

# Rethinking Punctuated Equilibrium Theory: A Public Administration Approach to Budgetary Changes

Carla M. Flink

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*What stimulates policy change in organizations? Punctuated equilibrium theory (PET) posits that over time policy moves slowly, but also experiences large, rapid changes. Explanations for punctuations have centered on institutional friction and disproportionate information processing. Lacking in PET literature is a theoretical understanding of policy change aside from structural and cognitive limitations. Other organizational features can create friction to slow or accelerate the policy process. This study utilizes both public policy and public administration theory by applying a public administration approach to studying budgetary change. Leveraging this approach, this work analyzes the pattern and explanations of budgetary changes. Centering on two concepts understudied in PET literature—policy feedback and endogenous organizational change—data from hundreds of organizations are used to demonstrate how organization performance and personnel instability contribute to budgetary changes for core organization activity. Results indicate that high levels of performance and low levels of personnel instability lead to incremental changes.*

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**KEY WORDS:** punctuated equilibrium theory, public policy process, public administration, public budgeting, organization performance, turnover

## 1. Introduction

The ability for organizations to hold steady policies while being able to adapt to changing needs takes a delicate balance. The policy process, as such, is both rapid and slow. As one theory of the policy process, punctuated equilibrium theory (PET) captures both of these dynamics by examining incremental and large, punctuated changes. Scholars in this literature have had much success in finding the pattern of change predicted by PET in a variety of policy settings.

Understanding the factors that contribute to the rate of policy change has been one of the core objectives in this literature. In broad terms, scholars have identified disproportionate information processing, institutional friction, and organizational history as reasons why policy subsystems experience more or less punctuated changes. Empirically, PET has been predominantly analyzed through examinations of distributions of policy changes, although there have been works that utilize multi-variate analyses (Robinson, Flink, & King, 2014; Robinson, Caver, Meier, & O'Toole,

2007). Traditionally, these studies use public budgeting data—federal, state, local, and school district levels.

Throughout PET literature, much effort has been devoted to explaining how the structure of institutions and organizations shapes policy outcomes. Features such as centralization, veto players, organization size, and bicameralism have all been shown to affect the rate of policy change by applying varying amounts of “friction” to the policymaking process. Moving away from structural considerations, other factors can slow or accelerate the policy process, although little scholarly work has been devoted to explaining these other features that influence the rate of policy change. Why do two organizations of the same structure experience different policy changes over time? Part of the answer lies in looking to other literatures that can explain factors that influence organizational decision making.

The purpose and main theoretical contribution of this article is to extend explanations of budgetary change in PET by applying theories from public administration—a literature devoted to explaining how bureaucrats, clientele, management, and the environment influence performance and efficiency in organizations. Public administration literature brings a new perspective on what causes friction in organizations, and what leads to policy changes. In turn, this study makes theoretical contributions to both public policy and public administration literatures by not only examining the *pattern* of budgetary changes but also developing *explanations* for those changes.

Two concepts understudied in PET literature—policy feedback and endogenous organization change—are examined in this study. Policy feedback is measured by organization performance. It indicates how well a policy is working for an organization, hence, providing policy feedback. Endogenous organization change is how alterations within the organization, not strictly related to policy changes, affect policy dynamics. In this work, endogenous organization change is measured as personnel instability (also referred to as employee turnover). Success of policies and internal organization changes are concerns for all organizations. Understanding how both concepts influence budgetary changes has benefits for academics and practitioners as the public sector works within an increasingly strained resource environment.

Justification for applying public administration theories is grounded in two critiques of the conceptualization of institutional friction. For one, friction is conceptualized as factors of the policy process or structure of decision making. There are organizational features outside of the traditional idea of “structure” that can influence budgetary changes. Second, the structures of policymaking, studied as institutional friction, stay relatively steady over time (Jones & Baumgartner, 2005). Policy decisions, though, are not based solely on how institutional and organizational structure influences decision costs, but on the current environmental demands. Organizations and institutions—regardless of their design—make decisions based on these current demands that are in constant fluctuation.

This article theorizes and tests policy feedback and endogenous organization change as catalysts for budgetary change by using a dataset that contains budgetary, personnel, and performance data for hundreds of school districts in Texas for an almost 20-year period. Organizational performance and personnel instability are

examined to assess how each influences changes in core program funding. The findings demonstrate that as performance increases, there is a significant rise in the proportion of incremental budgetary changes. For personnel instability, as turnover decreases, incremental budgetary changes become more prevalent. These results are significant while controlling for varieties of institutional friction.

In addition to theoretical advances, results also provoke discussion about two conventional measurement choices in the literature. For one, many scholars combine punctuated and medium size budgetary changes into one “nonincremental” category. The findings in this study show that medium size changes fluctuate depending on the degree of friction, while punctuated changes show little movement away from near zero probability of occurring. More examination should be given to medium size changes, given their frequency over punctuated changes.

Second, scholars typically combine positive and negative changes of the same absolute size in their measurement of budgetary changes. Findings in this study indicate that positive and negative changes, even of the same absolute size, are utilized at different times over the ranges of friction. This suggests researchers should work toward theorizing and measuring budgetary changes based on the direction of change.

In all, this study causes us to rethink PET in terms of the theoretical causes of policy change, how changes are measured, and the empirical methods applied to test PET. This study ends with suggestions for future scholarship in PET and public administration.

## 2. Literature

### *2.1. Models of Policy Change*

Incrementalism is part of the foundation of policy change studies. This is especially true in the field of public budgeting. The field has dedicated decades to explaining how incrementalism applies—or does not apply—to public budgeting (Davis, Dempster, & Wildavsky, 1966; Wanat, 1974; Wildavsky, 1964). In analysis of budgets from every level of government, country, agency, or organization, the same general incremental pattern is present: there are mostly small changes from year to year, supporting incrementalism (Cornia & Usher, 1981; Davis, Dempster, & Wildavsky, 1974). Incrementalism, though, is not readily accepted by all budgeting scholars. For one, the term “incrementalism” has become conceptually diffuse. Scholars have used the term to describe a method of problem solving, a process of interaction, a theory of organizational behavior, a theory of policy development, a shift in organizational relationships, and the size of monetary change (Berry, 1990; Dempster & Wildavsky, 1979). With this many meanings, some scholars have questioned if incrementalism is still a useful term for scholarly works (Berry, 1990). However, despite critiques noting the theoretical and empirical shortcomings of incrementalism (i.e., Bailey & O'Connor [1975]; Berry [1990]; Dempster & Wildavsky [1979]; Natchez & Bupp [1973]; Tucker [1982]), the theory could not be wholly rejected or replaced with all new theories. Hence, it still remains relevant to budgetary studies today.

PET, borrowed from geological studies, emerged as another theory of the policy process that embraced incrementalism and incorporated the expectation for large changes—a missing element of the incremental theory (Baumgartner & Jones, 2010). In this theory, Baumgartner and Jones (2010) relate the policy process to phenomena from the physical sciences like earthquakes and landslides. For example, earthquakes occur as a result of slowly building pressure from underneath the earth's surface that causes violent shifts of the earth's tectonic plates. The dramatic shift of the earth's plates causes earthquakes.

Keeping with the bigger picture, these are slow-moving processes that eventually lead to dramatic events. Policy processes work in much the same way. Policies typically experience modest changes. Over time though, pressure builds within the policy subsystem until enough pressure has accumulated that a large and dramatic policy change results. In PET, these large changes are known as punctuations. Features of the policy process can slow or accelerate the rate of policy change.

This theory has been supported in many contexts from incarceration rates (Schneider, 2006) to election results (Baumgartner et al., 2009), legislative actions (i.e., bill introductions and hearings) (Baumgartner et al., 2009), environmental policy (Busenberg, 2004; Repetto, 2006; Salka, 2004; Wood, 2006), and education (McLendon, 2003). The dominant testing ground, though, has been in the field of public budgeting. Local, state, comparative, and U.S. federal government agencies and public organizations have all exhibited characteristics consistent with PET (Baumgartner, Foucault, & Francois, 2006; Baumgartner et al., 2009; Breunig, 2006; Breunig & Koski, 2006; John & Margetts, 2003; Jones, Baumgartner, & True, 1998; Jones et al., 2009; Jordan, 2003; Mortensen, 2005; Robinson, 2004; Robinson et al., 2007).

Determining a series' conformity with PET has relied on assessing the shape of the distribution of annual percentage budgetary changes. The distribution is analyzed for how closely it follows a normal distribution. Specifically, the degree of kurtosis (a measure of central "peakedness") is examined. Distributions that support PET have high values of kurtosis and are known as leptokurtic distributions—distributions with significantly more central observations around the mean and in the tails of the distribution than a normal distribution. Theoretically, this is what PET predicts of the policy change process: mostly incremental changes with numerous sizable changes. This leptokurtic distribution, also known as a power function, is central to punctuated equilibrium studies. It has proven extremely robust and is considered a general empirical law (Jones et al., 2009).

Coupled with its theoretical growth, punctuated equilibrium literature is increasing in empirical complexity. Scholars are expanding their work beyond univariate analyses of distributions to multivariate hypothesis testing that can account for other explanations of budgetary changes. The few published works that use multivariate empirical tests predicting budgetary outcomes have divided the distribution of budgetary changes into categories based on their size to use either logit (Robinson et al., 2014) or multinomial logit (Robinson et al., 2007).

This is an important direction for the literature as it advances understanding of how various features of governments and organizations influence budgetary changes. Traditional univariate analyses in PET have focused on the shape of the

distribution of budgetary changes and have limited their ability to account for other variables. This has led to a literature that has probed deeper into describing a pattern of budgetary changes, instead of engaging in theoretical development of what triggers budgetary changes. By multivariate hypothesis testing methods, scholars can progress to understanding the causes of different sizes of budgetary changes.

## 2.2. *Causes of Punctuations*

The literature on PET identifies two broad reasons for punctuations in policy changes: disproportionate information processing and institutional friction.

Disproportionate information processing is an artifact of the direction of policy attention. As the name suggests, this explanation of PET attributes policy changes to the tendency of policymakers and policymaking institutions/organizations to react disproportionately to new information (Jones, 2001). This is in contrast to proportionate information processing (Jones & Baumgartner, 2005) in which policymakers form policy decisions proportional to information within the environment. Officials, though, cannot adequately process all information since there is only a limited amount of policy attention they can give (Jones & Baumgartner, 2005). As a result, policy subsystems commonly go through periods of underresponding or ignoring information to overreacting to it (Jones & Baumgartner, 2005; Workman, Jones, & Jochim, 2009). The over- and under-reactions contribute to the leptokurtic shape of the distribution of budgetary changes found broadly in policy subsystems.

Institutional friction, the other explanation for policy punctuations, occurs as a result of the institutional or organizational barriers or decision clearance points in the policymaking process. Friction is a term used to account for the difficulty in the process of making policy changes. The more hurdles there are in the process, the more friction there is within the policy subsystem. This has consequences for policy alterations. While institutional and organizational designs with multiple actors and decision-clearances promote checks and balances (which provide comfort to citizens), they slow down the policy process. This, in turn, builds pressure within the policy subsystem. Over time, the accumulation of pressure will yield a punctuation.

There have been many different ways in which friction has been measured. The measure is meant to describe the concentration of power or the barriers in deciding policy changes. Institutional friction has been measured by bureaucratization (broken down to centralization and organization size), stage in the policy cycle, political system (presidential or parliamentary), executive dominance, single-party governments, bicameralism, partisan control of government, partisan distance of governing parties, and decentralization (Baumgartner et al., 2009; Breunig, 2006; Jones et al., 2009; Robinson, 2004; Robinson et al., 2007). Empirically, each of these factors affects the degree of kurtosis in the distribution of budgetary changes.

While the literature on PET establishes an overall pattern of change identified through distributions, examining distributions of budgetary change does not allow scholars to see when punctuations occur one time point to the next—the time series aspect of budgetary change is lost when all years are combined to form a single

distribution. To examine when punctuations occur while preserving them in a time series format, Robinson et al. (2014) test how the history of punctuations influence the probability for future punctuations. The authors develop two theoretical models of the effect of organizational history on punctuations. In the Error Accumulation model, the probability of an organization experiencing a punctuation is negatively related to having one in the recent past. In this model, punctuations occur to correct the policy subsystem to the desired level of policy. Once this correction has been made, policies will only see incremental changes until the distance between the actual and desired level of policy reach a critical threshold.

The other model is the “Institutional Model” of policy change that states large policy changes occur from characteristics within the organization (like poor design or mismanagement). Since the propensity of punctuations is tied to the organizational design, the probability of having a punctuated change is positively related to having one in the recent past. The authors’ findings support this Institutional Model—punctuations occur in clusters. In other words, a history of punctuations yields a higher probability that organizations will have a punctuation in the future.

### 3. Untested Sources of Friction

Literature has demonstrated that institutional friction influences budgetary changes. There are, however, common characteristics of the measures of institutional friction that leave open many questions about other sources of friction within policy subsystems. For one, measures have been conceptualized as the policy *process*.<sup>1</sup> Indeed, this was one of the original goals of this research agenda—examining the policy consequences of structures of policy subsystems. Prior to PET, little was known about how organizational or institutional structure shaped policy outcomes. Early explanations centered on factors aside from the process. For example, the political, economic, social, and administrative environments were said to influence policy changes (Davis et al., 1974).

Punctuated equilibrium literature, however, has progressed in explaining the process and structural factors as well as theorizing over cognitive limitations, leaving other factors virtually unexplored. While PET is a theory of government information processing (Workman et al., 2009), there are other elements to organizations that can cause friction among decision makers and in turn, affect policy changes. Public administration literature can help bring more depth to the understandings of policy change and provide an avenue to study concepts heavily discussed, yet not thoroughly tested in PET literature.

Public administration literature aims to explain how bureaucracy, management, clientele, and various public and private organizations all interact to affect and implement public policy. It aims to explain how well governments deliver goods and services in light of new policies, varying management strategies, racial diversity, conflicting goals, coordinating programs among many organizations and institutions, and numerous other considerations. This literature has helped identify factors that contribute to healthy and unhealthy organizations—ideas that can transfer to PET by explaining ways in which organizations experience friction other than through

organizational/institutional processes. Public administration literature adds a new dimension to the PET reasoning for budgetary change by incorporating indicators of the organization environment, uncertainty, personnel, clientele, and task difficulty as proxies for friction within a policy subsystem. This is the main theoretical contribution of this study—understanding how these organizational features that give substance to the interactions among decision makers influence the rate of budgetary change.

Budgets, in short, are not simply artifacts of the policy processing structure of organizations. This would give the impression that organizations are natural systems, with outcomes dependent on however the organization was originally designed (leading to high or low friction). Organizations, however, are *human* systems—their outcomes are dependent on more than structural design. For example, organizations of the same structure can experience different levels of budgetary change as a result of varying amounts of friction brought about by environmental demands or other issues surrounding the organization. Institutional friction captures how efficiently policies are processed, but it does not give an idea to the problems the organization is trying to address. An understanding needs to be gained about the contextual elements that can show stress within organizations and signal a greater need for budgetary change.

A second common feature of the institutional friction policy process measures is their relative stability over time (Jones & Baumgartner, 2005). The fixed measures allow for comparisons of the institutional/organizational arrangements over time—an essential component to understanding the policy change process. However, many aspects of organizations fluctuate over time. Instability and uncertainty within organizations create friction that can jolt an organization. This lead to many theoretically interesting questions related to how policy stability persists in light of factors that change frequently within the organization.

These two points—structure and stability—have inhibited the study of many organization features that can influence policy dynamics. This study addresses both of the above critiques by examining two organizational features that are outside of the decision-making structure and that fluctuate over time: policy feedback as organizational performance and endogenous organizational change as personnel instability. Policy feedback<sup>2</sup> is conceptualized as the success or failure of a given policy determined by organizational performance. The feedback received by policymakers provides information on the type of adjustment—minor or major—that is needed for the policy to be more effective for the organization. Obtaining reliable and timely feedback is a crucial element of policy development. Endogenous organizational change examines how internal alterations within the organization can have broader implications for policy dynamics. The changing of personnel, managers, clients, operating procedures, performance metrics, organization structure, and so forth, although all internal organization issues, can have impacts on policy alterations.

Organization performance and personnel turnover are two important and salient elements to virtually all organizations (Rainey, 2003) and are commonly studied throughout public administration literature. They are constantly monitored and taken into account for many organization decisions. If either of these features is less

than adequate, it can cause issues within the organization. Most likely, there will be disagreement within the organization on the best way to improve the quality of outputs and employee retention. How each element can be a potential source of friction, and in turn impact budgetary changes, is outlined below.

### *3.1. Policy Feedback: Organizational Performance*

The performance of public organizations is scrutinized by citizens and public officials. Even though they are generally characterized as underperforming (Moynihan, 2008; Rainey, 2003), the reason for the existence of public organizations is to provide quality goods and services to their clientele. Efforts to increase the efficiency and effectiveness of public organizations have gained momentum. Elected officials have developed extensive accountability systems to incentivize good and penalize bad performance in public organizations. A weakness of these policies is their one-size-fits-all approach. Numerous studies have demonstrated the unequal results of these programs across organizations (Moynihan, 2008; Radin, 2006; Rainey, 2003; Rutherford, 2014). Public organizations have unique missions, environments, and multiple dimensions on which to measure performance—suggesting there is no one way in which they can be motivated or evaluated.

Numerous performance initiatives implemented by government have made attaining set standards a high-stakes endeavor. Performance is virtually the biggest concern for any organization. Throughout academic work, this is reflected in management and organization theory's central focus on explaining different aspects of organization performance and effectiveness (Rainey, 2003). The literature assessing the determinants of organizational performance is large and spans many diverse fields. In practice, outputs are regularly monitored by public officials, managers, employees, and service recipients. Based on what is observed, current and future target levels of performance shape organization work and direction. Over- and underperforming organizations, however, must take different approaches to their work. The general assumption is organizations achieve success through proper management of their internal and external environment. When public organizations fall below a set standard, governments must intervene to help manage the situation.

Organizations with sustained high performance have implemented successful policies and properly managed their environment. Assuming no government interventions or other environmental shocks, changes to the organization are typically modifications to existing routines. These organizations are more likely to benefit from increased resources and support from government or the addition of new clients. Organizational goals then focus on maintaining current standards and possible expansion of their work.

There are harsh consequences for underperforming public organizations. With the push for greater accountability, these organizations are threatened by sanctions, penalties, government interventions, and closure. Managers, employees, and clients want to improve performance, but finding consensus on the best way to achieve that end is difficult. The choice on what alterations to make within the organization is



complicated by the many options available to decision makers. Resources, regulation, markets, organization, and management all influence public service performance (Boyne, 2003). Isolating the parts of the organization that need to be changed can cause conflict and friction. In light of this friction, policy changes are likely to be large (a case can be made for either positive or negative punctuations, depending on the situation), as a desperate attempt for performance improvement. Incremental changes are not likely to provide the jolt needed within the organization to spark performance increases.

This leads to the performance hypothesis:

*Hypothesis 1: Low performance decreases the expected proportion of incremental budgetary changes and increases the expected proportion of medium and punctuated budgetary changes.*

### 3.2. Endogenous Organizational Change: Personnel Instability

One of the core concerns of management is their organization's workforce. Human capital is one of the most valuable assets of any organization (O'Toole & Meier, 2009; Rainey, 2003). Bringing in new talent, retaining workers, and enhancing the skills of employees are essential for organizations to have quality performance. Given the importance of human capital for organization success, personnel instability is a relatively understudied area of public administration (Meier & Hicklin, 2008; Raffel, 2007; Selden & Moynihan, 2000). Most works on turnover analyze its effect on organizational performance. The leading theory is that personnel instability leads to lower organization performance (Meier & Hicklin, 2008; O'Toole & Meier, 2003). However, a refined version of the theory acknowledges benefits from turnover (like the organization staying fresh, bringing in new ideas, and the dismissal of ineffective workers) that suggest its nonlinear relationship with performance (Abelson & Bay-singer, 1984; Meier & Hicklin, 2008; Mosher & Kingsley, 1936).

There remain many research questions on the consequences of employee turnover beyond performance. This study examines its effect on policy stability. As stated before, PET focuses on procedures as sources of friction. However, even if structures and procedures can stay constant, personnel turnover induces another type of instability for the organization that changes the dynamics among actors (Weber, 1946). High turnover can signal problems and dissatisfaction among employees (Rainey, 2003). Additional stress occurs by replacing and retraining workers—it can be a costly endeavor that takes a substantial amount of resources within the organization (Griffeth & Hom, 2001; Wright & Kim, 2004). In organizations with high turnover, there should be more friction overall, yielding more punctuated changes. Policymakers may feel the need to enact major policy changes to retain employees. In organizations with low turnover, the friction models suggest there is less friction within the organization leading to less punctuation.

High turnover could also be a conscious effort by the organization to phase out current employees for new workers. This can occur when an organization is redeveloping and redirecting its mission. Turnover, then, is not necessarily a voluntary

move by the employee to leave a poor working environment, but a planned effort by management to bring in a new workforce and new direction for the organization. In this case, large policy changes could be associated with friction from the evolution of the organization stimulated by managerial decisions. Organizations that are not experiencing a redefinition should have a more stable workforce, low friction, and more incremental policy changes. This leads to the personnel instability hypothesis:

*Hypothesis 2: High personnel instability decreases the expected proportion of incremental budgetary changes and increases the expected proportion of medium and punctuated budgetary changes.*

#### 4. Data and Methods

Data for this study come from Texas school districts. This large dataset provides budgetary, performance, employee, and administrative information for school districts within Texas. Given the districts' similar policy environment, structure, and goal of educating students, this dataset allows for a comparison of hundreds of similar organizations. In addition, it provides an adequate time span, 1993 to 2010, to examine the dynamics of punctuated equilibrium by capturing the rare events of policy punctuations.

Similar to other studies in PET, the dependent variable in this study will be a budgetary measure. School districts are expected to fund many diverse functions from athletics to gifted and talented classes, to student transportation, to bilingual education. Districts have numerous budget categories. With some limitations, school districts are granted discretion in how they allocate their funds across programs. Budgetary decisions are made in light of current environmental demands of the organization. At its best, budgetary decisions are made with the intent of addressing organization needs and allocating funds to programs that will yield the most benefits (as viewed by decision makers, but this can be a source of friction).

For the analysis in this study, the dependent variable is the annual percentage change in instructional spending per pupil. Instructional spending per student is one of the core program funds for all school districts. It represents one type of educational strategy that allocates funds directly to educating students. Since this is one of the most important functions of districts, managers will make budgetary decisions to protect these funds from financial environmental turbulence. Meier and O'Toole (2009) find that when the overall budget falls, instructional spending per student is only cut a fraction compared to the overall budget change. Changes in this category represent pointed decisions by managers—they do not solely reflect the availability of funds for school districts from state and local sources.

Analyses follow methodology proposed in Robinson et al. (2007) by dividing the dependent variable (annual change in instructional spending per student) into five categories based on the size of change. The categories are: negative punctuations, medium negative changes, incremental changes, medium positive changes, and positive punctuations. The division of categories is determined by laying a normal curve over the histogram of budgetary changes. This leads to four intersections—two near

**Table 1.** Distribution of Budgetary Changes (Dependent Variable)

Change Category	Frequency	Percent
Negative punctuation	57	0.45
Medium, negative	1,964	15.42
Incremental	8,675	68.12
Medium, positive	1,963	15.42
Positive punctuation	75	0.59

*N*: 12,734.

Kurtosis of distribution of budgetary changes (continuous variable): 41.84.

the central part of the distribution and two near the tails of the distribution—that serve as the threshold cut points between the five categories. Using this method creates a nonarbitrary way to determine incremental, medium, and punctuated changes.<sup>3</sup> The frequency of budgetary changes within the five categories is displayed in Table 1.

The hypotheses cover each of these five categories (without specifying differences between positive and negative changes). Thus far, scholars have not put a lot of effort into theorizing on the differences between medium and punctuated changes, nor positive and negative changes. Generally, hypotheses explain incremental and nonincremental changes and do not differentiate between positive and negative changes. In this study, predictions are similar for each of the nonincremental categories, given that scholars have not demonstrated the uniqueness of these categories. This study will examine if differences do exist.

As discussed above, the two explanatory variables to capture alternative sources of friction are organizational performance and personnel instability. The percentage of students in a district that passed the annual statewide standardized test will be used to assess organizational performance. This is the customary measure of performance in public administration (studies that use educational data) and education literatures. Personnel instability is measured by the percent of teacher turnover within a school district. This is another common measure in the education and public administration literatures (Meier & Hicklin, 2008; O'Toole & Meier, 2003, 2009). Since performance assessment and turnover typically happen at the end of a school year, the lagged values of each of the measures are used in the empirical model—it is more plausible the prior year influences the current year budgetary changes.

Revisiting the two critiques of institutional friction conceptualizations (they characterize only the policy process and stay relatively stable over time), both of these variables hold up to these points. In regards to the process, both of these measures do not refer to the structure of decision-making processes. Organizational performance should influence budgetary changes, but it is not an indicator of policy processes in the same way as conceptualizations of institutional friction. Personnel instability is a little less clear on this issue. The measure actually assesses the stability of teachers within a school district. In public administration terms, teachers are characterized as street-level bureaucrats. While past measures of institutional friction

have considered bureaucratization, it was meant to indicate a concentration of decision making. In school districts, budgetary decisions are top-down process that typically do not involve input from all levels of the organization. Teachers do not have a large amount of input in budgetary decision making. Thus, this measure of bureaucratization is a measure of stability within an organization, not of centralization of decision-making power.

Fluctuations occur frequently in both of these variables, as well. For example, in the present sample, the average annual percentage change is 2.99 for performance and 13.45 for turnover. Also in this setting, organization size and centralization have been examined as measures of institutional friction for other work. The average annual percentage change for organization size is 0.75 and 0.54 for centralization. Within this sample, there are greater alterations for the two new measures of friction introduced in this study.

Control variables are added to the model to account for institutional friction. Measures for centralization (percent of school district's budget dedicated to central bureaucracy) and centralization squared are included in the model. The squared term is necessary to account for the rising and then declining impact of centralization for organizations (Ryu, 2011). In other words, increasing centralization benefits organizations only to a certain point. Organizational size (student enrollment) and growth (percentage change in student enrollment) are also included as control variables. History of punctuations in the organization (experiencing a punctuation within the previous five years) is accounted for in the models as well, given research by Robinson et al. (2014) that finds a history of policy punctuations leads to a greater probability of punctuations in the current time period (said differently, punctuations occur in clusters). These control variables are also common to PET articles that use this dataset (Robinson, 2004; Robinson et al., 2007, 2014). Table 2 displays the descriptive statistics for all explanatory variables used in analyses.

This study adds to the literature that examines PET through multivariate statistical analyses (Robinson et al., 2007, 2014). The dependent variable (instructional spending per student split into five categories) is designed to use multinomial logit as the method of analysis. Multinomial logit is used when the dependent variable consists of categories that are unordered and discrete.<sup>4</sup> The method calculates the probability of explanatory variables being in one category compared to a baseline category. In this analysis, the baseline category is incremental changes.

## 5. Results

The results of the multinomial logit model are shown in Table 3.<sup>5</sup>

### *5.1. Policy Feedback: Organizational Performance Results*

Organization performance is negative and statistically significant across all categories of budgetary change in the multinomial logit model. This means that as test performance improves in a school district, it is significantly less likely that

**Table 2.** Descriptive Statistics of Explanatory Variables

Variable	Mean	Std. Dev.	Minimum	Maximum
Organizational performance ( <i>standardized test pass rate</i> )	72.42	15.70	6	100
Personnel instability ( <i>teacher turnover</i> )	17.47	9.51	0	100
Centralization	7.39	3.71	1	73.30
Centralization squared	68.31	125.73	1	5,372.89
Organization size (logged)	6.95	1.52	1.95	12.26
Organizational growth	0.75	7.13	-63.30	117.33
Organizational history ( <i>Dummy Variable</i> )	No Punctuation: 0	11,911	Punctuation: 1	823

N = 12,734.

**Table 3.** The Effects of Friction on the Relative Probability of Experiencing Large and Medium Versus Incremental Budgetary Changes

Size of Change	Negative Punctuation	Medium, Negative	Medium, Positive	Positive Punctuation
Policy Feedback				
Organizational performance ( <i>standardized test pass rate lagged</i> )	-0.024*	-0.007*	-0.034*	-0.044*
	-3.25	-3.79	-20.42	-6.99
Endogenous Organization Change				
Personnel instability ( <i>teacher turnover lagged</i> )	0.033*	0.022*	-0.002	0.013
	3.91	7.86	-0.79	1.56
Institutional Friction				
Centralization	-0.083	-0.223*	-0.164*	-0.202*
	-1.29	-11.44	-8.39	-3.46
Centralization squared	0.003**	0.005*	0.004*	0.004*
	2.18	7.37	6.25	3.41
Organization size (logged)	-0.725*	-0.470*	-0.482*	-1.090*
	-4.99	-17.80	-17.95	-8.43
Organizational history	2.155*	0.631*	0.191	1.247*
	6.57	6.45	1.79	4.35
Organizational growth	0.014	0.032*	-0.008**	0.011
	1.47	9.24	-2.14	1.16

Z-score below each coefficient. N = 12,734.

LR test: 1,730.76,  $p < 0.00$ .

BIC: 21,301.385. Pseudo  $R^2$ : 0.08.

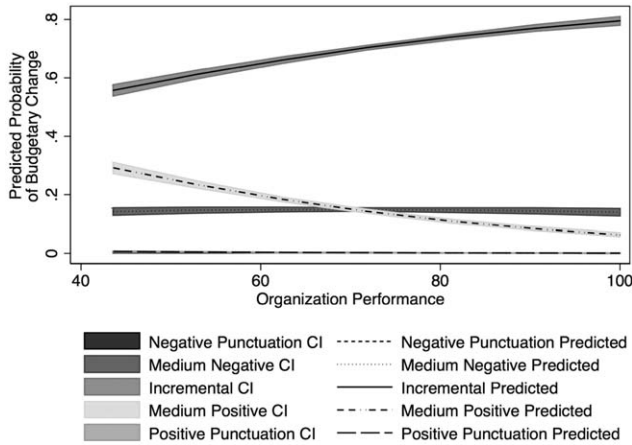
PCP: 68.75 %; PMP: 68.12 %; PRE: 1.95 %.

\*=  $p < 0.05$

\*\*=  $p < 0.01$

organizations will experience nonincremental (medium or punctuated) budgetary changes. In terms of friction, when a district is performing at a high level, there seems to be less friction among decision makers that is resulting in major policy changes. For policy feedback, this means that when the feedback is good, there are mostly small changes. When feedback is bad, however, there is a tendency for more dramatic policy shifts.

To help illustrate the effect of organizational performance, Figure 1 shows the predicted probability of experiencing each of the five categories of budgetary change over the range of pass rates for the exam. In this set of predicted probabilities, all other variables are set to their mean values. Incremental changes see dramatic growth



**Figure 1.** Predicted Probabilities of Categories of Budgetary Changes over Organizational Performance (District Student Pass Rate of Exam).

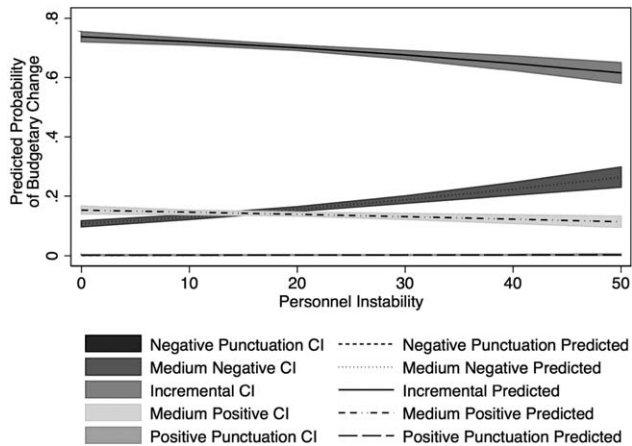
as organization performance improves. This is consistent with Hypothesis 1 that states that low-performing organizations will have a decrease in incremental changes.

The two categories of medium size changes offer mixed support for the hypothesis (low performance increases the expected proportion of medium size budgetary changes). For medium, positive changes the hypothesis has support—there is a significant decrease of positive budgetary changes as performance improves. In contrast, medium, negative changes do not see much of a change over the spectrum of pass rates.

These results are surprising and theoretically interesting considering previous research. In analyses of PET, positive and negative changes are usually combined into one variable representing the magnitude of the size of the budgetary change (medium or punctuated). These studies typically contain a sentence or two in the conclusion stating scholars should begin to theorize about the differences in positive and negative budgetary changes (Robinson et al., 2014). The results presented here say, yes, scholars do need to move in that direction. In Figure 1, positive and negative budgetary changes have differing slopes—one is significantly changing across the spectrum of friction, the other is not. The findings suggest the potential for new theoretical developments on the direction of policy change, not just the magnitude.

For punctuated changes, there is little evidence to support the hypothesis. Punctuated changes, both positive and negative, are very small in their predicted probabilities. Across the range of organization performance, both categories of punctuated change remain close to zero and behave in similar manners (unlike medium changes). Given the rarity of punctuations, it seems there should be less emphasis in the literature in explaining their occurrence—the interesting trade-off occurs between incremental and medium size changes.

The stark difference in the use between punctuated and medium changes has been masked by previous works that combine both of these categories into one “nonincremental” category. By dividing nonincremental changes between medium and punctuated changes, a new understanding of PET is gained by seeing how little



**Figure 2.** Predicted Probabilities of Categories of Budgetary Changes over Personnel Instability (Percent Teacher Turnover).

punctuations are predicted to occur versus medium changes. Medium changes appear to be a more popular way for the release of friction in a policy subsystem. Scholars should make an effort to theorize on the occurrence of medium changes.

### 5.2. Endogenous Organizational Change: Personnel Instability Results

Personnel instability again gives mixed support for Hypothesis 2. From Table 3, personnel instability is positive and statistically significant for the negative categories of changes and insignificant for the positive changes. In other words, as turnover increases, organizations are more likely to experience negative medium and negative punctuated budgetary changes than incremental changes. There is no statistically significant finding between incremental and positive medium or punctuated changes. These findings demonstrate that endogenous organization change inconsistently stimulates policy changes.

Similar to Figure 1, Figure 2 displays the predicted probabilities (with all other variables held at their means) for each of the five categories of budgetary changes over the range of turnover. From the graph, a statistically significant decrease in incremental budgetary changes is present as turnover increases. This declining trend supports Hypothesis 2. In relation to friction, low employee turnover signals less stress within the organization leading to more incremental budgetary changes.

The findings for medium size budgetary changes again give mixed results. Hypothesis 2 stated that high personnel instability increases the expected proportion of medium size budgetary changes. In support of the hypothesis, negative medium size changes increase as personnel instability increases. In thinking about the specific variables, this makes sense. As more teachers are leaving the district, money is slowly decreasing from instructional expenditures. As the classrooms become unstable, schools are pulling funds from that function.

Against the hypothesis, medium positive budgetary changes see a slight decrease as turnover increases. The insignificance of this finding is very interesting.

One might expect to see larger, positive budgetary changes as turnover increases as an effort to retain employees or as managerial effort to redevelop the organization around new employees. These results do not support this idea—when turnover increases it seems money is more likely to be taken away, leading to a more tense work environment opposed to more money being spent to create a better work environment and encourage employee retention. Like the results of performance, these findings also support separately theorizing and empirically testing negative and positive changes.

Hypothesis 2 also predicts that with increased turnover comes increased friction, thus leading to an increase in punctuations. However, there is little support for either hypothesis. Again, positive and negative punctuations hover around the zero mark and do not move much across the range of personnel instability. Like Figure 1, it suggests more of the action takes place between incremental and medium size changes, rather than punctuations. Only a small part of the budgetary change picture is described by punctuations.

Lastly, the control variables for institutional friction are examined to check for consistency with the literature. Every variable is significant in the expected direction except centralization—it is statistically significant in the negative direction for three of the categories. This is a contradiction to past studies (Robinson, 2004; Robinson et al., 2007) that have indicated an increase in centralization yields greater probabilities of nonincremental changes. However, this model contains a variable for centralization squared that is positive and statistically significant. This suggests a nonlinear U-shaped relationship between centralization and budgetary changes.

## 6. Conclusion

The findings in this study present new theoretical insights to the PET literature. Returning to the roots of PET, the theoretical reasons for policy changes were extended by examining policy feedback and endogenous organization change. While traditional conceptualizations of institutional friction measure the process of decision making, the expanded understanding of friction presented in this study captures the features of organizations that fluctuate, stimulate friction within the policy subsystem, and give substance to the interactions of those in the organization that influence policy changes.

Drawing from public administration literature, organizational performance and personnel stability were examined as policy feedback and endogenous organization change, respectively. These measures serve as a way to capture alternative sources of friction in a policy subsystem. Using data from Texas school districts, it was found that low district pass rates on the statewide standardized test as well as high teacher turnover led to a decrease in incremental budgetary changes for instructional spending (a core expenditure of school districts). These findings give scholars a new understanding of the causes of policy change.

Figures 1 and 2 brought new insight to separating positive and negative budgetary changes (something not standard to this literature). The figures show that the predicted probabilities for positive and negative medium changes have unique



slopes, meaning they are being utilized in different circumstances for organizations. This study represents a first step into understanding and theorizing beyond the magnitude of change, but to the direction of change. Increases and decreases in policy outcomes can vastly impact society. An organization experiencing a medium size budgetary change needs to know if it is a positive or negative change to take appropriate courses of actions. Finding out the unique stimuli for positive and negative changes not only gives a better understanding of the policy process but also provides valuable information to those within organizations.

The predicted probability graphs demonstrated little support for the punctuation hypotheses, both positive and negative. In fact, the predicted probabilities for punctuations remained close to zero across each of the figures. The graphs show greater probability and fluctuations among the use of medium size changes. Perhaps scholars should devote more work to theorizing on medium size changes, instead of punctuations. This can still relay important information on how organizations and institutions handle friction within a subsystem.

The bridging of public administration theory and PET gives ideas for future research of other dimensions of friction or factors that can influence policy changes. The management strategies—prospector, defender, or reactor (Miles, Snow, Meyer, & Coleman, 1978)—used in organizations could influence policy changes. In simplest of expectations, we would expect managers that predominantly use a defender strategy to have a propensity toward incremental changes. Prospectors and reactors would be less apt to consistently engage in incremental policy changes.

Drawing from race and ethnic politics, the racial composition of clientele and managers could also create tension and friction in an organization. Diversity in organizations (racial diversity in this example, but diversity can take a variety of forms) can lead to conflicting needs or views on the direction of the organization. Future research could also examine and compare many dependent variables of policy change (not just core functions) to see how they may fluctuate differently. What type of friction triggers change in certain policy areas? There may be unique mechanisms of policy change for minority interests versus majority interests.

Future work should also examine growth hypotheses—how the changes in performance (and other factors) affect policy changes. The analyses in this study consider only the absolute level of performance and level of turnover. To illustrate, in the context of the standardized test pass rate for school districts, individual organizations have unique target levels for performance. For some schools, 75 percent student test pass rate is acceptable. For another school, 75 percent is extremely low. Perhaps a steady decline or growth in performance, whatever the absolute level, affects policy changes.

Other research could center on how these unique types of friction interact to affect policy dynamics. The strictly institutional/structural types of friction could be conditioned by other types of friction found in performance or in organization personnel turnover. There are many possibilities in this avenue of research.

This study contributes to our understanding of policy change, but more broadly, adds to our knowledge of how decision makers address organizational issues through the budgetary process. Policy feedback and endogenous organization

change influenced the magnitude of budgetary changes, even while controlling for structural forms of institutional friction and other organizational features. Although there are still many questions left for future research, this study represents another step to a better understanding of the policy process.

**Carla M. Flink** is an assistant professor in the Department of Public Administration at The University of Texas at San Antonio.

### Notes

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1. Measures inside the policy subsystem or process would address the rules and structure of deciding policy. Measures outside the policy subsystem or process would encompass features like the environment external to the organization/institution, changes in personnel or clientele, organization performance, and so forth.
2. Baumgartner and Jones (2002) use the term "policy feedback" to describe policy changes. The authors consider two types of policy feedback: positive and negative. Positive feedback occurs when one policy change leads to a greater change. Negative feedback occurs as policy processes lead to stability and incrementalism in policy dynamics. The definition of policy feedback used in this work is unique from those definitions and conceptualizations.
3. The exact cut point percentage values are  $-33$ ,  $-2$ ,  $10$ , and  $35.5$ . These values are the interior and exterior intersections between a normal distribution overlaid on the histogram of annual percentage budgetary changes. See Robinson et al. (2007) for further explanation.
4. Even though there is an order to the categories (positive to negative), the hypotheses are based on magnitude of the change (incremental to punctuated). This makes it unclear how to order positive and negative changes of the same magnitude. Because of this, there is no clear way to order the categories. Thus, multinomial logit is used instead of ordered logit.
5. Diagnostic tests did not reveal multicollinearity among variables. The present study does violate the IIA assumption made for multinomial logit models. Multinomial probit produced results similar to the logit models. The model was estimated with robust standard errors, district clustered standard errors, and year fixed effects, but the results were always similar. The standardized test switched from TAAS to TAKS in 2003. The results are still robust with the exclusion of that year. There is concern over the relationship between performance and personnel stability. While they are correlated at  $-0.3824$ , Wald and likelihood ratio tests indicate each variable adds significantly to the model and should be included. Total student enrollment serves as a proxy for total revenue and total expenditures in a district (enrollment is highly correlated with revenue and expenditures at  $0.97$  and  $0.95$ , respectively). Inclusion of total revenue and expenditure variables in the model does not significantly alter the results.

### References

- Abelson, Michael A., and Barry D. Baysinger. 1984. "Optimal and Dysfunctional Turnover: Toward an Organizational Level Model." *Academy of Management Review* 9 (2): 331–41.
- Bailey, John J., and Robert J. O'Connor. 1975. "Operationalizing Incrementalism: Measuring the Muddles." *Public Administration Review* 35 (1): 60–6.
- Baumgartner, Frank R., and Bryan D. Jones. 2002. "Positive and Negative Feedback in Politics." In *Policy Dynamics*. Chicago: University of Chicago Press.
- . 2010. *Agendas and Instability in American Politics*. Chicago: University of Chicago Press.

- Baumgartner, Frank R., Christian Breunig, Christoffer Green-Pedersen, Bryan D. Jones, Peter B. Mortensen, Michiel Nuytemans, and Stefaan Walgrave. 2009. "Punctuated Equilibrium in Comparative Perspective." *American Journal of Political Science* 53 (3): 603–20.
- Baumgartner, Frank R., Martial Foucault, and Abel Francois. 2006. "Punctuated Equilibrium in French Budgeting Processes." *Journal of European Public Policy* 13 (7): 1086–103.
- Berry, William D. 1990. "The Confusing Case of Budgetary Incrementalism: Too Many Meanings for a Single Concept." *Journal of Politics* 52 (1): 167–96.
- Boyne, George A. 2003. "Sources of Public Service Improvement: A Critical Review and Research Agenda." *Journal of Public Administration Research and Theory* 13 (3): 367–94.
- Breunig, Christian. 2006. "The More Things Change, the More Things Stay the Same: A Comparative Analysis of Budget Punctuations." *Journal of European Public Policy* 13 (7): 1069–85.
- Breunig, Christian, and Chris Koski. 2006. "Punctuated Equilibria and Budgets in the American States." *Policy Studies Journal* 34 (3): 363–79.
- Busenberg, George. 2004. "Wildfire Management in the United States: The Evolution of a Policy Failure." *Review of Policy Research* 21 (2): 145–56.
- Cornia, Gary C., and Charles L. Usher. 1981. "The Institutionalization of Incrementalism in Municipal Budgeting." *Southern Review of Public Administration* 5 (1): 73–90.
- Davis, Otto A., M. A. H. Dempster, and Aaron Wildavsky. 1966. "A Theory of the Budgetary Process." *The American Political Science Review* 60 (3): 529–47.
- . 1974. "Towards a Predictive Theory of Government Expenditure: US Domestic Appropriations." *British Journal of Political Science* 4 (4): 419–52.
- Dempster, M. A. H., and Aaron Wildavsky. 1979. "On Change: Or, There is No Magic Size for an Increment." *Political Studies* 27 (3): 371–89.
- Griffeth, Rodger W., and Peter W. Hom. 2001. *Retaining Valued Employees*. Thousand Oaks, CA: Sage.
- John, Peter, and Helen Margetts. 2003. "Policy Punctuations in the UK: Fluctuations and Equilibria in Central Government Expenditure since 1951." *Public Administration* 81 (3): 411–32.
- Jones, Bryan D. 2001. *Politics and the Architecture of Choice: Bounded Rationality and Governance*. Chicago: University of Chicago Press.
- Jones, Bryan D., and Frank R. Baumgartner. 2005. *The Politics of Attention: How Government Prioritizes Problems*. Chicago: University of Chicago Press.
- Jones, Bryan D., Frank R. Baumgartner, Christian Breunig, Christopher Wlezien, Stuart Soroka, Martial Foucault, Abel Francois, et al. 2009. "A General Empirical Law of Public Budgets: A Comparative Analysis." *American Journal of Political Science* 53 (4): 855–73.
- Jones, Bryan D., Frank R. Baumgartner, and James L. True. 1998. "Policy Punctuations: US Budget Authority 1947–1995." *Journal of Politics* 60: 1–33.
- Jordan, Meagan M. 2003. "Punctuations and Agendas: A New Look at Local Government Budget Expenditures." *Journal of Policy Analysis and Management* 22 (3): 345–60.
- McLendon, Michael K. 2003. "The Politics of Higher Education: Toward an Expanded Research Agenda." *Educational Policy* 17 (1): 165–91.
- Meier, Kenneth J., and Alisa Hicklin. 2008. "Employee Turnover and Organizational Performance: Testing a Hypothesis from Classical Public Administration." *Journal of Public Administration Research and Theory* 18 (4): 573–90.
- Meier, Kenneth J., and Laurence J. O'Toole. 2009. "The Dog that Didn't Bark: How Public Managers Handle Environmental Shocks." *Public Administration* 87 (3): 485–502.
- Miles, Raymond E., Charles C. Snow, Alan D. Meyer, and Henry J. Coleman. 1978. "Organizational Strategy, Structure, and Process." *Academy of Management Review* 3 (3): 546–62.
- Mortensen, Peter B. 2005. "Policy Punctuations in Danish Local Budgeting." *Public Administration* 83 (4): 931–50.
- Mosher, William Eugene, and J. Donald Kingsley. 1936. *Public Personnel Administration*. New York: Harper and Brothers.

- Moynihan, Donald P. 2008. *The Dynamics of Performance Management: Constructing Information and Reform*. Washington, DC: Georgetown University Press.
- Natchez, Peter B., and Irvin C. Bupp. 1973. "Policy and Priority in the Budgetary Process." *The American Political Science Review* 67 (3): 951–63.
- O'Toole, Laurence J., and Kenneth J. Meier. 2003. "Plus ça Change: Public Management, Personnel Stability, and Organizational Performance." *Journal of Public Administration Research and Theory* 13 (1): 43–64.
- . 2009. "The Human Side of Public Organizations Contributions to Organizational Performance." *The American Review of Public Administration* 39 (5): 499–518.
- Radin, Beryl. 2006. *Challenging the Performance Movement: Accountability, Complexity, and Democratic Values*. Washington, DC: Georgetown University Press.
- Raffel, Jeffrey A. 2007. "Why Has Public Administration Ignored Public Education, and Does it Matter?" *Public Administration Review* 67 (1): 135–51.
- Rainey, Hal G. 2003. *Understanding and Managing Public Organizations*. San Francisco: Jossey-Bass.
- Repetto, Robert C. 2006. *Punctuated Equilibrium and the Dynamics of US Environmental Policy*. New Haven, CT: Yale University Press.
- Robinson, Scott, Carla M. Flink, and Chad M. King. 2014. "Organizational History and Budgetary Punctuation." *Journal of Public Administration Research and Theory* 24 (2): 459–71.
- Robinson, Scott E. 2004. "Punctuated Equilibrium, Bureaucratization, and Budgetary Changes in Schools." *Policy Studies Journal* 32 (1): 25–39.
- Robinson, Scott E., Floun'say Caver, Kenneth J. Meier, and Laurence J. O'Toole. 2007. "Explaining Policy Punctuations: Bureaucratization and Budget Change." *American Journal of Political Science* 51 (1): 140–50.
- Rutherford, Amanda. 2014. "Organizational Turnaround and Educational Performance: The Impact of Performance-Based Monitoring Analysis Systems." *American Review of Public Administration* 44 (4): 440–58.
- Ryu, Jay Eungha. 2011. *Bounded Bureacracy and the Budgetary Process in the United States*. New Brunswick, NJ: Transaction Publishers.
- Salka, William M. 2004. "Mission Evolution: The United States Forest Service's Response to Crisis." *Review of Policy Research* 21 (2): 221–32.
- Schneider, Anne Larason. 2006. "Patterns of Change in the Use of Imprisonment in the American States: An Integration of Path Dependence, Punctuated Equilibrium and Policy Design Approaches." *Political Research Quarterly* 59 (3): 457–70.
- Selden, Sally Coleman, and Donald P. Moynihan. 2000. "A Model of Voluntary Turnover in State Government." *Review of Public Personnel Administration* 20 (2): 63–74.
- Tucker, Harvey J. 1982. "Incremental Budgeting: Myth or Model?" *The Western Political Quarterly* 35 (3): 327–38.
- Wanat, John. 1974. "Bases of Budgetary Incrementalism." *The American Political Science Review* 68 (3): 1221–8.
- Weber, Max. 1946. *Essays in Sociology*. HH Gerth and C. Wright Mills, Tr. New York: Oxford University Press.
- Wildavsky, Aaron B. 1964. *The Politics of the Budgetary Process*. Boston: Little, Brown.
- Wood, Robert S. 2006. "The Dynamics of Incrementalism: Subsystems, Politics, and Public Lands." *Policy Studies Journal* 34 (1): 1–16.
- Workman, Samuel, Bryan D. Jones, and Ashley E. Jochim. 2009. "Information Processing and Policy Dynamics." *Policy Studies Journal* 37 (1): 75–92.
- Wright, Bradley E., and Soonhee Kim. 2004. "Participation's Influence on Job Satisfaction: The Importance of Job Characteristics." *Review of Public Personnel Administration* 24 (1): 18–40.

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