

From There to Here: Punctuated Equilibrium to the General Punctuation Thesis to a Theory of Government Information Processing

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In this introduction to the Policy Study Journal's special issue on punctuated equilibrium, we provide an overview of the approach, how it evolved, some of the major critiques directed at it, and some of the major developments it has spawned. We argue that the most important aspect of a theory or framework is not whether it is right or wrong, but the extent to which it is fruitful; that is, the extent to which it stimulated further research. Finally, we review the articles in this issue and put them in context.

We are very pleased that the editors of the Policy Studies Journal chose to highlight Punctuated Equilibrium Theory (PET) in this special issue. We hope that the quality and the intellectual and empirical breadth of these articles validate their decision. In this introductory essay, we provide an overview of PET, how it evolved, some of the criticisms of the approach (which themselves stimulated more work), and some of the major developments it has spawned. Perhaps the most important aspect of a theory or framework (see Ostrom, PSJ special issue on Institutional Analysis and Development [IAD] for a discussion of the distinctions) is not whether it is right or wrong, or even whether it organizes research around a theme. We think it centers on the extent to which the idea is fruitful, by which we mean the extent to which it stimulates further research that itself raised more new questions. Nothing is settled in scientific inquiry, nor should it be. Indeed, the success of the concept may lie in its future obsolescence because new ways of thinking should be able to incorporate PET more or less seamlessly.

Punctuated Equilibrium Theory (PET) was born of our unhappiness with policy process models that emphasized stability, rules, incremental adjustment, and “grid-lock” whereas we saw policy change as oftentimes disjoint, episodic, and not always predictable. In the first generation policy process models, developed mostly in the 1950s and 1960s, decision making was thought of as incremental, subsystems seemed eternal, and the political order was stable. Minor adjustments from the status quo were achieved via heuristic rules worked out among the participants (Wildavsky version: Wildavsky, 1964) or via “mutual partisan adjustment” (Lindblom version:

Lindblom, 1959). Normatively, this seemed to be a beneficial approach because policymakers were operating within the reasonable range of experience, and incremental adjustments could always be reversed.

The stability framework was not the sole province of policy process theorists. Interest group theorists emphasized equilibrium and balance, in which preferences were weighted by intensity through the mechanism of involvement in the group process. The major critics of the approach mostly assumed the stasis model was correct and attacked it not for being wrong, but for not being democratic or responsive enough (Lowi, 1969). We hasten to add that we were (and are) big fans of the first generation models of Lindblom, Wildavsky, Fenno (1966), and others; they were great improvements on the mostly descriptive approach taken before them. They centered their models in bounded rationality, which continues to frame most work in public policy processes. Nevertheless, to us they seemed inadequate as descriptors of policy change. While they got the story mostly right, the part that they missed struck us as too important simply to ignore.

Yet just out of sight from the standard model was a literature that suggested a much less stable and much more disquieting political system. Burnham (1970, p. 181) wrote of critical elections as adjustment mechanisms when a conservative policy-producing system failed to respond adaptively to social and economic change, resulting in a broad redefinition of electoral and policy coalitions. Schattschneider (1960) began to think of political parties as mechanisms capable of disrupting the ongoing pluralist interest group system by expanding the conflict and bringing in new participants to the process. Cobb and Elder ([1972] 1983) systematically detailed the mechanisms participants might use in bringing new groups (and hence policy ideas) into the policymaking arena. Kingdon (1984), following Cohen, March, and Olsen (1972), grounded his theory of policy change in attention-based choice (and, more broadly, bounded rationality). Indeed, the whole notion of agenda setting, in which new proposals for governmental activity (or withdrawal from a committed line of activity) are discussed within government suggests disjointedness in the policy process.

The first generation of rational choice models in political science also emphasized the difficulties in achieving common objectives, and scholars recognized quickly the limited conditions under which equilibrium—in this case, equilibrium between policies and the preferences of participants in a political system—could be established. Kenneth Arrow (1951) and Duncan Black (1958) studied the problem of cycling in preference aggregation models, showing how complicated and unpredictable things could be. However, as long as analysts could assume that the preferences of publics and policymakers were stable and ordered along a single left-right dimension, the median voter theorem assured convergence to a stable and centrist point. Changes from this point would likely be incremental, or at least well behaved. While some formalists examined the possibilities of a multidimensional, and hence much less stable, world (McKelvey, 1976), too many scholars of political institutions, and particularly the American Congress, retreated to a one-dimensional, and hence stable and comforting, view of the world. William Riker, who in the end denied the possibility of political equilibrium, and Lin Ostrom and her research group, who

vigorously explored analytically and empirically the conditions under which collective goals could and could not be obtained, stand as major exceptions to the retreat to the safety of single-dimensionality.

Basics of Punctuated Equilibrium

PET sketches a disjoint and abrupt process of policy change, with long periods of stability separating the shifts. We undertook the original studies on which the theory was based in the late 1980s and early 1990s, when decrying “gridlock” was all the rage. We saw things differently: major policy changes were not only more frequent than the static gridlock approach suggested. They also could occur not just through elections but through a policy-by-policy adjustment process as well (Baumgartner & Jones, [1993] 2009). This policy-by-policy adjustment process allowed for disjoint policy change to ripple through the system without the need for top-down direction (although the model certainly allowed for that). Change encompassed incremental adjustment within policy subsystems and nonincremental, punctuated change when the subsystems assigned the policy could no longer contain the demands for change and the macropolitical institutions (Congress, the presidency, and the political parties) got involved. As had other scholars, we emphasized the incrementalist adjustment patterns within subsystems, leading David Prindle (2012) to refer to our approach as *punctuated incrementalism*. We saw these adjustment patterns as incomplete because the subsystem adjustments among affected interests omitted the disinterested, a theme that both Redford (1969) and Burnham (1970) stress.

We saw policymaking as a continual struggle between the forces of balance and equilibrium, dominated by negative feedback processes, and the forces of destabilization and contagion, governed by positive feedback processes (Baumgartner & Jones, 2002). In the former, a disturbance is met with countervailing actions, in a thermostatic-type process. In the latter, change begets change, generating a far more powerful push for change than might have been expected. Peter Érdi (2008) notes that the appreciation of positive feedback processes is central to a general scientific movement toward the study of general complex systems in which complex feedback mechanisms can lead to large and occasionally surprising changes. Most recently, Mark Lawrence Schrad (2010), in his study of prohibition policies in the United States, Sweden, and Russia, deftly shows how these processes can be filtered through the institutional structures of nations.

Microfoundations

PET rests solidly on a microfoundation: a model of decision makers based on bounded rationality. Bounded rationality rejects the premise of comprehensive rationality that humans tally up costs and benefits and choose the best course of action. Rather, decisions are channeled by their cognitive and emotional architectures. In particular, decision makers are prisoners to their limited attention spans, and the key governor of the allocation of attention: emotion (Jones, 1994, 2001, 2003; Simon, 1983,

1986). Through such methods as specialization of function and hierarchical organization, human organizations are able in part to overcome some of the facets of human cognitive architectures. For example, a properly organized public agency or legislative committee system allows for the parallel processing of inputs, overcoming the cognitively dictated limits to serial processing of human cognition. Nevertheless, at some point, the organization *qua* organization must take action—Congress must vote on its committees' proposals—and at that point parallel processing shifts to serial, with its severe attention limits. We term the focus of collective organizational attention its *agenda*. As a consequence of the need of all organizations to process information in serial fashion, emotional arousal is part of policymaking, responsible for rapid shifts in the focus of policymaking attention.

In focusing on the human cognitive and emotional side of political decision making, PET is similar to the Advocacy Coalition Framework (ACF) (see the special issue of the *Policy Studies Journal* 39 [3] 2011). However, ACF relies on attitudinal and belief structures, whereas PET is based more on the allocation of attention and the heuristics that decision makers, and consequently organizations, use to allocate scarce attention. Unlike other resources capable of being allocated to choice, which can be adjusted continuously to the nature of the problem, attention must be allocated in a disjoint and episodic manner. Moreover, decision makers have a built-in resistance to altering their decision premises, which is required for major policy change.

Attention allocation is a critical, but not the only, reason for disjoint policy change. The other is the resistance built into the institutional structure of policymaking. The rules for making binding decisions in any political system operate to make change difficult. This is especially true of the American system, with its constitutionally required complex of divided and separated powers.

Dynamics of Policy Change: Where Punctuated Equilibrium Fits

Punctuated equilibrium is explicitly a theory of policy dynamics as it focuses on the mechanisms that lead to policy change. As such, it joins several other explicitly dynamical theories oriented toward understanding political change by detailing a specific mechanism (or set of related mechanisms) responsible for policy change.

In today's political climate of intense partisanship and polarization, one might be tempted to conclude that the adjustment processes of PET are no longer relevant, with only top-down party-organized change being possible. Yet consider the following. In late 2010, with broad bipartisan support, Congress passed and the president signed the Food Safety Modernization Act, a major new food safety bill, the first major revamping of these laws since the 1930s. However, this was not the only subsystem-generated act passed by the 111th Congress. Others include the Credit Card Act (passed unanimously); the Family Smoking Prevention and Tobacco Control Act; and the Healthy, Hunger-Free Kids Act.

At the subnational level, the rights of homosexuals have gained tremendous traction through state-level action—quite clearly the sort of positive feedback mechanism across states analyzed so persuasively by Boushey (2010). Through a similar

mechanism, the use of the death penalty in all states is declining and now prohibited in former death-penalty states Illinois and New Mexico (Baumgartner, De Boef, & Boydstun, 2008). Antiabortion and antismoking advocates have won skirmish after skirmish by using a venue-by-venue approach, with only limited actions by the macropolitical institutions. Texas, facing a huge scandal in its juvenile justice system in 2007, has reformed the system so thoroughly that the *New York Times* (2010) cited it as a potential model for the nation.

Nevertheless, many of the major laws passed by the 111th Congress were related to the economy or to the major healthcare reform bill, most only after intensely partisan debate. It seems likely that had Republicans held the presidency and Congress after 2009, they would not have passed the Health Care and Education Reconciliation Act of 2010. However, they would still have been faced with a failing economy and would likely have addressed the problem with some set of measures—indeed, many of the major measures directed at addressing the financial meltdown of 2008 were initiated by the outgoing Republican Bush Administration. It was the “facts on the ground” that led to the primary policymaking agenda of the 111th Congress, not the election itself.

The Standard Model

In the study of American political institutions, there is a standard model of policy change, and it is based in elections. Policy change is caused by changes in the policy preferences of policymakers. Policymaker preferences change when they are replaced through the election process. Change is generated by elections, which shifts the preferences of policymakers by replacing them with other policymakers, who in turn shift policy. This among many is taken as the essence of democratic accountability. The ability of new majorities to shift policy is limited by the set of institutional governing rules and procedures (Krehbiel, 1998). Because the approach treats the sources of change as fully exogenous, it is characterized as *comparative statics* (that is, comparing one static state [preelection] with another [postelection]). The “elections matter” model is perhaps the single most common interpretation of politics both in the United States and in comparative studies of Western democracies.

As attractive as the standard model is on its face, as a general model of policy change, it is much more limited than analysts realize (Baumgartner, Jones, & Wilkerson, 2011; Workman, Jones, & Jochim, 2009). First, in many cases, major policy change occurs in the absence of electoral change—including such important pieces of legislation in the United States as the Bipartisan Campaign Finance Reform Act of 2002 (McCain-Feingold) and the Troubled Asset Relief Program of 2008. Second, the standard model has no role for the prioritization of policy issues—why does a legislature choose to work on health care rather than economic regulation, for example? The approach assumes that policymakers may be ordered along a liberal-to-conservative dimension, and parties as a consequence may be ordered along the same dimension as well. The one-dimensional approach assumes that health care and economic regulation fall somehow along the liberal-to-conservative dimension,

with one being more liberal than the other. When conservatives replace liberals, the agenda-setting process is shifted to the right. However, it is unclear that shifts in ideology have much to do with the prioritization of problems facing government or, at a minimum, it leaves a huge range of possible priorities from which the new leaders may choose. Third, many major changes in policy have been forged by conservative leaders expanding the role of government, or liberals shrinking it. George W. Bush enacted both No Child Left Behind Act of 2001, the largest expansion of the federal role in education, and the Medicare Modernization Act of 2003, the largest expansion of the social safety net since the Lyndon Johnson presidency. Nixon created the Environmental Protection Agency; Clinton ended “welfare as we know it.”

This does not deny the impact of elections; these can and do create important shifts in the direction of public policy. However, we can point to many policies where this is not the case, and when we have looked at a list of all policy changes, or when we have tracked budgets over time, we have often found that elections were an important element in only a small (but nonetheless distinct) percentage of the cases (Baumgartner, Foucault, & François, 2009; Baumgartner, Jones et al., 2011).

In effect, the comparative statics approach has conflated the choice of policy issue (agenda setting) with the policy solution chosen *given* a policy problem. At the problem stage, political parties and elections play a limited role. At the solution stage, ideology and partisanship clearly play a more important role. By looking over time and by focusing on attention and agenda setting, we have often noted that actors across the entire political system collectively shift attention; these shifts are rarely the province of one partisan camp alone, ignored by the other side. Sometimes these shifts are related directly to election considerations or results, sometimes they are not. In any case, these shifts are not explainable within the confines of the standard model based in preference shifts caused by electoral change.

The agenda-setting perspective has recognized the critical role of information in the policy process in a way that the election-centered model has not. Problem definition does not generally occur in a vacuum; it occurs when the flows of information indicate that a situation is worthy of governmental attention. As a consequence, agenda changes can occur in the absence of elections or public opinion.

Given the importance of collective shifts of attention over time, shifts that can sweep across the entire political spectrum, it is not surprising that the agenda-setting perspective has led to research directions that cannot be pursued by relying on the more common research project focusing on decision making or bargaining during a single congress or a single presidency. Such studies take the items on the agenda, the focus of attention, for granted and attempt to explain the partisan conflict associated with the choice of solutions. An agenda-setting perspective takes one step back in the process, attending to the choice of issues that become the grist for political conflict. Because we look at issues over a long enough time frame, we can observe changes in attention patterns to issues, not just the selection of solutions. Perhaps more than any other difference, this one explains how the policy dynamics approach differs from the preference-based approaches to the study of political institutions. Dynamics are at the center, not cross-sectional variation.

Evolution of Punctuated Equilibrium

If not the standard model, then what? In an attempt to account for large-scale policy changes at the macropolitical level as well as within subsystems, we developed the *general punctuation thesis*, a generalization of the punctuated equilibrium approach (Jones & Baumgartner, 2005). This more general approach emphasizes the role of the processing of information in a policymaking system. Information processing involves collecting, assembling, interpreting, and prioritizing signals from the policymaking environment (Jones & Baumgartner, 2005). Some of this is done explicitly, as is the case for monitoring the state of the economy, and some without any explicit regard to systematic monitoring. In either case, information can be *uncertain* (the precise value of the estimate is not set) and *ambiguous* (subject to more than one interpretation). Even when attended to, information still must be interpreted and translated into policy action.¹

While traditional approaches to information tend to focus on private information that is not available to all, we emphasize the great availability of information in most policymaking realms (Jones & Baumgartner, 2005).² Policymakers are bombarded with diverse information from many different sources, with varying reliabilities. Much of this information has implications for the prioritization of policy action. Policymakers, as boundedly rational decision makers with human cognitive constraints, focus on some of this information and ignore most of it. This selective attention process has critical consequences for policymaking, and especially how the political system prioritizes problems for policy action.

Many theories of policy change emphasize the correspondence between the direction of preferences (left to right) among legislators or the public, on the one hand, and the direction of policy (liberal to conservative), on the other. We, however, emphasize the necessity of prioritizing issues they address. The key question is how policymakers prioritize issues for action given the flow of information into the system. Both the bounded rationality of political actors and the resistance to change structured into the U.S. governmental system imply that the processing of information will be disproportionate—that is, it will not match the policy implications of the information available to policymakers. Rather, the system will tend to shift from underreacting to overreacting to information.

This tendency toward the disproportionate processing of information means that problem prioritization will be stable for most of the time because the resistance will not be overcome by the flow of information. Hence, the policymaking process will appear to be stable and unchanging. When policies change, they will shift in a disjoint and episodic manner; as a consequence, policymaking will appear to be in a period of exception to the general rule of stability—or simply responding to unspecified “exogenous forces.” But in fact the disjoint policy responses are part and parcel of the same policymaking process that generated the periods of stability. In a not-unfamiliar story line, a problem festers “below the radar” until a scandal or crisis erupts; policymakers then often claim “nobody could have known” about the “surprise” intervention of exogenous forces, and then scramble to address the issue.

The more general approach, compared with the original PET formulation, has both costs and benefits. The benefits are the movement toward a more comprehensive theory of policy change. The costs are that the detailed substantive policy analyses that are the cornerstone of PET get submerged in the more general formulation (Weimer, 2008).

Stick-Slip Dynamics³

The general punctuation thesis specifies an interaction between the flow of information into a policymaking system and the resistance, or friction, to adjustment that is built into the system. In the natural world, there are various specifications for friction, but all of them involve the interaction of two forces: a retarding force and a force directed at overcoming the retarding force. Earthquakes are a primary example of one type friction. The general process that generates earthquakes is known as stick-slip dynamics. The earth's tectonic plates are held in place by a retarding force, the "friction" of the plates, while the dynamic processes generated by activities in the earth's core push on these plates. When the forces acting on the plates are strong enough, the plates release, and, rather than slide incrementally in adjustment, slip violently, resulting in the earthquake.

Political systems, like many social systems, are characterized by considerable friction. Standard operating procedures in organizations, cultural norms, and facets of human cognitive architectures provide stability of behavior in a complex world. In politics, ideology and group identifications provide strong and stable guides to behavior in complex circumstances. In politics, a second source of friction exists: institutional rules that constrain policy action. In the United States, the national government can enact policies only when supermajorities are assembled. In parliamentary democracies, especially ones with proportional electoral systems, action may be constrained by multiparty governing coalitions.

The comparative statics approach (the standard model discussed above) ignores the ongoing information-processing needs of an adaptive system, and political systems are clearly adaptive systems. They dynamically respond to incoming information, not just the preferences of those making decisions. Punctuated equilibrium provides an alternate analytical frame to the preference-based analyses of comparative statics. The stability imposed by the two kinds of friction, cognitive/organizational friction and institutional friction, does not cause universal gridlock, with a system awaiting elections to point to change. However, it is a retarding force that interferes with the smooth adjustment of a political system to changing information signals from the policymaking environment. Change occurs only when the informational signals from the external world either are extraordinarily strong, on the one hand, or when the signals accumulate over time to overcome the friction. (This latter mechanism is known as error accumulation.) As a consequence, policymaking systems remain stable until the signals from outside exceed a threshold, and then they lurch forward—that is, a policy punctuation occurs; afterward, they resume "equilibrium." Disproportionate information processing, in which the

system tends to alternate between under-adjusting to the flow of information and overresponding to it, is directly related to stick-slip dynamics.

Over the years, public policy scholars have amassed considerable evidence that the general punctuation thesis has validity at the federal level in United States, at the state level in the United States, and in several European nations (see True, Jones, & Baumgartner, 2007; Prindle, 2012, for a summary of the findings).

Democracy, Preferences, and Adjustment

Does this mean that elections are meaningless? More broadly, is the emphasis on information processing rather than the preferences of citizens in policymaking fundamentally undemocratic? Surely it implies a loss of control by the electorate to control the behaviors of policymakers.

We think not. We think of the traditional political forces such as public opinion, interest groups, elections, and other forms of political participation as providing *weights* for the information signals. Elections themselves may be indicators not so much of the desire of the public to move to the right or the left and more an indicator of the need for policymakers to solve problems viewed as pressing by the public. This is what we mean by weights on the information signals. We have found, for example, that the extent to which the public weights the economy as the most important problem facing the country is more important in affecting whether Congress pays attention to economic policy (has hearings on economics) than the actual state of the economy (Jones & Baumgartner, 2005). More generally, the issues that policymakers in the United States address are closely matched to the priorities of the public, but the correlation weakens as we move from attention to lawmaking to budgeting (Jones, Larsen-Price, & Wilkerson, 2009). Given the American system, this makes sense. It is reasonably easy to address a concern through, for example, congressional hearings, but it is not so easy to schedule and win a roll-call vote on the issue, and even harder to enact a law addressing the issue.

Stochastic Processes and Complex Systems

Our original work on policy punctuations drew heavily on developments in other disciplines. Our debt to the debate on the pace of evolution in paleontology is clear (see Prindle [2012] and Vergano [2011], for a lucid popular account). The debate over whether the mechanisms of evolution could support rapid punctuations continues in biology, but social and political mechanisms are fully capable of causing such changes. We were far more influenced by developments in finance economics and what has become known as the study of complex systems. In finance, the efficient market thesis continues to be debated (see Sewell [2011] for a brief but thorough review), but we were more drawn to the work of those scholars, beginning with Benoit Mandelbrot (1963, 1997), who challenged the thesis. Briefly, the efficient market thesis postulates that markets reflect all information about an asset (such as a stock or commodity) in prices; hence, the period-to-period changes in valuation should resemble a random walk—essentially no trends or cycles should be in

evidence. As a consequence, period-to-period changes (such as day-to-day or month-to-month) in prices should be normally distributed. Mandelbrot, however, showed that certain commodity prices were not distributed normally, but rather were distributed as a power function. This implies that markets are capable of much larger changes than would be predicted based on the efficient market thesis—an issue now known as the “fat-tailed problem” because the tails of the distribution are much larger than expected based on the normal distribution. While the debate on the thesis continues in finance (Mandelbrot & Hudson, 2004), Mandelbrot’s insights provided the basis for our studies of budget distributions.

Independently, the debate over incrementalism in budgets was forwarded by the work of John Padgett (1980), who introduced stochastic process methods to budgetary studies. Padgett showed that in incremental budgeting, period-to-period changes (annual budget changes) should be normally distributed. Our work showed that most period-to-period changes in budgets were not normally distributed, but rather leptokurtic with more slender peaks and fatter tails than normal distributions (Jones & Baumgartner, 2005; Jones, Baumgartner, & True, 1996). Indeed, they generally followed power function distributions (Jones, Baumgartner, et al., 2009). This directly implied the large changes that were qualitatively expected in the original punctuated equilibrium thesis. Moreover, power functions are the signature feature of slip-stick dynamics, hence unifying the role of institutional and cognitive friction into the stochastic process approach.⁴

Fat tails in budgets rule out the comforting policy world of incremental adjustments in all places at all times, although budget leptokurtosis implies that most of the time in most of the cases, incrementalism holds (Howlett & Migone, 2011). However, most policy change is accounted for by the punctuations, not the incrementalism. Such changes cannot be caused by smooth linear models that remain dominant in political science research and in social science more generally. Rather, multiplicative models with complex feedback features are called for. This puts punctuated equilibrium squarely within the complex systems approach, which emphasizes complex interactions and positive feedback in which “change begets more change” in addition to the more typical negative feedback, in which change in one direction stimulates counteracting change (Baumgartner & Jones, 2002). Interactions of a system with its environment are seldom linear and direct. One must appreciate internal system dynamics as well as external inputs to understand system outputs. The adjustment incorporates potentially complex interactions between the internal parts of the system and its environment. These interactions are often governed by simple processes, but they can combine in ways that generate a great deal of complexity—including the possibility of large changes that would not be anticipated by analyses relying on linear analysis (Érdi, 2008).

The study of complex systems is in its infancy, and to date, the approach involves more of a general almost philosophical stance about the world and how it works than a precise set of rules for addressing the issues that emerge. While the basis of the approach currently lies in exploring the complexity that emerges from simple forms, it has other characteristics, including the use of computer simulations, the mining of large datasets for patterns, and interdisciplinarity. Students of policy processes

would do well to begin thinking along the lines of scholars working in this field, being open to the possibilities of sudden, large-scale transforming change, and monitoring work in this field for applications to our own area of study.

Comparative Analysis

The ideas we developed in *Agendas and Instability* struck many readers as quintessentially American. We focused on “venue-shopping,” developed a theory in which parties were only a minor part of the story, and gave plenty of room to the dynamics of federalism and the conflict among branches of government. How would these ideas fare in other political systems? In Europe, a vigorous scholarship developed using case studies to examine whether the patterns we observed in the United States also occurred there. Perhaps surprisingly, many studies convincingly found such patterns (see True et al., 2007, for a review and discussion). Most recently, a special issue of *Comparative Political Studies* examines the current state of agenda-setting research in comparative politics (see Baumgartner, Brouard, Green-Pedersen, Jones, & Walgrave, 2011).

There are good reasons for the pattern to exist elsewhere. There is nothing uniquely American about limited attention and policy subsystems. As we developed in greater detail in *The Politics of Attention*, the ideas at the base of the punctuated equilibrium model relate to human cognition and institutional resistance, and thus should be common to all political systems. Of course, they do not work in the same manner; institutional design and political culture matter, and these aspects should show up in definable differences among systems.

Beginning in 2004, scholars in a number of countries began to replicate the databases that are at the core of the Policy Agendas Project (see <http://www.comparativeagendas.org/>). When they have looked at various elements of political change, stick-slip dynamics, not smooth adjustment nor election-governed changes, have appeared in every country where investigations have taken place. We entitled our paper on the distribution of changes in public budgets “A General Empirical Law of Public Budgets” because the similarities were so strong across all budgets and because we have yet to discover a public budget that does not have the tell-tale fat-tailed distribution that provides evidence for punctuated equilibrium (Jones, Baumgartner, et al., 2009). Moreover, we observed systematic differences among countries in the parameters of the distributions, differences that were associated with measures of friction within the countries.

In a second set of studies, scholars have found evidence of stick-slip dynamics through the stages of the policy cycle. If the general punctuation thesis were correct, one would expect to find the lowest level of resistance or friction in the earlier stages of the policymaking process, particularly agenda setting, with higher resistance as a proposal moves through the process. This has been confirmed first in the United States (Jones & Baumgartner, 2005; Jones et al., 2003) and later in European countries (Baumgartner et al., 2009). A second implication of stick-slip dynamics is that public opinion should be more important earlier in the cycle and less important later, a

thesis that has received strong support in the United States (Jones, Larsen-Price, et al., 2009) and in Spain (Bonafont & Palau, 2011).

As scholars have investigated policy dynamics in a wide range of political settings, they have found some patterns that seem to be universal such as the inability of any government to respond smoothly to changes in the environment. These findings have raised new questions. For example, are some institutional processes more efficient than others? Does the number of veto players affect the ability of governments to respond to incoming information? Do the disciplined parties and greater institutional control of a Westminster-style democracy allow for stronger election effects than we have seen in the United States, with its separation of powers, decentralized parties, and federal structure? Using the new datasets, scholars have discovered some surprising things, such as the important role of the parliamentary opposition in affecting the policymaking agenda and the associated constraints on the ability of governing parties to set the agenda (see Green-Pedersen & Mortensen, 2010). It is not that opposition parties can set the policymaking agenda; they can't. However, they can take advantage of circumstances to force governing parties to address issues they would rather avoid.

Measurement and Infrastructure

Punctuated equilibrium is a theory of policy change, but the Agendas Project is a large collaboration based on the idea that whatever theory one is examining, careful measurement is critical. Political science and policy studies have collectively suffered from a focus on relatively small-scale empirical projects. Whereas biologists have taken on the task of mapping the entire human genome, creating massive international collaboration costing billions of dollars and lasting decades, social scientists typically work on a much smaller scale, typically that of a single scholar working alone.

Early in our collaboration, we concluded that the study of the dynamics of public policy was being retarded by the lack of availability of data over longer periods of time. Most quantitative policy studies were based on budgets and expenditures, but those measures are far "downstream" from the problem-definition and agenda-setting processes we were studying. The long-run results are the datasets of the Policy Agendas Project (<http://www.policyagendas.org/>) and the Congressional Bills Project (<http://www.congressionalbills.org/>). The key to the system is a content-based categorization system for public policy that is reliable, and hence can be traced across long periods of time. Only with such data could scholars seriously study changes in the policymaking agenda with any degree of confidence.⁵

We developed a system for freely distributing all the data we code, along with an on-the-fly analysis tool that allows scholars and students alike to compare trends in the databases. The payoff, we have hoped, is that analysts would come to where the data are available, exploring unforeseen research directions, but also help in the development of a more serious public policy database infrastructure. And indeed we have been surprised at the different research projects that have used the resources of

the Policy Agendas Project (many are noted on our web site, and we invite researchers to let us know of projects that they have pursued using the data).

It is one thing to develop a model of politics, but quite another to provide the resources to test it in a variety of ways. It is in the confrontation with empirical observation that the analyst is forced to refine, improve, and perfect the theory. We have constantly been impressed at the fruitfulness of puzzling over data. Our initial forays into the comprehensive database that we developed on U.S. federal spending led us to look at each series one by one; we found no common pattern and no sensible overarching theory that could make sense of the wide range of trends we observed. From this failure came the theory of stick-slip dynamics, which helps explain not the individual cases but the overall pattern of spending changes. Many political scientists are wary of induction, but all scientific disciplines advance by a mixture of induction and deduction. Theories are confronted with data, and data are confronted with different theories. The two are so intertwined that we see the development of an infrastructure of measurement and observation to be absolutely central to the process of developing theory because one cannot advance without the other. Thus, punctuated equilibrium may not be the Agendas Project, and many users of the Agendas Project have no interest in testing any theory at all. However, we could not have developed the ideas that are central to our understanding of punctuated equilibrium without spending years and building the large international collaboration focused on measurement as we have done. It has been time well spent.

Qualitative Studies

Much of the work that has come from the Agendas Project, especially that focusing on the distribution of budgetary changes (work that we believe has not only reinvigorated the study of budgeting, but also provided the most wide-ranging and convincing evidence for punctuated equilibrium outcomes across a variety of political institutions), has been almost exclusively quantitative. Our original contribution, *Agendas and Instability*, relied on quantitative assessments mixed with qualitative treatments, but in comparison to earlier agenda-setting studies, *Agendas and Instability* was more quantitative. In the years since then, there has been a flowering of many types of work, but perhaps the most influential has been more sophisticated in terms of analytic techniques. We applaud this, we have participated in this directly, and the resources made available through our Policy Agendas Project have made this possible indirectly.

However, we think it is incomplete. A full test of the implications of the theory of punctuated equilibrium will require more in-depth fieldwork-based studies of actual policy processes as these are worked out on the ground. Gary Goertz, among others, has stressed that a world full of complex interacting systems requires qualitative studies as well as quantitative ones. We should particularly be interested in cases that fall at the far ends of our empirical distributions. Did decision makers reached “outside of the box” in terms of the cognitive models that justify the policy change? Are they characterized by positive feedback processes? Do the cases in the central peak correspond to those where few alternatives were considered?

Any number of behavioral elements of the model of cognitive friction that is at the core of our understanding of the causes of punctuated equilibrium could fruitfully be studied by interviews and process tracing using government documents. So far, such studies are rare. Perhaps this is a reflection on the state of the discipline, but we see too much of a divide by methodological approach. We have proposed a cognitive model of attention scarcity and postulated that it should be related to a stick-slip dynamic leading to a certain pattern of policy changes. This cognitive model could be judged by talking to those involved in the policy process, by reading the documents they produce, and by other means. The literature will be healthier, and the state of knowledge about punctuated equilibrium will move forward faster if we can integrate a wider range, including qualitative work, into assessing whether the processes we postulate are indeed at work in generating the outcomes that we document.

Fruitfulness: The Unpredictability of a Research Framework

Interesting ideas tend to produce unpredictable results; indeed, that is what we mean by the fruitfulness of an approach. In observing the research that others have pursued using our original ideas as a springboard, including the articles in this special issue, we are continually surprised at the directions and findings that others have produced, and even the direction that our own research took after working out the original ideas.

So in putting together this special issue, we looked for articles that pressed the margins of the original PET formulation and had the potential for taking policy process studies in unexplored directions while nevertheless remaining within the general framework of attention allocation and large policy change.

David Prindle's extraordinary article sets the stage. Drawing on his impressive knowledge of evolutionary biology, policy process studies, and philosophy of science, Prindle's "Importing Concepts from Biology into Political Science: The Case of Punctuated Equilibrium" (2012) develops a strong case for the use of metaphorical thinking in the transference of ideas in science. Prindle's criterion for whether such a transfer is "Can it be made useful to us?" He claims that in the case of the policy process version of punctuated equilibrium, "The answer was a resounding 'Yes'." He shows how the concept has morphed into new directions, most of which he finds exciting. However, Prindle adds two cautions. One is a suggestion that the term might best be labeled "punctuated incrementalism," which is certainly more descriptive of the policymaking process. Second, he points to difficulties in integrating the mechanistic analogies common in our work (and in much of political science)—including friction models, stick-slip dynamics, and even punctuated equilibrium itself—into its human choice foundations. "(A)lthough Jones and Baumgartner have explicitly grounded their version of the theory in the human struggle over meaning, they have never frontally addressed the issue of how such a model can translate human choices into mechanical outcomes without losing the symbolic and emotional processing that is its substance." This is a powerful critique indeed that all of us working in the field should take seriously.

In “The Tortoise or the Hare: Incrementalism, Punctuations, and Their Consequences,” Christian Breunig and Chris Koski (2012) examine U.S. state budget processes to assess the long-run budgetary consequences of budget incrementalism versus budget punctuations. These two scholars have examined the causes of budgetary punctuations earlier in the pages of the *Policy Studies Journal*; now in an imaginative research design, they examine their consequences. They show that some states and some budgetary categories experience more budgetary punctuations than others and that more punctuated patterns are associated with lower long-term growth rates. The authors think that these differences are due to the manner in which budgetary systems allocate attention—more regular attention leading to more regular growth but fewer punctuated cutbacks.

The European Council, consisting of the heads of state or government of the member nations, its own president, and the president of the European Commission is the primary agenda-setting body for the European Union for macropolitical actions. In their contribution to this special issue, “Policy Punctuations and Issue Diversity on the European Council Agenda,” Petya Alexandrova, Marcello Carammia, and Arco Timmermans (2012) analyze all Council Conclusions issued from 1975 to 2010. The authors content-coded these documents using a modified version of the U.S. Policy Agendas Project coding protocol. Using several of the tools developed for analyzing large-scale policy changes in the United States, the authors show that the council agenda became more diverse over time, displayed the characteristic pattern of high kurtosis associated with abrupt shifts in policy direction but also displayed an episodic oscillation over time.

In “What are Policy Punctuations? Large Changes in the Legislative Agenda of the UK Government, 1911–2008”, Peter John and Shaun Bevan (2012) use data from the United Kingdom Policy Agendas Project and qualitative historical evidence to study differences in major changes in legislation that occurred during the last 97 years. They isolate three kinds of punctuated policy change: those that are combinations of activities that are not well-connected; those that are connected policy initiatives but are not particularly salient to the press and mass publics; and those transformative changes that capture the attention of the public and the media. This work, along with the contribution of Alexandrova, Carammia, and Timmermans (2012), demonstrates the utility of starting with a general framework based in how governments process information and using databases coded via a similar content system. This allows direct comparisons of policy output patterns across varying political institutions.

Michelle Wolfe, in “Putting on the Brakes or Pressing on the Gas: The Media and Public Policy” (2012), makes a major contribution in our conceptualization of the role of the media in policy change. While *Agendas and Instability* views the role of the media as potentially disruptive of policy subsystems, Wolfe notes that in many cases the media can provide stability and communication among linked actors in the subsystem. In such cases, media attention can slow down policy change by raising attention and provoking countermobilization by supporters of the existing policy arrangement. Using an event history approach, Wolfe studies lawmaking in the 109th Congress and finds that increased media coverage slows down the time from

bill introduction to passage. Media coverage may aid in accessing the agenda but retard actually getting things done.

One implication of this research is for policy scholars to begin to think in terms of conditional probabilities: $P(A)$ is the probability that an issue accesses the policy-making agenda—that is, a bill is introduced; $P(L|A)$ is the probability that a bill becomes a law given that it is on the agenda (which is necessary but not sufficient). We might hypothesize that $P(A)$ is directly related to media coverage, but that $P(L|A)$ is inversely related to coverage.

Graeme Boushey, in his contribution to this volume entitled “Punctuated Equilibrium Theory and the Diffusion of Innovations” (2012) is also interested in what circumstances move different policies through the policy process at different speeds. Boushey first develops the connection between the diffusion dynamics and the positive and negative feedback effects so critical in punctuated equilibrium. He then studies the diffusion of 81 policies in the American states, using a Bass Diffusion Model, an approach that allows him to differentiate diffusion processes caused by common external events from those that are caused by internal mimicking dynamics. Boushey is able to tie the speed of policy diffusion to the nature of the policy through the particular pattern of parameter estimates from the Bass Model. He finds that the federal government encourages rapid diffusion, but its involvement produces a different pattern from other rapid diffusion such as policy outbreaks generated by positive feedback processes. The Bass Model allows him to differentiate between rapid diffusion prompted by federal coercion from that generated state policy mimicking. It also identifies incremental diffusion patterns. As a consequence, Boushey’s approach moves us toward a more complete theory of policy diffusion.

Heather Larsen-Price’s “The Right Tool for the Job: The Canalization of Presidential Policy Attention by Policy Instrument” (2012) uses the tools of modern policy process theory to reconceive the role of the president in the policy process. Do presidents coordinate their use of policy instruments—that is, proposing laws, issuing executive orders, making speeches, and presenting the government’s position in court cases? To examine this, Larsen-Price codes new datasets on presidential messages, Solicitor General Briefs, according to the Policy Agendas Protocol (having already been responsible for the Executive Orders and dataset), allowing her to do the comparisons across policy issues that are necessary to discern policy coordination. She finds some evidence of coordination but only when attention to the issue is high.

Jeff Worsham and Chaun Stores, in “Pet Sounds: Subsystems, Regimes, Policy Punctuations, and the Neglect of African American Farmers, 1935–2006” (2012) is the only article in this special issue to return to the policy subsystems basis of *Agendas and Instability*. Worsham and Stores show exactly how resistant some policy arrangements can be to national political trends. They study the resistance of the agricultural policy subsystem to the civil rights “policy regime” at the macropolitical level. For nearly seven decades, agricultural policymakers refused the demands of black farmers for compensation for the wrongs done by past government policy. Dominance of the agricultural subsystem by Southern congressmen and agenda crowding after their influence faded, account for the power of the resistance.

Each of the topics of the special issues of PSJ has concentrated on a different aspect of the policy process. IAD centers on the rules of governance, how they are established, and the consequences they have. ACF focuses on the belief systems of actors, how they generate coalitions, and the consequences for governance. 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. One of the major challenges as we move forward is to think about how these different perspectives interact with one another, with an aim not necessarily to integrate them but to generate new hypotheses and research directions (see Worsham, 2006).

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Notes

We appreciate comments from David Prindle on an earlier draft.

1. It is important to note that information can indicate that government ought to do less, not more, in a particular policy area.
2. We do not deny the existence of private information or its role in politics; it is just that this information is often not germane to policy priorities, although it may well shape the nature of potential solutions.
3. This section relies on the discussion in Jones et al. (2009).
4. There are of course other reasons for leptokurtic policy distributions than the classic punctuated equilibrium dynamic. Punctuated equilibrium implies leptokurtic budgets but the opposite is not strictly true. However, pure incrementalism is strictly eliminated as an explanation.
5. We have discussed the logic of our classification system elsewhere in some detail. See Baumgartner, Jones, and Wilkerson (2002), Baumgartner et al. (2011).

References

- Alexandrova, Petya, Marcello Carammia, and Arco Timmermans. 2012. "Policy Punctuations and Issue Diversity on the European Council Agenda." *Policy Studies Journal* 40 (1): 694–88.
- Arrow, Kenneth. 1951. *Social Choice and Individual Values*. New York: John Wiley and Sons.
- Baumgartner, Frank R., and Bryan D. Jones. 2002. "Positive and Negative Feedback in Politics." In *Policy Dynamics*, ed. Frank R. Baumgartner, and Bryan D. Jones. Chicago: University of Chicago Press, 3–28.
- . [1993] 2009. *Agendas and Instability in American Politics*, 2nd ed. Chicago: University of Chicago Press.
- Baumgartner, Frank R., Suzanna L. De Boef, and Amber E. Boydstun. 2008. *The Decline of the Death Penalty and the Discovery of Innocence*. New York: Cambridge University Press.
- Baumgartner, Frank R., Martial Foucault, and Abel François. 2009. "Public Budgeting in the French Fifth Republic: The End of La République Des Partis? *West European Politics* 32 (2): 404–22.
- Baumgartner, Frank R., Sylvain Brouard, Christoffer Green-Pedersen, Bryan D. Jones, and Stefaan Walgrave, ed. 2011. "The Dynamics of Policy Change in Comparative Perspective." *Comparative Political Studies* 44.
- Baumgartner, Frank R., Bryan D. Jones, and John Wilkerson. 2002. "Studying Policy Dynamics." In *Policy Dynamics*, ed. Frank R. Baumgartner, and Bryan D. Jones. Chicago: University of Chicago Press, 29–46.

- . 2011. "Comparative Studies of Policy Dynamics." *Comparative Political Studies* 44 (8): 947–72.
- Black, Duncan. 1958. *The Theory of Committees and Elections*. Cambridge: Cambridge University Press.
- Bonafont, Laura Chaqués, and Anna M. Palau. 2011. "Assessing the Responsiveness of Spanish Policy-makers to the Priorities." *West European Politics* 34: 706–30.
- Boushey, Graeme. 2010. *Policy Diffusion Dynamics in America*. Cambridge: Cambridge University Press.
- . 2012. "Punctuated Equilibrium Theory and the Diffusion of Innovations." *Policy Studies Journal* 40 (1): 127–46.
- Breunig, Christian, and Chris Koski. 2012. "The Tortoise or the Hare? Incrementalism, Punctuations, and Their Consequences." *Policy Studies Journal* 40 (1): 45–67.
- Burnham, Walter. D. 1970. *Critical Elections and the Mainsprings of American Politics*. New York: WW Norton.
- Cobb, Roger, and Charles D. Elder. 1972 (1983). *Participation in American Politics*. Baltimore: Johns Hopkins University Press.
- Cohen, Michael, James March, and Johan Olsen. 1972. "A Garbage Can Model of Organizational Choice." *Administrative Science Quarterly* 17: 1–25.
- Érdi, Peter. 2008. *Complexity Explained*. Berlin: Springer.
- Fenno, Richard. 1966. *The Power of the Purse*. Boston: Little, Brown.
- Green-Pedersen, Christoffer, and Peter B. Mortensen. 2010. "Who Sets the Agenda and Who Responds to It in the Danish Parliament?" *European Journal of Political Research* 40 (2): 257–81.
- Howlett, Michael, and Andrea Migone. 2011. "Charles Lindblom Is Alive and Well and Living in Punctuated Equilibrium Land." *Politics and Society* 30: 53–62.
- John, Peter, and Shaun Bevan. 2012. "What Are Policy Punctuations? Large Changes in the Legislative Agenda of the UK Government, 1911–2008." *Policy Studies Journal* 40 (1): 89–107.
- Jones, Bryan D. 1994. *Reconceiving Decision-Making in Democratic Politics*. Chicago: University of Chicago Press.
- . 2001. *Politics and the Architecture of Choice*. Chicago: University of Chicago Press.
- . 2003. "Bounded Rationality in Political Science: Lessons from Public Administration." *Journal of Public Administration Theory* 13: 395–412.
- Jones, Bryan D., and Frank R. Baumgartner. 2005. *The Politics of Attention*. Chicago: University of Chicago Press.
- Jones, Bryan D., Frank R. Baumgartner, and James L. True. 1996. "The Shape of Change: Punctuations and Stability in US Budgeting, 1947–96." Paper presented at the Midwest Political Science Association, Chicago, IL.
- Jones, Bryan D., Frank R. Baumgartner, Christian Breunig, Christopher Wlezien, Stuart Soroka, Martial Foucault, Abel Francois, Christoffer Green-Pederson, Chris Koski, Peter John, Peter Mortensen, Frederic Varone, and Steffan Walgrave. 2009. "A General Empirical Law of Public Budgets: A Comparative Analysis." *American Journal of Political Science* 53: 855–73.
- Jones, Bryan D., Heather Larsen-Price, and John Wilkerson. 2009. "Representation and American Governing Institutions. 2009." *Journal of Politics* 71: 277–90.
- Jones, Bryan D., Tracy Sulkin, and Heather Larsen. 2003. "Policy Punctuations in American Political Institutions." *American Political Science Review* 97: 151–70.
- Kingdon, John. 1984. *Agendas, Alternatives, and Public Policies*. New York: Longman Classics.
- Krehbiel, Keith. 1998. *Pivotal Politics*. Chicago: University of Chicago Press.
- Larsen-Price, Heather A. 2012. "The Right Tool for the Job: The Canalization of Presidential Policy Attention by Policy Instrument." *Policy Studies Journal* 40 (1): 147–68.
- Lindblom, Charles. 1959. "The Science of 'Muddling Through.'" *Public Administration Review* 19: 79–88.
- Lowi, Theodore. 1969. *The End of Liberalism*. New York: W.W. Norton.
- Mandelbrot, Benoit. 1963. "The Variation of Certain Speculative Prices." *Journal of Business* 36: 294–419.
- . 1997. *Fractals and Scaling in Finance*. New York: Springer.

- Mandelbrot, Benoit, and Richard L. Hudson. 2004. *The (Mis)Behavior of Markets*. New York: Basic Books.
- McKelvey, Richard D. 1976. "Intransitivities in Multidimensional Models: Implications for Agenda Control." *Journal of Economic Theory* 12: 472–82.
- New York Times*. 2011. "Texas's Progress on Juvenile Justice." *New York Times* (July 9): SR11.
- Padgett, John F. 1980. "Bounded Rationality in Budgetary Research." *American Political Science Review* 74: 354–72.
- Prindle, David F. 2012. "Importing Concepts from Biology into Political Science: The Case of Punctuated Equilibrium." *Policy Studies Journal* 40 (1): 21–43.
- Redford, Emmette. 1969. *Democracy in the Administrative State*. Oxford: Oxford University Press.
- Schattschneider, Elmer E. 1960. *The Semisovereign People*. New York: Holt, Reinhart, and Winston.
- Schrad, Mark Lawrence. 2010. *The Political Power of Bad Ideas*. Oxford, UK: Oxford University Press.
- Sewell, Martin. 2011. *A History of the Efficient Market Hypothesis*. London: Research Note, University College of London Department of Computer Science.
- Simon, Herbert A. 1983. *Reason in Human Affairs*. Stanford, CA: Stanford University Press.
- Simon, Herbert A., and Associates. 1986. "Decision-Making and Problem-Solving." *Research Briefings: Report of the Research Briefing Panel on Decision-Making and Problem-Solving*. Washington DC: National Science Academy Press.
- True, James., Bryan D. Jones, and Frank R. Baumgartner. 2007. "Punctuated Equilibrium Theory: Explaining Stability and Change in Policymaking." In *Theories of the Policy Process*, ed. Paul A. Sabatier. Boulder, CO: Westview Press, 155–87.
- Vergano, Dan. 2011. "Paleontology Points to Political Punctuations." *USA Today* 7: 24.
- Weimer, David. 2008. "Theories of and in the Policy Process." *Policy Studies Journal* 36: 489–96.
- Wildavsky, Aaron. 1964. *The Politics of the Budgetary Process*. Boston: Little, Brown.
- Wolfe, Michelle. 2012. "Putting on the Brakes or Pressing on the Gas? Media Attention and Policymaking." *Policy Studies Journal* 40 (1): 109–26.
- Workman, Samuel G., Bryan D. Jones, and Ashely Jochim. 2009. "Information Processing and Policy Dynamics. 2009." *Policy Studies Journal* 37: 75–92.
- Worsham, Jeff, and Chaun Stores. 2012. "Pet Sounds: Subsystems, Regimes, Policy Punctuations, and the Neglect of African American Farmers, 1935–2006." *Policy Studies Journal* 40 (1): 169–89.
- Worsham, Jeffrey. 2006. "Up in Smoke: Mapping Subsystem Dynamics in Tobacco Policy." *Policy Studies Journal* 34: 437–52.