirical and statistical tools (Eaton, Deutsch, Deroos, Lapis, & Zikopoloulos, 2012). Two factors have driven the exponential growth of Big Data in recent years. The first factor is digitization. The digitization of images, video, environmental sensor readings, online behavior, purchases, social media, and smart phones (to name a few) generate billions of datum each day. The development of cloud computing is the second factor driving Big Data. When data exist “on the cloud” the data are housed across networks instead of in a single physical location. Cloud computing has expanded the storage capacity of data beyond conventional measures. Indeed, Bollier (2010) observes that part of the enthusiasm around Big Data has been on storage capabilities and less about “superior ways to ascertain useful knowledge” (p. 14).

Eaton and colleagues (2012) present three characteristics of Big Data—volume, variety, and velocity—that are useful in distinguishing Big Data from the conventional data used in extant policy analysis. We briefly discuss each of Big Data's characteristics then turn to a discussion of Big Data and policy analysis.

The volume of Big Data verges on incomprehensible. Consider that kilobytes ( $10^3$ ) describe the number of bytes in a typical word processed document and a CD-ROM holds 600 megabytes ( $10^6$ ) of data. Big Data are measured in terabytes ( $10^{12}$ ), petabytes ( $10^{15}$ ), exabytes ( $10^{18}$ ), and yottabytes ( $10^{24}$ ). To contextualize these figures, in early 1997 the entire World Wide Web contained approximately two terabytes of textual data (Lesk, 1997, p. 218); in 2013, Twitter users generated more than three times this amount of data (7 TB) *each day* (Eaton et al., 2012, p. 5).

Big Data's structure, or lack thereof, is another distinctive characteristic. Standard quantitative data used in policy analysis and econometrics is relational. Relational data are information stored in tables as rows and columns where values in certain cells may link to additional tables. Nonrelational data do not fit this model. Instead, the term nonrelational captures the text, environmental sensors, video and audio, and transactional data that are dynamic and not easily categorized in rows and columns. This variety presents obvious empirical challenges for traditional policy analysis.

"Velocity" is the third characteristic that separates Big Data from conventional policy analysis data. In a given data-collection effort for traditional policy analysis a researcher would likely focus on the rate at which data were accumulating. This accumulation of data, and ultimately reaching a certain amount of data (i.e., a pre-determined sample size  $n$ ) is important because the researcher likely needs a minimum amount of data to carry out a particular statistical analysis. With Big Data, on the other hand, researchers are interested in the *flow* of data. In other words, the speed at which data are created, not the accumulation of data, matters. The focus on the velocity of data is largely driven by Big Data's short shelf-life, a topic we discuss later.

Turning to policy analysis applications of Big Data, after a thorough search of the literature we find no policy analysis which uses Big Data. Like others (e.g., Choi & Varian, 2012) we are optimistic, however, that policy analysis will soon leverage the opportunities found in Big Data. We surmise that two sources of data in particular—Google search data and data from federal agencies—will potentially inform future policy analysis.

In an analysis of internet search trends, Ripberger (2011) notes that Google controls 86 percent of the worldwide market and 70 percent of the U.S. market for internet searches. This market share allows Google to aggregate immense amounts of data from the more than one billion searches carried out daily around the world (Google, n.d.). Among sources of Big Data for policy analysis, Google is unique because much of the search data collected is publicly available (at least at a highly aggregated level) through Google Trends. Google Trends indexes, both daily and weekly, the volume of queries that users search through Google.

Using Google data for "now-casting" is increasingly common with implications for policy analysis. Now-casting predicts the present (Choi & Varian, 2012) instead

of using present-day data to forecast future policy-relevant outcomes. Google Flu Trends is a salient example of how “predicting the present” has potential as an effective policy analysis tool. Google Flu Trends aggregates search terms such as “flu” and “cold/flu remedy” by geography to track influenza rates in the United States (Ginsberg et al., 2009). Flu trend data detect regional outbreaks of influenza 7–10 days before the Centers for Disease Control and Prevention is able to do so with conventional surveillance systems (Carneiro & Mylonakis, 2009). The flu trend data also have a high correlation between city-level search trends and emergency room visits and waiting time (Dugas et al., 2012).

We see a clear opportunity for policy analysts; if a healthcare policy, for example, was implemented in certain cities or areas of the country, Google Trends could provide a massive amount of internet search data (i.e., Big Data) that could provide insight to the policy’s effects on individual information-seeking behavior and other associated behavioral outcomes. Since Choi and Varian (2012) note that job-seeking behavior on Google also correlates closely with unemployment measures, the effects of workforce development policies are another area which may be empirically explored with internet search data.

A 2010 report to the president and Congress argued that every federal agency needs a Big Data strategy (President’s Council of Advisors on Science and Technology, 2010). In 2012 the Obama administration embraced this recommendation by announcing the “Big Data Research and Development Initiative” (White House, 2012). The hallmark of the initiative is the dedication of \$200 million by six federal departments and agencies toward efforts that advance the technologies needed for federal agencies to manage, analyze, and share Big Data. The departments and agencies involved with the Big Data initiative are the National Science Foundation (NSF), Health and Human Services/National Institutes of Health (HHS/NIH), the Department of Energy (DoE), the Department of Defense (DoD), the United States Geologic Survey (USGS), and the Defense Advanced Research Projects Agency (DARPA).

The potential uses of Big Data provided by federal agencies are numerous; for illustrative purposes we outline two here. The digitization of health records presents an obvious opportunity for the evaluation of healthcare policy at the federal and state level. Aggregating healthcare data and tracking policy-relevant health outcomes can extend HHS/NIH research into hard-to-reach populations that might have otherwise been difficult to reach using conventional data-collection efforts. Data collected from environmental sensors is another area which can potentially provide a wealth of information to policy researchers. With a network of sensors around the globe constantly feeding real-time data to scientists, the USGS has the capacity to measure policy effects ranging from global warming initiatives to how local watershed policy affects the organic material of streams and rivers (USGS, 2012).

We close this discussion on Big Data with mention of a promising trend and a cautionary observation. The promising trend we observe is the development of courses and programs at U.S. universities focused on Big Data. The National Science Foundation, for example, has earmarked a \$2 million award to support undergraduate, graduate, and postdoctoral training on graphical and visualization techniques

using Big Data. There are also presently more than a dozen universities that offer courses on Big Data (Schutt, 2012). This academic focus on Big Data will provide the training for a next generation of policy analysts.

We offer a cautionary observation that policy analysts must be aware of the many ethical concerns that accompany the use of Big Data. The use of Big Data by policy analysts, government officials, and the private sector presents noteworthy issues related to privacy, civil liberties, and consumer freedom (Bollier, 2010). An individual's physical location can be easily tracked through Twitter use (Azmandian, Singh, Gelsey, Chang, & Maheswaran, 2013) and personal information collected online is increasingly easy to identify even when researchers purport to use anonymized data (Ohm, 2010; Tene & Polonetsky, 2012). Although any type of sensitive data requires conventional precautions to protect individuals' privacy, the constellations of variables in Big Data require added safeguards to ensure against confidentiality abuses.

### Conclusion

Conventional wisdom suggests that increasingly complex statistical techniques will continue to drive policy analysis innovation. We argue, conversely, that the types of data discussed in this article present researchers and analysts with novel opportunities to analyze public policy in ways that have been previously impossible (or at least highly impractical) given empirical constraints. These new opportunities for empirical policy analysis are constrained not by statistics but rather by access to data granted by state and local governments and private companies (e.g., Google).

We believe our field would be better served by discussing and clarifying the distinctions and commonalities amongst these burgeoning sources of data. Administrative data, GIS data, and Big Data are not mutually exclusive but there are several distinctions that deserve attention. Administrative data are curated and maintained in a repository from which researchers can query or download data, making these data often applicable to numerous research questions. Conversely, Big Data typically requires an anterior determination of what data are needed for the research question at hand. For instance, researchers interested in the use of Twitter for disaster response cannot record and save all global Twitter activity, but must instead specify specific search terms or values, for instance "#OilSpill", which will cause a given tweet to be stored and saved. This clearly changes the way in which projects must be conceived and designed, and likewise changes the types of questions that can be asked since the researcher is essentially sampling from a giant data stream in real time.

GIS data are also not mutually exclusive from either Big Data or administrative data but key distinctions exist. Namely, GIS data must contain data about spatial location that can be analyzed via geographic information systems. Many administrative datasets available from agencies such as the United States Geological Survey are GIS data related to topics such as land cover or hydrography. Spatial data are stored as points, lines, polygons, and rasters (e.g., a matrix of cells analogous to the



pixels on a screen) (UWCGIA, 2013). Similar to administrative data and Big Data, the overlap between GIS data and Big Data increases as technological capabilities grow (ArcNews, 2013).

Finally, the use of administrative, geographic, and Big Data for policy analysis do not address the role of random assignment in policy research. As we noted, the debate on randomization is multifaceted and will undoubtedly endure. We agree with Berlin and Solow (2009) that the questions posed by policymakers ought to determine the method of analysis. Randomized controlled trials will likely remain the “gold standard” in many cases. In other cases when a research question lends itself to nonexperimental methods, innovations in data represent a new frontier for enterprising policy researchers and analysts.

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### Note

1. The Landsat program is a joint initiative by the United States Geological Survey (USGS) and the National Aeronautics and Space Administration (NASA), initiated in 1972, that uses a system of orbiting satellites to take imagery of various aspects and attributes of land use and land change.

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## Advances in Public Opinion and Policy Attitudes Research

Jennifer Bachner and Kathy Wagner Hill

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*There has been much advancement in the field of public opinion research in the past few years, particularly with respect to the formation of policy attitudes in response to elite rhetoric, the translation of policy information into attitudes, and the biological foundations of policy attitudes. Much of the progress made in these areas of study can be attributed to the increased use of innovative, experimental methods and new data sources. Nonetheless, unresolved issues persist, such as whether there is an identifiable genetic basis of policy attitudes and the extent to which cultural versus partisan orientations drive opinions. This review will discuss both new findings in the field and identify areas that require further research.*

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**KEY WORDS:** public opinion, policy attitudes, elite influence, political trust, partisanship, risk perception, big data analytics

### Introduction

The scholarly study of public opinion has a rich history and established findings. The existing research provides valuable insights into the origins, structures, and measurement of policy attitudes (for a helpful review, see Mullinix, 2011). Persistent questions, however, remain with respect to the causes of opinion change, the relationship between public opinion and democratic accountability, the influence of biological traits on opinion formation, and the linkages between public opinion and policy change. This review focuses on the ways in which emerging research sheds light on these critical issues.

An overarching trend that is immediately evident upon a review of recent research is the increased reliance on experimental and unstructured data for empirical analysis. It is clear that the advent of easy-to-use survey software (e.g., Qualtrics) and online labor markets (e.g., Amazon Mechanical Turk) has greatly lowered the costs associated with conducting survey experiments. Further, political scientists are just beginning to capture and analyze the wealth of textual information published daily on the Internet. As this field of study advances, unstructured data is likely to serve as a much-needed supplement to traditional surveys as a means of measuring public opinion.



In the policy studies literature, several theoretical frameworks have been developed to explain the policymaking process, such as the Advocacy Coalition Framework (ACF) (Sabatier & Jenkins-Smith, 1993) and Narrative Policy Framework (NPF) (Jones & McBeth, 2010). Both of these frameworks identify specific processes through which opinion influences policy formation. The ACF, for example, explains that shared beliefs are the fundamental building blocks of advocacy coalitions (Sabatier, 1988). This review, however, is focused most heavily on opinion formation, change and measurement and less on the ways in which these attitudes function in the policy process.

This review examines recent work in seven evolving areas of public opinion research. First, we discuss new findings regarding the influence of political elites on policy opinions. This section determines that, although party cues matter, their effect is heavily moderated by factors such as the availability of policy information and the presence of alternative source cues. Second, the review considers the dynamics of mass partisanship over time. Partisanship appears to function not simply as the outcome of policy opinions, but as a fundamental predisposition that influences opinions across the spectrum of issues. Third, we review new developments in understanding how citizens process information and form opinions during political campaigns and policy debates. We next turn to a discussion of the biological foundations of political behavior, and relatedly, how personality traits connected to trust and risk influence policy opinions. We then examine the impact of opinion in a specific policy area, climate change, and consider how Punctuated Equilibrium Theory provides a framework for understanding the interplay between public opinion and policymaking. Last, we conclude with an overview of new sources of public opinion data, such as weblogs, microblogs, and social networking websites.

### **Elite Influences on Mass Opinion**

Much of the recent literature on public opinion examines the relationship between elite and mass opinion. The theoretical motivation for this work stems from the principle of democratic accountability. Elected officials are influenced by the policy preferences of their constituents owing to their desire for reelection (Miller & Stokes, 1963). The literature on spatial voting similarly predicts that legislators will reflect the preferences of the median voter (Black, 1958; Downs, 1957). Empirical evidence, however, reveals a substantial divide between the preferences of voters and elected officials (Gerber & Lewis, 2004).

One of the foremost challenges with quantifying the distance between voters and representatives is measuring policy preferences at appropriate units of analysis. In particular, it is quite difficult to measure opinion at the congressional district level. Most surveys are not large enough to be disaggregated into 435 districts. To address this problem, Warshaw and Rodden (2012) develop a model that employs data from several surveys and the U.S. Census to generate estimates about district-level opinion on policy issues such as same-sex marriage, abortion, environmental

protection, and stem cell research. The model outperforms presidential vote shares (a measure typically used to gauge district-level opinion) in predicting the outcomes of ballot referenda. This new model allows researchers to examine more closely the extent to which congressional representatives, and even state representatives, are responsive to the policy preferences of their constituents.

Bafumi and Herron (2010) examine the responsiveness of members of Congress by comparing ideal points. Using survey responses, the authors calculate the ideal point for the median Democratic and Republican voter in each state.<sup>1</sup> These numbers are compared to the ideal points of House members and senators from those states. The results indicate that both House members and senators tend to be more extreme than partisan voters, though the disparities are largest among House members.<sup>2</sup> Further, when there is a change in the party of the elected official, the new member is likely to be just as extreme, but in the opposite direction; the authors term this phenomenon "leapfrog representation." An extreme legislature (relative to voters) raises normative concerns about the efficacy of voting as a means of democratic accountability and the influence of donors on public policymaking.

Extremism among elites also has significant implications for our understanding of the opinion formation process. There is a growing debate in the current literature, for example, over the influence of party cues on policy preferences. It is firmly established in the extant research that citizens, on average, have limited political knowledge (Delli Carpini & Keeter, 1996) and volatile opinions (Converse, 1964). As a result, citizens rely on cues as information shortcuts (Popkin, 1994). Although parties have long been thought to serve as a dominant cue, emerging research identifies a set of circumstances that blunt the influence of parties and other political leaders. In fact, much of this research finds that policy content is at least as persuasive as source cues.

For example, Bullock (2011) finds that when individuals are presented with a substantial amount of information about a policy proposal, the effect of party cues diminishes. Druckman, Peterson, and Slothuus (2013) also uncover evidence of the importance of policy substance. When experiment participants were presented with a weak argument and strong argument, the effect of party cues was negligible; respondents were more likely to support the policy proposal with the strong argument (even if that proposal was endorsed by the respondent's opposing party). Likewise, in a comparison of the effects of source cues and group beneficiary cues, Nicholson (2011) finds that groups dominate. When respondents were presented with policies that either harmed a disliked group (e.g., the KKK) or benefited a liked group (e.g., veterans), support was high regardless of the policy's sponsor. This suggests that policy content outweighs source cues with easy-to-understand issues.

Hayes and Guardino (2011) take a slightly different approach to the debate over source cues in their examination of the effect of foreign political elites on public opinion. Using opinion data about the Iraq War, the authors demonstrate that Democratic and Independent citizens expressed opposition to the war in response to views voiced by foreign officials. This research is among the first to quantify the relative influences of foreign and domestic political elites.

New research, however, does not wholly discredit the influence of party cues. There remain many situations in which party cues dominate. In short, a growing number of studies detail the “conditional nature of elite influence” (Nicholson, 2012, p. 52; see also Eshbaugh-Soha & Linebarger, 2013). Out-party cues, for example, appear to have a far greater influence than in-party cues. Nicholson (2012), using experimental evidence gathered during the 2008 election, demonstrates that Republicans were less likely to express support for immigration and foreclosure policy proposals when told that Barack Obama supported the measures. Democratic respondents likewise expressed lower levels of support when told that John McCain was in favor of these policies. The results thus suggest that party cues tend to polarize policy opinions.

Additional factors that moderate the influence of party cues include the strength of the arguments being advanced about a policy proposal and the level of partisanship among political elites. In a non-polarized environment (i.e., experimental participants were told that partisan disagreement on the issue was low), citizens resort to party cues only when they are presented with arguments of equal strength from either side of the political spectrum (Druckman et al., 2013). In a polarized environment, however, citizens are likely to follow party cues, even when their party offers a weak argument.

In sum, recent research on the influence of political elites on policy opinions suggests that citizens are not blind followers of party cues, or at least not all the time. When the issues are relatively easy, substantive information is available, the arguments coming from both sides are relatively equal in strength, and the opinions of foreign elites are publicized, the cues of party elites diminish. Out-party cues and elite polarization, in contrast, amplify party cues. Future research should continue to explore these and other moderating factors.

### **Mass Partisanship and Policy Attitudes**

In addition to devoting more attention to elite polarization, recent scholarship examines how polarization in the public has evolved over time. Much of the current literature focuses on the public’s policy positions and finds that they have become increasingly extreme (Abramowitz, 2010; Tesler, 2012). New research moves beyond policy attitudes and examines affective partisanship. Iyengar, Sood, and Lelkes (2012) find that both Republican and Democratic identifiers increasingly rate each other lower on the classic thermometer scale. Interestingly, whereas affective orientations toward members of “out-party” racial and religious groups have continuously improved since the 1960s, the opposite is true with respect to members of “out-party” partisans. The authors attribute this polarization to the negativity of modern political campaigns (Geer, 2010) and the abundance of targeted news sources (Baum & Groeling, 2008).

The increased polarization of the mass public is noteworthy because of the active role partisanship plays in shaping one’s political attitudes and behaviors. Although debate persists regarding whether partisanship is the cause or effect of opinions and

actions, emerging work provides strong support for the notion “that partisanship is an active force changing how citizens behave in and perceive the political world (Gerber, Huber, & Washington, 2010, p. 720).

One group of works examines the pervasiveness of perceptual bias, namely the extent to which one’s partisanship shapes the retention of political information and use of that information in forming attitudes. Jerit and Barabas (2012), for example, use a combination of observational data, content analysis data, and experimental data to test for perceptual bias across a wide range of policy issues.<sup>3</sup> This work builds upon previous research that focuses on how partisanship shapes economic and candidate evaluations (e.g., Bartels, 2002; Burden & Hillygus, 2009; Tilley & Hobolt, 2011). The authors find that partisans demonstrate a much higher level of political knowledge with respect to factual questions that “cast their party in a positive light.” Further, partisans demonstrate a significantly lower level of political knowledge when asked factual questions that imply something negative about their party. This effect is magnified by news coverage; among issues receiving a high level of news coverage, perceptual bias is heightened. The results therefore demonstrate that partisans accrue accurate policy information when it aligns with their political predispositions and is discussed in the media.

The causal effect of partisanship, however, extends beyond the absorption of political information. In the past few years, scholars have shown that partisanship drives the formation of opinions and the decision to participate in politics. This work aligns with the notion that partisanship is a “psychological identification” or “affective orientation” that remains fixed over time (Campbell, Converse, Miller, & Stokes, 1960). Partisan identities, like race or religion, affiliate citizens with a stable social group. These attachments are formed “relatively early in adulthood” and are “enduring features of citizens’ self-conceptions” (Green, Palmquist, & Schickler, 2002). Partisanship can therefore be viewed as a political orientation that is causally *prior* to opinions and behavior.

To document this phenomenon empirically, Gerber et al. (2010) conducted an experiment in which unaffiliated registered voters were mailed information prior to an election that reminded them that only registered Republicans and Democrats could vote in each party’s upcoming primary.<sup>4</sup> Among voters who received the mailing, many were more likely to (1) identify as partisans on a post-treatment survey, (2) register as partisans, and (3) exhibit political attitudes similar to those expressed by strong partisans. In sum, the results demonstrate that, by activating a citizen’s latent partisanship, the citizen thinks and behaves like a “typical” partisan.

Highton and Kam (2011) build upon this work in their research on the causal effect of partisanship on race, economic, and cultural issue orientations over time. The authors find that the causal effect of partisanship is not unidirectional. An analysis of the Political Socialization Panel Study (1965–1997) reveals that, during the period of 1973–1982, partisanship exerted a causal effect on opinions. From 1982–1997, however, the causality runs in the opposite direction; in the later period, issue positions drive partisanship. Read in conjunction with other work in this area, it is clear that partisanship can influence opinions and behaviors, but that causality often flows in both directions.

It is important to note, however, that ideology and partisanship are not the only belief systems that structure policy preferences. Gastil, Braman, Kahan, and Slovic (2011), for example, argue that one's cultural orientation (defined as adherence to values such as individualism and egalitarianism) can have an equally, if not stronger, influence on preferences than traditional liberal and conservative predispositions (p. 711). In a similar vein, Ripberger, Song, Nowlin, Jones, and Jenkins-Smith's (2012) work demonstrates that even those with low levels of political knowledge demonstrate familiarity with the values associated with cultural theory, and that they rely upon these values to formulate coherent policy preferences. To advance this area of research, scholars should consider how individuals negotiate between their ideological and cultural orientations. What are the conditions under which one orientation dominates over the other?

### Information Processing During Campaigns and Policy Debates

Another area of public opinion that continues to receive much attention is information processing. In particular, scholars have begun to address the relative dearth of studies that explore the temporal component of information effects. While a substantial literature employs cross-sectional data to examine the effect of information, frames, and competing messages on attitudes, scholarship on the *dynamics* of these effects is scarce. This is deeply problematic, as campaigns and national discussions in the real world are multi-week phenomena. Recent research makes use of experimental and panel data to measure information effects over time.

The conclusion from these recent studies is that information effects decay over time, but that there are several factors that moderate the decay. Using a 12-week panel experiment, Mitchell (2012) finds that policy information is subject to a "rapid displacement model." In a campaign, citizens negotiate between three types of information: persistent information (such as their partisan attachments), transient information (namely new information about candidates and issues), and past information (about candidates and issues). Persistent information constrains attitudes within a set range, but within that range, new information affects opinions while old information is largely irrelevant. Chong and Druckman's (2010) work corroborates this finding, as they determine that the influence of frames related to the renewal of the Patriot Act and urban growth, even strong ones, decay quickly over the course of a few weeks. Taken together, new work in this area firmly establishes the transient effects of messaging on political and policy attitudes.

Nonetheless, it is evident that information effects are real, even if they are short-lived. In today's media environment, citizens are consistently exposed to policy-relevant messages from a wide array of sources. Although there is a strong literature that explains how individuals cope with myriad considerations when asked to express an opinion (Chong, 1993; Feldman & Zaller, 1992; Zaller, 1992), new work extends the empirical rigor of this field by examining the effect of competing messages over time. Chong and Druckman (2010) find that exposure to concurrent competing messages yields negligible effects—they cancel each other out. On the



other hand, when individuals are exposed to competing messages sequentially, more weight is given to the more recent message when expressing a policy preference.

Beyond focusing on the direction of individuals' preferences in response to competing messages, we can also consider the ambivalence of these preferences—to what extent are citizens attracted to opposite sides of an issue or political contest? While others have demonstrated the positive link between attitude strength and level of ambivalence (Greene, 2005; Keele & Wolak, 2008; Rudolph & Popp, 2007), recent research examines the variation in ambivalence over time. Through an analysis of ambivalence during the 2008 election, Rudolph (2011) finds that ambivalence fluctuates in response to political information, but the effects are heterogeneous. Most Americans experience some degree of ambivalence at the beginning of election season, and this ambivalence tends to decay as the campaigns progress. Strong partisans, however, experience a far higher rate of decay than weak partisans and Independents, which suggests that individuals with firm prior attitudes are more likely to process incoming information in such a way that it confirms or aligns with previously held beliefs.

Druckman, Fein, and Leeper's (2012) recent work in this area provides additional evidence that, when presented with policy information over time, competing frames received at the same time cancel each other out whereas, in the case of sequential messages, the most recently received message exerts the strongest influence over opinion. Interestingly, however, the authors uncover a primacy effect when experiment participants were encouraged to conduct their own searches for additional information after receiving an initial message. This scenario—the presentation of a message and subsequent participant-driven search for information—results in attitude stability rather than decay. In the real world, citizens receive information both as a captive audience (e.g., campaign commercials) and as a result of their own initiative (e.g., Internet searches). It is therefore difficult to know whether the primacy or recency effect of information is more dominant in reality.

In addition to focusing on the temporal characteristics of information processing during campaigns and policy debates, recent work advances our understanding of how citizens navigate the clutter of politically relevant arguments made in the context of these discussions. Tilley and Hobolt (2011) examine the ways in which partisanship functions as a "perceptual screen" when individuals evaluate policy outcomes and attribute responsibility for those outcomes. In a campaign, voters are bombarded with contradictory information about the policy performance of the incumbent. When faced with information that contradicts their political predispositions, partisans can either ignore facts that contradict their initial evaluation of the incumbent's performance (selective evaluation) or adjust their perception of who is responsible (selective attribution). The authors find support for both processes, but far stronger evidence in favor of selective attribution—partisans adjust their interpretation of the facts such that their attribution of responsibility aligns with their political predispositions. Arceneaux (2012) likewise studies how voters process competing information and determines that the most persuasive messages are those that "evoke loss aversion via a fearful response—even in the face of a counterargument" (p. 271).

### Biological Foundations of Political Attitudes: A New Version of Nature vs. Nurture?

To date, much of social science research has assumed that the behavior and attitudes of individuals largely reflect environmental factors. The possibility that underlying biological or genetic factors may be determinants of political attitudes and opinion formation has only recently begun to be explored by researchers (Hatemi, Dawes, Frost-Keller, Settle, & Verhulst, 2011).

A thorough review of research prior to 2011 conducted by Hatemi, Dawes, et al. (2011) assesses the findings thus far on the genetic sources of differences in the political attitudes and preferences of individuals. The two basic behavioral genetic techniques used in these studies are: (1) twin and kinship research designs to estimate the amount of variation in political attitudes due to genetic and environmental factors; and (2) molecular genetic approaches to identify specific genetic variants related to a trait of interest. Hatemi, Dawes et al. (2011) explain that political scientists are now developing a more integrated approach to understanding political behavior that incorporates “elements of genes and environment into a unified theoretical approach that more precisely identifies the behavioral precursors and enable[s] a richer understanding of how distinct behaviors are related to each other” (Hatemi, Dawes, 2011, p. 68).<sup>5</sup>

Research on the relationship between genes and political behavior, as Smith et al. (2012, p. 8; see also, Hatemi, Gillespie, et al., 2011) note, indicates that “biology plays a critical role in shaping social, economic, and political attitudes and behavior . . . [s]o while there may be no gene for a specific issue preference or ideological orientation, the biological systems built by genes seem to play an important role in mediating political attitudes.” According to the authors, twin studies consistently find that between 40–60 percent of the variation in adult political orientations is heritable (Smith et al., 2012). Using the first twin study devoted primarily to political variables, in which they surveyed 1,349 individuals including 596 complete twin pairs from the University of Minnesota Twin Registry (MTR), they assess the relative influences of genetic and environmental factors on the ideological similarities within sets of twins. The findings indicate that 60 percent of the variance in political attitudes is attributable to “broad sense heritability” and less than 5 percent to the shared environments of twins.

Hatemi, Gillespie, et al.’s (2011) results are drawn from the first genome-wide analysis of liberal and conservative political attitudes; the study employs DNA samples of 13,000 respondents collected in conjunction with a 50-item sociopolitical attitude questionnaire. Whereas previous studies quantified the overall genetic influence on political attitudes, this research attempts to identify genetic markers that can be further tested for their association with particular political traits. The goal is to “identify specific genes that contribute to the genetic influence on political preferences” and, by doing so, take a preliminary step toward locating genes that account for the heritability found in twin and kinship studies (Hatemi, Gillespie, et al., 2011, p. 2). This study advances our understanding of the biological components of political ideology and the findings suggest that more attention

should be devoted to identifying the genetic loci that influence information processing and cognition.

The complexity of the interplay between the biological and environmental factors that influence an individual's political ideology, opinions, and actions is all the more evident to those most engaged in this area of research. A number of commonalities emerge through a review of recent work and suggest a consensus that heritable core predispositions influence political attitudes (Funk et al., 2012; Kandler, Bleidorn, & Riemann, 2012; Verhulst, Eaves, & Hatemi, 2012; Verhulst, Hatemi, & Eaves, 2012). It is not that specific attitudes are inherited, but that core predispositions, which include values and personality traits, are inherited, and these are then influenced by life experiences and other environmental factors (Funk et al., 2012; Kandler et al., 2012; Smith et al., 2012; Verhulst, Eaves, et al., 2012).

Also using the Minnesota Twin Registry (MTR), Funk et al. (2012) find that political predispositions constitute a dimension of personality that is distinct from the "Big Five" personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). Using the top-down/bottom-up theory of attitude formation as a framework for assessing social and environmental factors (top-down) and genetic (bottom-up) pathways for different political attitude dimensions, Verhulst, Eaves, et al. (2012) disentangle a bit further the influences of genetic and environmental on political ideology and attitudes (see also Jost, Frederico, & Napier, 2009). This research finds a "remarkably different" development of political attitudes at the genetic level than at a shared or unshared environmental level of analysis and that "ideology exists in different forms at different levels of analysis" (Verhulst, Eaves, et al., 2012).

Given the complexity of the political ideology construct, along with the resulting political attitudes, it follows that their influence on public opinion will similarly need to be disaggregated. Work in this area is tackling head on the issue of correlation versus causation between personality traits and political ideology, and the extent to which the relationship between these two phenomena is a function of a fundamental, underlying genetic factor (Verhulst, Eaves, et al., 2012). As Hatemi, Dawes, et al. (2011, p. 81) conclude, "The more we learn about how genes lead us into environments, affect our interpretations of the exogenous environments we encounter, and how our social environments may change our genetic expression, the more we can contribute to the discipline at large about which environments matter and why." The answer to the nature versus nurture debate is, once again, that both matter; the unresolved issues are how and in what ways.<sup>6</sup>

### **Political Trust and Risk Perception: How Both Influence Public Opinion**

A thick literature examines the related issues of trust and risk in opinion formation, and recent work provides further insights. Hetherington and Husser (2012), using a media content analysis and survey data collected from 1980 through 2004, find that political trust influences public opinion on salient issues. Specifically, prior to the 9/11 attacks in 2001, political trust impacted preferences for redistribution

policies and race-targeted programs. After 9/11, the impact ceased for these issues and political trust instead affects defense and foreign policy preferences. The salience of an issue through media coverage of a contemporary event can increase political trust and thereby boost support for government action in a policy area. As Hetherington and Husser's (2012) work demonstrates, this is because once priming shifts to another area of public concern, so does the public's trust and support for government action in that area.<sup>7</sup>

Another significant finding in this work is that the public trusts certain parts of the government more than others. Hetherington and Husser (2012) note that, while prior work underscores the relevance of political trust to domestic policy attitudes, their research indicates that trust can impact foreign policy preferences as well. Further, the authors suggest that trust can impact both the liberal and conservative ends of the political spectrum, as domestic issues are considered primarily of value to "policy liberals" while foreign policy issues are seen as more beneficial to conservatives (Hetherington, 2005; Hetherington & Husser, 2012). This is more of a conjecture than an empirical finding that builds upon the existing argument that the effects of political trust on policy preferences are heterogeneous (Popp & Rudolph, 2011; Rudolph, 2009; Rudolph & Popp, 2009; see also Eckles & Schaffner, 2011). The key takeaway point from this area of research is that individuals "can and do have more than one meaningful belief about an issue or an object, with different presentations of it unlocking different evaluations" (Hetherington & Husser, 2012; see also Feldman & Zaller, 1992; Zaller & Feldman, 1992; and Kellstedt, 2000).

Eckles and Schaffner (2011) expand upon this work through their finding that mentions of risk prime individuals to express lower levels of support for military interventions than they would otherwise. In their research, which uses data from the 2008 Cooperative Congressional Election Study, they find that priming less risk-tolerant individuals to consider the risk of potential military intervention in Darfur lowered support for that policy, while the same prime increased uncertainty for the risk-tolerant individuals. The implication is that, when individuals are not told by elites (or others) of the risks associated with an intervention, surveys of their opinion on the intervention register more support than they would if such information was available (see also Berinsky, 2009; and Aldrich, Gelpi, Feaver, Reifler, & Sharp, 2006).

Another noteworthy study focuses on the intergenerational transmission of risk and trust (Dohmen, Falk, Huffman, & Sunde, 2012). Somewhat contrary to the research on the biological foundations of political attitudes reviewed above, Dohmen et al. (2012) find that socialization is important to the transmission process with respect to an individual's willingness to trust and take risks. More consistent with the findings from the genetic influences literature, they find that parental characteristics strengthen the socialization process and its impact.

Given that fear is a genetically informed trait, it is not surprising that individuals differ in their underlying fear dispositions. Hatemi, McDermott, Eaves, Kendler, and Neale (2013) find that this variation has implications for out-group political preferences (see also, Kam & Simas, 2010). Using a sample of 29,682 kinships, this study finds that people with a higher degree of social fear hold more negative opinions toward out-groups, as measured by attitudes toward immigration and segregation.

The authors conclude that “*social* fear might serve as a foundation for some part of the edifice of certain aspects of political ideology” and this “helps explain one of the ways in which emotion undergirds more complex cognitive structures” (Hatemi et al., 2013).

An important line of research on the impact of risk attitudes on policy views and political participation has been undertaken by Cindy Kam at Vanderbilt University and her colleague Elizabeth Simas at the University of Houston (Kam, 2012; Kam & Simas, 2010, 2012). Using the 2008–2009 American National Election Study panel and an Internet survey conducted in 2011, Kam (2012) finds that risk-accepting individuals are more likely to engage in political life because it offers novelty and excitement.

Previously, Kam and Simas (2010) found that risk-accepting individuals are less susceptible to framing effects, and frames therefore exert minimal influence on the policy preferences of these individuals. This means that individuals’ risk orientations are consequential not only in determining their policy views, but also their susceptibility to framing and priming effects (Kam & Simas, 2010). More recently, Kam and Simas (2012) demonstrate that risk-accepting voters are more willing to support candidates characterized by uncertainty and change, such as challengers in U.S. House races. They conclude that risk-accepting individuals are more willing to “gamble” on challengers, who are usually less experienced and represent a departure from the status quo; this accords with Kam’s (2012) finding that novelty and excitement are motivators of political participation for risk-accepting citizens.

### **Punctuated Equilibrium Theory and Climate Change**

The seminal work on Punctuated Equilibrium Theory (PET) by Baumgartner and Jones (1993/2009) continues to motivate research on how information is used to effect policy change.<sup>8</sup> Shanahan, Jones et al. (2011) emphasize that the focus of PET research is not on finding direct casual links between policy entrepreneurial activity and public opinion, and recent work in this area indicates that attempts to influence public opinion are actually best understood as efforts to focus public attention on an issue (see Jones & Jenkins-Smith, 2009).

There is a continued need to further unpack the role of the media in policy change, as it has both a first-order and second-order role in the policy process (see Shanahan, McBeth, et al., 2011; and also Shanahan, McBeth, Hathaway, & Arnell, 2008; Jones & McBeth, 2010; and Jones & Jenkins-Smith, 2009). Shanahan, McBeth, et al. (2011) utilize a quasi-experimental design with 194 students who were surveyed about a controversial snowmobile policy for Yellowstone Park. The treatment consisted of two different media accounts that reflected divergent policy narratives from advocacy groups. The researchers found that media policy narratives influence public opinion in two ways: (1) they “preach to the choir” for those in agreement with the narratives’ opinions; and (2) they “convert” when read by those with divergent views, as they can overpower the cultural beliefs and policy views of the individuals and thereby instigate a change in opinion on a controversial issue (Shanahan, McBeth, et al., 2011).



The application of PET and related frameworks can help scholars better understand change in a wide range of substantive policy areas, including climate change. One recent study of telephone survey data from the United States and Canada regarding attitudes toward climate science and climate policy finds that support for the carbon taxation policy option is highest in the two Canadian provinces (British Columbia and Quebec) that have successfully implemented a carbon tax (Lachapelle, Borick, & Rabe, 2012). The researchers surmise that this is because public opinion in these provinces supported the adoption of a carbon tax policy, but it is also possible that acceptance of the policy followed the passage of the carbon tax laws. The same phenomenon occurred with respect to support for cap and trade policy, which is highest in the Canadian provinces (British Columbia, Manitoba, Ontario, and Quebec) that are most active in negotiating a multi-government initiative, the Western Climate Initiative (WCI). The researchers acknowledge, however, that further research is needed to explore the impact of individual or systemic factors, such as risk perception, trust, political ideology, new information, and economic conditions on the relationship between public opinion and policy views in this area (Lachapelle et al., 2012; see also Borick & Rabe, 2010; and Brulle, Carmichael, & Jenkins, 2012).

A promising effort in this area is Brulle et al.'s (2012) comprehensive examination of factors influencing U.S. public opinion on climate policy from 2002–2010. The authors examine five factors (extreme weather events, public access to accurate scientific information, media coverage, elite cues, and movement/countermovement advocacy) that have been theorized to influence public opinion with respect to climate policy.<sup>9</sup> Of the five factors, their time-series analysis indicates that elite cues, and particularly partisan battles over climate change, exert the most influence over public opinion. This tracks with previous findings that when elites agree, the public does tend to be in agreement as well; when elites disagree, polarization in the mass public follows and individuals turn to other factors when determining their policy positions (see McCright & Dunlap, 2011).

Brulle et al. (2012) find that media coverage has a significant influence on policy opinions, but it is largely a function of elite cues and economic factors; weather extremes do not have a large effect and scientific information has only a minimal impact on changing public opinion.<sup>10</sup> The researchers suggest that additional research should determine the impact of second-order media effects, such as how the framing in mass media coverage of an issue like climate change influences levels of public concern (as their study only examines first-order media impacts as measured by the quantity of coverage of climate issues). The authors relate their findings to the literature on policy moods, which refers to the idea that there is an aggregate “policy mood” regarding the favorability toward governmental action for any given policy issue (Brulle et al., 2012; see also Atkinson, Baumgartner, Coggins, & Stimson, 2011; Stimson, 1999, 2004; and Enns & Kellstedt, 2008). One of the key contributions of this work is the use of a relatively long time series data set, which permits the analysis of policy attitude change.

Additional research is needed on the extent to which policy narratives lead to policy opinion change and the interplay between policy opinions, genetic predis-

positions, and individual traits (such as risk perception and political trust). This area of research lies at the intersection of political science, biology, psychology, and sociology. The greatest insights into the complexities of human political opinions and behavior are most likely to be gained from this type of cross-disciplinary work.

### **New Methods of Measuring Opinion: Big Data and Analytics**

For the past half century, the study of public opinion has largely relied on observational and experimental survey research. The exponential use of online media, however, serves as an additional source of empirical evidence. More and more individuals express politically relevant opinions on weblogs, micro-blogs (e.g., Twitter) and social networking websites (e.g., Facebook), which presents opinion researchers with an untapped treasure trove of information.<sup>11</sup> While the majority of analysis of this textual information is currently being undertaken by computer scientists, political scientists are slowly beginning to leverage this massive source of unstructured data to answer a wide variety of interesting questions (see, for example, King, Pan, & Roberts, 2013).

Analyses of social media postings allow researchers to gain purchase on questions related to aggregate-level public opinion. For example, we can use social media postings to learn about the national policy agenda. Issue salience is typically measured with a survey question that asks respondents to name the country's most important problem.<sup>12</sup> As an alternative, researchers can instead examine Internet search queries. Scharkow and Vogelgesang (2011) compare the salience of issues during the 2005 German general election as measured by traditional surveys and Google Insights for Search. The results reveal a strong correlation.

Sentiment analysis (and relatedly, election prediction) is a second aggregate-level use of social media analysis. It is becoming relatively easy for researchers to gather and store posts made to social media websites. Both Facebook and Twitter have APIs that facilitate the scraping of these posts. Text mining techniques can then be used to measure the sentiment of the posts. Sentiment is typically considered to have two dimensions: positivity/negativity and strength. Both are often measured using dictionary-based lexicons, such as OpinionFinder.<sup>13</sup> A sentiment analysis of one billion Twitter posts by O'Connor, Balasubramanyan, Routledge, and Smith (2010) reveals a correlation between social media posts related to consumer confidence and presidential job approval and traditional polling on these issues. Tumasjan, Sprenger, Sandner, and Welpe (2010) examine 104,003 tweets and find that "despite the fact that the Twittersphere is not a representative sample of the German electorate, the activity prior to the election seems to validly reflect the election outcome."

At the moment, analysis of social media postings is best used as an alternative to surveys for measuring aggregate trends. This is because there is no easy way to link postings with the background characteristics of the users. As social media websites continue to develop new technologies for making their data accessible by researchers, this information may become available.

Using unstructured data to measure public opinion holds many advantages over traditional survey research. Surveys are notoriously subject to a host of challenges, such as social desirability bias, recall problems, low response rates, question wording effects, constrained answer choices, and topic limitations. The use of social media postings as a means of gauging public opinion mitigates many of these problems, as the opinions expressed by users are unsolicited and, often, content-rich. (O'Connor et al., 2010). Further, this approach to opinion measurement is far less expensive than large-scale surveys.

Nonetheless, those who have begun to explore social media analysis urge researchers to proceed with caution. First, the extent to which social media users represent the opinion distribution of non-social media users is unclear. Further, even among users, there is inequality in participation. A small percentage of users accounts for a large number of postings (Tumasjan et al., 2010). It is therefore evident that the majority of content produced by users represents a very small percentage of the citizenry.

A second area of concern with using social media output as indicators of public opinion is measurement issues. A content analysis of micro-blogs and social network posts misses much of the content that is exchanged, as many of these postings contain links to the key substance—should researchers incorporate the texts accessed through links into the analysis, and if so, how? Moreover, how should researchers deal with “retweets”—presumably a retweet represents an opinion held by the “retweeter,” but should the message be counted twice? And what about postings that are automatically generated; many news organizations automatically release social media postings that contain article headlines. In short, future research will need to grapple with serious methodological issues when devising measurement strategies.

Beyond simply measuring opinion with social media, some scholars have begun to examine whether social media use affects opinion formation. The preliminary evidence, however, is quite pessimistic. Conover et al. (2011) examine 250,000 tweets during the 2010 U.S. midterm election and find that the “retweet network” is highly partisan; right and left identifiers are unlikely to interact. This conclusion is echoed by Sunstein (2008), who argues that social media do not serve as a forum for the kind of cross-cutting political deliberation as conceived by democratic theorists such as Hayek and Habermas. Baumgartner and Morris (2010) take a different tack, as they look to see whether social media increases political knowledge and participation among young citizens. The authors find that “virtually all of the data point in the same direction, namely, that the potential for [social network] Web sites to increase youth political engagement has not yet been realized” (p. 38).<sup>14</sup>

### Conclusion

Despite the significant advances made, there are still many areas of public opinion research that require further study. For example, the debate over memory processing remains very much unresolved. It is still unclear whether individuals, for example, sift through previously stored information to arrive at considered evalua-

tions (the memory-based model) or rely on the most recent information to update an existing evaluation (the on-line model). To better understand opinion change and the nature of political persuasion, we need to develop a more robust model of information processing.

Relatedly, there is still much unknown about the origins of policy opinions. Owing to advances in our understanding of the human genome, the nurture versus nature debate would benefit from additional research (though scholars should keep Charney and English's [2013] concerns in mind). There are also lingering questions regarding the extent to which cultural orientations versus ideological and partisan orientations drive policy opinions. A firmer understanding of the causes of policy opinions, particularly the conditions under which certain factors are influential and others less so, will provide a stronger foundation on which to study persuasion and advocacy.

And finally, additional research is needed to identify the conditions under which shifts in public opinion lead to policy change. Although clear correlations between public opinion and policymaking are evident, the directions of the causal arrows, and the strengths of these relationships, are unclear. The influence of public opinion on both the behavior of individual elected officials and the institutions in which they operate is fertile ground for further study. Perhaps we can make inroads in this area by tapping into the wealth of unstructured public opinion data that is ripe for the picking.

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## Notes

1. An ideal point is a position in a unidimensional policy space. Voter ideal points are calculated using survey responses about respondents' positions on roll call votes. The ideal points for members of Congress are calculated using their actual roll call votes (Bafumi & Herron, 2010).
2. A similar pattern emerges at the state level. Lax and Phillips (2012) demonstrate that there is a "democratic deficit" at the state level, in that state governments only translate opinion majorities into public policies approximately 50% of the time.
3. The authors identified 205 domestic and foreign policy-related factual questions across 43 surveys.
4. Participants in the experiment were registered voters who were not officially registered with a party but expressed a preference for a party on a survey.
5. The "unpacking" of gene-environment relationships to understand political behavior more thoroughly is only just beginning. For more research on the relationships between genes, personality and political attitudes, see Hatemi and McDermott (2011); Hatemi, Dawes, et al. (2011); Hatemi et al. (2013); Smith et al. (2012); Verhulst, Eaves, et al. (2012); and Verhulst, Hatemi, et al. (2012).
6. Not all scholars in this area agree that advancing the field of "genopolitics" is a worthwhile endeavor. Charney and English (2013) dispute the assumption that the genome is a fixed, unchanging template that determines political orientations and attitudes (p. 393). The authors argue, "Genopolitics relies on a naive conception of the genome uninformed by some basic principles of genetics and by discoveries in molecular genetics over the past 50 years" (p. 393).

7. Priming refers to “changes in the standards that people use to make political evaluations” (Iyengar & Kinder, 1987, p. 63; see also Eckles & Schaffner, 2011; and Berinsky, 2009).
8. For recent work in this area, see Jones and Baumgartner (2012).
9. Brulle et al.’s (2012) data consist of 74 separate surveys that cover a nine-year time period. For additional recent research on public opinion on climate change, see Kellstedt, Zahran, and Vedlitz (2008); Marquart-Pyatt et al. (2011); Pidgeon and Fischhoff (2011); Weber and Stern (2011); Spence, Poortinga, Butler, and Pidgeon (2011); Sterman (2011).
10. Somewhat in contrast with this finding, Egan and Mullin (2012) show that direct exposure to extreme weather causes individuals to reassess their opinions on global warming, though the effect decays fairly rapidly.
11. In addition to examining social media content, some scholars have studied Internet search terms as another means of measuring public attention to political issues (Ripberger, 2011).
12. Alternatively, some scholars use content analyses of newspapers to construct measures of issue salience.
13. Newer methods of sentiment analysis instead employ supervised or unsupervised learning techniques (Stieglitz & Dang-Xuan, 2012).
14. See also Hoffman, Jones, and Goldwaite Young (2013) for an examination of the motivations that drive online political engagement.

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## New Avenues for the Study of Agenda Setting

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*Existing literature on the agenda-setting process is grounded and well cited in studies of U.S. national institutions, but emerging scholarship has taken the fundamental principles of agenda setting—attention, information, and learning—and has extended their applicability to understudied participants and institutions. This essay highlights three areas of study that have undergone particular growth during the last few years and best represent the trend of applying the well understood dynamics of agenda setting to a broader swath of participants in the policy process. We first examine how scholars have focused on agenda setting within U.S. state and local governments and the way these institutions balance their agenda-setting needs internally, while still trying to be heard within a federal system. Second, we highlight policy scholars' contributions to create better definitions and measures of the relationship between the media and policy process. Finally, we explore the contributions to the broader agenda-setting literature made by scholars examining non-U.S. institutions. These three categories are but a part of the growing trend in the subfield to expand the scope of agenda-setting research.*

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**KEY WORDS:** policy process, agenda setting, state/local governments, media, comparative policy studies

### Introduction

The public policy discipline is constantly evolving to develop a more complex and dynamic understanding of institutions, actors, and information, and the subfield of agenda setting is no exception. Traditionally, studies of agenda setting have focused on agendas within U.S. federal government subsystems. These are now being augmented by a broader examination of agenda-setting dynamics to include underdeveloped avenues of study. John W. Kingdon (1995) posits that two factors have the ability to direct agenda setting and the development of policy alternatives: active participants and the processes through which issues rise to prominence. In many new studies, these foundational theories of the policy process remain constant, but new insights regarding participants and the roles they play within the policy process come to light.

This evolution in the field is evident in a sample of recently prominent subtopics that represent agenda-setting studies' growth toward examining alternate processes—state and local governments, the media, and comparative policy. These



three fields represent previously underdeveloped platforms for policy scholars to better understand and test traditional notions of the agenda-setting process and to understand how these dynamics are generalizable outside of the well-tilled field of existing literature. These topics and the particular citations for each represent some of the innovation that has occurred over the past few years. They are certainly not an exhaustive list of the innovative work that has been done on agenda setting. Others, such as Peter May, have added considerable insight into policy regimes and boundary-spanning issues (Jochim & May, 2010; May, Jochim, & Sapotichne, 2011; May & Jochim, 2013). Christian Breunig and Chris Koski's (2012) work on state budgets and the broad consequences of incrementalism and policy punctuations also advance our understanding of agenda setting.

The topics and scholars highlighted in this piece represent the trend of moving beyond the institutions that are commonly studied to uncover insights about the agenda-setting process. These scholars represent a larger movement toward a richer understanding of agenda setting, which can only be developed by analyzing the alternate avenues through which political actors try to influence the agenda space. By looking beyond the institutions that were used to uncover the initial dynamics of the policy process, we can uncover relationships that are generalizable across systems, but were not as apparent in the original studies.

The foundations of agenda setting come directly from studies of relationships within the U.S. federal government, and as a consequence, the classics in the field all rely on observations from one policymaking system (Baumgartner & Jones, 2009; Cobb & Elder, 1972; Kingdon, 1995; Schattschneider, 1957). The literature implies or states directly that the uniqueness of the American system led to relative ease of agenda access and hence policy punctuations. Baumgartner and Jones (2009) suggest that federalism and the associated increase in the number of policymaking venues should increase the ability of new policy ideas to receive serious consideration by policymakers. But such ideas can only be tested for their broad generalizability if agenda-setting processes are studied in other institutional systems.

The expansion of agenda-setting research in recent years has led not just to more research, but more research on different institutions. In this review, we discuss three subtopics of agenda setting that recent scholarship has emphasized. First, we examine increased analysis of agenda setting within state and local institutions to find that these institutions engage in two levels of agenda setting: the first, occurring within state and local institutions and the second, occurring when state and local governments' attempt to influence the agendas of federal institutions. The first variety of agenda setting is critical to developing an understanding of how states and local actors manage their agendas without the outside influence of the national government (Heidbreder, 2012). The second addresses an understudied aspect of federal-state relations in which the state tries to communicate its preferences to change the national agenda (Leckrone & Gollob, 2010). In both types of agenda-setting research, the authors move beyond conventional discussions of how state agendas are influenced by the national government and examine how states act to promote their own interests, regardless of attention from the national government (Lowery, Gray, & Baumgartner, 2010).

Next, we turn to the role of the media in the agenda-setting process and note two important ways the literature has grown. First, we stress the scholarship that denotes the schism between agenda-setting definitions in political communication and policy studies literatures and the analyses that attempt to narrow this divide (Boydston, 2013; Wolfe, Jones, & Baumgartner, 2013). Second, media influences on the policy process are still not fully understood (Vliegthart & Walgrave, 2011). New scholarship emphasizes going beyond traditional methods of newspaper analysis and notions of media as a vehicle for positive feedback in order to explore the connections between media and elite attention. This two-prong expansion in the way policy scholars examine the media's effects has the potential to improve the field by widening the media's applicability within the policy process.

Finally, we review the subtopic that has, without a doubt, undergone the widest expansion of research on agenda setting: comparative policy. Comparative policy studies continues to flourish as a field, as it has over the last half century (Gupta, 2012), and a closer study of agenda setting is a component of that recent growth. Within each international institution, scholars attempt to examine the agenda-setting process, noting the ways in which participants and the process are affected by different rules, procedures, and customs. The key comparative question has been how agenda-setting processes vary across such divergent institutional systems (Baumgartner, Jones, & Wilkerson, 2011)? To be able to conduct cross-sectional analyses of policy, the field requires more robust empirical study within the international systems in order to draw comparisons.

Individually, these three avenues offer new insights to the agenda-setting literature, but taken together, represent a broadening of the applicability of established agenda-setting principles and aid in the establishment of a new direction for future agenda-setting research.

### **State and Local Agenda Setting**

Much of the established work on policy processes within the American federal system has focused on either a top-down perspective of national influence on state policy (Baumgartner & Jones, 2009; Karch, 2006; Wood, 1991) or state-to-state policy diffusion (Boushey, 2012; Berry & Berry, 2007). Scholars have made considerable advances in these fields, particularly Graeme Boushey's reconceptualization of diffusion dynamics, which highlights diffusion as a largely incremental process, punctuated with periods of rapid diffusion, the product of policy feedback (Boushey, 2010). But the literature has recently taken an important turn away from these well-studied areas. Previously, conspicuously absent was an exploration of the differences between state and national institutional agendas and how states affect national agenda construction. New research that treats the state as an influential actor, rather than a policy test balloon, highlights why it is critical to move beyond the simplistic understanding of states as "laboratories of democracy" (Baumgartner & Jones, 2009). States have their own agenda priorities, and these priorities will affect how states act in the federal system, attempting to influence the federal agenda in

pursuit of state-level goals. The emerging literature about states' impacts on internal and external agendas demonstrates the importance of challenging accepted views of the interactions between federal levels.

The established literature on agenda setting takes into account that the policy aims of state or local governments are often different than the national government (Baumgartner & Jones, 2009; Lowery et al., 2010; Volden, 2005), but previously there had not been much work on the characteristics of those differences. Given that there is considerable variation across the 50 states and thousands of sub-state-level governments, the inherent differences between governments make it critical for state and local agendas to be considered independently of the way in which national and subnational governments interact.

One of the ways state and local agenda setting is different from the national level is the potential influence of direct democracy through the legislative initiative and referendum. David Damore, Shaun Bowler, and Stephen Nicholson (2012) examine how different actors use the initiative or referendum in order to shape the agenda to best suit their interests. This study highlights how the dynamics of these individual processes result in adoption by different actors within a system: the initiative has long been a primary tool of interest groups, while the referendum has become primarily a tool of legislators. These findings reflect a distinctive characteristic of subnational governments in the United States, where state constitutional mechanisms have allowed direct democracy to introduce additional methods for getting an issue on to the agenda.

Agenda setting in state government is also unique because of the differences in powers between many governors and the president. The president has limited legislative powers: he has the power to sign or veto laws (Art. 1 Sect. 7) and the responsibility to recommend legislation to Congress (Art. 2 Sect. 3), but the legislative powers of state governors is much more variable. Brianne Heidbreder's (2012) study of gubernatorial agenda setting illustrates how governors have gained more formal powers through setting the agenda. They develop these formal powers by taking the lead on producing solutions to policies that had long been the purview of the federal government; by embracing longer terms in office, which allowed for more time for policy in between campaign cycles; and through increased responsibility for producing the budget, as well as tools like the line-item veto, which allows the governor in many states to shape legislation from start to finish. These additional powers require scholars to consider the many other ways the executive can shape the institutional agenda other than "going public" (Kernell, 2007) or using persuasion (Neustadt, 1990).

A third aspect of state and local agenda setting that differs from our understanding of the process at the national level is how the process is perceived by policy elites. Xincheng Liu, Eric Lindquist, Arnold Vedlitz, and Kenneth Vincent's (2010) study of policy elites highlights a number of differences about the process at the local level. Using Kingdon's multiple streams theory as the framework for understanding the local policy process, they find that, in lower levels of government, consensus and coalition building heavily influence policymaking, whereas shifting public mood and opinion drives the national policy process. Additionally, policy elites most often

report policy compatibility as the reason for the success of a particular policy alternative, as opposed to technical feasibility, value acceptance, or anticipation of future constraints, which fit more prominently in the Kingdon conception of the characteristics that allow policy alternatives' to survive, all of which were conceived of while studying the national government. These deviations from Kingdon suggest that agenda setting on the local level differs from agenda setting on the national level. These works offer new avenues through which to consider state and local agenda-setting dynamics. These differences, whether they are institutionally founded or embody elite perceptions of the process, are not merely nuance: they have the potential to alter fundamental understandings of the policy process. These studies offer new directions and questions for an improved understanding of the policy process.

As the literature on agenda-setting dynamics in the states grows, it is vital to pay attention to alternate ways in which states and the federal government interact regarding policy agendas in the federal system. As mentioned previously, a great deal of research has looked at the top-down pressure the national government puts on states to consider certain issues. Many scholars are beginning to consider how states work from the bottom up, trying to influence the national agenda. One such study, by David Lowery, Virginia Gray, and Frank Baumgartner (2010), examines whether policy attention on the state level can influence agenda setting on the national level. They find that only in rare situations can states directly influence the attention the national government pays to issues, suggesting that "to a considerable degree, state and national legislatures still have their own policy agendas and their own policy cycles" (p. 304). An important takeaway from this study is that if, in the short term, states have little to no effect on the national policy agenda, then it is important to refine or eliminate the assumptions that exist regarding the influence state policy innovation has on national policymaking. A great deal of the work on policy diffusion rests on the premise that the federal government learns from state-level experimentation, and while there has been evidence of this in terms of single issues, its absence on a larger, more systematic scale throws many theoretical assumptions into question.

Another study of bottom-up agenda-setting influence is by Westley Leckrone and Justin Gollob (2010), who observe that while states cannot compel the federal government to act, that has not stopped states from communicating their preferred positions to Congress. Leckrone and Gollob examine memorials, which are requests to the federal government that convey a preference either for or against some action. Because they offer specific direction from states to the federal government, they offer political scientists the opportunity to understand how states try to affect action at the federal level. By looking at whether states send policy messages, and if so, on which policies, they can develop an alternate method for understanding the federal-state relationship. They find that 95 percent of memorials are used to convey substantive policy messages, focusing on policy topics ranging from state-specific and to general national issues, but primarily, are used in an attempt to influence policies that are in the domain of the national government. By examining an alternate method of communication between levels of government, Leckrone and Gollob open the door to

further research by seeking insight through the examination of understudied aspects of the policy process.

The recent literature on agenda setting sees states as more than second-class venues for policy entrepreneurs to bring their issues (Baumgartner & Jones, 2009; Kingdon, 1995). States have policy agendas, which may or may not be similar to the national agenda (Lowery et al., 2010). Only with further study will the similarities and differences between state, local, and national agenda-setting processes be understood. These studies offer a starting place, highlighting sources of data that have previously been ignored and offering important challenges to the assumptions that have permeated the study of agenda setting due to the national government bias inherent in much of the foundational work, proving that there is still plenty more work to be done on state and local agenda-setting processes.

### Media

The ambiguous role of “the media” in political science is widely cited (Baumgartner & Jones, 2009; Bennett, 1990; Cook, 2005; Dearing & Rodgers, 1996), but literature that thoroughly examines the media’s impact on the public policy process is much more limited. Even if we were to narrow our focus to the role of the news media within the subfield of agenda setting, the majority of research that addresses the media tends to perpetuate broad, vague notions of how it might influence the policy process. Amber Boydstun (2013) offers one of the few comprehensive overviews of the status of the media within the political process—specifically highlighting how media outlets shape attention as it fluctuates across issue areas. She proffers that the effect of media is not constant, but rather episodic and abrupt, raising attention for some topics but generally ignoring most. The media, like the policy process, is dynamic and it is this dynamic relationship that requires further research and development. However, without more work like hers, attempting to develop a cohesive theory for the interaction of media with all parts of the policy process, we are left trying to piece together disparate theories.

Recent research has attempted to better situate the intricate relationship between media and public policy within a larger framework of information exchange, while at the same time reconciling these information dynamics with the conceptual expansion of the term “agenda setting” to incorporate broader literatures with policy scholars’ established definitions. Recent literature includes the study of media’s down-reaching effects on the policy process, as well as media’s position relative to diverging agenda-setting definitions.

The media exist within a complex system of information, and the exchange of information across institutions is critical to an understanding of media influence. Bryan Jones and Michelle Wolfe (2010) offer that, in addition to the media shaping what and how we think, the media serves a vital function: sorting out what information is received and how it should be prioritized. Scholars continue to debate the impact of media—its indexing function or its ability to shape preferences—but the authors posit that a more fruitful framework for understanding the media in the policy process is by examining the information exchange in the interactions between



policy communities and the press. Public policy is a dynamic process, and according to Jones and Wolfe, our assessments of the participants within that process must also reflect the dynamism of political interactions. By moving beyond static assumptions regarding an important set of actors in the policy process, future scholarship has the potential to uncover the overlooked dynamics and the far-reaching effects on agenda setting.

The varied relationship between press and politics is also evident by the separate conceptualizations of media agendas and policy agendas that are able to coexist—despite many scholars disregard for their compatibility. Michelle Wolfe, Bryan Jones, and Frank Baumgartner (2013) provide a synoptic outline of the simultaneous, yet disparate use of the term “agenda setting” between policy and political communication studies. Policy scholars have long analyzed agenda setting by assessing the relationship between boundedly rational government elites and attention, as is evident in Kingdon’s definition of the policy agenda as “a list of problems to which government officials, and those associated with government, are paying serious attention” (1995, p. 3), a definition that forms the foundation of the literature. Political communication scholarship has long operated from a definition of agenda setting focuses on public, rather than elite, attention. The theoretical foundation of public agendas relies on Walter Lippmann’s (1965) work on the news media as a filter for reality and has been further refined by McCombs and Shaw’s (1972) study on the media’s ability to set the public agenda. Wolfe, Jones, and Baumgartner formally acknowledge the schism between the two fields, and in recognizing this discord, encourage future scholars to merge the two notions of agenda setting by retrieving them from their individual, academic silos. This work pushes the fields further toward analyses that consider the broad implications of the media on elite policy and public agendas in tandem. It has long been understood that the relationship between policies and publics is not limited and unidirectional (May, 1991; Soroka & Wlezien, 2005), and the press is but one of many factors that mediate such associations. By encouraging scholars to move in this direction, Wolfe, Jones, and Baumgartner’s work illuminates a new path for scholars of the policy process.

Another attempt to build bridges between previously separate literatures is Rens Vliegthart and Stefaan Walgrave’s work on partisan moderators of the media’s agenda influence (2011). They identify one way to operationalize both policy and communication studies’ different perceptions of agenda setting across nations. By applying the methodology to test an argument similar to Wolfe, Jones, and Baumgartner, the authors identify the dissonance between communications and policy agendas, and attempt to bridge the divide by depending on communications’ long-use of media coverage as an indicator of attention, while adopting the dependent variable, policy agendas, from political science. Emerging research in the policy field continues to test the applicability of this methodology, but Vliegthart and Walgrave demonstrate that by manipulating the model to assess how parties, parliamentary action, and temporal concerns temper the media’s agenda-setting influence, they offer a rigorous way to test a theoretical bridge between scholarly literatures. They find that media have a considerable effect on the agenda-setting process, but that effect is greater for opposition parties and smaller parties who lack the ability to

specialize forcing them to rely on journalists, which echoes the Baumgartner and Jones (2009) characterization of outside or minority interests who draw attention to an issue in order to gain access to a previously inaccessible policymaking space. The study demonstrates that media effects are not fixed and widening the scope of inquiry beyond the literature's established practices to include research on the political behavior of parties and work on political communication produces better analysis of the policy process. By stretching our agenda-setting approaches, we simultaneously add depth to the well-established breadth of policy process analyses.

Gunnar Thesen (2011) promulgates further discussion of the relationship between the political agenda and parties and the link the media plays in that relationship, as he finds that opposition parties will actively respond to negative media stories that find fault with the governing party. This attention-raising strategy used by opposition parties, which has ramifications for both media and political agendas, is then countered by the government, which attempts to defend its policy choices and exhibit competence publicly. Issue ownership and party competition contribute to parties' desires to define the policy space in their own terms and the media is the primary linkage between the two sides. Thus, media create and frame public perceptions regarding social problems, and the political agenda space is built on those realities, which are again perpetuated by the media agenda. This cyclical relationship highlights the inextricable place media have in the agenda-setting process.

So while some scholars have focused on a broad explanation of media within the policy process, others have advanced an agenda that considers the need for a more detailed understanding of the media's impact on the agenda-setting process. The recent scholarship, discussed above, has concluded that the media matters when it comes to agenda setting, but exactly what that role is and how we can measure it are questions for additional inquiry.

By furthering the methods by which we measure media influence, we are able to make more informed judgments about its role in the political process. As previously mentioned, agenda setting is part of a larger discussion about the flow of information within the political process, and Stuart Soroka (2012) is one scholar who has examined the importance placed on that flow of information. He emphasized the media's function as a gatekeeper between the information shaping the policy process and the information actually distributed to the public. This agenda-setting function shapes the public "reality" and Soroka proposes measuring the disjunction between information received and information distributed through automated content analysis measures that assess tone, a novel approach to this task. Soroka (2012) points out that the application of such analytic tools goes well beyond the agenda-setting function of the media and the topics that it distributes, and has greater implications for our ability to study the flow of information. Information and the public recognition of said information is what garners attention and fills the limited agenda space.

Michelle Wolfe (2012) also examines the role of media in the information process by questioning a popular precept in punctuated equilibrium theory: that the media serves as a promulgator for the positive feedback process. She challenges that assumption with a study of whether the media is able to slow the legislative process. She theorizes that, in addition to the media as an "agent of change," the media can

legitimize new participants and arguments, which slows the policy process. Wolfe finds that the speed of legislative passage decreases with increased media attention. Policy change is not consistently incremental (Baumgartner & Jones, 2009), and Wolfe offers a dynamic understanding of the media's effect on policy that echoes that variability. The media introduces friction into the political system that hinders policy change, along with aiding policy feedback. This research supports the broader conceptualization of the media as part of a complex information-processing system (Workman, Jones, & Jochim, 2009) with dynamic processes of its own within the feedback process.

In addition to these more detailed analyses of the role of the mass media, scholars continue to develop methods for assessing media effects on the legislative process. Peter Van Aelst and Stefaan Walgrave (2011) offer a comparative agenda-setting perspective that finds that, although the mass media affects agenda setting in the aggregate, a more nuanced analysis of how that happens is necessary to fully understand the relationship between media and policy. A survey of both subjective and objective methods for studying the role of the media finds that subjective methods, such as government interviews, suggest a large media effect whereas objective methods, such as time-series studies, indicate a more modest or limited effect. This contradicts the Kingdon (1995) finding that the media has a minimal effect on the policy process: a conclusion he reached through a series of interviews with government officials in the 1980s. Van Aelst and Walgrave posit that government officials often overestimate the effect the media has on the political agenda. In their study of members of Parliament in Denmark, the Netherlands, Belgium, and Sweden, the authors find that almost two-thirds of MPs agree that the media sets the political agenda more than politicians or events. Van Aelst and Walgrave also look beyond traditional newspaper articles in their objective assessment of media impacts, and find that television news has a greater impact on MPs' perceptions of agenda-setting influence. Van Aelst and Walgrave attribute the subjective/objective discrepancy to weak elites, misplaced initiators, positive feedback, and media power. This dual method highlights the importance of research design in understanding political actors' impacts on the system. Additionally, their findings regarding the variable magnitude of media effects on policy go beyond the accepted notion that the media has "some impact." This is an important step forward for agenda-setting studies, but further work still needs to occur to test the generalizability of these findings.

Van Aelst and Walgrave (2011) observe a difference between the agenda-setting effects of newspapers and television—positing that not all mediums behave similarly in the policy process. Eric Jenner (2012) continues this line of research by looking at the disparity in agenda-setting effects between newspaper articles and newspaper photographs on environmental issues. His approach measures how each affects issue salience for members of the public and policy spheres—harkening back to the Wolfe, Jones, and Baumgartner discussion of the bridge between public and policy agendas. Jenner finds a substantively different relationship between public and policy responses when classified by media type. While many policy scholars measure attention through news articles, Jenner finds that photographs elicit greater

attention from policy elites within congressional committees, while public attention is more responsive to newspaper articles. Jenner's work is representative of recent research that aims to apply more fine-grained analytical techniques to the policy process. His work suggests that nuanced approaches to agenda setting—moving beyond vague terms like “media”—are needed to fully grasp the impact of actors on the policy process. Media and agenda-setting interactions cannot be understood without distinguishing between types of agendas, in particular the distinction between public and policymaking agendas, and will be far more robust as scholars disaggregate “the news” into its various mediums. This finding, if applied to scholarship on broader policy process, could revolutionize our understanding of policy dynamics through its substantive differentiation between the effects that various actors have on the process. As has repeatedly been noted, this is a dynamic process and failing to account for the dynamic variation, for the sake of generalizability, has the potential to ignore considerable advances for the field.

### Comparative Analysis

The comparative agenda-setting literature has moved beyond showing the viability of policy process models in non-American settings toward exploring how these models operate similarly or differently within different political systems. A great deal of this work is due to the development and expansion of the Comparative Agendas Project (<http://www.comparativeagendas.info/>). The Comparative Agendas Project is a network of political system-level projects, each of which focuses on one of fifteen countries and the European Union. Each country project has established a policy content coding system, based on the one developed by the U.S. Policy Agendas Project (<http://www.policyagendas.org/>). The collaboration allows scholars to study policy changes over time, across issues, and across countries with consistent measures.

One of the primary findings of scholars working within the Comparative Agendas Project has been the rejection of the “standard model” of agenda setting in comparative analysis. In that standard model, policy change is a result of the replacement of policymaking elites through elections: because policymakers and their preferences change through elections, the policies advocated by the governing coalition shift. Surely, then, the issues addressed change as a consequence (Jones & Baumgartner, 2012). In this view, everything works through elite preferences, which are influenced by the masses via elections. As attractive as the standard model is, it does not account for much policy change and it does not account for the issues addressed by a political system. Several of the papers in a recent special issue of *Comparative Political Studies* center on progress in the comparative analysis of agenda setting, which shows that the issues addressed by political systems are not governed by elections (Baumgartner, Brouard, et al., 2011).

If not elections, then what causes policy change? Theoretically grounding much of the comparative agendas research is work on the dynamic relationship among information, preferences, and institutions in the policy process. Baumgartner, Jones, and Wilkerson (2011) offer an overview of such comparative analysis and emphasize,

that of those three principles, the role of information in agenda setting needs further exploration within comparative analysis. Policy change often originates from the emergence of new information and policy learning, rather than solely from changes wrought by the electoral process (Sabatier & Weible, 2007; Workman et al., 2009). As a consequence, understanding how political systems process information is a key to our understanding of agenda setting. The result is a clarion call for comparative scholars to move beyond election and party-control analyses to assess the policy dynamics across political systems (Baumgartner, Jones, et al., 2011).

Attention also plays a key role in information processing for political systems as well as for individuals (Jones, 2001; Jones & Baumgartner, 2005). New information about a subject may draw attention to a frame or aspect of the policy that was not previously critical to the debate (Baumgartner, Jones, et al., 2011). The theory of punctuated equilibrium suggests that the shifting of attention, based upon the information being presented, is a vital component to changes in policy action.

Utilizing these theoretical underpinnings, comparative policy scholars have examined a wide range of institutional frameworks. Will Jennings, Shaun Bevan, and Peter John (2010) examine the Speeches from the Throne—a tool for expressing executive policy priorities in the British government—and find remarkable stability in the executive agenda. Consistent with studies of executive agenda-setting communications in other countries, the content of the Speech from the Throne is shaped by the limited agenda space. Jennings, Bevan, and John show that, while the size of the agenda has remained stable over time, those topics that make it onto the agenda have changed to reflect shifting priorities and information. This paper reinforces the idea that the process for setting an agenda is comparable across systems, but the intricacies of particular national institutions are critical to the policy outcomes that occur across studies.

Peter John and Shaun Bevan (2012) use the legislative agenda of the United Kingdom as a case study to better understand policy changes that result from information, attention, and agenda shifts. These authors' study assumes the tenets of punctuated agenda change and seek to create a typology to better understand how to categorize the magnitude of punctuations. John and Bevan build on the punctuated equilibrium literature, which states that political agendas can be stable for long periods of time, but are also susceptible to system-wide shocks of varying magnitude (Baumgartner & Jones, 2009). The magnitude of those shocks is what John and Bevan seek to divide into three categories to better understand how and when shocks will result in shifts to the political agenda. John and Bevan argue that to understand causal processes, we must address all three categories. Their work demonstrates how scholars can move beyond a dichotomous understanding to uncover dynamics of the policy process within and across systems.

Additionally, important work is being done on agenda setting within supranational institutions. Petya Alexandrova, Marcello Carammia, and Arco Timmermans's (2012) study of agenda setting within the European Council highlights the many aspects of the Council's policy process that mirror the punctuated equilibrium dynamic found in other institutions and countries, but also demonstrate how the unique structure of the Council and its interactions with other political institutions



make it vital to examine the agenda-setting process without adopting assumptions from works on other types of governing bodies. Though the agenda space is limited, like all institutions, the European Council has a more flexible institutional framework because, unlike national executives, there is no obligation to set out yearly priorities. This institutional difference reveals important characteristics about the issues that reach the European Council, but also highlights the impact that institutional constraints, such as setting out an advanced agenda, have on national agenda formation. This is but one signal as to how supranational institutions can share characteristics with national institutions, but contain distinctive characteristics, which require separate, rigorous analysis.

As comparative policy analysis moves beyond demonstrating the applicability of simple cross-state issue comparisons, many studies have also started taking a closer look at different political systems to uncover the intricacies of agenda setting within elite institutions, particularly in multiparty systems. Rens Vlieghe, Stefaan Walgrave, and Corine Meppelink (2011) use the case of the Belgian Parliament to assess how inter-party agendas and party competition shape the policy agenda. They argue that the party dynamics found within the institution of Parliament offer a better understanding of how policy agendas are formed because mimicking behavior between political actors may lead to the creation of a unitary parliamentary agenda beyond specific party preferences. If differing parties draw attention to an issue, others are likely to follow if they fulfill certain characteristics such as speaking the same language, are part of a coalition, form an electoral pact, or occupy a niche within the political landscape. This initial analysis of party-level agenda setting provides the foundations for other countries and other political systems to begin a cross-comparison.

A different view on the interaction between parties and institutions is evident in Christoffer Green-Pedersen and Peter B. Mortensen's (2010) article on agenda setting in the Danish Parliament. The central hypothesis is that opposition parties have more opportunities to advance their preferred issues: governing parties cannot concentrate solely on issues that are advantageous to them because the public expects them to be responsive to all issues. As Green-Pedersen and Mortensen point out, opposition parties can push governments to discuss issues that are politically and electorally advantageous to the opposition even if they are distracting or potentially damaging to the strength of the government. The authors note that this conclusion might not be the same across all parliamentary systems, which reinforces the need for further examination before any generalizable claims can be made on a cross-national scale.

Studying comparative agendas across institutional settings is an emerging field within policy studies, particularly as scholars increase their ability to theorize across systems and employ methods for rigorous inter- and intra-system comparisons. The growth and refinement of cross-national efforts, like the Comparative Agendas Project, aid such research, and provide a vehicle for more robust scholarship within comparative policy. Further intra-state research provides multinational projects with more informative agenda analysis, which may be used as a springboard for more abstract considerations. Only when policy scholars build on the work of these

previous scholars will these inspiring, but currently disjointed, research agendas coalesce into a comprehensive understanding of the agenda-setting process around the world.

### Conclusions

The agenda-setting subfield has grown increasingly complex as scholars attempt to understand its role within the larger policy process. We have examined three areas that contribute to that complexity by analyzing literature that expands agenda-setting studies beyond U.S. national institutions and looks at the policy dynamics that exist in alternate systems. One area has shown that by developing a more sophisticated understanding of the role of the media, we can better integrate the media into models of the policy process. Many scholars acknowledge a role for the media in the agenda-setting process, but fail to further delineate that role. That stronger understanding of the media is a key necessity for better analyses, and recent scholarship has taken the field in exactly that direction.

A great deal of work has also focused on policymaking by elites within specific policy systems at the local, state, and international level. Basic principles of the agenda-setting process are present in every political system and further study, both domestically and comparatively, is building an understanding of how those processes are filtered through institutional mechanisms. The roles of information processing and attention are ever present, but how they operate is a key component that differentiates political systems.

The media, federal, and comparative relationships within the policy process are merely three avenues within an ever-expanding network for agenda-setting studies. We urge researchers to engage in continual questioning of assumptions by exploring newer methods and untapped areas of study. One possible avenue for policy scholars is to further develop the methods used to assess agenda setting and measure elite attention. Established methods have gotten us to where we are currently, but in order to go farther, we need to pay additional attention to how we measure attention and the agenda space. Just because we have consistent measures of analysis does not mean that there are not better alternatives. Consistency can breed complacency. Christopher Wlezien (2005) has pointed to this problem by leading discussions regarding the measurement issues in the study of issue salience for the public and what reliable measures can be used to compare elite attention (Jennings & Wlezien, 2011). The Comparative Policy Agendas Project provides us with one set of tools to do cross-system comparisons, but we ought to continue to refine and maintain these data collection processes. Additionally, data mining and agent-based simulations (Thomas, 2013) are but two areas that can be employed in the quest to keep the study of agenda setting dynamic.

As we consider new methods of study for elite attention, we must also consider the sources of these measures. Communication between policy actors and those outside the subsystem becomes even more critical within a globalized community. How has the expansion of communications technology, particularly the Internet, changed the policy process? Policy subsystems rely on limited attention and infor-

mation outside the network (Gais, Peterson, & Walker, 1984), but in the digital age, the divide becomes blurred and the agenda formation process is thus altered. As the world is more connected through the Internet, the blogosphere, social media, and unlimited data access, our understanding of the policy process should adapt to reflect these altered relationships.

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## Current Trends in Science and Technology Policy Research: An Examination of Published Works from 2010–2012

Sarah Troussel

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*This essay identifies three notable trends in recent science and technology policy research. By analyzing the keywords listed within published scholarship from 2010–2012, a predominant portion of articles focuses on universities, patenting, and innovation policy models. Scholars have gained some insight into these processes by focusing on how collaborations between the government, universities, and industry impact technological outcomes. However, data and measurement issues have limited research in this area.*

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### Introduction

The purpose of this review article is to provide a summary of recent trends in scholarship within the field of science and technology (S&T) policy. By providing a focus on recent literature, this essay gives scholars a quick overview and examination of current research directions within the subfield. I begin with a discussion of my methodology for identifying the boundaries of the field and my method for selecting articles to be included in this review. I examine articles published within the past few years (primarily 2010–2012) in the top S&T and public policy journals. Next, given the wide range of topics that fall within S&T policy, I begin by presenting a broad overview of recent research trends by analyzing the keywords listed within published articles. After providing an expansive perspective of the field, I then give a more detailed summary of published research that examines questions in the three most popular keyword topic areas: universities, patents, and innovation.

### Identifying the Field of S&T Policy

In order to organize and assess recent research in S&T policy, a more primary question must be addressed—is there a separate and definable subfield that can

be called S&T policy? If so, what are the common theoretical or methodological questions that unite scholars within this area? Despite the recent emergence of several S&T policy review articles (Fagerberg, Fosaas, & Sapprasert, 2012; Jasanoff, 2010; Martin, 2012; Martin, Nightingale, & Yegros-Yegros, 2012; Van Den Besselaar, 2001), identifying the core research questions that shape the boundaries of the subfield of S&T policy has proven to be a difficult task. Scholars studying S&T policies come from a variety of disciplinary perspectives and utilize multiple methodological approaches. Unfortunately, the evolution of the field has resulted in vague terminology (see Bozeman, 2001), making it sometimes unclear how various pieces of scholarship are interconnected. For example, some scholars use science policy, research policy, technology policy, and innovation policy interchangeably, yet others see these as quite distinctive concepts. This results in a field consisting of a wide variety of theoretical approaches and research orientations.

For example, within the literature, there is disagreement in regards to whether science and technology studies (STS), science and innovation studies, and science and technology policy research more generally, constitute as distinct disciplinary fields. STS is a subfield that includes scholars from multiple disciplines: anthropology, economics, history, law, philosophy, psychology, sociology, and political science, and takes a more normative view of S&T policy issues. Jasanoff (2010) describes the field as a merger of two streams of literature: research that investigates the nature and practice of science, and research that investigates the impacts and control of S&T in regards to the potential risks of S&T to society. However, this merger did not include an integration of core assumptions or methods across S&T studies. Jasanoff argues that while the analysis of S&T policy has involved a wide range of questions from multiple disciplines, the central unifying feature has traditionally been the subject of study (for example, investments in S&T) and not specific theoretical commitments. STS includes, but is not limited to, questions such as: What are the social processes by which scientific and technical knowledge is created? How do people evaluate scientific and technical information? What is the role of science and technology in society? Finally, what are the normative implications of scientific and technological issues on society, culture, and politics? Another important component within STS includes scientometric studies (see Martin et al., 2012). This is often referred to as the quantitative component of STS and includes the study of science indicators. Scientometric studies focus on methods for analyzing and measuring scientific research. Bibliometrics is the most commonly utilized methodological approach in scientometric studies and measures the impact of scientific publications.

A second subfield is science and innovation studies. Martin (2012) summarizes the evolution of science policy and innovation studies (SPIS), which he considers to be a separate field from STS. Martin focuses on policy, economic, management, organizational, and some sociological research regarding national science policy. SPIS developed from a focus on the management and economics of science, technology, and innovation. Over time, these concepts have fallen under the short title, "innovation studies." SPIS includes, but is not limited to, questions such as: what is the role of innovation on the economy? How has technology and innovation impacted industrial development and economic growth? What contributes to new

technological developments? What attributes of actors (in particular, firms) influence technological outcomes? Finally, how is basic research converted to usable knowledge? What are the economic, political, and theoretical aspects of innovation?

A third subfield under the umbrella of “S&T policy” includes scholarship studying policy problems that span a broad spectrum of substantive issues (biotechnology, stem cell research, nanotechnology, etc.). Across these substantive issue areas, S&T scholars study a wide range of questions about regulatory processes, funding, expertise, scientists, public engagement, ethics, etc. Finally, it is imperative to note that some scholars also study the role of S&T in making policy decisions in other subfields, such as: environmental policy, energy and natural resource policy, defense and national security policy, health policy, etc. All of these alternative research projects have scientific or technological components, but are excluded in my discussion because explaining S&T policy is not their central focus.

I recognize that the distinctions between these subfields are a topic of major debate amongst some scholars within the discipline (see Leydesdorff, 1989; Van Den Besselaar, 2000, 2001). Although this debate is a critical issue to defining the boundaries of the field, this debate cannot be resolved within the limits of this essay. While there are some distinguishable publication patterns, wherein particular types of questions are published within specific journals (see Van Den Besselaar, 2001), there are also areas of overlap (see my methodology section below). It is not clear that the research questions identified within specific focus areas are markedly different enough to warrant identification as entirely separate disciplinary fields—particularly given that in some recent publications, insights from STS are being incorporated into studies on the management of science policy (Garforth, 2012; Garforth & Stöckelová, 2012; Parker & Crona, 2012). While I agree that these areas of specialty utilize different theoretical or methodological approaches, I believe their common ground is found in their effort to contribute generally to questions in regard to national S&T policies within the United States and abroad. Therefore, for the purposes of this review article, I do not treat these as separate subfields, but anchor my analysis on including all recent publications that explain S&T policies.

However, it is important to note that some scholars have conducted limited analyses to examine this question of a scholarly divide within the field and have argued that most of the apparent divisions within the S&T academic community are methodological in nature (Jasanoff, 2010; Martin, 2012; Martin et al., 2012). One example of this division includes a divide between qualitative research on the production of scientific knowledge and quantitative, scientometric studies (Besselaar, 2000, 2001; Leydesdorff, 1989; Martin et al., 2012). Peter Van Den Besselaar (2000) found that while on the one hand there is a stronger segregation between qualitative and quantitative research within S&T studies on the other hand, there is a greater integration between scientometrics and S&T policy studies. However, this integration was mainly in regards to evaluation and performance studies. In addition, Van Den Besselaar (2001) also identified that while some scholars work as specialists in a subfield, some S&T policy authors (and their affiliated institutions) can be classified as generalists, because their published research cut across several of these categories.

In summary, although there have been a few recent attempts to review research in S&T policy, these reviews have been mainly expansive overviews that attempt to summarize the historical development of the field. These articles (Jasanoff, 2010; Fagerberg et al., 2012; Martin, 2012; Martin et al., 2012; Van Den Besselaar, 2001) have identified the broad topics and important seminal works within the field, but do not identify the most recent research questions currently gaining scholars' attention. In order to provide a systematic and objective overview of current research directions within the field, I collected and analyzed the keywords provided within selected articles published between 2010–2012 in 17 journals. I describe my methodology more fully in the next section.

### *Article Selection and Methodology*

Every review must bound its phenomena and reviewing S&T policy research presents a unique challenge, given that scholarship is published so widely across a variety of venues ranging from technology-specific journals, international technical journals, public policy journals, and various scientific journals. For example, Martin and colleagues (2012) identified the top 155 core contributions of STS since the 1960s and found that they were cited in approximately 6,000 journals covering a wide range of research areas. For the purposes of this research review, I employed multiple strategies that I believe provide a strong and semi-exhaustive list of the key publications in S&T policy. While recognizing that I may have excluded some articles published in specialty journals, I analyze articles published in 17 core S&T policy or general public policy journals. I have noted the journals' 2012 impact factor (IF) in parentheses.<sup>1</sup>

- First, I focused primarily on publications from the top 10 journals that are characterized as holding the greatest proportion of citations publicized within S&T research handbooks. In two separate review articles, Martin and colleagues (2012) and Fagerberg and colleagues (2012) employed similar methodology by examining the citations of S&T handbooks. They analyzed these citations and provided the following journals as holding the greatest number of key publications:

First, the top 5 journals citing STS core contributions, as identified by Martin and colleagues (2012, p. 1189), include: *Social Studies of Science* (IF 1.770); *Scientometrics* (IF 2.133); *Science, Technology and Human Values* (IF 2.406); *Research Policy* (IF 2.850); and *Studies in History and Philosophy of Science* (IF .562).

Second, the top 5 journals in innovation studies, as identified by Fagerberg and colleagues (2012), include: *Research Policy* (IF 2.850); *Strategic Management Journal* (3.367); *International Journal of Technology Management* (IF 0.56); *Academy of Management Review* (IF 7.895); and *Journal of Management Studies* (IF 3.799).

- Peter Van Den Besselaar (2001) identified the following S&T journals as most important, based upon their impact scores in their respective focus areas: *Social*

*Studies of Science and Science, Technology and Human Values* for qualitative STS; *Research Policy* as the policy oriented studies; and *Scientometrics* as the quantitative S&T studies. As you can see, these were already included based upon the prior method noted above.

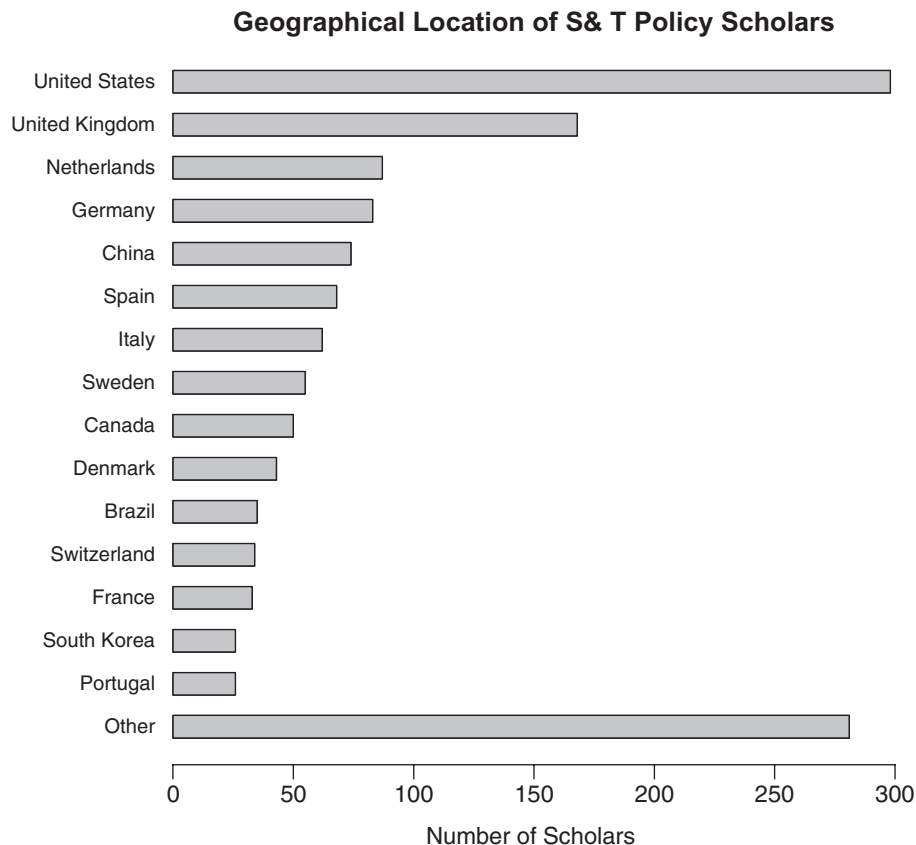
- Finally, I scanned recent publications within *Policy Studies Journal* (IF 1.791); *Policy Sciences* (IF 1.059); *Science and Public Policy*; *Journal of Policy Analysis and Management* (IF 1.781); *Review of Policy Research* (IF 1.113); *European Journal of Public Policy* (IF 1.21); *Journal of Public Policy* (1.033); and *Journal of Comparative Policy Analysis* (IF 0.509).

After identifying these key journals, I only included articles in my review that were specifically about S&T policy and fall within one of the categories described in the previous section. I did not include book reviews, commentaries, opinion pieces, or editorial-introductory articles. For each article, I collected the keywords provided by the authors, as well as the authors' geographic location. I examined a total of 668 articles, written by 1,423 authors.<sup>2</sup> Ten articles did not have keywords and 15 articles did not have geographical affiliations of the author. I collected 3,282 keywords,<sup>3</sup> and used a word cloud of these keywords to identify trends within these publications.<sup>4</sup> In the next section, I begin by providing a general overview of these trends across the entire collection of articles. After providing a wide snapshot of the field, I then give a more detailed summary of published research that examines questions in the three most popular keyword topic areas: innovation, universities, and patents. However, before talking about these general trends, I quickly provide some basic geographic information about S&T policy scholars.

#### *Geographical Location of S&T Policy Scholars*

Because this review article is published within the *Policy Studies Journal's Public Policy Yearbook*, I thought it would be interesting to present the geographic location and collaborative behavior of S&T policy scholars. Moreover, a growing body of literature within S&T examines whether scientific productivity is influenced by a scientist's credentials, environment, or networking activities (see Hoekman, Frenken, & Tijssen, 2010; Caro, Cataldi, & Schifanella, 2012). I collected information on the geographic location of scholars' listed affiliations in each of the published articles in my sample. Within the sample of 1,423 authors, S&T policy scholarship comes from institutions within 58 countries.<sup>5</sup> The greatest proportion of scholarship comes from the United States (21%) and the United Kingdom (12%). Figure 1 shows the top 15 countries that scholars' identified as the location of their institutional affiliation. As the figure shows, 80% of scholars work at institutions within these 15 countries, while 20% work across the other 43 countries. Finally, in regards to the collaborative behavior of S&T policy scholars, I collected data on the number of authors that are identified on each of the 668 articles. Over half of the articles were sole-authored (235) or written by two authors (220). The remaining 32% of articles were written by the collaboration of 3 or more authors: 136 articles by 3 authors, 48 articles by 4 authors, and 29 articles by 5 or more authors.





**Figure 1.** Top 15 countries that recent S&T policy scholars identified as their institutional locations.

### General Overview of Current Trends in S&T Policy Research

An examination of the keywords provided by scholars to classify the focus of their research articles offers us an interesting view into the current trends within S&T policy research. Figure 2 is a word cloud that was created in Tagxedo<sup>6</sup> with 3,282 total keywords. The more prominent a word is in the word cloud (shown as a larger text size) means that the word or phrase appeared more frequently in the data's text. Similar keywords were coded to be identical so that they weren't misrepresented as different terms. For example, indicator and indicators were coded in the plural form. Genetically modified organisms and GMOs were coded as the acronym. Finally, in some cases, terms that were different words but referred to the same general concept were coded to be identical: for example, impact assessment and impact evaluation. The parameters within the Tagxedo program were set to maintain an accurate portrayal of the relative proportion of the frequencies of each keyword. Furthermore, Tagxedo removes common words and stop words such as: "is," "are," "do," etc. The graphic in Figure 2 lists the top 200 most frequent terms or phrases. I cross-referenced the word counts within the program with the dataset to ensure its reliability.



Figure 2. This word cloud portrays the relative frequencies of keywords presented in recent S&T policy articles.

The benefit of using a word cloud is that we can graphically show numerical data in such a way to easily interpret or identify patterns within the tabular data. I recognize that frequency does not necessarily equal impact, but it does indicate a form of importance if scholars are repeatedly referencing a particular area of research. The word cloud shows that the top three keywords are innovation, universities, and patents. Looking a little broader, the top 20 unique keywords include (frequencies denoted in parantheses):

1. innovation (59)
2. patents (58)
3. universities (57)
4. biotechnology (33)
5. citation analysis (27)
6. environment (26)
7. governance (26)
8. research (25)
9. collaboration (24)
10. entrepreneurship (23)
11. bibliometric analysis (23)
12. institutions (23)

13. expertise (20)
14. technological innovations (19)
15. gender (19)
16. nanotechnology (16)
17. China (16)
18. networks (16)
19. risk (15)
20. business (15)

Several of the published articles in S&T between 2010–2012 focus on important concepts in public policy scholarship such as: institutions and actors, including, universities and businesses. In addition, these articles are interested in topics such as governance, collaboration, expertise, gender, and networks. Furthermore, several articles are focused on methodological topics including citation analysis or bibliometric analysis. Finally, the word cloud shows that the most popular substantive areas include biotechnology and nanotechnology. The next section describes in greater detail the research questions being investigated within articles containing the three most popular keywords: innovation, universities, and patents. Given the connection and often overlap between university issues and patents, I begin with these two areas and finish with a discussion on the broader concept of innovation. It is important to note that while the goal of this review article is to focus on trends over the last few years, most of the current research is continuing to examine questions that have been asked by scholars for several decades. In order to situate the following discussion in its context, it is occasionally necessary to cite scholarship that precedes the 2010–2012 time frame. For each section, I begin with a very brief presentation of the context to which these research questions speak, and then present some of the main theoretical questions being addressed by scholars in the last few years.

### Universities

The word cloud in Figure 3 shows 276 unique keywords that coincided with the keyword “university.” Unlike Figure 2, these keywords were not collapsed into similar terms, in order to preserve insight into the variety of areas being studied. This came from 53 articles that were written by 133 authors. Most of these authors are located within the United States (26), United Kingdom (14), Italy (13), Spain (11), Mexico (10), and China (9). Through a closer examination of this subset of articles, it is apparent that the most common coinciding keywords include: research, development, collaboration, industry relationships, industry interactions, commercialization, and technology transfer offices. Using these terms as a guide, I briefly summarize the core developments within these articles below. Within S&T policy research, scholars have pointed to two primary policy changes (dating back to the 1980s) that have influenced university activities: performance-based funding and



Figure 3. The word cloud above shows the keywords that coincided with the term “university.”

patent law reforms (Doern & Stony, 2009; Fisher & Rubenson, 2010). Because the next section focuses in on patent laws, the following discussion will focus primarily on the effects of funding policies on university knowledge transfer.

Post-WWII research policy in the United States provided scientists at public universities or government laboratories with generous public funding and immense flexibility in the scientific endeavors that they pursued. In the postwar period, the traditional linear model, which describes a process for connecting scientific knowledge, technological development, and economic growth was the primary way for understanding how governmental support for science research should be structured. The historical underpinnings of the linear model, which are often traced back to arguments made by Vannevar Bush in *Science: The Endless Frontier* (1945) (see Godin, 2006), not only advocated for an ideal of “pure” or “basic” science<sup>7</sup> to precede “applied” research, but also justified the necessity of major investments in “basic” science research to be accomplished primarily through universities.<sup>8</sup> Although S&T research takes place in both government labs and industrial organizations, U.S. policymakers still hold the view that the strength and success of the university system is the key to S&T success (U.S. House, 2012, p. 4). In 2009, academic institutions were responsible for carrying out 53% of all funded basic research within the United States (U.S. House, 2012).

However, over the past several decades, the relationship between the government, university, and industry actors has changed (Leydesdorff & Etzkowitz, 2001; Upham & Small, 2010). This has resulted in part because of a growing body of literature that challenged the postwar framework. First, several scholars argue that the relationship between S&T is more dynamic than what the linear model described (e.g., Stokes, 1997). Second, the proliferation of policy models such as the National Innovation Systems (NIS) model (Freeman, 1987; Lundvall, 1992; Nelson, 1993), laid the foundation for connecting economic performance with the technological capa-

bilities of the institutions within a nation (Castellacci, 2008; Fagerberg & Srholec, 2008; Filippetti & Archibugi, 2011; Mokyr, 2002; North, 2005; Zhao & Guan, 2012). These ideas had a strong influence on transformations in public funding mechanisms for science, which now require justifications for funding research to be connected with applied uses and/or economic benefits to society.

Therefore, science policies in the current period are less concerned with providing research autonomy and more concerned with public accountability, as evident by requirements that research programs show the value of their contributions in order to secure funding (DeMeritt, 2000). In fact, the concept of knowledge transfer, which recognizes scientific knowledge as a significant driver of economic growth, is now the central argument for contemporary university policies for research.<sup>9</sup> These recent shifts in university research policies have been attributed to several structural changes in the funding application process. During the 1980s, the United States experienced a proliferation of programs to build university research centers to bridge academic research, education, and industrial innovation (Ponomariov & Boardman, 2010). As another example, dating back to 1993, policy changes under the Government Performance and Results Act (GPRA) include requiring impact statements as a justification for research grants funded by the government, with similar adoptions occurring in the United Kingdom, Asia, and the European Union (DeMeritt, 2010). Structural changes in universities are also evident by the massive growth in creating technology transfer offices. In 1980, there were about 25 technology transfer offices in the United States, increasing to approximately 230 in 2004 (Thursby & Thursby, 2011a). Finally, a continued movement toward performance-based funding is evident in recent policy changes as well. One recent notable policy change that has been proposed with the intent to encourage use-inspired research is innovation inducement prizes (see Williams, 2012). In 2010, the America COMPETES Reauthorization Act of 2010 was passed and provided all federal agencies with the authority to offer innovation inducement prizes. Agencies can advertise specific problems and provide open calls for submissions for applied research that can serve as potential solutions to those problems.

These policy changes that emphasize applied research have generally resulted in increased collaboration between university and industry actors. Industrial partners are responsible for an increasing share of university funding, and some argue, with concern, that basic science funding for universities is decreasing (see Gulbrandsen & Smeby, 2005; Godin & Gingras, 2000; Goldfarb, 2008). It is important to note that this concern about the relationship of "basic" versus "applied" research on university activities has been going on for several decades (see Byerly & Pielke, 1998; Gibbons, 1998; Geuna, 1999, 2001; Ziman, 1996; Martin, 2003; Ranga, Debackere, & Von Tunzelmann, 2003; Sarewitz & Pielke, 2007). Furthermore, scholars continue to be divided over the true implications of this shift, given a general lack of empirical substantiation to these claims (see Van Looy, Ranga, Callaert, Debackere, & Zimmerman, 2004).

Recent work examining these policy changes is a continued attempt to understand two broad questions. First, what is the impact of the research funding process on university activities? Second, what are the effects of these policy changes on



industry-university collaboration? In an effort to answer these broader questions, scholars focus on more specific questions across a wide variety of contexts. First, how have changes in funding affected the nature of research results (i.e., basic versus applied research) (Auranen & Nieminen, 2010; Furman, Murray, & Stern, 2012; Hessels, Grin, & Smits, 2011; Parker & Crona, 2012; Smith, 2010; Weingart, 2010)? Second, how have these changes affected the behavior of academic scientists (Lam, 2010; Perkmann, King, & Pavelin, 2011; Perkmann et al., 2013; Yang & Chang, 2010)? Third, what institutional factors promote or inhibit university-industry relationships (Bruneel, D'Este, & Salter, 2010; Hessels et al., 2011; Hewitt-Dundas, 2012; Shapiro, 2012; Sá & Litwin, 2011)? A selection of articles that highlight the major arguments within the literature is discussed below.

First, how has a shift in S&T policy that emphasizes applied research impacted contemporary university activity? In particular, has university knowledge production shifted away from traditional "basic" science, to more "applied" orientations? As the government adopts new processes that emphasize economic productivity, some scholars suggest that this has caused shifts in the types of scientific knowledge that are being produced (Boden & Epstein, 2006, 2011; Gulbrandsen & Smeby, 2005), and that these policies are potentially transforming the identity of many academic institutions (Abramo, Cicero, & D'Angelo, 2011; Parker & Crona, 2012; Weingart, 2010). These scholars are concerned that the push for applied research will not only impact funding for "basic" research, but that it will also threaten the survival of the university system as a whole, because it will shift the types of research scholars must engage in to secure funding. For example, Smith (2010) analyzed interviews with academic researchers in Scotland and England between 1997 and 2007, and found that the pressure to produce policy-relevant research is diminishing the capacity of academia to provide a space in which innovative and transformative ideas can be developed, and is instead promoting the construction of "institutionalized and vehicular (chameleon-like) ideas" (p. 176). In addition, some scholars contend that changes in university-industry relationships are transforming the external boundaries of the knowledge base of academic work as well as academic professional identities (Beck & Young, 2005). Since the 1980s, scholars have continued to examine this question and remain quite divided in finding evidence to support these claims. In order to move the literature forward, scholars have proposed changes in the types of variables under investigation.

First, scholars argue that research examining changes in knowledge production should focus on the different types of funding that are used and also the rate of change in funding policies. While some scholars have argued that these policy changes have negatively affected universities, others disagree. Several scholars argue that university-industry relationships can have positive impacts on university scientific productivity, especially when multiple funding sources are used (Manjarres-Henriquez, Gutierrez-Garcia, & Vega-Jurado, 2008). Martin (2003) argues that the consequences of this shift for universities may not be too egregious if changes in funding policies are made incrementally. According to Martin, universities will evolve to match these changes and universities will continue to be important for national science policy, but perhaps in new ways. However, other scholars

argue that federal policies are not the only explanation for changes in publication outputs. For example, Auranen and Nieminen (2010) analyze performance-based systems in eight countries, and analyze whether different funding environments impact publication performance. They found that while there are clear differences in the competitiveness of funding systems across countries, there was not strong evidence that these financial incentives were related to increases in publication productivity. Their results relate strongly to other previous studies examining funding and publication behavior (Albert, 2003; Behrens & Gray, 2001; Van Looy et al., 2004). In addition, although Beaudry and Allaoui (2012) found a strong relationship between public funding and publication outputs in the case of Canadian nanobiotechnology research academies, there was no relationship between research funding and the citation count (typically used as a proxy for “quality” or “prominence”) for academic articles. Furthermore, private contract grants (which are typically closely tied to applied research) did not have a negative effect on article publications. This provides some support that concern that use-inspired funding was diminishing basic research may be overstated. Instead, an additional factor that was connected with increased publication output was the presence of strong collaborative networks.

Research along these lines has led many scholars to examine whether changes in knowledge production are better explained by institutional factors. Hessels and colleagues (2011) examined what institutional features can moderate how performance-based funding influences academic practices in Dutch agricultural science. They found mixed evidence based on their use of bibliometric indicators. Factors such as collaboration with societal stakeholders and attributes of leading research questions within a field were found to be important predictors for article production. In some cases, researchers who engaged with local stakeholders were able to maintain a basic research agenda. In other contexts, when researchers worked under pressure to meet performance criteria, this tended to result in a shift of research that was more application oriented. Similarly, in the case of South Korea, Park and Leydesdorff (2010) found that performance-based funding mechanisms that emphasized publication performance for tenure unintentionally discouraged collaborative behaviors. This suggests that an unintended consequence of these policies can result in a lack of networking between universities, industry, and government; which subsequently diminishes potential technological outcomes.

Second, scholars argue in favor of changes in the types of dependent variables being examined in this literature. Some scholarship is emphasizing that academic publications are not the only valuable contribution made by universities. For example, Bramwell and Wolfe (2008) contend that universities are not only producing knowledge transfer, but also contribute to economic growth through generating local talent, technical support, and industrial collaborations. Furthermore, Grimaldi, Kenney, Siegel, and Wright (2011) have argued that academics participate in several types of entrepreneurship that go beyond publishing research, including: social critic, patenting, licensing, academic spinoffs, collaborative research, contract research, and consulting. In addition, Perkmann et al. (2013) provide a meta-analysis of articles about university-industry relationships and argue that universities engage in several additional avenues of knowledge dissemi-

nation beyond commercialization, such as academic entrepreneurship and creating intellectual property. They emphasize that university-industry partnerships extend beyond financial motives as academics and industry engage in collaborative research, contract research, consulting, and informal relationships.

For example, Ding and Choi (2011) examine the different ways that scientists may be involved with commercialization, focusing on two activities such as participating on a firm's scientific advisory board or founding a company to commercialize a new discovery. In particular, they analyze when and why scientists choose to engage in one of these activities. In their analysis of 6,100 scientists, they find many factors to be important. First, the timing during a scientist's career cycle is an important predictor, with founding activity occurring much earlier than advising activities. The more productive a scientist is in their career (measured as publications), the more likely they are to found their own company, with no effect on advising. In addition, prior experience as an advisor to a firm decreases the likelihood that a scientist will engage in academic founding activities. In both activities, females lag behind male scientists but have a greater likelihood to participate in advising. These findings are similar to other research that finds that women are less likely to become a scientist entrepreneur (Aldridge & Audsretsch, 2011; Allen, Elam, Lagowitz, & Dean, 2007). Finally, institutional factors such as coming from a top-ranked university increases the propensity to engage in founding over advising by two-fold.

The foregoing discussion relates closely to a second body of questions within the S&T literature that examines how performance-funding systems have affected the behavior of scientists. Lam (2010) also argues that critics concerned that university-industry relationships are negatively impacting academic scientific practices have been too harsh. Whereas early characterizations of scientists describe them as ambivalent to external challenges, a growing literature has analyzed the active role of scientists in redefining the boundaries of their work in response to funding changes (Ashforth, Kreiner, & Fugate, 2000; Calvert, 2006; Gieryn, 1983; Kreiner, Hollensbe, & Sheep, 2006; Lamont & Molnar, 2002). In Lam's analysis of scientists from five UK research universities, she tracks the behavior of scientists and identifies four dominant roles that characterize scientists as strategic actors. These roles vary from one extreme, a "traditional" scientist, in which scientists are resistant to collaboration with industry and are motivated by the need to obtain funding, to the opposite extreme, an "entrepreneurial" scientist, in which scientists believe in the importance of science-business collaboration and are motivated by the need to pursue the most important application of science and engage in networking that facilitates knowledge exchange. The implication of this study is that while some scholars have shown concern that the increasing collaboration between industry and universities is hurting academic practices, her findings show that these changes do not necessarily mean that the values associated with university research are eroding. Rather, academic scientists in her study were still able to maintain a sense of autonomy in defining their research goals. Furthermore, Yang and Chang (2010) also found scientists that operated with an entrepreneurial commitment were more likely to move away from traditional methods for sharing knowledge and enhance the development of applied research.

Similarly, Furman and colleagues (2012) found that in the case of the United States' policy regarding public funding of human embryonic stem cell research, in the period between 2001 and 2003, changes in science policy resulted in scientists responding strategically to research funding restrictions. Despite limited funding targets within U.S. policies, scientists found alternative mechanisms to fund their research. Accordingly, the initiative of both U.S. university research programs and collaboration amongst scientists with global research partners drove an increase in the production of stem cell research in 2003.

Third, scholars in S&T are continuing to examine what factors promote or inhibit university-industry collaboration. Perkmann et al.'s (2013) meta-analysis highlights several individual characteristics that predict an increase in likelihood to collaborate with industry. Gender is an important predictor, as male academics were more likely to engage with industry. Age was insignificant, although seniority had a positive relationship with collaboration. Finally, more productive scientists were generally more likely to engage with industry (see Perkmann et al., 2011). However, they note that their findings remain tenuous given the nature of their data, and that future research needs to provide more consistent measures and could benefit our understanding by providing longitudinal data.

Building on our understanding of what factors encourage collaboration, Bruneel and colleagues (2010) investigate the organizational barriers to university-industry collaboration by analyzing several UK firms that partnered with universities on publicly funded research projects (see also Leisyte, 2011; Thune & Gulbrandsen, 2011). Coming from the industry's perspective, they found that industries with prior experience (reoccurrence) in collaborating with universities and industries with high levels of trust in university practices were better able to overcome organizational and contractual barriers to ensure productive partnerships. In addition, Sá and Litwin (2011) identified several policy tools employed by Canada to improve university-industry linkages. These policy tools include: information tools that foster communication; legal instruments that include tax incentives and credits for collaborating; and finally, financial instruments that include federal level institutions created specifically for distributing funding for collaborative efforts. These policy tools highlight the multifaceted ways that countries have restructured their innovation systems to encourage university-industry linkages.

In summary, scholars investigating the impact of funding policy changes on universities continue to be quite divided in regards to the extent of these impacts. While several scholars certainly agree that these policies have changed the nature of university activities, the findings in their analyses show that negative concerns may have been overstated. Most of this scholarship, however, has only grown incrementally over the past several decades, with the primary challenge being a methodological one (see Salter & Martin, 2001). Insufficient longitudinal data and measurement issues make it extremely difficult to pinpoint the effects of these policies on knowledge production. For example, the literature commonly compares the effects of these performance-based systems across countries (for example, Auranen & Nieminen, 2010; Hicks, 2012). However, scholars are recognizing the





response to reforms in patent laws. Scholarship on patent production falls mostly along two lines. First, what factors promote the production of patenting? Second, what is the impact of changes in patent policies on university research activities? To provide the reader with context, The Bayh-Dole Act, The Stevenson-Wydler Technology Innovation Act, and Uniform Federal Patent Policy Acts of 1980 shifted intellectual property rights of publicly funded research away from the government to the institutions responsible for conducting the research (DeMeritt, 2000; Mowery, Nelson, Sampat, & Ziedonis, 2001). The Bayh-Dole Act gave universities full autonomy to patent and license intellectual property that was produced at their university, even if it was publicly funded. These policies were developed to encourage university scientists to engage in patenting activities, and to incentivize industrial partners to license these products. In the early 2000s, most S&T policy scholarship focused on analyzing the quantity and quality of university patents (Berman, 2008; Mowery & Ziedonis, 2000; Mowery et al., 2001; Mowery, Sampat, & Ziedonis, 2002; Sampat, 2006). Several studies found that in the United States and in Europe, the quantity of patents increased, although the quality has decreased (Geuna & Nesta, 2006; Geuna & Rossi, 2011; Mowery et al., 2001). In an effort to build upon our understanding of the impacts of patents, scholars are showing continued interest in several different questions. First, scholars treat patenting as the dependent variable and examine what factors influence the choice to patent (Grimaldi et al., 2011; Huan, Feeney, & Welch, 2011)? Furthermore, what explains the general decline in patents over the last decade (Leydesdorff & Meyer, 2010)? Second, what is the impact of patenting on knowledge production (Crespi et al., 2011; Evans, 2010a, 2010b; Geuna & Rossi, 2011; Parthasarathy, 2011; Thursby & Thursby, 2011a, 2011b; Wong & Singh, 2010)?

First, recent research has continued to build upon the previous literature by investigating the factors that determine the propensity for a scientist to engage in patenting activities. First, several studies are pointing to institutional factors that encourage patenting. For example, Huan and colleagues (2011) utilized a national survey of university scientists and engineers and found that both individual and organizational factors were correlated with individual patent production. Primarily, they found that universities that provided departments financial incentives were associated with higher quantities of patenting. Evolving institutional performance mechanisms can also be attributed to a possible decline in patenting. Leydesdorff and Meyer (2010) address concerns that since the early 2000s, university patenting has been on a general decline. They argue that data quality issues, including the new university ranking system, which do not include patents or spin-offs, have made it difficult to accurately draw conclusions about the cause of recent patent declines. However, Geuna and Rossi (2011) attribute a general decline in patenting in Europe to a shift from academic patent ownership to university patent ownership. Under academic patent ownership, an individual researcher would have the intellectual property rights to their research. Under university patent ownership, the institution that supports the research maintains rights to the product. This research suggests that scientists have adjusted to these changes by choosing alternative commercialization practices.

Along similar lines, Link, Siegel and Van Fleet (2011) found that the Bayh-Dole and the Stevenson-Wydler Act did not have an impact on patenting at National Laboratories in the way that these policies have on universities. Rather, policies that focused on financial incentives, such as the Federal Technology Transfer Act, had a greater influence in prompting patenting. Furthermore, their results showed that senior scientists who demonstrated strong publication records and had open-science attitudes (measured as the extent to which the scientist favored open-science norms and values) were more likely to have multiple patents.

In addition, Wong and Singh (2010) found additional evidence that strong publication records are an important predictor of patent quantities. Their study showed a positive relationship between the patenting output of major universities around the world and the quantity and quality of their scientific productions. However, while production is high within North America, the degree of internationalization of faculty members is found to reduce patenting performance within North American universities. Furthermore, patents had less of an impact on the quality of productions for universities outside North America. In similar research, Haeussler and Colyvas (2011) find several individual characteristics of university scientists that predict greater participation in academic entrepreneurship. Scientists with attributes such as professional security and productivity were more likely to value patenting and other commercial achievements.

Second, scholars are continuing to draw connections between the existence of patents and the impact on knowledge production. Thursby and Thursby (2011a) examined eight U.S. universities' patenting activities between 1983–1999, to test a reoccurring hypothesis that patent practices under the Bayh-Dole Act have diverted faculty away from participating in traditional basic research (see also Sampat, 2006). Their study found no evidence to support this view. In contrast, they found that both basic and applied research has increased since the passing of the Bayh-Dole Act, although around 2002 basic research leveled off, with applied research continuing to increase.

Andersen and Rossi (2011) also found that patents had a positive impact on industrial knowledge production. In a study of 46 universities in the UK, patents were seen to result in the most effective knowledge dissemination in the economy. Furthermore, proprietary forms of IP led to increases in financial resources and knowledge transfer flows from university to industry, but non-proprietary forms of IP were primarily beneficial to the universities' own innovation processes. Nonetheless, shifts in patent laws led several universities to engage in activities with industry, such as commercial ventures that might lead to profit.

Along similar lines, concerns about the impact of the Bayh-Dole Act have led several scholars to investigate the impact of patent reforms on knowledge sharing. Evans (2010a) examined the impact of university-industry relationships on knowledge dissemination and sharing by comparing interviews with academic scientists and industrial researchers. While members of academia are acculturated toward communicating and sharing scientific ideas, professional and career goals may incentivize scientists to withhold scientific information, at least until they can secure credit for their results. Contrastingly, Evans found that companies tend to manage

their resources for long-term control. The results of his study found that industry sponsorship was associated with a reduced effort by scientists to share research results and methodology. However, this may be in part due to differences in the types of research these scientists undergo. Horta and Lacy (2011) found that information sharing is higher at large research institutions than small research institutions. In addition, academics at large research institutions were more likely to publish internationally. In a separate study, Evans (2010b) found that government funding tended towards confirmatory work with established methodology, but industrial funding was more likely to explore new scientific ideas with speculative techniques. In summary, perhaps due to commercialization incentives, industrial researchers are engaging in more innovative research, but they are also more cautious about sharing their research results.

In summary, scholars are finding continued support that the Bayh-Dole Act of 1980 successfully prompted universities to increase their patenting efforts. However, it was the National Technology Transfer Act that had a greater influence on national laboratory patenting. Second, whereas some scholars have argued that these reforms may be diminishing the production of basic science research, evidence by Thursby and Thursby (2011a) does not support this view. Instead, increases in patenting seem to encourage both basic and applied research to rise. Along similar lines to the university research discussed above, research on patent reform is limited primarily due to methodological concerns. Several studies noted poor data quality and measurement issues (Crespi, D'Este, Fontana, & Geuna, 2011; Geuna & Nesta, 2006; Leydesdorff & Meyer, 2010). For example, Aldridge and Audretsch (2011) discuss the limitations of data coming from technology transfer offices because they do not include robust measures of scientist entrepreneurship. Furthermore, similar to the university issues, scholarship on patents also highlights the limitations with comparative studies that examine changes across nations (Geuna & Rossi, 2011). Most of the research discussed above about performance-funding mechanisms and about patent reform emphasized how these policies resulted in increased collaboration between university, industry, and government organizations. These collaborations are the structural elements of several different innovation models that explain national technological outcomes. The next section describes, in greater detail, research on innovation processes.

### **Innovation**

Figure 5 is a word cloud that was built from 797 keywords that coincided with the keyword "innovation." Innovation was the most frequent keyword to appear in recently published S&T articles (210). These terms came from 155 articles that were written by 348 authors. Most of these authors are located within the United Kingdom (64), United States (56), the Netherlands (31), Spain (19), Sweden (17), China (16), Denmark (12), Italy (12), and Germany (11). The word cloud reveals that the most common keywords to coincide with "innovation" include: technological innovations, innovation policy, national system of innovations or national innovation systems,



*National Innovation Systems*

Starting in the late 1980s, Christopher Freeman (1995), Bengt-Ake Lundvall (1992), and Richard Nelson (1993) developed the National Innovation Systems (NIS) model for understanding innovation processes. These authors were primarily interested in the relationship between economic growth and technological production. Scholars at this time argued that international competitiveness was linked with knowledge production. Earlier work in NIS focused on the role of firms in long-term economic change, but in the last several decades, NIS scholars have argued that economic benefits from knowledge production will vary depending on social, political, organizational and institutional factors at the national level (Edquist, 2006; Gray, 2011). While the growth of research in NIS has remained steady (Uriona-Maldonado, dos Santos, & Varvakis, 2012), it is important to note that scholarship in NIS set the path for the emergence of more recent approaches to understanding innovation systems. These arguments were critical for understanding the transformation in science policy from focusing on the production of basic information to focusing on usable or applied information (Fagerberg & Sapprasert, 2011). More importantly, NIS research laid the foundation for connecting economic performance with the technological capabilities of the institutions within a nation (Castellacci, 2008; Fagerberg & Srholec, 2008; Filippetti & Archibugi, 2011; Mokyr, 2002; North, 2005; Zhao & Guan, 2012). One important implication of NIS studies and previous research on innovation is that technological advancement is not directly related to investments in R&D, but rather learning and innovation occur between different users and producers of knowledge and technology (Brooks, 1968, 1990; Fagerberg & Sapprasert, 2011; Freeman, 1995; Hung & Whittington, 2011; Nelson, 1993). Recent work in a scientometrics study by Zhao and Guan (2012) are continuing to reach these same conclusions, finding that there was no significant connection between R&D expenditures in nanotechnology and the actual practices of research within universities. Rather, their study emphasized the importance of collaboration between university and industry actors in order to promote technological developments. The main theoretical premise behind NIS led to the proliferation of other science policy models that examine the processes that connect knowledge outputs with technological developments. There is a rapidly growing literature on two of these models: Mode 1 and Mode 2 forms of knowledge and the Triple-Helix model.

*Mode 1 and Mode 2*

This emphasis on the interactions between key actors such as government, universities, and industry is central to another scholarly effort to model technological outcomes called Mode 1 and Mode 2 conceptualizations of knowledge. In 1994, in *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*, by Gibbons et al. (1994) contended that the research process had changed dramatically since the postwar period. First, these scholars argued that the relationship between S&T was much more interactive than the linear model pro-



posed, and second, the process involved a broader set of participants in the decision-making process. Gibbons et al. call the old paradigm "Mode 1" and argued that this paradigm had evolved into what they call "Mode 2," or a research process that had an applied focus, was dominated by a multi-disciplinary approach, and involved a broader set of participants in the decision-making process. The evidence they cite for this transformation included: "users" or "consumer" participants on peer review boards, detailed impact studies that acknowledge the applications that can be derived from funded research projects, and scientific knowledge being no longer considered a public good, but rather considered intellectual property that is traded in a similar fashion to other goods and services. The transformation of knowledge into intellectual property was a result of globalization and the development of new research communities including knowledge organizations, think tanks, management consultants, and activist groups (Nowotny, Scott, & Gibbons, 2003).

Mode 2 processes promote a more interactive and multi-disciplinary approach to problem identification and research practices than Mode 1. Recent scholarship in S&T investigates the extent to which research programs designed upon the premises of the Mode 2 approach to research management actually promote interaction amongst government, university, and industry. In the United Kingdom, for example, Mitev and Venters (2009) assessed a three-year research project on environmental sustainability in the construction industry, funded by the Engineering and Physical Sciences Research Council. Although a Mode 2 research approach promotes a trans-disciplinary approach to knowledge production, Mitev and Venters found a lack of consensus and unresolved tension amongst research collaborators, resulting in different agendas from academic and industrial partners. They also identified impacts from institutional incentives that are tied with university performance criteria. They found that academic researchers behaved differently in the research funding application phase and post-funding phases, resulting in poor multi-disciplinary collaboration (see also Swan, Bresnen, Robertson, Newell, & Dopson, 2010; Worrall, 2008; and Scarbrough & Swan, 2001). In addition, because the issue of environmental sustainability tends to be politically charged, Mitev and Venters conclude that tensions between public and private agencies were likely due to different preferences over research practices and different sources of accountability, resulting in a lack of agreement over proposed solutions. In summary, their study challenges the Mode 2 research management approach for neglecting institutional and political contexts (see also Hansen, 2009). These scholars argued that the boundaries between Mode 1 and Mode 2 research are not clear, and therefore they suggest improving the management and implementation of the Mode 2 approach.

A Mode-2 society is conceptualized such that the production of scientific research is to be socially embedded and emphasizes open discussion and interaction between scientific experts and the public (Lengwiler, 2008; Nowotny et al., 2003). However, in a study of public engagement projects in fourteen approaches to nanoscience and technology funding, Kurath (2009) found little evidence that the programs increased social robustness. For example, a few of the approaches scored negatively on the criteria of acceptability. The tension in her findings may also be due to unclear boundaries between Mode 1 and Mode 2 processes, or they may be a

reflection that the conceptualization of Mode 2 overstates its promise to produce socially robust knowledge. While more empirical work is needed to understand the implications of the Mode 2 paradigm, other scholars within S&T have focused on the relationship between government, university, and industry through a Triple-Helix model.

### *Triple-Helix Model*

The Triple-Helix model is another recent way that scholars describe innovation, or the translation of knowledge production into technological outcomes. This model also describes technological outcomes as a result of the interaction between universities, industry, and government, but also emphasizes the transformations of these actors as a result of these interactions (Etzkowitz, 2003; Etzkowitz & Leydesdorff, 1997, 2000; Metcalfe, 2010; Park, Hong, & Leydesdorff, 2005; Shin, Lee, & Kim, 2012; Webster & Packer, 1997). Proponents of this model argue that this tri-fold relationship is the key to maximizing the conditions for innovation. The government utilizes contractual agreements that stabilize interactions, the university provides new knowledge, and finally industry provides the production of new technologies. Organizational arrangements within the government have changed such that it has resulted in many new developments, including hybrid academic research centers that collaborate with both industrial and governmental partners. Whereas former views of the role of universities was that universities limit themselves to research and education, Henry Etzkowitz (2003) argues that currently, entrepreneurial universities play a critical role in the production of innovation as these universities seek to influence the economy. Entrepreneurial universities arose as university policies began responding to competitive research funding systems. Similar shifts are occurring within industry and the government. The federal government is playing more of a steering role in the research-funding process and within industry we are seeing the rise of spin-off organizations that have academic characteristics. The Triple-Helix model argues that as universities, industry, and government increase their interactions, new organizational forms will arise to promote innovation and enhance each actors' general performance.

But are government, universities, and industry the only important actors? Amy Metcalfe (2010) examines intermediating organizations that operate in the spaces between public, private, and academic organizations. These organizations are typically nonprofit organizations that include: professional associations, foundations, consortia, independent research support organizations, and special interest groups. Using case analysis of two intermediating organizations in Canada, Metcalfe found these organizations to have a major influence on the exchange of actors, resources, and flow of commerce. Acting as liaisons, these organizations were important for the creation of strategic alliances and collaboration, as well as drawing attention to new products and services.

Initially, the Triple-Helix Model underemphasized the role of the public in optimizing S&T programs. However, drawing upon the literature in Mode 1 and Mode 2 conceptualizations, some scholars have synthesized these frameworks into a

new mode for future science policy. Carayannis and Campbell (2012) argued that innovation modeling should be expanded to a Mode 3 or a Quadruple-Helix model that includes interaction between government, universities, industry, and civil society. Whereas Mode 1 was a focus on basic university research, and Mode 2 was centered on knowledge application and knowledge-based problem-solving, a Mode 3 approach focuses on a synthesis of top-down government, university, and industry policies with a bottom-up civil society initiatives. They argue in this framework that by utilizing civil society organizations as well as media-based and culture-based public organizations, science policies can gain valuable insight into socio-economic and socio-political factors that surround issues in S&T. By integrating all four actors (government, industry, academia, and civil society), the interaction between these groups will promote co-development and co-specialization that will facilitate the emergence of different knowledge modes. Taking their model further, Carayannis and Campbell also conceptualize the possibility of the Quintuple Helix that would incorporate the natural environment or societal context. Arguing for a systems theoretical approach to understanding these dynamics, they argue that by encompassing these additional factors, S&T policy can move toward a knowledge-based and innovation-based democracy that integrates the many factors that have been woven throughout S&T policy research.

Although the literature above has been the predominant way for scholars to model technological progress, these efforts have been criticized for being mostly atheoretical and needing greater empirical verification (Kleinman, 2010). How accurately do these theoretical models describe the real-world policymaking environment? Logar (2011) examined several of these models as well as Post-normal Science (Funtowicz & Ravetz, 1993), Pasteur's Quadrant (Stokes, 1997), and Well-ordered Science (Kitcher, 2001) in light of the policies adopted within the U.S. Department of Agriculture, the Naval Research Laboratory, and the National Institute of Standards and Technology. In these institutions, he found that two primary factors discussed in these policy models were accounted for: inclusion of applied-oriented research and input into the decision-making processes. From a policy application perspective, Logar argued that attributes of the more complex models, such as Mode 2 science, are too vague and difficult to evaluate. This suggests that by improving the empirical examination of innovation systems, policy scholars may improve their ability to build models that are not only more descriptively accurate, but that are also able to provide policymakers with guidance.

## Discussion

As presented in this review, the subfield of S&T policy is ripe for further exploration and new avenues of research. Most of the research over the past few years is continuing to examine questions that have prevailed over the past several decades. It seems that due to data limitations and measurement issues, this research has grown only incrementally since the 1990s. On the basis of the evidence currently at hand, it is becoming widely recognized that financial investment in scientific knowledge alone will not necessarily generate economic growth. Furthermore, there is disagree-

ment as to whether the Bayh-Dole Act is responsible for the rise in patenting after the 1980s (Berman, 2008). Thus, scholars are interested in finding more rigorous ways to explain when, how, and why these processes are effective. In both cases, scholars are pointing toward institutional factors. First, national S&T policy has direct implications for academics working in research universities as recent scholarship continues to examine how policy changes cause shifts in university outcomes. Although policy changes are affecting the nature of university activities, specifically in terms of the type of research scholars are engaged in and patenting activities, preliminary findings in scholarship are indicating the ways in which universities and scientists are adjusting to these constraints. Second, the complex aspects of many S&T issues has created a policy context that has called for restructuring the processes for managing science, technology, and innovation programs. Scholars have gained some insight into these processes by understanding how collaborations between the government, universities, and industry impact technological outcomes. However, research in this area has been primarily focused on theorizing and needs more rigorous empirical substantiation.

In conclusion, one general development that is reflective in this review article is a shift in focus in S&T policy scholarship, away from the production (both in terms of quantity and quality) of new technologies to a focus on the relevance and acceptability of technological outputs. However, the main challenges that emerge from such an assessment of the field are a lack of clarity regarding important concepts and the difficulties associated with conceptualizing and operationalizing variables within these studies. Looking across the entire spectrum of scholarship in S&T policy, it seems that scholarly efforts have mostly been centered on theorizing. While normative and formal theorizing is an important precursor to the expansion of theoretical ideas, theory is advanced through empirical analyses. S&T policy scholarship is moving in this direction, as some scholars have recently made calls for improved methodological methods (see Lane & Black, 2012; Fealing, Husbands, Lane, Marburger, & Shipp, 2011). By focusing on methodological advancements, this will provide stronger methods for hypothesis testing and theory development. In addition, better metrics will improve our ability to reliably measure the success or failure of scientific investments. As policymakers make decisions about future investments in R&D, further academic contributions in understanding the impact of S&T policy are vital for informing decision-making at the federal level. Although recent scholarship provides preliminary insight into these questions, there is still need for more rigorous research in these areas.

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### Notes

1. The Impact Factor is a measure reflecting the average number of citations to recent articles published in the journal, and is typically indexed for the two previous years.

2. This does not reference unique individuals. If a person authored more than one article, then they may have been included multiple times. Because these indicators are about influences on the nature of published research, it seemed relevant to include each author as many times as they appeared.
3. An individual "keyword" may be a single word or a phrase made up of multiple words.
4. By using the keywords provided by authors, it provides us with an interesting view into what they deem as the most important concepts within their article. Any given article can be about a range of important topics: methodological, substantive topical, theoretical, or all of the above. I use the provided keywords as a starting point to organize the structure of this analysis, and then provide a more in-depth narrative analysis that summarizes and discusses the most common topics. This provides us with an objective selection of a large number of articles covering a wide-variety of topics.
5. These countries include: Argentina, Australia, Austria, Belgium, Brazil, Brussels, Bulgaria, Canada, Chile, China, Colombia, Croatia, Cyprus, Czech Republic, Denmark, Ethiopia, Finland, France, Germany, Ghana, Greece, Hungary, Iceland, India, Iran, Ireland, Italy, Japan, Kenya, Latvia, Macau, Malaysia, Malta, Mexico, Netherlands, Norway, Pakistan, Poland, Portugal, Russia, Saudi Arabia, Serbia, Singapore, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, United Kingdom, United States of America, Venezuela, and Vietnam.
6. Tagxedo is a software program that takes text and utilizes the frequencies of words to create a word cloud. It is available online at: [www.tagxedo.com](http://www.tagxedo.com).
7. The defining characteristic of "basic" science is experimental or theoretical work toward the purpose of a broad understanding of particular phenomena within a field.
8. During that time, proponents of the scientific enterprise placed great value on the production of "basic" science, and national science policy placed a clear boundary between funded research and commercial applications. Vannevar Bush and his supporters were concerned that constraining the pursuit of general knowledge to ties with practical use could potentially stunt the creativity of scientific research and the country's competitive edge. The idea of the "linear model" grew out of this insight and becharacteristic of the National Science Foundation (NSF) concept of "technology transfer" (Stokes, 1997).
9. In the postwar period, the traditional linear model, which describes a process for connecting scientific knowledge, technological development, and economic growth, has been the predominant paradigm for understanding how governmental support for science research should be structured. The linear model describes a process that clearly delineates amongst the following four stages: scientific information begins as basic research (acquiring information about a subject without specific applications), is then incorporated into applied research (acquiring information for specific objectives), and finally, that information is utilized in the development, as well as the production of new technology. This model has been the adopted approach for the past several decades and provided the structural basis for most research and development programs that were financed within the Department of Defense (Stokes, 1997). The historical underpinnings of the linear model not only advocated for an ideal of "pure" science to precede "applied" research, but also justified the necessity of major investments in basic science research to be accomplished primarily through universities. However, several scholars have criticized the use of the linear approach and have highlighted its insufficiencies for guiding future investments in science policy. More recently, scholars are analyzing alternative models that shift the making of national science policy away from the linear model to more interactive models, particularly given the evolving relationship between public funding, universities, and industry.

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## Policy Journal Trends and Tensions: *JPAM* and *PSJ*

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*Academic journals may especially influence the development of an emerging field; early editors of public policy journals were explicit about that goal. Two leading journals—the Journal of Policy Analysis and Management and the Policy Studies Journal—were compared for changes between the early 1980s and 2007–2010. Over time, both journals published far fewer research articles by practitioners, and the non-university share of both editorial boards also declined. The journals continued to focus largely on the United States. Both showed a dramatic increase in the proportion of co-authored articles. Over time, JPAM became far more likely to publish studies by economists and far less likely to publish political scientists while PSJ increasingly published political scientists. JPAM authors now primarily reference economics journals. PSJ authors often cite political science, public administration, and other public policy journals. Both journals moved away from broad policy essays, with JPAM heavily trending to multivariate (essentially econometric) secondary analyses of large data sets and PSJ including a broader range of methodologies. Contrary to early predictions of a progressively more interdisciplinary field, the opposite trend—stronger alignments with specific disciplines—reflects public policy’s ongoing challenge in transcending long-standing academic legacies and boundaries.*

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**KEY WORDS:** public policy journals, authorship, editorial boards, interdisciplinary research, publication trends

### Introduction

Publishing peer-reviewed research allows academic journals to help shape a field by setting its boundaries, sustaining or discarding certain lines of investigation while introducing new ones, featuring studies that reinforce or advance preferred methodologies, and screening out papers judged unworthy. In an emerging interdisciplinary area, leading journals may play an especially influential role.

Public policy is one such field, a notoriously tricky academic arena with intersecting disciplines, varied methods, and diverse foci. Perhaps public policy journals have a particularly influential role molding, and not just reflecting, such a field. Indeed the “main function” of the *Journal of Policy Analysis and Management*, according to its first editor Raymond Vernon (1985, p. 578), was to shape developments that would “speed the day” when public policy would be a “recognized professional field” with “a hard core of methodologies, a considerable body of

accumulated wisdom, and a common language for the communication of such ideas." Other early editors also made it clear that their journals' proactive task was to "help give some shape to the developing area of policy studies" (Nagel, 1973 in *Policy Studies Journal*) and "nurture and structure a discipline" (Brewer, 1974, p. 239, in *Policy Sciences*).

As gatekeepers, editors and reviewers must continually decide what research to reward with publication. The cumulative impact of their individual verdicts builds an overall voice and tone for a journal, constructing a highly visible component of a new field such as public policy. Although constrained by the choices among submitted papers, much of a journal's power and prestige is due to the selectivity of its choices, winnowed to only about two dozen research articles each year. A general public policy journal cannot possibly cover all topics, all countries, and all methods, but the final publication patterns—whether inadvertent or due to intentional priorities—still allocate scarce resources and showcase the chosen few articles as the most exemplary research in public policy.

Whether or not the editor explicitly states that the journal's role is to shape the field, the quarterly compilation of all their incremental choices reflects priorities on many dimensions. To what extent, for example, does it publish research that is grounded in a particular parent discipline such as economics or political science, that relies on certain preferred methodologies, that takes a practitioner or more academic orientation, that focuses on the U.S. or elsewhere in the world, and that requires increasingly large collaborations or can be conducted by a solitary scholar?

Journal content matters if, over time, these judgments make journal decision-makers architects rather than merely curators of the field. Thus, in areas related to public policy, scholars have found it useful to track trends of research articles in their leading publications, including economics (Heck & Zaleski, 1991), political science (Bennett, Barth, & Rutherford, 2003; Elliott, Ho, & Holmes, 2009), public administration (Lan & Anders, 2000; Raadschelders & Lee, 2011), and management (Scandura & Williams, 2000). While not a longitudinal study, deLeon, Gallaher, Pierce, and Weible (2010) reviewed recent years in *Policy Studies Journal*. Otherwise, systematic reviews of trends in public policy journals could not be found.

To explore public policy journals in more detail, some screening is required. Which public policy journals matter most? Without sinking too deep in the quagmire of competing citation and reputation measures of journal rankings (Beed & Beed, 1996; Pontille & Torny, 2010), a few general conclusions can be drawn. Exact standings vary year to year and measure to measure, but the most highly ranked, primarily American, public policy journals without a subject-area focus typically are (in alphabetical order):

- *Journal of Policy Analysis and Management*
- *Policy Sciences*
- *Policy Studies Journal*

*Public Choice*, with its distinctive theoretical base, is regularly in the top tier as well.

With more resources, one might track trends in all these journals, but this undertaking first narrowed the pool based on 2011 Eigenfactor Scores in the online ISI Journal Citation Reports. These scores are calculated from the number of citations over the past five years (excluding each journal's self-citations) weighted by the citation prominence of each citing journal. Using that final criterion, the *Journal of Policy Analysis and Management (JPAM)* and *Policy Studies Journal (PSJ)* were chosen for more extensive analysis,<sup>1</sup> although future research could examine *Policy Sciences*, *Public Choice*, and other journals as well.

To assess the directions of these two leading journals, we coded 400 research articles on a variety of variables. Focusing on full-fledged research articles was the practice of prior journal studies for related disciplines and allows for comparability between *JPAM* and *PSJ*. Excluded were book reviews, book notes, editor's notes, announcements, addresses, and organizational news sometimes found in both journals. Also excluded from the comparison of research articles were the usually short pieces sometimes appearing in *JPAM* (after the section entitled "research articles") under such headings as "point/counterpoint," "insight," "reflexions," "professional practice," and "curriculum", along with short *JPAM* "case notes" and its lists of working papers and dissertations. Altogether these later sections constituted no more than one fifth of *JPAM*'s pages during the period studied, but to be comprehensive, we will also report their content in the analysis that follows. In reviewing *PSJ*'s research articles, we excluded short comments and replies that occasionally followed articles.

To compare trends over time, a good period to start is the early 1980s. *JPAM* was launched in 1981 as the field of policy research was rapidly gaining academic standing. For each journal, the first 100 research articles were reviewed starting with their first issues in 1981.<sup>2</sup> For the later period, research articles were reviewed for each journal ending with the last issue in 2010, working back to assemble 100. The later period encompassed all of 2008–2010 and part of 2007 for both journals. The initial period included most of 1981–1982 for both journals and extended into part of 1985 for *JPAM* since *PSJ* was then including more research articles per issue.

Closely reviewing these 400 articles was a time-consuming process encompassing more variables than reported in this summary. The coding was refined during repeated group discussions and the resulting inter-coder reliability was 96%. Data from these 400 articles offer an opportunity to gauge trends in these two important journals across nearly three decades.

Over time, how have these public policy journals focused our attention? We first examine three issues:

- (1) Are they directed inward to the academic world or outward toward practitioners?
- (2) Are they emphasizing the United States alone or other polities as well?
- (3) Are more research articles authored by teams rather than by individuals?

Then we turn to two perhaps more controversial questions regarding public policy's disciplinary and methodological struggles:

- (4) Have these leading journals become more interdisciplinary or do they maintain a more distinct disciplinary focus toward either economics or political science?
- (5) Are they featuring a narrow set of research methods or a wide variety?

Each question, examined in the context of previous research, will be addressed in turn.

### Academics vs. Practitioners

Is the field of public policy relevant to practitioners? Are public policy researchers much like anthropologists who analyze another culture without intending to advise and transform it? Or are we more like the Peace Corps, offering lessons that policymakers and other practitioners can understand and perhaps implement? And do we seek to gain insights from the experience of practitioners or is their language and culture too alien?

Public policy would appear to be a field with enormous inherent relevance for practitioners. Yet, Kieser and Leiner (2012) argue that, even in applied academic fields, true collaboration between practitioners and academics is quite difficult—despite rhetorical gestures to “relevance.” The contexts of science and practice are, they say, just too divergent and evidentiary standards too different. So academic researchers are sometimes characterized as unable or unwilling to contribute germane, practical insights to practitioners (deLeon, 1994; George, 1993; Hacker, 2010; Meier & Keise, 1996; Rivlin, 1984). Samuel Lewis (1993, p. ix) blamed “the two different cultures of academe and government.” Policymakers who must act on “imperfect information” are frustrated by the “abstraction and jargon” of leisurely scholars who, in turn, complain practitioners put “too much faith in intuitive judgment” and reach simplistic, ad hoc conclusions.

Faced with such tension, cultural clashes, and even language gaps, have *JPAM* and *PSJ* been able to bridge this divide? We examine each journal’s stated objectives, editorial board membership, publications, and authorship for evidence about whether the academic-practitioner gap has narrowed or widened in recent decades.

*Stated Objectives.* *JPAM* tells prospective contributors that, among other things, to make the submissions realistic and practical ([bit.ly/jpam-a](http://bit.ly/jpam-a)):

We seek studies that give a real-world sense of how government or non-governmental organizations operate and what they are able to do. It helps if the analysis makes use of program data or reflects contact with actual programs or agencies “on the ground.”

Indeed, “government researchers and practitioners” are listed second, ahead of economists and behind political scientists, as the targeted readers of *JPAM* ([bit.ly/jpam-p](http://bit.ly/jpam-p)). And *JPAM*’s listing of its invited contributor categories mentions “public managers” second (just behind economists). This is not a new ambition for *JPAM*. On page one of its first issue (Vernon, 1981), the editor wrote about aiming for readers who include practitioners in public agencies and in management firms. He also



mentioned the goal of obtaining contributions by individuals who are “thoughtful and seasoned” practitioners (p. 3). In contrast to *JPAM*, *PSJ* has generally not been as explicit about the goal of addressing or publishing practitioners.

*Editorial Boards.* Editors, their editorial teams, and editorial boards (“boards” for short) frame the overall scope and content of academic journals and constitute the most engaged professionals involved in their production. In 1981, *JPAM* began with a total of 25 board members. Fully one third were from outside universities, with five from nongovernment research organizations (e.g., Brookings), one from a foundation, one from a corporation, and one from a quasi-governmental entity in France. While none were practitioners working in government, the board still had a large non-university contingent.

By 2010, the *JPAM* board had expanded to 35 members, but those lacking a university affiliation had declined to three (all at think tanks), leaving the non-university minority falling from 32% to 9%. Current affiliation does not reflect lifetime associations, of course; *JPAM* has illustrious board members like Alice Rivlin and Burt Barnow who have rotated among academe, think tanks, and government. Nevertheless, such career shifting was the case in 1981 as well as in 2010, and the decline in non-academic membership is still substantial.

In both periods, *PSJ*'s board was less practitioner-oriented than *JPAM*'s but followed the same trend. In 1981, non-university representation of *PSJ*'s board was not large (3 out of 32, 9%) but that declined (to 2 out of 55, 4%) by 2010.

*Authorship.* Over these nearly three decades, both *JPAM* and *PSJ* became increasingly unlikely to publish papers written by or co-authored with practitioners. Defining practitioner strictly as anyone outside of both academia and independent research organizations, the percentage of articles with at least one practitioner author fell from 18% to 9% in *JPAM* and from 15% to 3% in *PSJ* between the early 1980s and 2007–2010.

In both journals in the early 1980s, a majority of the articles with a practitioner author were sole authorships. In the later period, all but one of the dwindling number of articles by a practitioner were co-authored with at least one academic, suggesting either that practitioners could no longer get through the review process without an academic teammate or their declining interest in publishing in these journals. If author data are weighted by the number of authors per article,<sup>3</sup> then the decline in practitioner contributions appears in sharper relief: down from 14% to 5% in *JPAM* and from 13% to 1% in *PSJ*. During that same period there was only a slight decline in practitioner participation in the typically much shorter, less academic, and sometimes invited pieces in *JPAM*'s various supplementary sections—from 11% to 9%.

To be sure, authors' current organizational affiliation is not a perfect measure. Some practitioners listed as affiliated with government agencies may also be former or adjunct faculty colleagues or former (or current) graduate students of their co-authors. And some current academics may have government and other “off-campus” work experience. Yet, practitioner bylines still declined.

Editors have bemoaned the difficulty in securing submissions from practitioners. One former *JPAM* editor commented, off the record, about the challenge of getting “papers of sufficient quality to get past even sympathetic referees” and said he had “to work very hard—soliciting, heavily editing, and guiding the manuscripts through the editorial process—to get even a few articles by practitioners.” After all, he noted, practitioners are at “organizations that simply do not reward publications so the opportunity cost of publishing is very high and the rewards very low.”

This cost-benefit argument helps account for the low levels of practitioner participation but not the sizeable decline. Perhaps content in both journals has become less appealing or relevant, or perhaps the peer-review hurdles have become higher. One colleague speculated that practitioners might have gone to the *Public Administration Review*. In fact, Raadschelders and Lee (2011) found that public administration journals had also undergone substantial declines in practitioner authorship.

*Non-University Research Centers.* While researchers at think tanks and other non-university research institutes may not be public managers or formal policymakers, collectively they may be somewhat close to practitioners—frequently conducting government-funded program evaluations and occasionally advising policymakers directly. Authorships (weighted by the number of authors) from researchers at non-university centers ebbed in *PSJ* from 9% to 2% and edged up slightly in *JPAM* from 7% to 10%, but not enough to offset the much larger decline in practitioner contributions. At the same time, in the later sections of *JPAM*, pages from think tank authors increased from 11% to 16%.

*Management Articles.* With practitioners in the audience, how much attention do these two journals give to the topic of public management? In 2011, Laurence Lynn, Jr. assembled an electronic compilation ([bit.ly/jpam-l](http://bit.ly/jpam-l)) of three decades of *JPAM* articles, comments, rejoinders, and short symposia pieces related to this topic. While the collection is substantively rich, especially Lynn’s own *JPAM* contributions over the years (e.g., Lynn, 1994; and Hill & Lynn, 2004), few of the research articles came from the 2007–2010 period. In the early years, articles about management and governance, broadly construed, had constituted 14% of *JPAM* articles. That share fell to 6% in 2007–2010. Going beyond its research articles, *JPAM*’s later sections show a similar pattern; management was the topic of 12% of the pages in the early years and 7% in the later years. In *PSJ*, research articles focusing on management and governance have held steady over time (15%, then 14%).

### United States vs. International Coverage

In addition to the challenge of addressing both academics and practitioners is the challenge of addressing the United States and other parts of the world. Along with complaints about Anglo-American academic hegemony and the “linguistic imperialism” of English (e.g., Yeung, 2001; Paasi, 2005; Stenius, Obot, Kerr-Corrêa, Furtado, & Barbour, 2004; Tietze & Dick, 2013), even the Anglo side has complained

about U.S. ethnocentrism. Soon after *JPAM* debuted, a review in a British-based journal (Kafandaris, 1982) described *JPAM* as “deeply North American, and quite provincial at that” (p. 770).

In defense of a U.S. slant, one might note that roughly twenty European countries can be added together before matching the population and economy of the United States, making the United States a rather sizeable “province.” At the same time, an exclusive focus on one country may deprive us of insights that might be gained by comparative analysis (Gupta, 2012; Rose, 2005). Thucydides long ago saw that Greek city-states could be better analyzed comparatively rather than individually.

The challenge for a single journal is enormous and one cannot do everything. The surfeit of policy topics multiplied by nearly 200 countries makes covering all the world’s public policies impossible. But do these journals at least signal that comparative analysis is important? To what extent are these two U.S.-based journals looking at public policy in other parts of the world?

*Board Membership.* Perhaps their editorial boards will again offer some insight into these journals. In 1981, the *PSJ* board had no members from outside the United States. By 2010, that had changed markedly with 11 from outside the United States (all from affluent OECD countries)—not exactly a United Nations but now 20% of the board. In contrast, *JPAM* began with three board members in Europe but was down to one from a non-U.S. institution (Korea) by 2010, declining from 8% to 3% of the expanded board.

*Article Focus.* A large majority of attention in both journals focused on the United States and neither journal changed much over time. *PSJ* gave slightly more coverage to other countries than did *JPAM*, but despite the international additions to its board, *PSJ* did not show a parallel jump in international articles.<sup>4</sup> Research articles in *PSJ* encompassing countries beyond the United States comprised 22% in the early 1980s and 23% in the later period. The corresponding share in *JPAM* was 17% initially and later 15%. Turning past research articles to the later sections in *JPAM*, during the years under study almost all of the country content was about the United States, with the exception of a two-page comparative note.

Among the articles that did go beyond the United States, both journals shifted to more comparative studies with most examining two or more countries rather than just one. This is consistent with *PSJ* data for the partially overlapping 2004–2009 period reported by deLeon et al. (2010). At the conclusion of that review, after noting the heavy U.S. publication tilt but its “global circulation,” *PSJ* editors endorsed increased “internationalization of *PSJ*’s content” and encouraged submissions not focused exclusively on the United States as well as submissions from authors from other countries.

### Individual vs. Collaborative Research

Another variable of interest in journal articles is between research by a single person and collaborative research by two or more co-authors. Editors and reviewers

may increasingly prefer statistically sophisticated papers that may be more often produced by a team. Fisher, Cobane, Vander Ven, and Cullen (1998) found that statistically advanced articles were more likely to be produced by teams of researchers in sociology, political science, and criminology. And, in the 1990s, powerful desktop computers began to support software capable of complex multivariate data analysis (Adams, Infeld, & Wulff, 2013) as well as email and word processing to facilitate collaborative research to a degree never before possible. Over this period, authorship in related fields underwent a striking change. In public administration, co-authored articles ballooned from 40% in 1973 to over 85% in 2007 (Corley & Sabharwal, 2010). Similar trends occurred in economics (Maske, Durden, & Gaynor, 2003), political science (Fisher et al., 1998), and sociology (Moody, 2004). What about in public policy?

Our research shows that authorship in *JPAM* and *PSJ* was transformed as well. As shown in Figure 1, co-authored articles surged in both journals from only one-third (33% in *JPAM*, 32% in *PSJ*) to about two-thirds of the articles (68% in *JPAM*, 64% in *PSJ*). The share written by two authors grew in both journals, especially in *PSJ* (from 28% to 41%; *JPAM* 26% to 34%), and articles by three or more authors also rose in both journals, especially in *JPAM* (7% to 34%; 4% to 23% in *PSJ*). Each journal even had an article with more than enough co-authors for a baseball team.<sup>5</sup>

*Co-Authorship and Complex Statistics.* Was the increase in co-authorship associated with increased publication of statistically complex research as Fisher et al. (1998) had found? The pattern is mixed in *JPAM* and nonexistent in *PSJ*. A large majority of

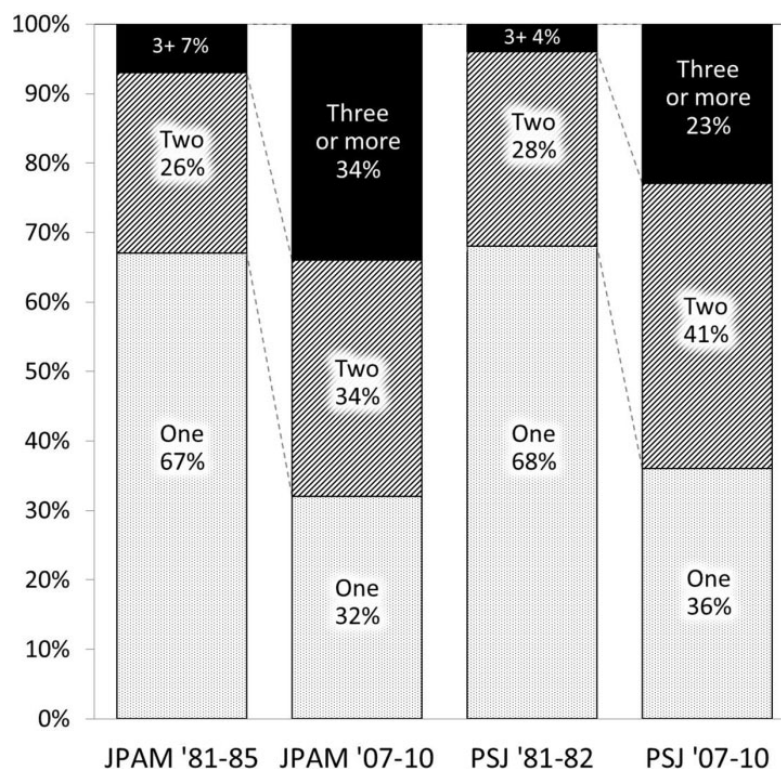


Figure 1. Number of Authors per Article by Journal and Period.



*JPAM* articles using multivariate statistics were indeed co-authored (62% in the 1980s; 67% in the later period), far more often than among those with simpler or no data analysis in the early 1980s (28% co-authored). However, in later years, among the few less quantitative *JPAM* articles, all eight were co-authored. In *PSJ* in the early 1980s, articles with multivariate statistics were somewhat more likely to be co-authored (45%) than were other articles (30%). Yet, in later years, *PSJ*'s multivariate articles have been slightly less likely to be co-authored (59%) than have other articles (69%). Thus, in public policy, the drive toward collaboration cannot be easily explained by the appeal of multivariate analysis for multiple authors.

Other factors, now facilitated by the electronic ease of co-authorship, may account for the enormous change. Collaborative research can offer advantages such as efficient division of labor, effective use of specialized knowledge, increased methodological depth and diversity (Laband & Tollison, 2000), increased cross-fertilization of ideas and greater intellectual camaraderie (Katz & Martin, 1997). Even the challenges, requiring compromises in design, interpretation, and presentation (Mullen & Kochan, 2001), may produce a more polished product.

Co-authorship correlates with publication quantity in diverse fields such as economics (Laband & Tollison, 2000; Maske et al., 2003), and mathematics, chemistry, and biomedicine (Glänzel, 2002), although findings are mixed for public administration (Corley & Sabharwal, 2010). Increased productivity can strengthen annual reports and promotion applications. And, at least in economics, multiple-author articles are not discounted nearly in proportion to the number of co-authors (Liner & Sewell, 2009).<sup>6</sup>

*Student Co-Authors.* While, as reported above, practitioners have become increasingly rare in both journals, students now appear far more often. In *PSJ*, the number of articles with at least one student in the byline soared from 5% to 29%, and rose in *JPAM* from 7% to 18%. That large increase would not have been possible without increased co-authorship with students. In *PSJ*, 85% of later articles with a student author were co-authored, up from 60% in the early 1980s; comparable figures for *JPAM* were 86%, up from 67%. Only a handful of articles were written by individual students who successfully ran the review gauntlet alone (4 out of 100 later *PSJ* articles, and 2 out of 100 in the earlier *PSJ* period, and also 2 in each of the *JPAM* periods).

Are more generous faculty members now giving credit to valuable research assistants who a generation earlier would have received no more than a stipend and a footnote thanks? Whatever the dynamics, graduate students had been particular beneficiaries of the collaboration trend in both *JPAM* and *PSJ*, gaining career-enhancing publications and mentorships (Bozeman & Corely, 2004).

### Economics vs. Political Science

From the beginning, scholars have grappled with public policy's messy multidisciplinary academic identity. During its emerging phase, it was often portrayed as an area that would surely meld together a vital synthesis of its parental disciplines



(Lasswell, 1970) and that must do so to be successful (deLeon, 1981). But the powerful, distinctive, and valuable legacies of large, well-established disciplines like economics and political science have not easily or rapidly blended into a new unified field.

When political scientist Raymond Vernon retired as *JPAM*'s first editor, his "swan song" essay (1985) emphasized the battles he faced forging a journal out of warring disciplines. The field of public policy, he wrote vividly, can be viewed as (pp. 573–574):

... a great struggle between opposing armies. One side is labeled economists; the other side is a motley coalition bearing different banners, joined mainly by a common urge to stop the advancing economists. . . . [U]sing their word processors as weapons, the opposing armies pound out their hostile messages in distinctly different tongues. The actual battle, therefore, is seldom joined. Even within the coalition that is arrayed against the economists, the various members have difficulty in communicating; only when they speak of the enemy do they readily understand each other . . .

Most who teach, research and practice in public policy. . . think of their specialty as economics or law or journalism. . . . It is as if a faculty of clinical medicine were being drawn mainly from experts in chemistry, plumbing, butchery and statistics.

Vernon had also been frustrated facing manuscripts filled with discipline-specific terminology and words that sound ordinary but have "sharply restricted technical meaning" that others might not detect (his examples are all from economics, pp. 576–577). He also objected to the disciplinary narrowness of policy concerns (p. 577):

More difficult than overcoming the problems of language has been overcoming the parochialism of authors arising out of their various specializations. Economists have dealt with the aspects of their problems that they regarded as "economic," leaving questions of politics, management, ethics, or ideology for others to consider. Political scientists, no less ethnocentric, have usually left questions of efficiency for economists.

*PSJ* never faced as much of a challenge of reconciling economists with non-economists since it was born with political science DNA. Stuart Nagel and others from the American Political Science Association founded the Policy Studies Organization in 1971. The new group launched *PSJ* the following year with an issue that heralded its origins with a symposium entitled "Policy Studies from a Political Science Perspective." By 1981, *PSJ*'s editor (Dye, p. 3) was proud to note its "expansion beyond political science to economics, public administration, sociology, anthropology, and geography." But the political science link remained and in 2004 the Public Policy Section of the American Political Science Association joined the Policy Studies Organization as a co-sponsor of *PSJ*. In contrast, *JPAM* operates under the auspices of the Association for Public Policy Analysis and Management, without a formal link to a specific discipline.

The thorny question of whether public policy can ever genuinely become, as once anticipated, or ought to become a disciplinary melting pot, is beyond the scope of this study. But we can investigate the extent to which these journals have, over nearly 30 years, become more interdisciplinary and thus may be nudging disparate sectors of the field in a common direction.

*Authorship.* As shown in Figure 2, although each journal drew on a somewhat different constituency, bylines (weighting by the number of authors for each article) were actually more eclectic in the early 1980s. Despite the hope of going beyond academic silos as the field matured, the opposite trend occurred as both journals became less diverse and intensified rather than reduced their disciplinary alignments.

Over time, *JPAM* drew increasingly on authors in economics departments or (from an economics perspective) in public policy programs and published far fewer articles by political scientists. *JPAM* also had relatively fewer authors identified with management and business as well as fewer practitioners. Conversely, *PSJ* substantially increased its publication of political scientists, along with those identified with public affairs. The only other authors to gain much representation in *PSJ* were from environmental programs. These increases came at the expense of non-university authors and all other academic areas, such as urban planning and sociology. *PSJ* had not published many economists from the outset and even that share declined.

In coding research articles, authors with joint appointments were assigned to the first affiliation cited. And of course one could spend months further dissecting the credentials of the 705 authors of these 400 articles to calibrate their disciplinary tendencies, especially for those in research centers or interdisciplinary units such as public policy or public affairs. Our inspection of the work by authors from public policy programs, for example, reinforces the conspicuous trends shown in Figure 2; public policy authors in *JPAM* tended to take an economics perspective, while those in *PSJ* had a more political science bent.<sup>7</sup>

*Citations.* Another way to measure how public policy journals are situated is to examine the literature that their authors cite. What other journals are most germane to their research? What prior works ground their studies? Online ISI Journal Citation Reports were used to compile the sources cited by each journal in 2011. The top ISI journals cited in *JPAM* and *PSJ* articles are listed in Table 1, leaving no doubt about the segregated approaches to public policy. (Note: The top ten most cited journals became eleven due to ties.)

Seven of the most cited journals in *JPAM* were unambiguously economics journals; none were political science journals. Of the top journals cited in *PSJ*, four were in political science, two in public administration, and one in public policy, plus two in overlapping areas (*Political Psychology* and *Public Opinion Quarterly*). Another notable *PSJ* resource was the *American Economic Review*, the sole journal to appear in both lists.

Turning to all 2011 citations of ISI journals (excluding self-citations) indicates that *JPAM*'s slant toward economics went beyond the top sources listed in Table 1; of all

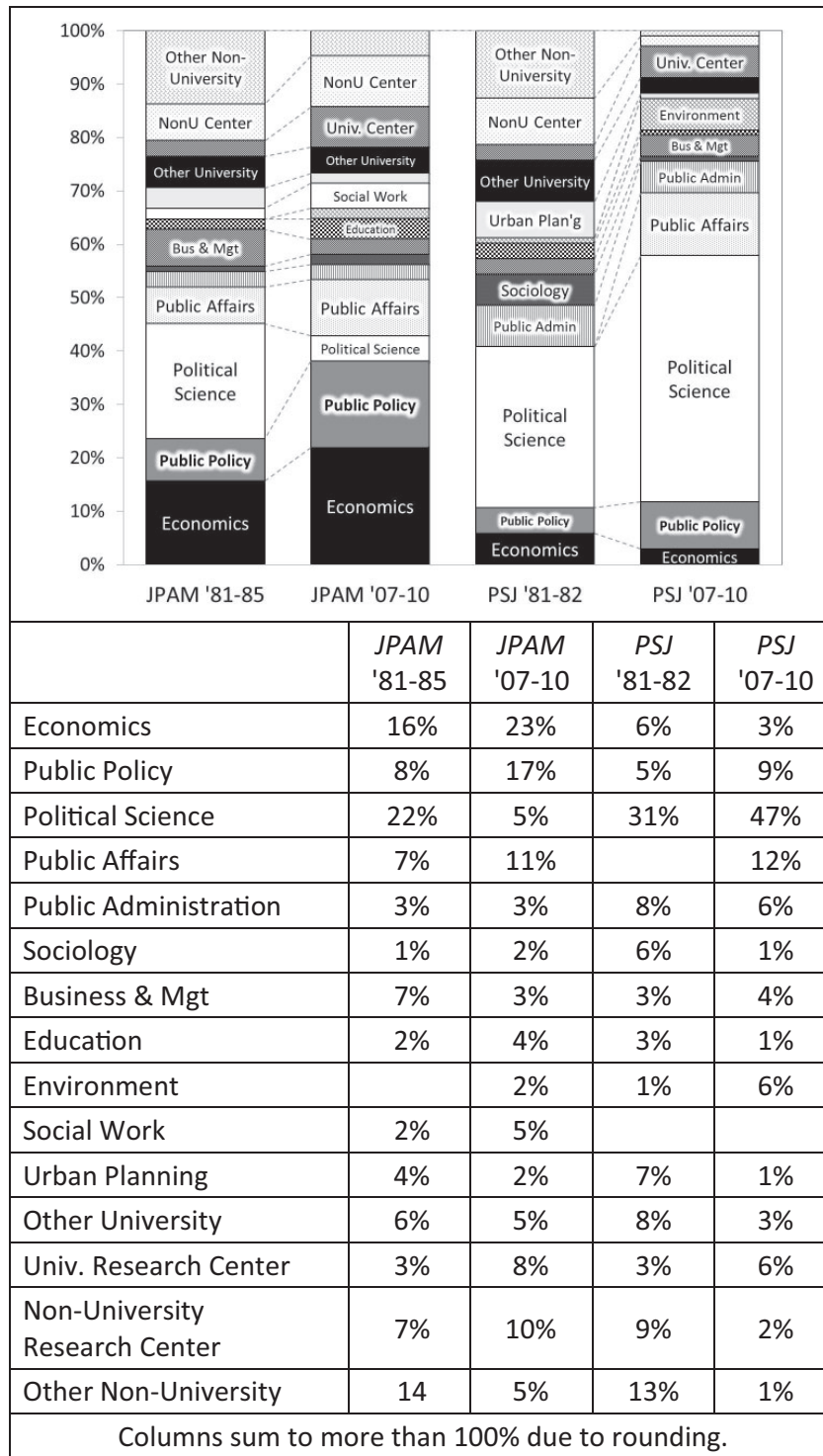


Figure 2. Author Affiliation by Journal and Period.

its citations, 52% were from economics journals. Just 2% of *JPAM* citations were from political science journals. Conversely, just 9% of *PSJ* citations were from economics journals and a majority was from political science (33%), public administration (13%), and public policy (10%) journals.

Table 1. Top Journal References Cited in JPAM and PSJ, 2011

JOURNAL OF POLICY ANALYSIS & MANAGEMENT	POLICY STUDIES JOURNAL
▶ <i>American Economic Review</i> (32)	• <i>American Political Science Review</i> (63)
▶ <i>Quarterly Journal of Economics</i> (23)	• <i>Journal of Politics</i> (55)
<i>Child Development</i> (17)	• <i>Am Journal of Political Science</i> (55)
▶ <i>Journal of Human Resources</i> (15)	• <i>J Public Admin Research &amp; Theory</i> (35)
<i>American Journal of Public Health</i> (14)	• <i>Policy Sciences</i> (32)
▶ <i>Journal of Health Economics</i> (13)	• <i>Political Research Quarterly</i> (26)
▶ <i>Econometrica</i> (12)	• <i>Public Administration Review</i> (24)
▶ <i>Journal of Political Economics</i> (12)	<i>Political Psychology</i> (19)
▶ <i>Journal of Public Economics</i> (12)	▶ <i>American Economic Review</i> (18)
<i>New England Journal of Medicine</i> (12)	<i>Research in Higher Education</i> (17)
▶ <i>Review of Economic Statistics</i> (12)	<i>Public Opinion Quarterly</i> (17)

Source: Data compiled from 2011 online ISI Journal Citation Reports.

▶ Economics journal • Political science, public administration, or public policy journal

To elaborate on that latter category, in 2011, *PSJ* authors drew on research published in other public policy journals a total of 99 times, with references to *JPAM*, *Policy Sciences*, *Journal of European Public Policy*, *Review of Policy Research*, and *Public Choice*. *JPAM* authors referred to research published in other public policy journals just six times (twice to *PSJ* and four times to *Evaluation Review*).

*Topics*. Just as authorship and citation trends indicate divergence rather than convergence, so too do most trends in the main topics of articles. As shown in Table 2, *PSJ* enormously increased its attention to politics and the policymaking process (jumping from 8% to 39% of all research articles), while *JPAM* (also starting at 8% in early 1980s) has essentially abandoned the area. As noted earlier, *JPAM* also moved away from articles focusing on governance and management, while *PSJ* held steady in the area.

Surprisingly, both journals moved away from articles about economic policy; economic development; and budget, tax, and trade policy. Likewise, articles about regulation and deregulation (a popular topic in the Reagan years) declined sharply in both journals and *PSJ* also discarded its early emphasis on law enforcement and crime. *PSJ* took up most of the slack with a large increase in articles about the policy process and politics, topics of great interest to political scientists, along with somewhat more attention to environmental and energy issues.<sup>8</sup> *JPAM* especially added articles about education, welfare and poverty, the environmental and energy, and housing, as well as showing slight increases in attention to a variety of other specific policy topics.

Policy areas receiving little attention could have been consolidated into "Other" to reduce the number of rows in Table 2. Keeping them separate shows the consistently low profile of several important policy topics in these journals. It also confirms the ultimately impossible challenge of any general policy journal having sufficient space to publish many articles on every policy topic, no matter how consequential the topics may be. Perhaps after a topic achieves a critical mass in a journal it then attracts more submissions that help sustain the topic's presence there

Table 2. Topic Focus by Journal Period

Article Topic	<i>JPAM</i> '81–85 (n = 100)	<i>JPAM</i> '07–10 (n = 100)	<i>PSJ</i> '81–82 (n = 100)	<i>PSJ</i> '07–10 (n = 100)
Policy process & politics	8%		8%	39%
Governance & management	14%	6%	16%	14%
Economic policy/development; budgetary, tax, trade policy	20%	10%	13%	5%
Education policy	5%	20%	7%	5%
Welfare policy, poverty	6%	19%	5%	3%
Energy & environmental policy	2%	11%	5%	12%
Regulation, deregulation	11%	1%	8%	3%
Social, urban, aging, & family policy	4%	7%	7%	4%
Law enforcement & criminology	2%		13%	3%
Methodology	6%	3%	4%	2%
Labor policy, human resources	2%	4%	6%	
Race, discrimination, equity	1%		5%	4%
Housing	1%	7%		1%
International development/policy	4%	1%		3%
Public health	2%	4%	2%	
Policy analysis as a field	7%			
Immigration		2%		2%
Science & technology policy	3%		1%	
Nonprofit organizations	1%	2%		
Social security	1%	2%		
Transportation		1%		

(e.g., recently in *JPAM*, education, welfare, and environmental policy; in *PSJ*, especially environmental policy).

### Secondary Multivariate vs. Eclectic Methods

Methodological practices tend to overlap with disciplinary boundaries, but they are not synonymous. What have been the trends in the methods used in research articles in these two journals? Carlson (2011) contended that three notable policy methods trends have been toward meta-analyses, social experimentation, and Monte Carlo simulations. However it is telling that none of his 30 citations included *JPAM*, *PSJ*, or any other public policy journal for that matter. In our search, meta-analyses were rarely found and they appeared as much in the early 1980s as during 2007–2010 (three in each period in *JPAM*; one in each period in *PSJ*), no sign of a trend. Randomized, controlled trials were also rare; in 2007–2010, two were featured in *PSJ* and one in *JPAM*. Since none were found in the early 1980s, this might be generously considered a slight hint of a trend. Similarly, articles employing computer simulations, typically with Monte Carlo techniques, are also still uncommon, but increased very slightly in *JPAM* (3 to 5) and *PSJ* (0 to 1).

Little of Carlson's trends were reflected in these two journals, but what changes did we observe? Any review of methods trends must first clarify one important transformation in the content of research articles in both journals. In the early 1980s, both often published articles that looked at policy questions rather broadly, perhaps



Table 3. Article Type by Journal Period

	<i>JPAM</i> '81–85 (n = 100)	<i>JPAM</i> '07–10 (n = 100)	<i>PSJ</i> '81–82 (n = 100)	<i>PSJ</i> '07–10 (n = 100)
Macro	59%	2%	60%	22%
Qualitative	1%		14%	15%
Quantitative	35%	91%	21%	52%
Mixed	5%	7%	5%	11%
Total	100%	100%	100%	100%

examining competing arguments and principles, drawing on illustrative data from varied sources, referencing some applicable cases. For lack of a better term, we characterize these more expansive articles as “macro”—not as synonymous with macroeconomics but as efforts to examine policy more broadly than a more narrowly focused quantitative analysis of a single dataset.

For example in *JPAM*, “The Bird in Hand: Feasible Strategy for Gun Control” (Moore, 1983), offered a policy analysis that assessed key objectives for gun control, detailed alternative policy options, and recommended a particular policy in light of political and other constraints. An example from *PSJ* is “Research Strategies for Evaluating the Adoption Potential of Energy Technologies” (Berry & Bronfman, 1981), which argued that some novel energy technology innovations are not amenable to “prospective economic analysis of adoption potential.” Noneconomic models and evidence were employed such as reasoning by analogy, qualitative ratings, marketing studies, and decision-making models.

In the early 1980s, a majority of articles in both *PSJ* (60%) and *JPAM* (57%) were in this eclectic, macro category. By 2007–2010, such efforts were less common in *PSJ*, falling to 22%. (See Table 3.) The decline was greater in *JPAM*. Adding six ambitious “Policy Retrospective” articles, occasionally published in a section following research articles, puts the 2007–2010 *JPAM* distribution at 8% macro, 86% quantitative and 7% mixed (supplementing number crunching with some qualitative or case studies). No entirely qualitative studies were found in *JPAM* in the recent period.

A slim majority of *PSJ*'s articles (52%) also fell into the strict quantitative category, along with 11% that were mixed methods. *PSJ* also published some predominantly qualitative (15%) articles as well as a nontrivial share that fell into our macro classification (22%), yielding a substantially greater variety of approaches than in *JPAM*. By the 2007–2010 period, the prototypical *JPAM* article was likely to fit a particular formula: a secondary analysis of a large (typically government-collected) dataset using multivariate, regression-based statistics (91%). Quantitative articles in *PSJ* were somewhat more diverse: not so overwhelmingly reliant on secondary data (29% primary data) or on regression (33% without it). *PSJ* articles were also more likely to employ factor analysis or other clustering techniques (29% in *PSJ* vs. 2% in *JPAM*) and analysis of variance (27% vs. 11%).

*JPAM*'s leadership may be rethinking its conspicuous lack of qualitative studies. In 2013, *JPAM* announced a forthcoming symposium on “Qualitative and

Mixed-Methods for Policy Analysis” to include papers analyzing “advances in these methodologies” and evaluation research that employs these methods ([bit.ly/jpam-q](http://bit.ly/jpam-q)). Without such a bold move, *JPAM*’s prior record would not have made it a plausible target for placing a qualitative paper.

### Conclusions

The rationale for this study is that academic journals may be especially likely to influence the development of an emerging field. Early editors of public policy journals made that ambitious goal explicit. Thus, we tracked directions that two prestigious, highly competitive, public policy journals have taken since the early 1980s. This analysis of 400 research articles in *JPAM* and *PSJ* revealed a few similar patterns.

Both journals have turned increasingly “inward” to academia with fewer bylines from practitioners. The non-university share of their editorial boards has also declined. Both journals have also stayed relatively “inward” geographically with the overwhelming majority of data-based articles focusing exclusively on the United States, although *PSJ* does have slightly more diversity in its articles and now has more international diversity on its editorial board. Also, in both journals, the proportion of co-authored articles has surged from only about one-third to about two-thirds of all articles.

In one significant area, *JPAM* and *PSJ* have conspicuously diverged since the early 1980s. *JPAM* became far more likely to publish studies by economists (and by those in public policy programs using econometric methods) and far less likely to publish political scientists. Moving in the opposite direction, *PSJ* became much more likely to publish political scientists and those in public affairs programs, and less likely to publish authors from nearly all other fields except environmental studies. In this vein, *JPAM* authors heavily reference economics journals, rarely political science or other public policy journals. *PSJ* authors gravitate toward citing political science, public administration, and public policy journals, along with economics journals occasionally. These trends could be characterized as “inward” too, with a strong pull of *JPAM* to economics and *PSJ* to political science, rather than becoming increasingly interdisciplinary.

Across the same decades, *JPAM* moved away from broad policy analyses to a heavy focus on multivariate (essentially econometric) data analysis of large secondary data sets. *PSJ* also moved away from broad policy essays but presented a more diverse array of approaches, including some qualitative studies, more mixed methods, and quantitative studies using a wider variety of statistical tools.

Decisive conclusions about underlying causes are impossible without data about all papers that were submitted but not published. While we can say, for example, that “transportation policy” or “immigration policy” garnered few pages, it may be that only a handful of such articles were submitted. Nevertheless, the final patterns must reflect both the (acknowledged or unconscious) preferences of editors and reviewers along with the interests of contributing researchers—sculpted and vetted by their estimates of whether certain studies stand a chance of being published in light of a

journal's recent record. Past journal performance, they may reasonably suppose, is the best available indicator of future performance. And so, without aggressive moves by editors (e.g., *JPAM* actively soliciting qualitative papers), journals seem more likely to evolve slowly, as they acquire a self-fulfilling reputation as especially hospitable toward certain methods and topics.

Many readers may consider it self-evident that, in the years since Raymond Vernon was at the helm, *JPAM* has essentially become an economics journal and that *PSJ* remains, while perhaps slightly more diverse than *JPAM*, a political science journal. But the degree and nature of that difference is of more than passing interest since it both reflects and reinforces the challenges faced by public policy in transcending long-standing academic legacies and boundaries (Brewer, 1999). The results are a far cry from early aspirations for a field that was more than just the "mingling at the frontiers" of old disciplines but rather would "integrate the various disciplines into a single movement" (Quade, 1970) and achieve the convergence Lasswell (1970) envisioned.

### Notes

1. Journal Citation Reports put *PSJ* ahead of *JPAM* on its "impact factor" and "immediacy" measure, while *JPAM* was higher on five-year impact, total cites, and "eigenfactor metrics." Focusing on the United States, reputational ratings also elevate *JPAM* and *PSJ* as highly regarded and well known general public policy journals according to recent opinion surveys in political science (McLean, Blair, Garad, & Giles, 2009) and public administration (Bernick & Krueger, 2010). Recent Norwegian ([dbh.nsd.uib.no](http://dbh.nsd.uib.no)) and Danish rankings had the two tied in the highest category of quality journals, although two Australian rankings gave *JPAM* the edge ([bit.ly/harzing](http://bit.ly/harzing)).
2. *JPAM* editors were Raymond Vernon in the early period and Maureen Pirog in the 2007–2010 period. *PSJ* editors were Thomas Dye in 1981–85 and Hank Jenkins-Smith followed by co-editors Peter deLeon and Chris Weible in the 2007–2010 period.
3. Thus, if an article had two co-authors, they would be each weighted 0.5.
4. The Policy Studies Organization gathers an annual listing of policy scholars for *Public Policy Yearbook* included in a special issue of *Policy Studies Journal*. "Comparative public policy" was the fourth most popular area of interest, surpassed only by "governance," "environmental policy," and "social policy" (Jenkins-Smith & Trouset, 2011).
5. These ten-author articles in *JPAM* (King et al., 2007) and *PSJ* (Parks et al., 1981) do not rival the infamous *New England Journal of Medicine* article with 972 co-authors (Gusto Investigators, 1993) later surpassed in the *Journal of Instrumentation* with 2,926 co-authors (Aad et al., 2008).
6. Liner & Sewell's survey (2009) of economics chairs found only a slight discount for co-authorship when evaluating tenure applications. Holding journal reputation constant, chairs weighted productivity so that just five triple-author articles matched four single-author articles and only four and one half two-author articles equaled four single-authored articles. Co-authored articles do not necessarily yield many more subsequent citations; findings vary (cf. Corley & Sabharwal, 2010, on public administration; Barnett, Ault, & Kaserman, 1988, and Piette & Ross, 1992, on economics; Nemeth & Goncalo, 2005, on psychology).
7. Authors from programs or schools with both "public policy" and "public administration" in the title were consistently not writing about public administration in these journals and were merged into the public policy umbrella.
8. These *PSJ* findings diverge somewhat from deLeon et al. (2010) who examined a different period (2004–2009) and tended to code articles involving the policymaking process into the topical category of the policy. We distinguished research about the policy process (grouped together regardless of policy issue) from policy analysis/evaluation (where the topic area was coded).

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