A COMPARATIVE STUDY OF THE INSTITUTIONAL FOUNDATIONS OF
PUNCTUATED EQUILIBRIUM

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To my loving family
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My life in Bloomington was enriched immeasurably by the society of fellow graduate students at the School of Public and Environmental Affairs, Department of Political Science, Vincent and Elinor Ostrom Workshop, and School of Informatics and Computing. There are far too many people to name, so I shall confine myself to remarking that my fondest memory in the course of my doctoral studies was the first year I spent in Park 3 at the Workshop in the delightful company of Christopher Bartlett, Frederik Eisinger, Ursula Kreitmair, Sobhi Mohanty, and Pontus Strimling.
The punctuated equilibrium thesis states that minority obstruction contributes to episodes of "punctuated" disruption in government processes by preventing incremental, corrective adjustments. A decade of research on liberal democracies has conclusively shown that the more centralized the regime structure, the less effective minority obstruction and the less punctuated attention allocation become.

Contrary to their findings, I document significant intensification of punctuated volatility under authoritarian institutions despite the active containment and marginalization of policy challengers for unilateral decision-making. Focusing on the constraints on information exposure, I propose a new theory of authoritarian information processing to reconcile these empirical inconsistencies with the received understanding of the institutional foundations of punctuated equilibrium.
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<td></td>
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</tbody>
</table>
Chapter 1

Introduction

Sir John James Cowperthwaite, Financial Secretary from 1961 to 1971, is commonly credited as the architect of Hong Kong’s postwar transformation from a pre-industrial settlement awash with refugees into an international financial center governed by a modern bureaucracy. By 1996, just one year before the territory’s handover to China, Hong Kong’s average income was higher – 137% bigger to be exact – than the British equivalent. All the while, the government did not issue any debt, accumulated one of the largest foreign reserves in the world, and kept income taxes low at a flat rate of 15%. These spectacular successes were often attributed to Cowperthwaite’s version of laissez-faire policy known as “positive non-interventionism”, an anomaly at a time when other governments facing similar challenges resorted to state planning to speed up industrialization (Goodstadt 2005).

These remarkable achievements notwithstanding, what made Cowperthwaite’s approach a true outlier was his single-minded resistance to the collection of any kind of economic statistics by the government. When Milton Friedman visited Hong Kong in 1963, he called on the financial secretary for an interview. He was baffled to learn that the colonial authorities were not in the habit of gathering and analyzing economic statistics despite the economic hardship attendant to the postwar influx of refugees from Mainland China. In fact, the financial secretary actively forbad such efforts. The collection of official statistics was abolished. Complaints from lawmakers and government officials over the lack of information on economic performance were
routinely dismissed. Delegates sent by London demanding such figures were literally made to board the same flight back.

The future Nobel economist was naturally curious about this unconventional “experiment”: surely the government would prefer informed decision-making to operating in ignorance? Cowperthwaite’s response was characteristically wry, “if I let them compute those statistics, they’ll want to use them for planning”. He was concerned that the compilation of economic statistics would give cause for government involvement in what should be settled entirely by market force (Friedman 1998). When he was about to retire in 1970, he made a more elaborate defense of his view on economic statistics with reference to what he thought to be the proper approach to policymaking and governance:

“You are in the happy position, happier at least for the Financial Secretary where the leverage exercised by Government on the economy is so small that it is not necessary, nor even of any particular value, to have these figures available for formulation of policy. We might indeed be right to be apprehensive lest the availability of such figures might lead, by a reversal of cause and effect, to policies designed to have a direct effect on the economy. I would myself deplore this” (Legislative Record 1970).

Few leaders if any in the democratic world enjoy a similar level of power over what information the government should allow itself to be exposed; political institutions enabling this unusual extent of manipulation and suppression of information most certainly differ from those that entail democratic decision-making and subsequently the collection, analysis, and dissemination of any information deemed relevant by the broad range of actors involved in an open, accessible policy process. Indeed, another Hoover scholar, Alvin Rabushka (1976, 57), observed that “Cowperthwaite wouldn’t last five minutes in a similar post in Britain” and that “only the constitutional structure of Hong Kong allowed him that power” to ban the collection of statistics. It would have been impossible for the colonial authorities to keep such vital
information off the policy process without the authoritarian supports for centralized decision-making.

To some, this is nothing but an anecdote of administrative idiosyncrasy, but for students of government information processing its profound theoretical implications are hard to miss. For many years, researchers have sought to understand how information is processed and attention allocated in government. Initially, many concluded that the process is closely managed by rational decision-makers who, because of risk aversion, uncertainty, political strategy, or a mix of these reasons, make incremental changes at the margins of current allocations (Davis, Dempster, and Wildavsky 1964; Lindblom 1959). Since then, researchers have rejected incrementalism based on new evidence that attention allocation is in fact punctuated, in that the process is universally characterized by rare but dramatic shifts interspersing long periods of stasis (Jones and Baumgartner 2005). They attribute this pattern—known in government information processing theory as “punctuated equilibrium”—to democratic institutions that empower minority groups to obstruct adjustments in the status quo. Because of this institution-enabled resistance against regular adjustments, attention allocation is static in the short run but susceptible to dramatic dislocations in the long run. The literature has come to view institutional friction—how much power minority groups have to resist change in the status quo—as the primary cause of punctuated equilibrium and the determinant of the intensity of punctuated instability across political systems and processes: more friction means greater punctuated volatility (Baumgartner et al. 2009; Jones et al. 2009).

What transpires from colonial Hong Kong is that the institutional foundations of attention allocation in authoritarian systems cannot be more different. Authoritarian information processing unfolds in a unique combination of conditions that cannot be sufficiently captured in
terms of institutional friction, even though variation on that dimension has provided such a powerful explanation for punctuated instability across liberal democracies. Like Cowperthwaite, elite policymakers in authoritarian governments have sufficient power to determine exactly what information to be left out and by extension what information should be given priority, thus creating the optimal condition for incremental attention allocation. Yet, new data shows that attention allocation in authoritarian governments exhibits significantly greater punctuated volatility. Therein lies the puzzle of authoritarian information processing: authoritarian institutions create drastic reductions in institutional friction as well as more dramatic punctuations in attention allocation, a combination of outcomes that is in serious conflict with what we currently know about information processing in government.

This project is set to resolve this empirical inconsistency by studying the authoritarian institutional foundations of punctuated equilibrium. First to analyze punctuated equilibrium in non-democratic contexts, my work represents an important empirical and theoretical advancement through examining these overlooked aspects in the theory of government information processing and facilitating an expanded comparative perspective on punctuated government attention allocation. I propose a new theory of punctuated equilibrium under authoritarian institutions, with special emphasis on how authoritarians obtain and process policy information and how centralized power—which entails significant reductions in institutional friction—can intensify rather than abate punctuated instability.

I draw on new empirical evidence from Hong Kong to show how exposure explains punctuated dynamics across changing authoritarian settings as the British administration sought first to co-opt local elites and then to democratize the political system towards the end of colonial rule. While the postwar British administration of Hong Kong preserved the colonial institutions
out of geopolitical necessities (Tsang 1988), emerging on the other side of Shenzhen River after 1949 was a radically different system of authoritarian governance modeled on the Soviets. In contrast with the colonial government’s more tolerant stance towards political opposition and inclusive approaches to policymaking (King 1975; Tsang 1997), the Communist Party of China adopted severe restrictions on dissent and collective action. Not only were open challenges to government policy forbidden, voicing views that could be interpreted as inconsistent with or subversive to state ideology would lead to certain political ostracization and persecution (Miller 1996). Even in the post-Mao era, the growth in citizen participation and civic mobilization is matched by an evolving censorship apparatus for the containment of collective action (Esarey and Qiang 2008; Jiang and He 2009; King, Pan, and Roberts 2013; Pei 2009). These contrasts mean that the Chinese variety of authoritarianism entails even more powerful limitations on information exposure even to this date, while post-colonial reforms in Hong Kong have removed a number of important barriers to political representation and participation (Cheung 2011; Scott 2000). Comparing the two cases extends the generalizability of the findings to a number of systems on the wide spectrum of authoritarianism (Razo 2013).

This chapter will conclude with a note on data collection and coding. Chapter 2 reviews the theory of punctuated equilibrium, focusing on the limited generalizability of the theory in its extant form to authoritarian states and propose a new theory of information processing under centralized control and contained opposition. Chapter 3 considers key methodological issues for the quantitative analysis of punctuated equilibrium. Emphasis is placed on the conceptual ambiguities arising from arbitrary choices in measurement and how they may lead to problematic characterization of attention processes. In Chapter 4, I use the case analysis of the Hong Kong government and Chinese regional administrations to show how authoritarian centralization
creates an information disadvantage and intensifies punctuated equilibrium. Moving from broad characterizations to specific mechanisms, Chapter 5 shows how bureaucrat attention punctuate with changes in the signals issued by the authoritarian elites. Chapter 6 offers a synthesis of these findings. Chapter 7 concludes this thesis by way of outlining directions for future research.

*Data collection and coding*

New datasets were specifically compiled for the case analysis of Hong Kong and China. A novel data set was compiled from the various annual reports and press releases published by the Hong Kong government from 1946 to 2007, which are archived in the Hong Kong Collection at the libraries of the University of Hong Kong. These documents cover two domains of government action in the case analysis in Chapter 3: legislative deliberations and annual budgetary estimates proposed by policy bureaus and departments. The records of legislative debates are recovered from the *Hansard*, which is publicly available through the legislature’s website. The budget estimates are proposed by various government bureaus and departments and reviewed and finalized by the Financial Secretary. Table 2 provides a description of the dataset. Additional data on administration reorganization presented in Chapter 5 was compiled from a large set of government reports on agency establishment, expenditure, and agency restructuring; some of the data come from secondary resources, e.g. Ho (2004). The Policy Address and the Budget Speech, which are annual policy statements on policy goals and the corresponding fiscal

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arrangements, were retrieved from a range of archival resources in the Hong Kong Special Collection.

The Hong Kong codebook was adopted from the 2009 Policy Agendas Project. Most of the original topics are applicable, but some changes are made to avoid entry misclassification and to align with the local policy history (See Table 1.1). The topics “Energy and Power” (8), “Science, Technology, and Communications” (17), and “District Administration, Municipal Affairs, and Community Relations” (24) are renamed because some aspects in these areas are only prominent in the US context. We also add “Constitutional Affairs and Relationship with Sovereign” (32), “Internal Security, immigration and corruption issues” (33), and “Post-war Resettlement and Reconstruction” (34) to reflect the unique aspects of the administrative and policy history of Hong Kong. Entries of government policy and agenda activities were sorted into one of 30 topics and 255 subtopics.

Data on regional government spending in the People’s Republic of China were compiled from the China Statistical Year Book published by the National Bureau of Statistics from 1996 to 2013, which report spending figures from 1995 to 2012 (Chan and Zhao 2014). The dataset includes government spending of 28 region governments at the provincial level administrative division, of which 23 are provinces and 5 are autonomous regions. The direct-controlled municipalities (Beijing, Tianjin, Shanghai, and Chongqing) are excluded to increase unit homogeneity. The original budget records sort government spending into functional categories that correspond with the policy responsibilities of the major government bureaus and ministries. I computed the labor disputes per capita for each of the 28 regions based on the China Labor

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2 The most recent version is available from http://www.policyagendas.org

3 The year books are available online at http://www.stats.gov.cn/tjsj/ndsj/: last accessed October 1, 2014.
The *China Statistical Year Book* from 2002 to 2009. These estimates, which we turned into per capita values using population data from the *China Statistical Year Book*, allow us to rank the regions by the frequency of labor disputes.

The 2014 version of the PAP codebook was similarly revised for the Chinese regional government budgets (Table 1.2). To strike a balance between consistency with other agendas project and compatibility with the special conditions in China, we introduced a minimum number of changes. First, a new topic “Culture, Sports, and Mass Media” (40) is created in replacement of the topics “Arts and Entertainment” (23), “Sports and Recreation” (29), and subtopic 1707 “Broadcast Industry Regulation (TV, Cable, Radio)” under “Space, Science, Technology and Communications” (17) in the original codebook. Second, weather and meteorology in China are closely tied to land development or agriculture. I moved 1708 (“Weather Forecasting and Related Issues, NOAA, Oceanography”) to either Topic 21 (“Public Lands and Water Management”) or 4 (“Agriculture”) depending on the purpose of spending. The budget entries are coded based on the codebook topics by researchers who are involved in related research projects using the same dataset. Inter-coder agreement analysis was performed to ensure accuracy.

Part of the data collection was supported by the Hong Kong Research Grants Council through the General Research Fund (Grant HKU746008H). Some of the findings presented in this dissertation extend from reports written in collaboration with the GRF team, which studied the over-time transition in the dynamics of policy attention in Hong Kong in the postwar era.
### TABLE 1.1. Policy Agendas Codebook, Hong Kong 1946-2007

<table>
<thead>
<tr>
<th>Topic</th>
<th>Legislative sittings</th>
<th>Budget estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>min</td>
<td>μ</td>
</tr>
<tr>
<td>1. Macroeconomic</td>
<td>2.92</td>
<td>12.48</td>
</tr>
<tr>
<td>2. Civil rights, minority issues, and civil liberties</td>
<td>0.00</td>
<td>0.51</td>
</tr>
<tr>
<td>3. Health</td>
<td>0.00</td>
<td>6.41</td>
</tr>
<tr>
<td>4. Agriculture</td>
<td>0.00</td>
<td>6.54</td>
</tr>
<tr>
<td>5. Labor, employment, and immigration</td>
<td>0.52</td>
<td>4.93</td>
</tr>
<tr>
<td>6. Education</td>
<td>0.00</td>
<td>2.28</td>
</tr>
<tr>
<td>7. Environment</td>
<td>0.00</td>
<td>1.90</td>
</tr>
<tr>
<td>8. Energy and power*</td>
<td>0.00</td>
<td>0.37</td>
</tr>
<tr>
<td>9. Transport</td>
<td>0.00</td>
<td>7.87</td>
</tr>
<tr>
<td>10. Law, crime, and family issues</td>
<td>5.17</td>
<td>17.03</td>
</tr>
<tr>
<td>11. Social welfare</td>
<td>0.00</td>
<td>1.46</td>
</tr>
<tr>
<td>12. Community development and housing issues</td>
<td>0.00</td>
<td>1.78</td>
</tr>
<tr>
<td>13. Banking, finance, and domestic commerce</td>
<td>2.38</td>
<td>10.38</td>
</tr>
<tr>
<td>14. Defense</td>
<td>0.00</td>
<td>0.71</td>
</tr>
<tr>
<td>15. Science, technology, and communications*</td>
<td>0.00</td>
<td>2.05</td>
</tr>
<tr>
<td>16. Immigration</td>
<td>0.00</td>
<td>0.77</td>
</tr>
<tr>
<td>17. Foreign trade</td>
<td>0.00</td>
<td>0.44</td>
</tr>
<tr>
<td>19. Government operations</td>
<td>0.00</td>
<td>4.94</td>
</tr>
<tr>
<td>20. Public lands and water management</td>
<td>0.00</td>
<td>1.77</td>
</tr>
<tr>
<td>21. District administration, municipal affairs and community relations*</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>22. Weather and natural disasters</td>
<td>0.00</td>
<td>0.47</td>
</tr>
<tr>
<td>23. Arts and entertainment</td>
<td>0.00</td>
<td>0.56</td>
</tr>
<tr>
<td>24. Sports and entertainment</td>
<td>0.00</td>
<td>0.44</td>
</tr>
<tr>
<td>25. Death notices</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>26. Churches and religion</td>
<td>0.00</td>
<td>0.66</td>
</tr>
<tr>
<td>27. Constitutional affairs and relationship with Sovereign&quot;</td>
<td>0.00</td>
<td>2.75</td>
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<tr>
<td>28. Internal Security, immigration and corruption issues&quot;</td>
<td>0.00</td>
<td>5.35</td>
</tr>
<tr>
<td>29. Post-war resettlement and reconstruction&quot;</td>
<td>0.00</td>
<td>1.34</td>
</tr>
<tr>
<td>30. Other, miscellaneous, and human interest</td>
<td>0.00</td>
<td>3.33</td>
</tr>
</tbody>
</table>

**Note:** Editions based on the 2009 version of the PAP codebook. *Topics 8, 17, and 24 are renamed from “Energy”, “Space, Science, Technology, and Communications”, and “State and Local Government Administration” in the US codebook; #Topics 32, 33, and 34 are new.
<table>
<thead>
<tr>
<th>Topic</th>
<th>As a share of total regional budget</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>1. Macroeconomics</td>
<td>15.05%</td>
<td>6.21%</td>
<td>41.98%</td>
</tr>
<tr>
<td>2. Civil rights, ethnic issues, and civil liberties(^{a})</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3. Health</td>
<td>4.59%</td>
<td>2.51%</td>
<td>9.15%</td>
</tr>
<tr>
<td>4. Agriculture</td>
<td>7.87%</td>
<td>1.18%</td>
<td>19.36%</td>
</tr>
<tr>
<td>5. Labor and employment, and immigration(^{b})</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6. Education</td>
<td>16.41%</td>
<td>0.83%</td>
<td>31.73%</td>
</tr>
<tr>
<td>7. Environment</td>
<td>1.69%</td>
<td>0.18%</td>
<td>10.87%</td>
</tr>
<tr>
<td>8. Energy</td>
<td>0.84%</td>
<td>1.56%</td>
<td>10.83%</td>
</tr>
<tr>
<td>10. Transportation</td>
<td>2.95%</td>
<td>0.16%</td>
<td>15.36%</td>
</tr>
<tr>
<td>12. Law, crime, and family issues</td>
<td>6.46%</td>
<td>2.53%</td>
<td>20.77%</td>
</tr>
<tr>
<td>13. Social welfare</td>
<td>8.34%</td>
<td>0.10%</td>
<td>25.49%</td>
</tr>
<tr>
<td>14. Community development and housing issues</td>
<td>7.02%</td>
<td>0.67%</td>
<td>28.12%</td>
</tr>
<tr>
<td>15. Banking, finance, and domestic commerce</td>
<td>1.23%</td>
<td>&lt; 0.01%</td>
<td>14.42%</td>
</tr>
<tr>
<td>16. Defense</td>
<td>0.16%</td>
<td>0.02%</td>
<td>14.71%</td>
</tr>
<tr>
<td>17. Space, science, technology, and communications</td>
<td>5.23%</td>
<td>0.39%</td>
<td>29.64%</td>
</tr>
<tr>
<td>18. Foreign trade</td>
<td>0.04%</td>
<td>&lt; 0.01%</td>
<td>0.84%</td>
</tr>
<tr>
<td>19. International affairs and foreign aid</td>
<td>0.75%</td>
<td>&lt; 0.01%</td>
<td>4.84%</td>
</tr>
<tr>
<td>20. Government operations</td>
<td>9.30%</td>
<td>4.51%</td>
<td>27.86%</td>
</tr>
<tr>
<td>21. Public lands and water management</td>
<td>0.51%</td>
<td>&lt; 0.01%</td>
<td>6.65%</td>
</tr>
<tr>
<td>24. Provincial and local government administration(^{a})</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>26. Weather and natural disasters</td>
<td>0.20%</td>
<td>&lt; 0.01%</td>
<td>19.06%</td>
</tr>
<tr>
<td>27. Fires(^{c})</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>40. Culture, sports, and the mass media</td>
<td>1.50%</td>
<td>1.09%</td>
<td>3.84%</td>
</tr>
<tr>
<td>41. Special items (\textit{tiaxiang})(^{d})</td>
<td>1.09%</td>
<td>&lt; 0.01%</td>
<td>20.68%</td>
</tr>
<tr>
<td>42. Constitutional and Party affairs(^{a})</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>99. Miscellaneous and other</td>
<td>8.78%</td>
<td>0.32%</td>
<td>28.20%</td>
</tr>
</tbody>
</table>

Note: Editions based on the 2014 version of the PAP codebook.
\(^{a}\)Items not applicable to regional budgetary data in the Chinese context.
\(^{b}\)Item included under macroeconomics (1) due to accounting standards.
\(^{c}\)Item included under weather and natural disasters (26) due to accounting standards.
\(^{d}\)Depending on the political context, special items are generally miscellaneous expenses for non-permanent programs.
Chapter 2

Literature Review

A recurring question in the study of politics considers the behavioral and institutional contexts of decision-making in government. It concerns how cognitive and behavioral constraints influence individuals in decisional settings and how high-level social institutions regulate the aggregate impact of these constraints on broad patterns in political processes (Axelrod 2006; Coleman 1994; Hardin 1968; Ostrom 1999; Schelling 2006). With a special focus on why governments allocate attention in a “punctuated” manner, this chapter reviews what scholars of government information processing have done in the past two decades to gradually unveil the complex interactions between bounded rationality and institutions and how they give rise to punctuated instability in attention processes.

A notion first applied to describe the prevalence of stasis in evolutionary processes interspersed by rare but disruptive speciation events (Gould and Eldredge 1977), “punctuated equilibrium” captures comparable dynamics in the way governments process information (Prindle 2013). In the words of Jones et al. (1998, p.2),

“[r]ather than making moderate adaptive adjustments to an ever-changing environment, political decision making is characterized sometimes by stasis, when existing decision designs are routinely employed, and sometimes by punctuations, when a slowly growing condition suddenly bursts onto the agendas of a new set of policymakers or when existing decision makers shift attention to new attributes or dimensions of an existing institution. Complex interactive political systems do not react slowly and automatically to changing perceptions or conditions; rather, it takes increasing pressure and sometimes a crisis atmosphere to dislodge established ways of thinking about policies. The result is periods of stability interspersed with occasional, unpredictable, and dramatic change” (emphasis added).
The research program of punctuated equilibrium has come a long way in characterizing and explaining the general pattern of policy processes (Jones and Baumgartner 2012). Early theories focused on risk aversion and institutional constraints as collective determinants of incrementalism in government processes, especially in government budgeting (Davis, Dempster, and Wildavsky 1966; Fenno 1966). In the incrementalist view, officials are fully rational decision-makers that tend to break changes into increments for gains in predictability and risk-exposure minimization (c.f. Jann & Wegrich 2007; Lindblom 1959). For example, they minimize risk exposure by tying estimates to expenditure figures from the previous fiscal year (Wildavsky 1964). In accounting for “stochastic disturbances” that deviate from their models of budgetary requests and allocation decisions, Davis et al. (1966) attribute these nonconformities to historical circumstances and misclassifications of the budget items and argue that these deviant cases are only atheoretical exceptions to a primarily incremental process of change.

In reaction, a slew of empirical studies challenged the incrementalist view with many examples of disruptive change in government. In the study of government budgets, Natchez and Bupp (1973), Gist (1982), Wanat (1974), Berry (1990), and Padgett (1980; 1981) reported empirics that failed to corroborate with incrementalist predictions. Although their efforts exposed the empirical shortcomings of incrementalism, they were not sufficiently organized to make sense of the discrepancies through a theoretical lens. Revisiting the cognitive and institutional basis of incrementalism, Bryan Jones and Frank Baumgartner were first to articulate the puzzle of punctuated change with respect to a theory of how governments allocate attention and process information (Jones and Baumgartner 2005; 2012). Governments switch attention from one policy topic to another episodically, they argue, because of a confluence of critical conditions—each individual event of punctuated change may be accidental, but the general pattern of disjointed
change has roots in the institutional makeup of the political system (Jones and Baumgartner 2005; Kingdon 1984). Their works on what they call “punctuated equilibrium” specify the cognitive and institutional foundations that lead to episodic disruptions to an otherwise static process of attention allocation. Importantly, current theory attributes punctuated change to minority obstruction that blocks small adjustments to attention allocation in the short term, enabling errors to accumulate and necessitating radical changes in the long term. As this dissertation shows, this particular aspect of the government information process theory fails to account for punctuated equilibrium in the authoritarian context.

It is the purpose of this chapter to take stock of current knowledge of the institutional foundations of punctuated equilibrium and examine some of the outstanding theoretical puzzles and analytical challenges with respect to application to authoritarian information processing. Beginning with a more detailed overview of current theory, the rest of the chapter reviews three special topics in the theory of government information processing that constitute the focus of this dissertation.

Current view of the cognitive and institutional foundations of punctuated equilibrium

The central thesis of punctuated equilibrium is that government attention allocation is non-incremental; long periods of stability are interspersed by spurts of disruptive change to attention allocation. Skeptical of the theory of incrementalism embodied by the early rational-choice models of the budgetary and policy process (Davis et al. 1966; Wildavsky 1964; Lindblom 1954; Fenno 1966) and as a theoretical follow-up on empirical studies pointing to disjointed, non-incremental changes in policy (Natchez and Bupp 1973, Gist 1982, Wanat 1974, Berry 1990, and
Padgett 1980; 1981), Jones, Baumgartner, and others reported evidence of punctuated dynamics in a range of policy processes and proposed a behavioral theory of government information processing that attributes these non-incremental patterns of change to two factors: bounded rationality and institutional friction (Baumgartner & Jones 1993; Breunig & Jones 2010; Breunig & Koski 2006; Jones et al. 2003; Jones et al. 2009a; Jones & Baumgartner 2005; May et al. 2008).

Bounded rationalists economize cognitive resources through pattern recognition; they associate problems with choices they have made previously and repeat those decisions without critical assessment (North 2006; Simon 1982). This behavioral pattern means that information indicating changes in problem nature is rationally ignored (Caplan 2001), and solutions are not updated until the errors are serious enough to move information processing from the automatic search for existing solutions to the ad hoc construction of representations new problems (Jones 2001). In addition, bounded rationalists can only process problems serially. “[W]hen we are thinking about one problem, we cannot be thinking simultaneously about another” (Jones & Baumgartner 2005, 45). Lacking the ability to process information in parallel, “people generally work on goals sequentially [because] trade-offs among goals are very difficult” (Jones 2003, 399). This increases the short-term immobility of attention distribution and makes changes to the status quo difficult in the absence of emotional or informational arousal (Simon 1947). When the problem is finally realized, the bounded rationalists tend to overreact and undertake radical changes. In the aggregate, these cognitive limitations contribute to inefficient, punctuated pattern of change (Jones 2003; Jones et al. 2009b).

As for institutional foundations, exactly what aspect of the structural makeup of different political systems matters varies across contexts and it is often hard to characterize and measure
institutions due to the high dimensionality of the concept (Breunig and Koski, 2003; Jones et al. 2009). Without taking into account the issue of context-specificity in operationalizing measures of institutions, it is generally understood that the tendency of attention allocation to alternate between prolonged stasis and radical changes is the dynamical manifestation of minority obstruction realized in one way or another (Jones and Baumgartner 2005). The central thesis of punctuated equilibrium theory is that punctuations are expected to grow in intensity under institutions that increase institutional friction, i.e. empower minority obstruction to resist change (Jones et al. 2009). In decentralized systems such as the US government, the policy process is structurally fragmented by policy “subsystems”, which are institutionally-embedded decisional settings controlled exclusively by sector interests, politicians, and bureaucrats (Baumgartner and Jones 1991; 1993; Gai, Peterson, and Walker 1984). Since change is normally obstructed by restrictions on participation and veto player bargaining (Rochefort and Cobb 1993; Schattschneider 1975; Tsebelis 2002), change only arises when subsystemic proceedings are disrupted by extraordinary mobilization activated by focusing events (Birkland 1997; Jones, Baumgartner, and Talbert 1993; Kingdon 1984; Stone 1989). With reduced institutional friction under centralizing institutions, policy processes in the United Kingdom and other mixed parliamentary systems are less punctuated (Baumgartner and Jones 2010; Eissler et al. 2014; Jones et al. 2009).

Taken together, comparative punctuated equilibrium has repeatedly shown that institutional friction varies positively with the intensity of punctuated equilibrium. Jones, Sulkin, and Larsen (2003) argue that democracies may actually be purposively designed to induce momentary disequilibrium; for them, “the key may be to think of tuning a system toward regular disruption, suffering dislocations but avoiding the catastrophe”. What we take from this
statement is that liberal democratic institutions lead to two balancing outcomes for attention allocation: they raise transaction costs and make it difficult to organize change efficiently or incrementally, but they also sustain competition and expose the status quo to constant perturbations. In other words, democratic institutions may make current policy more resilient because minority groups can block most challenges to the status quo in the short run, but they also make attacks on current policy more frequent, more relentless, and impossible to completely contain in the long run. The accessibility of the democratic policy process allows policy entrepreneurs to strategically expand agenda conflict when favorable conditions co-occur at critical junctures (Baumgartner and Jones 1993; Kingdon 1984; Pralle 2003; 2006).

Authoritarian institutions and punctuation without friction

The main theoretical puzzle of the punctuated equilibrium literature is why government attention allocation does not change incrementally. As our review shows, current theory attributes the non-incremental changes to minority obstruction, a condition that is lacking in the authoritarian state (Razo 2013). Authoritarian regimes face minimal political resistance, enjoy elite consensus and belief homogeneity, and afford few opportunities for minority obstruction and policy conflict manipulation by the opposition (Gandhi 2008; Gandhi and Przeworski 2006). The political leadership is empowered to control the political agendas and shift attention allocation using a mix of co-optative and coercive strategies (Boix and Svolik 2013; Svolik 2009). Because the hierarchy of power is often reinforced by ideological conformity, the extent to which the opposition can challenge the fundamentals of state policy is further limited (Chen 1995; Guo 2003). If current theory is directly applied to models of authoritarian information processing, one
should expect less punctuated intensity in authoritarian governments because they are free from the inefficiencies associated with the politics of minority obstructionism (Kingdon 1984; Rochefort and Cobb 1993). The removal of the inefficiencies associated with a powerful and obstructionist opposition would presumably deprive the policy process of an important source of institutional friction and promote more incremental patterns of change. Yet, there is evidence that authoritarian regimes actually experience greater punctuation than liberal democracies; government attention of authoritarian systems is even more static in the short run but susceptible to even more dramatic episodes of disequilibrium in the long run. Contrary to the predictions of current theory, punctuated equilibrium becomes more intensified with a significant drop in institutional friction.

This discrepancy points to two issues. First, punctuated attention allocation is not the result of the simple aggregate of institutional friction and bounded rationality, or it would have exhibited less intense punctuated equilibrium due to the removal of the inefficiencies associated with liberal-democratic institutions. The qualitative contrasts in the institutional foundations of punctuated equilibrium across regime types must be examined in a new theory of information processing under authoritarian institutions. Second, the research program relies on broad characterization of government types because the notion of institutional friction was originally developed to specifically account for the dynamics of attention allocation in the US context (Jones and Baumgartner 1993); the applicability is likely to be limited to democracies that are structurally similar, such as other well-established liberal democracies in Europe (Jones et al. 2009). These conceptual weaknesses are in turn the product of arbitrary methodological choices, specifically the confining of case selection to liberal democracies alone, which poses a threat to causal and conceptual validity with respect to the role of institutional friction in the
intensification of punctuated dynamics. Lacking in the current research on information processing is a systematic application of punctuated equilibrium theory to authoritarianism to address these limitations on both causal and descriptive inference (Gerring 2007; Goertz 2006; King, Keohane, and Verba 1994).

Organizing bureaucratic attention in the authoritarian state

Punctuated equilibrium operates as a broad characterization of entire political systems and processes with respect to the dynamics of attention allocation. This has led to years of innovative research focusing on institutional attributes underlying punctuated equilibrium in different political systems and processes (Baumdgartner et al. 2009; Baumgartner et al. 2006a; Breunig 2006; Jones et al. 2009; Robinson & Floun’say 2006). However, research in this direction has not adequately addressed any questions about punctuated equilibrium as an outcome of interactions within these systems: how non-incremental, disproportionate shifts in attention emerge from interconnected information processes and whether the pattern of interacting attention allocation reflects the institutional structure in which punctuated changes occur. With few empirical studies engaging internal mechanisms of attention allocation in government (e.g. May, Workman, and Jones 2008), the research program of punctuated equilibrium remains tenuously linked to the rich literature on public policy, public administration, and the bureaucracy despite the shared substantive interest in interactions between subcomponents of government (e.g. Besley 2007; Wood and Waterman 1991; 1994; Scholz 1986).

In a forthcoming publication, Baumgartner and Jones (2014) make a critical theoretical contribution by connecting the theory of government information processing to the theory of
communication. In particular, the challenge of information processing lies in the communication and processing of signals. This interpretation of information processing opens up questions about how processes of attention interact in a setting for communication and noise in signals. Information processing inside a political system can be conceptualized analogously, in that political elites send out signals indicating attention allocation and bureaucrats process these signals in organizing their own attention. This process reflects

Going beyond the view that punctuated instability arises independently (e.g. Robinson 2004; Robinson et al. 2007; 2013), this dissertation will research on the extent that individual events of punctuated change in attention allocation are related to punctuations occurring elsewhere in the political system. As evidence of punctuated diffusion, research on bureaucratic responsiveness shows that policy change is filtered response to political signals (May et al. 2008; 2009). If punctuation is driven by diffusion, punctuation in one stream of government action will spread to other policy processes. This is demonstrated by, for example, the strong connection between changes in ministerial appointments and what happens subsequently in government agencies (Gordon 2011; Wood & Waterman 1991). I conjecture that the pattern of diffusion varies with institutional conditions. Political context can be characterized by the extent of power and institutional decentralization. In political systems with a high level of institutional centralization, the diffusion of instability through interaction across attention processes is enabled by close coordination across government branches as well as a lack of mitigating resistance from marginal venues. Competition across institutional and jurisdictional boundaries means that agenda changes in one area may even be actively resisted by others operating independently of that domain (Canes-Wrone 2001). Decentralization intensifies agenda competition and leads to misalignment in the pattern of punctuations.
**Issues in change quantification and case selection**

The “change score” as a standard measure of changes in attention allocation in the literature of punctuated equilibrium is an arbitrary choice out of other alternative measures to quantify policy change. The arbitrariness is acceptable when the analysis is confined to characterizing policy processes as a whole. In existing studies, summary statistics characterize multiple years of budget allocations and legislative agendas to facilitate comparisons between entire policy and political systems (Baumgartner et al. 2009; Jones et al. 2009). When the theoretical focus moves toward internal mechanisms (e.g. Robinson 2004; Robinson et al. 2007), individual instances of policy change become the basic unit of analysis. The definition and measurement of policy change now critically affects whether or not a specific instance is classified as punctuated change and, ultimately, the modeling of the causal mechanisms underlying their emergence. Better concept operationalization and measurement strategy are requisite to model testing and result interpretation (Goertz 2006; Sartori 1970).

As noted before, the lack of evidence from non-democratic countries poses another challenge to theory development and inference. The active suppression of dissent and power concentration in authoritarian institutions severely curtail minority-led obstruction, which is originally identified as the major source of policy instability because an effective opposition is needed to delay more frequent adjustments. Non-democratic governments do not face such resistance associated with the electoral politics and stakeholder activism of liberal democracies. The structural discrepancies alone do not provide sufficient basis to directly apply punctuated equilibrium to non-democratic settings. And does the active containment of conflict in
authoritarian regimes further reduce instability? Ultimately, the question about punctuated equilibrium under authoritarian institutions cannot be answered without a descriptive analysis of the constitutional fundamentals of non-democratic governments with case selection that tries to capture a variety of institutional settings covering authoritarian systems in strong and weak forms (Razo 2013).

Conclusion

In sum, punctuated equilibrium remains underdeveloped insofar as its applicability to non-democratic contexts is concerned. The current literature offers limited insights on how governments sharing authoritarian traditions of governance approach the challenge of information processing. Whereas liberal democracies differ in the extent of power separation, legislative pluralism, and regional decentralization (Jones et al. 2009a; Lijphart 1999), authoritarian regimes are structured for top-down decision-making and hierarchical control at the expense of competition and participation (Olson 1982). Elections, citizen participation, and other institutions that purposely maintain high transacting costs (i.e. institutional friction) are replaced with mechanisms that facilitate unilateral decision-making. With centralized power, skeptics of state policy become marginalized and elite conflicts are actively contained (Boix and Svolik 2013). These deviations from the current institutional foundations to which punctuated equilibrium is currently attributed are structural rather than quantitative.

This dissertation seeks to reconcile these structural differences across regime types with the original propositions on institutional friction as well as recent information-theoretical extensions (Jones 1994; Baumgartner and Jones 2014). Because current theory attributes
punctuated equilibrium to liberal democratic institutions enabling minority obstruction
(Baumgartner and Jones 1995; 2009; Jones 1994; Jones et al. 2009), it is likely that different
mechanisms drive periods of stability and episodic bursts of radical change in attention
allocation. Applying punctuated equilibrium to authoritarian information processing necessitates
theoretical modification to consider whether and how it stays non-incremental in the absence of
the institutional hallmarks of liberal democratic politics and an assertive opposition with power
to veto changes in the status quo. This theoretical challenge bears upon how stability obtains
under authoritarian institutions and, more importantly, whether authoritarianism is susceptible to
a unique form of punctuated equilibrium given the critical differences in the approaches to
regime stability and survival in the authoritarian context (Tsai 2002; 2007).
Chapter 3

A Critical Review of the Methodology of Punctuated Equilibrium

This chapter reviews the methodological foundations of punctuated equilibrium and focuses on three issues that, while not critical at the early stage of theory development, can lead to indeterminate results in comparative applications. First, while instability estimates are assumed to be robust to alternative measures of attention allocation, I find that political systems come to be characterized differently depending on just how government attention is quantified and measured. Second, there is no specific guideline on the length of the window of observation; I report evidence of system mischaracterization with respect to analysis that relies on either very short or very long windows of observation. Thirdly, the analytical focus is shifting from broad characterizations to individual instances of punctuated change. I find that whether individual changes are classified as “punctuation” depends on which measurement of instability is used.

Introduction

Early scholars spoke of conservatism in budgetary allocation (Davis et al. 1966; Wildavsky 1964; Fenno 1966) and “muddling through” in the policy process (Lindblom 1959). Criticizing the incrementalist models for dismissing instances of disruptive change as atheoretical anomalies, a new generation of policy theorists came to characterize the policy process as punctuated equilibrium (Baumgartner and Jones 1993; c.f. Prindle 2012). They theorize that government attention allocation is stable most of the time due to various inefficiencies arising
from the cognitive and institutional restrictions on government attention allocation (Jones 2001). Instead of gradual adjustment, government policy attention is revised in episodes of rare but radical instability (Jones and Baumgartner 1993). Hence, the basic empirical implication of punctuated equilibrium is that observed patterns of attention allocation in government should be statistically distinguishable from the probability distribution entailed by the theoretical postulate of incrementalism (Padgett 1980).

To empirically examine the claims of punctuated equilibrium, scholars have used variations of a common “change score” to characterize instability in attention allocation. Intuitively, the score is computed from the differences between consecutive allocations of attention, usually in yearly intervals. If the data is annual government budgets, the score summarizes the differences in budgetary allocations to the same policy issues across allocation intervals. The change score is computed from count values in the case of non-monetary attention allocation, such as parliamentary motions, written questions to the ministries, statements in policy addresses, and executive orders. Coders classify individual entries by policy topic and attention levels are tallied sums of the coded entries (Baumgartner and Jones 1993). The topic-by-topic sums of these entries are treated as the amount of attention allocated to each issue area. The change score is similarly computed from these yearly differences.

Alternative ways exist to compute the change score, but the so-called “percentage-percentage difference” finally emerged as the preferred choice. As the name suggests, each difference is computed from two sets of percentages. First, raw values of attention allocation are first transformed into percentages. For budgetary data, that is the share of the total government spending assigned to government programs under the same policy topic in the same year. For non-monetary data, that is the fraction of entries concerning the same policy topic out of all
entries produced in the same year. Then, the differences of percentages of consecutive time points are compared to the size of the allocation of the earlier time interval. This process takes the percentages of percentages to obtain change scores from raw differences.

TABLE 3.1. Methodological choices in major journal publications on punctuated equilibrium.4

<table>
<thead>
<tr>
<th>Year</th>
<th>Lead authors</th>
<th>Short title</th>
<th>Journal</th>
<th>Measure</th>
<th>Change score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>John, Bevan</td>
<td>“What are policy punctuations”</td>
<td><em>PSJ</em></td>
<td>Count</td>
<td>--</td>
</tr>
<tr>
<td>2010</td>
<td>Breunig, Jones</td>
<td>“Stochastic”</td>
<td><em>Pol. Analysis</em></td>
<td>Percentage / Count</td>
<td>L-kurtosis</td>
</tr>
<tr>
<td>2009</td>
<td>Jones, Larsen-Price, Wilkerson</td>
<td>“Representation and governing institutions”</td>
<td><em>JoP</em></td>
<td>Percentage</td>
<td>L-kurtosis</td>
</tr>
<tr>
<td>2009</td>
<td>Jones, Baumgartner, Breunig</td>
<td>“A general empirical law of public budgets”</td>
<td><em>AJPS</em></td>
<td>Percentage</td>
<td>L-kurtosis</td>
</tr>
<tr>
<td>2009</td>
<td>Baumgartner, Breunig, Green-Pedersen</td>
<td>“Punctuated equilibrium in comparative perspective”</td>
<td><em>AJPS</em></td>
<td>Percentage</td>
<td>L-kurtosis</td>
</tr>
<tr>
<td>2007</td>
<td>Albaek, Green-Pedersen, Nielsen</td>
<td>“Making tobacco consumption a political issue”</td>
<td><em>Comp. Policy Analysis</em></td>
<td>Count</td>
<td>--</td>
</tr>
<tr>
<td>2005</td>
<td>Jones, Baumgartner</td>
<td>“A model of choice for public policy”</td>
<td><em>JPART</em></td>
<td>Percentage</td>
<td>Kurtosis</td>
</tr>
<tr>
<td>2004</td>
<td>Jones, Baumgartner</td>
<td>“Representation and agenda setting”</td>
<td><em>PSJ</em></td>
<td>Percentage</td>
<td>--</td>
</tr>
<tr>
<td>2003</td>
<td>Jones, Sulkin, Larsen</td>
<td>“Policy punctuations in American political institutions”</td>
<td><em>APSR</em></td>
<td>Count</td>
<td>Kurtosis</td>
</tr>
<tr>
<td>1999</td>
<td>Jones</td>
<td>“Bounded rationality”</td>
<td><em>Annual Rev. of Pol. Sci.</em></td>
<td>Count</td>
<td>--</td>
</tr>
<tr>
<td>1998</td>
<td>Jones, Baumgartner, True</td>
<td>“Policy Punctuations”</td>
<td><em>JoP</em></td>
<td>Count</td>
<td>--</td>
</tr>
<tr>
<td>1997</td>
<td>Jones, True, Baumgartner</td>
<td>“Does incrementalism stem from political consensus”</td>
<td><em>AJPS</em></td>
<td>Count</td>
<td>--</td>
</tr>
</tbody>
</table>

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4 The list is compiled from the publication list on the PAP website ([www.policyagendas.org](http://www.policyagendas.org), retrieved on June 9, 2014). The selection here includes some of the most cited articles in the field.
Similarly, $L$-kurtosis quickly emerged as the most popular choice of estimation method in the field (the mathematical details are shown below). Padgett’s (1980) definition of inefficiency in the budgetary process is based on the notion of leptokurtosis. That is, the rates of change of efficient processes should converge to the Normal distribution (see also Jones and Baumgartner 2005, pp.110-3). Leptokurtic distributions arise from inefficient processes, where errors remain uncorrected and accumulate until some higher threshold is reached (Jones et al. 2009b). The pattern of change is more extreme in inefficient processes. Critically, inefficiencies bring about more instances of inertia and punctuated transition, indicating strong friction against regular adaptations and dramatic departures from the status quo due to the momentary loss of such friction, respectively. Kurtosis (and the more robust alternative $L$-kurtosis) captures the extent that an empirical distribution deviates from the normal distribution and exhibits features of prolonged inertia and dramatic, abrupt perturbations to the equilibrium (Hosking 1990).

In the context of theory development, the use of a common quantification and measurement strategy promoted comparability across studies (Eissler et al. 2014). It also helped narrow down the operational definition of punctuated equilibrium. The methodological convergence, however, was the result of arbitrary decisions made in handling what began as a relatively straightforward thesis on the incrementalism of policy change. That arbitrariness becomes increasingly problematic as researchers begin to explore more sophisticated models of information processing (Jones and Baumgartner 2012). This chapter revisits the methodological foundations of punctuated equilibrium and critically assesses the analytical implications of using specific change score measures and estimates. I argue that theory development toward
comparative punctuated equilibrium (Eissler et al. 2014) will be hindered if the basic assumptions of the conventional methodology are not sufficiently clarified.

Emerging methodological issues

The methodological review focuses on three issues. First, while it is generally assumed that instability estimates are robust to the choice of quantification and measurement, the claim was made with respect to earlier applications with the straightforward goal of statistically establishing the non-incremental nature of attention allocation (Jones and Baumgartner 2005). But by the time the analytical focus moved toward comparative punctuated equilibrium (Breunig and Koski 2006; Breunig et al. 2009; Jones et al. 2003; Jones et al. 2009a), the choice of measurement and estimation methods had already become a common practice based on convention. It is unknown whether empirical findings in support of the key theoretical propositions in punctuated equilibrium are robust to the choice of estimation methods, as researchers have moved from one estimate of instability measure (Jones et al. 2003; Jones and Baumgartner 2005) to another in more recent studies (Breunig and Koski 2012; Jones et al. 2009a; Baumgartner et al. 2009). More fundamentally, just how changes in attention allocation are quantified can lead to different results because the alternative measures capture different features of policy instability.

Second, while the level of instability of a political or policy system is estimated from longitudinal data on attention allocation, there is no coherent practice with respect to the length of the window of observation. Some analyses of policy instability relies on longitudinal budgetary data that cover at least a century of observations (Breunig and Jones 2011; Baumgartner et al. 2006). These data streams are directly compared to others that draw on less
than 20 years of data (Jones et al. 2009a). In the case of long data streams, estimates of policy instability may become biased if the observations are drawn across major discontinuities; such long data streams often straddle critical constitutional changes, such as government formation, mass enfranchisement, and territorial decentralization. On the other hand, estimates of instability based on extremely short data streams may become biased because the observations can either fall between instances of great disruption or fall on short-lived but particularly volatile intervals, resulting in system mischaracterization in either direction. These concerns are particularly relevant to punctuated equilibrium because punctuations are rare events by definition; because attention distribution is inherently disproportionate (Jones and Baumgartner 2005), shorter data streams are less likely to fully capture the general behavior of the attention allocation process.

Thirdly, researchers begin to move from system-level characteristics of attention allocation to the modeling of individual instances of punctuated change in these processes (see alternative attempts by Jones et al. 1997; 1998; John and Bevan 2012). I evaluate the extent that the classification of allocation changes as “punctuation” is similarly contingent on how one quantifies change. In modeling punctuated disruption, researchers are interested to know what conditions increase the probability of disruptive instability. Scott Robinson and colleagues (Robinson et al. 2007; 2014) are interested in find out whether the pattern of instability varies with organizational structure, and find that punctuated changes are likely to emerge in organizations with history of recent disequilibrium. Since alternative measures capture different features of attention allocation, instances that are large on one measure may well turn out to be classified as medium or small changes using a different measure of change. Thus the choice of methods has a substantive implication warranting extended elaboration at the conceptual level.
The differences may also affect choice of regression model for changes sorted into discrete categories.

Research design

The analyses are parallel to Jones et al. (2009a) and Baumgartner et al. (2009). In the AJPS article “A general empirical law of public budgets”, Jones and his colleagues try to specify a general empirical law of public budgets and find that increasing government centralization leads to less punctuated patterns of budgetary allocation. With data drawn from seven countries in North America and Europe, they argue that institutional arrangements lead to more timely response. Also published in AJPS in the same year, Baumgartner et al. (2009) examine the pattern of punctuation across policy “stages” in the United States, Denmark, and Belgium. They find that the pattern of instability is progressively punctuated. Where activities are heavily regulated by rules and bureaucratic procedures, the threshold for changes in attention allocation rises (see also Jones et al. 2003). The datasets for these studies are publicly available.\(^5\)

I begin with an analysis of the extent to which the findings reported in the two papers can be replicated using alternative measures. In the case of Jones et al. (2009a), I compare the rankings of countries using different measures of policy instability. Policy stages are similarly ranked with the data from Baumgartner et al. (2009). The second analysis involves two levels of comparison: within-country comparison of policy stages and cross-country comparison of averages. If the choice of quantification and estimation has no significant impact, then we should expect high consistency of the rankings across replications. The rankings are stable when the

\(^5\) Both datasets are available at [http://www.unc.edu/~fbaum/articles.htm](http://www.unc.edu/~fbaum/articles.htm) (retrieved June 4, 2014).
systems that are found to be relatively unstable remain similarly evaluated. The more inconsistent the rankings, the more problematic with choosing measurement and quantification strategies arbitrarily or out of convention.

To address the second question about the length of the window of observation, the longitudinal data on the budgetary changes in the United Kingdom, France, and the United States are randomly segmented in progressively shorter windows of observation. The randomization process will guide the discussion on whether systems can be properly characterized based on relatively short or relatively long series. This is an important issue because system characterization can become unreliable when the data are drawn from a particularly stable or volatile period. The disproportionality in the pattern of change increases the risk of biased estimates when generalizing from small datasets; if the estimates from smaller windows deviate significantly from the estimates of the general data, then we should be more careful about generalizing from smaller samples. On the other hand, if the randomized data segments return clustered estimates that deviate significantly from the full-series estimate, we need to be more circumspect about system characterization based on very long data series.

The last question brings us to the works of Robinson and colleagues (Robinson 2004; Robinson et al. 2007). They innovatively bring the research focus from whole policy processes down to individual instances of policy change. A similar test of result consistency is performed to see whether instances classified as punctuated change using the conventional percentage-percentage difference measure are consistently distinguished from instances of inertia if the alternative measures of policy change are used. Again, the results point to potential concern over the impact of arbitrariness on analytical outcomes. Due to the particular technicalities involved in this approach, only $L$-kurtosis is applied for these set of comparisons.
Attention allocation is broadly defined to as changes in policy priorities, for which there are alternative measures. First, the count-count difference is the inter-year difference in raw quantities of attention allocation. It can be stated as

\[ d_{t,t-1} = x_t - x_{t-1}, \]

where \( x_t \) and \( x_{t-1} \) are the amounts of attention allocated to the same policy topic at times \( t \) and \( t - 1 \), respectively. Since the common indicators of policy priorities, such as legislative agendas, will be counts or sums of counts but others, including budgetary outlays and expenditures, are continuous variables, the direct use of raw quantities can lead to concerns over statistical tractability and measure commensurability in different domains of government action. Estimates of aggregative properties of count-count differences are expected to deviate significantly from each other if directly computed from the raw quantities without any kind of transformation to achieve commonality across data types. Without adjusting for the increase in the volume of information processed, estimates derived from data cross long stretches of time may become biased due to inflation.

Raw values are commonly normalized because of these concerns. The count-percentage difference turns raw differences into relative values. The formula for the count-percentage difference is

\[ d_{t,t-1} = 100 \cdot \frac{x_t - x_{t-1}}{x_{t-1}}, \]

where \( x_t \) and \( x_{t-1} \) are the raw quantities of attention allocated at times \( t \) and \( t - 1 \), respectively. Like count-count differences, this formula can be applied where the overall allocation is
unknown or substantively irrelevant. This method is critically improved from the count-count measure because it maps raw values, including counts, onto the interval scale as percentages. As explained previously, percentage values are mathematically appropriate for the aggregative statistical analyses common in the punctuated equilibrium literature. However, the problem of attention inflation is not fully addressed here because the percentages are computed directly from count values. Fluctuations due to general increase in the volume of government attention are not distinguished from changes in allocation, which should be confined to changes in priorities holding the overall volume of information processed by the government across time fixed.

The percentage-percentage difference is the most commonly used change score in the literature. It defines change in attention allocation as

\[ d_{t,t-1} = 100 \cdot \left( \frac{p_t - p_{t-1}}{p_{t-1}} \right), \]

where \( p_{lt} \) and \( p_{lt-1} \) are the percentages of attention allocated at time \( t \) and \( t - 1 \), respectively. Instead of using raw quantities, attention allocations are first turned into topic-by-topic percentages or shares of total government attention before the differences of the paired percentages are computed. Since the computation is based on relative values in percentages, the “percentage–percentage” method aligns with the assumption of fixed aggregate attention across time. The impact of changes in absolute values now can only be reflected in the change score if the increase or decrease in attention allocation is proportionally salient, i.e. the overall priorities of issues are affected.

The last alternative measure of attention change is the growth rate proposed by Breunig and Jones (2011), which defines the measure of change as

\[ d_{t,t-1} = \ln \left( \frac{x_t}{x_{t-1}} \right), \]

32
where $x_t$ and $x_{t-1}$ represent the raw quantities of attention allocation at times $t$ and $t - 1$, respectively. The differences are transformed into logarithmic returns. In some applications where topic-by-topic weights of attention allocation are not known because allocations across the board are incompletely observed, the growth rates can be treated as percentage changes in spending (Breunig & Jones 2012). However, using the log of the change in quantities of attention allocation does not satisfy the concern over change score as a measure of change specifically in policy priorities. Changes in absolute values come from a variety of causes, some of which are unrelated to the problem of priority and agenda changes insofar as the topic-by-topic share of total attention is concerned.

The punctuated equilibrium theory contends that the rates of change of government attention change converge to a leptokurtic distribution. Such a distribution deviates from the Gaussian distribution predicted by the thesis of efficient incrementalism (Padgett 1980). Systems experiencing inefficiencies exhibit instances of extended inertia as well as dramatic disequilibria beyond the expectations under the Normal distribution. Structurally, the disproportionality of attention allocation is reflected by the acute peak in the center and fatter tails—representing instances of stasis and dramatic disequilibrium, respectively—of the empirical distribution, entailing what is known as leptokurtosis. These structural deviations can be estimated using high-order moment statistics (Breunig and Jones 2011). The Pearson moment formula for kurtosis is

$$K = \frac{\mu^4}{\sigma^4},$$

where $\mu^4$ is the fourth moment around the mean and $\sigma^4$ is the square of the variance. $K$ is approximately 3 when the change scores are normally distributed. The presence of excess kurtosis, i.e. $K - 3 > 0$, indicates that the distribution deviates from the Gaussian standard in the
direction of leptokurtosis. This measure of kurtosis is problematic because the value is directly computed from the moment statistics of the mean and the variance, both of which are sensitive to outliers. Jones et al. (2003) argue that while standard kurtosis estimates may not capture the full shape of the distribution, the statistic is at least sufficient for the detection of excess kurtosis (Mills 1995) and the broad comparison of distributions in that the “kurtosis measures generally order the distributions according to institutional friction” (Jones et al. 2003, p.158).

An alternative to the classic kurtosis estimates is the L-moment kurtosis. The moment $r$ is defined as

$$L_r = \frac{1}{r} \sum_{j=0}^{r-1} -1^j \binom{r-1}{j} E(X_{r-j:r})$$

where $r$ is the moment, $F(X)$ is a distribution function of the random variable $X$ and $X_{1:n} < X_{2:n} < X_{3:n} < \cdots < X_{n:n}$ so that the formula above is computed using the order statistics of a sample of $X$. As a result, L-moment statistics “are more robust than conventional moments to outliers in the data and enable more secure inferences to be made from small samples about an underlying probability distribution” (Hosking 1990, p.105; see also Baumgartner et al. 2009; Breunig and Jones 2011; Hosking 1992). The normalized sample L-kurtosis, defined as

$$\tau_4 = \frac{L_4(F)}{L_2(F)}$$

is bounded by 0 and 1 and is approximately .123 under the normal distribution. The value increases with excess kurtosis so that the L-kurtosis value for leptokurtic distributions goes above .123 (Wright and Herrington 2011).

Lastly, direct parameter estimation of policy instability is separately applied to changes located above and below 0. The empirical observations can be fitted to the power-law distribution $X \sim k \tau^{-\alpha}$, where $X$ is the cumulative frequency of values above $\tau$, $k$ a constant, $\tau$ a
range of empirical values, and $\alpha$ the estimated regression coefficient. The equation can be alternatively expressed as $\log(X) \sim \log(k) + \alpha \log(\tau)$, where $\alpha$ is the slope parameter. The slope parameter for the exponential indicates the level of punctuation in the distribution; more punctuated distributions have smaller coefficient estimates for $\alpha$ (Jones et al. 2003).

Problem 1: characterizing punctuated intensity

Comparative punctuated equilibrium examines the cross-system variation in the pattern of non-incremental change. Such systems include the national and local government budgets of different countries, legislation records, electoral results, and policy statements and orders made by the executive. Since these processes face varying levels of institutional constraints on change, they are expected to experience varying levels of instability. Budgetary changes are the result of multiple negotiations and are limited by bureaucratic constraints. Policy “input” processes such as elections and ministerial questions, on the other hand, are more in-step with changes in public opinion.

Empirical research has so far supported these theoretical propositions. Jones et al. (2009a) compare the level of instability in national and local budgets across governments to support the thesis that institutional friction contributes to more punctuated budgetary changes. They find that more fragmented institutions such as the federal constitution of the US produce greater policy instability compared with more centralized models, such as the Westminster system of the UK and other parliamentary system. Baumgartner et al. (2009) similarly compare the policy processes in the US, Denmark, and Belgium to arrive at the conclusion that instability increases with the level of institutional formalization, giving empirical support to Jones’s (2005)
hypothesis that “different institutions of American government can be arrayed along a continuum of efficiency in translating input signals into policy outputs. Those closest to the input stream, those focusing on monitoring and reporting relevant social indicators, are the most efficient, and those closest to the output stream, further along the policy cycle, are by nature less efficient in their response to problems” (171). In both cases, the researchers characterize a multitude of policy and political systems in relative terms, i.e. systems are ranked by kurtosis value.

Insofar as the primary methodological objective here concerns the arbitrariness in the choice of measurement and estimation strategies and insofar as the rankings of policy and political systems are critical to the theoretical conclusions reached in these key studies, a simple test can be developed to explore how switching between alternative measures of policy change and alternative strategies for instability estimation may affect the analytical output of the comparative studies of punctuated equilibrium. If the researchers had used, for example, a different change score measure instead of the popular percentage-percentage difference or the kurtosis estimates rather than L-kurtosis estimates, would the systems be similarly characterized? For example, could the US system become relatively incremental compared to some of the parliamentary systems if growth rates are used instead of percentage changes? Would policy processes suggest progressive increase in friction if policy change was represented in count-percentage differences? If the rankings are inconsistent, then the methodological arbitrariness should be given more attention.

The consistency of system characterization is defined by the distance between the highest and lowest rankings. The Kendall-$\tau$ coefficient of rank correlation is defined as

$$K(\tau_1, \tau_2) = \sum_{(i,j) \in P} \bar{K}_{ij}(\tau_1, \tau_2),$$
where \( \tau_1 \) and \( \tau_2 \) are paired rankings, \( P \) is the unordered pairs from \( \tau_1 \) and \( \tau_2 \), and \( \bar{K}_{ij}(\tau_1, \tau_2) = 1 \) if the paired entities are ranked in the same order, else \( \bar{K}_{ij}(\tau_1, \tau_2) = 0 \).

Intuitively, the computations are based on the number of pairwise disagreements between two rankings, or the difference between the number of concordant and discordant pairs in ranking order. Concordance is the condition that the paired entities are ranked in opposite order. The Kendall-\( \tau \) coefficient is bounded by \(-1\) and \(1\). It approaches \(1\) when the two rankings are in agreement and it approaches \(-1\) when the two rankings are in disagreement. If the coefficient is approximately \(0\), then the two rankings are independent from each other. A significance statistic on the dependence of \( \tau_1 \) and \( \tau_2 \) can be computed, where the null hypothesis is that the two rankings are statistically independent at the chosen level of confidence, i.e. Kendall-\( \tau = 0 \).

![FIGURE 3.1. Rankings of national budgets by level of punctuation.](image)

Using the R package Kendall, the test is first applied to the budget data from Jones et al. (2009). Table 3.2 reports the ranking consistency when alternative measures of policy change are used and Table 3.3 reports the corresponding statistics for alternative methods for estimating policy instability. The results show that the null hypothesis of ranking independence is not rejected in most cases, with only one-third of the paired rankings showing significant
dependence. That means that in most cases the political systems are characterized differently even when the same datasets are used. As shown in Figure 3.1, the kurtosis and L-kurtosis values of the US national government budgets are higher relative to other national budgets when measured in the percentage-percentage change score. But the instability appears to be less volatile when they are measured in growth rates or count-percentage differences. The choice of kurtosis estimates has a similar impact on the rankings. Measured in count-count differences, the US budgets are most volatile at Kurtosis = 336.3, a score more than twice as large as the second most volatile system representing the French national budgets, at kurtosis = 140.2. That order is all but reversed after switching from kurtosis to L-kurtosis. With L-kurtosis, the French national budgets are now the most volatile process at L-kurtosis = 0.63. The US trails both France and Germany as only the third most volatile at L-kurtosis = 0.58.

TABLE 3.2. Kendall \( \tau \) distances between rankings of budget processes by level of instability.

<table>
<thead>
<tr>
<th>Quantification measure</th>
<th>Estimate</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1.00***</td>
<td>0.05</td>
<td>-0.14</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.00***</td>
<td>0.43</td>
<td>0.81**</td>
<td></td>
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<tr>
<td>3</td>
<td>1.00***</td>
<td>0.24</td>
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<td>4</td>
<td>1.00***</td>
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<td>Count-count difference</td>
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<tr>
<td>1</td>
<td>1.00***</td>
<td>0.62*</td>
<td>0.05</td>
<td>0.33</td>
<td></td>
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<tr>
<td>2</td>
<td>1.00***</td>
<td>0.43</td>
<td>0.14</td>
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<tr>
<td>3</td>
<td>1.00***</td>
<td>-0.24</td>
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<td>4</td>
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<td>Count-percentage</td>
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<td>difference</td>
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<td>2</td>
<td>1.00***</td>
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<td>0.52</td>
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<td>3</td>
<td>1.00***</td>
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<td>Percentage-percentage</td>
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<tr>
<td>2</td>
<td>1.00***</td>
<td>0.71**</td>
<td>0.43</td>
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<tr>
<td>3</td>
<td>1.00***</td>
<td>0.71**</td>
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<td>4</td>
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</tbody>
</table>

Note: 1 = kurtosis; 2 = L-kurtosis; 3 = exponent coefficient (positive); and 4 = exponent coefficient (negative); \( p \)-value: * \( p < 0.1 \); ** \( p < 0.05 \); *** \( p < 0.01 \).

These outcomes do not comport with the original results. In the paper, the researchers compute a score of institutional friction, plot them alongside the L-kurtosis scores, and find a
significant positive correlation (Spearman’s Rho = .75) between the kurtosis scores and the friction scores. Figure 3.1 replicates the analysis using different change scores for both kurtosis and \(L\)-kurtosis estimates of disproportionality. The results show that the rankings are inconsistent to the extent that the correlation is either much weaker in strength if not altogether reversed in direction. Using the count-percentage change score, the correlation is positive with \(L\)-kurtosis estimates; greater institutional friction is associated with more volatility in policy change. With kurtosis, the relationship is negative, so that higher institutional friction actually leads to less volatile, or more incremental, change patterns. Even when directionality is consistent, the changes in rankings and strength of correlation are still substantial enough to challenge the original interpretation.

The same analysis is performed using Baumgartner et al.’s (2009) data on government processes in Belgium, Denmark, and the United States. While reaching similar conclusions that institutional friction raises disproportionality in the pattern of policy change, their study differs from Jones et al. (2009) by extending the analysis to policy processes other than government budgets. The outcomes support the notion that policy changes are increasingly disproportionate due to the plethora of bureaucratic rules and procedures in more administrative stages of the policy process.

<table>
<thead>
<tr>
<th>Punctuation estimate</th>
<th>Measure</th>
<th>1</th>
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<th>3</th>
<th>4</th>
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<tr>
<td>1</td>
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<td>-0.24</td>
<td>-0.14</td>
<td>-0.24</td>
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<tr>
<td>2</td>
<td>1.00***</td>
<td>0.71**</td>
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<td>1.00***</td>
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<td>(L)-Kurtosis</td>
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<tr>
<td>1</td>
<td>1.00***</td>
<td>-0.43</td>
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<td>1.00***</td>
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<tr>
<td>Exponent coefficient</td>
<td>(right tail)</td>
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<td>1.00***</td>
<td>0.05</td>
<td>-0.52</td>
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<tr>
<td>Exponent coefficient (left tail)</td>
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<td>3</td>
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</table>

Note: 1 = Growth rate; 2 = Count-count difference; 3 = Count-percentage difference; and 4 = Percentage-percentage difference; p-value: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

The analysis brings out two lessons. First, whether one classifies a policy process or political system more or less punctuated is contingent on the choice of method. Some systems are considered more punctuated than others using one measure but less punctuated using a different one. The inconsistency supports the view that these alternatives capture very different dynamical properties and we need better methods to distinguish these separate sources of instability as well as better conceptualization to sort out the entailed alternative operational definitions of government attention allocation. The fact that a mix of these measures are used in comparative studies (e.g. Breunig and Jones 2011; Jones et al. 2009a), is certainly based on the problematic assumption that different measures capture the same phenomenon and will lead to comparable assessment of instability levels. As the empirical results here show, this assumption only pertains to the general thesis that all government processes have excess kurtosis—punctuated equilibrium is a universal phenomenon—but it should not extend to analysis of relative differences in punctuation levels.

The second lesson is that some of the measures offer more conceptual clarity by focusing on particular sources of instability and, realizing the above-mentioned issues, it would only require more elaborate methods statements to differentiate different sources of volatility. Percentage-percentage differences reflect changes in topic-by-topic shares of the total attention, so it has a relatively restrictive interpretation in that the instability refers specifically to changes in the topic-by-topic share of total attention, rather than a broader concept of policy change that,
given the inconsistent estimates presented here, arguably should take account of instability in the total amount of attention allocated by the government.

In a simulated model of public policy choice, Jones and Baumgartner (2005) argue that budgetary changes are a modified version of incrementalism; it is “incrementalism with upward drift” because most government budgets in developed democracies have increased in size with the postwar economic growth. It follows that count-based budgetary changes can be stated as

\[ x_t = x_{t-1} + k x_{t-1} + \epsilon_t \]

where change is broken down to two components, a constant increment \( k \) representing the long-term upward drift, and an error term \( \epsilon \) representing random fluctuations from the predicted growth. The count-based alternatives thus pre-suppose a different process of change exposed to influences of factors other than attention allocation, such as borrowing behavior (Jones et al. 2009a). Similar upward drifts in the agenda process may be attributed to increased capacity for information processing in modern governments (Workman 2009). Annual percentage changes are best described as changes in the distribution of attention allocated by government on a topic-by-topic basis regardless of the actual volume of attention allocated. In conclusion, the analysis here reveals that punctuated equilibrium is operationally confined to the dynamics of attention allocation and theoretical discussions should become more specialized in that dimension of the policy process.

**Problem 2: window of observation**

Another issue that may give methodological concerns is the nature of the data as time series. In particular, depending on availability, some datasets cover very long periods. The US budgetary data (Jones & Breunig 2012) traces back to 1946. The national government budgets of France and the United Kingdom also extend to 1868 and 1911, respectively. In comparison,
some estimates of policy change disproportionality are based on time periods as short as one decade. The Belgian, Canadian, German, and Danish data cover within the range of 9 to 40 years. Figure 3.2 summarizes the varying lengths of budgetary data of Jones et al. (2009) with updates presented in follow-up studies. Intuitively, the variance in time frames is a particularly problematic issue for punctuated equilibrium because disproportionality is by definition characterized with the presence of very rare but intense outliers. Estimates drawing on shorter time frames may either understate the disproportionality of the policy or political system by leaving instances of major disequilibrium out of sample or overstate it if a single instance of dramatic policy transition falls within the window of observation by chance. Hence, the time frame of observation constitutes the second source of inconsistency in the characterization of systems.

FIGURE 3.2. Lengths of the window of observation in Jones et al. 2009a.

Compared to other datasets, the French national budgets cover 125 years more than the Belgian budgets and more than double the length of the US budget data of 65 years. Recent updates of the UK dataset expanded the window of observation to 97 years. To gauge the effect of time frames, I estimate change disproportionality from data randomly sampled from the US, the UK, and French national budgets. Samples of 10, 20, 40, and 60 years of continuous
budgetary data are drawn randomly from these series from 1950 onwards. With multiple draws, the estimates can show whether the variability of length leads to poor system characterization judging by the extent that system differences are statistically significant. Intuitively, smaller samples lead to more variability in the point estimates of kurtosis and $L$-kurtosis values, so that systems are more likely to be mischaracterized due to the random inclusion and exclusion of extreme cases. The problem is particularly pronounced owing to the nature of policy change as series of disproportionate changes. In this analysis I only use the percentage-percentage change score and $L$-kurtosis to leave the focus on time frames.

The analysis of the random samples from the French, US, and UK national budgets gives results with tremendous implications for future comparative studies. According to the proposition laid down by Jones et al. (2009), the disproportionality is most serious in the US system because of high institutional friction, whereas the British budgetary processes experience the lowest levels of disproportionality because of executive dominance, lower legislative pluralism, unified government, and administrative centralization (Lijphart 1999). Being a mixed presidential system with major checks and balances against single-party dominance in the legislature, France is located within the US-UK continuum but tends toward the Westminster model of centralized authority. The dominance of the central government over local authorities in France is arguably greater than its UK counterpart, at least before trends of devolution of power to local governments in the recent decades (Preteceille 1991; Thoenig 2005). The analysis is assessed by the extent that the empirical estimates of disproportionality align with the proposition: US $\gg$ France $\geq$ UK.\(^6\)

\(^6\) This is based on the institutional friction index applied by Jones et al. (2009). The scale based on the countries’ combined rankings by executive dominance, single-party governments, bicameralism, and
The disproportionality of the three budgetary datasets are measured with two strategies of resampling: sequential sampling and discrete sampling. In sequential resampling, resamples of size 1000 is drawn from the original sample of the national government budgets (US = 65 years; UK = 97 years; France = 134 years). For each draw, only the beginning year of the sequence is randomized, with the rest of the years being sampled together as continuous sequence of the specified length of observation. The $L$-kurtosis estimate is computed for each resample. These steps is repeated for each hypothetical length of observation, i.e. 10, 20, 40, and 60 years. For discrete resampling, each data point is drawn independently from the full dataset; the number of observations is equal to the length of observation multiplied by the number of topics. The approach respects the mathematical logic underlying previous studies on punctuated equilibrium: each instance of budgetary allocation is treated as a discrete draw from a (non-Normal) probability distribution. However, the statistic of interest here is not only the $L$-kurtosis value but also the interval estimate of that statistic computed from multiple resamples of the full budgetary datasets.

Because the 10-year resamples are short enough to fall between instances of dramatic change, there is considerable variation in what the sample mean might be if the $L$-kurtosis statistic is computed from shorter datasets. Figure 3.3 shows that, using sequential resampling (i.e. drawing resamples as continuous blocks of observations) the 10-year sample $L$-kurtosis values of the US national government budgets range from above 0.7 to below 0.4. The same decentralization. The figures for the US, UK, and France are 21, 10, and 6 respectively. In other words, the difference between France and the US (11) is almost three times the difference between France and the UK (4).
dataset, resampled as discrete observations in Figure 3.4, give even more extreme estimates where the L-kurtosis value could be anywhere between 0.75 and 0.3.

System characterization based on discrete resampling, measured in the interval estimate of the mean $L$-kurtosis of the resampling means, achieve statistical significance only with bigger sample size ($n > 20$). The distinction also follows the theoretical expectation that, as the most decentralized of the three, the US budgetary allocation process has the most disproportionate pattern of change than the other two, while the UK--the most centralized of the three--is ranked lowest in terms of change pattern disproportionality. It is important to note that these systems, while essentially different in the amount of institutional friction, are not statistically distinguishable from each other when the sample size is small. The distinction cannot be sufficiently captured when only a few data points are available. In the analysis, the salience of institutional friction as a determinant of the disproportionality of change is only marginally observed with sample size of 20 and above. The differences in system characterization are visualized in Figure 3.5.

FIGURE 3.3. Sequential Resampling of Budgetary Allocations.
Note: The blue estimates are computed from the full data series. The red estimates are the averages of the resampling means. The key methodological lesson is that future studies should avoid the analysis of data samples that are too small, i.e. $n \leq 20$. The likelihood of system mischaracterization arises from the rarity of events of policy punctuation; analysis based on data collected within windows of comparable lengths tend to either underestimate the level of punctuation of the subject system if the stasis sustained itself for the period or produce an overestimation if it includes a single strong punctuation by accident. Although primarily a methodological concern here, this result aligns with the theory-based suggestion in the policy process literature that observation of
change in policy systems should cover at least a decade (Sabatier et al. 2009). As a rule of thumb, the window of observation should extend to 20 years or more to sufficiently reduce the risk of system mischaracterization. Due to the rarity of disproportionate change, whether a given system is more or less prone to disproportionate change can be sufficiently ascertained only when the sample size is large enough to capture both the tendency to equilibrate and the moments when the policy equilibrium is disrupted.

FIGURE 3.4. Discrete Resampling of Budgetary Allocations.

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7 This consideration applies to the datasets with topic-by-topic subdivisions. Those with pooled budgetary sums, as indicated in the previous discussions of data quantification, capture conceptually separate properties of temporal dynamics. The rule may be adjusted to account for substantive variation, e.g. budgetary allocation vs. non-budgetary allocation.

8 Also, because L-kurtosis is a self-referential statistic, longer windows of observation are preferred to
Note: The blue estimates are computed from the full data series. The red estimates are the averages of the resampling means.

Figure 3.5. Interval Estimates of the Mean $L$-kurtosis Values, Discrete and Sequential Resamples.

It has also become evident that the analytical process behaves differently depending on the nature of the data. Figure 3.5 shows that both methods of resampling successfully separate the US budgetary systems from the UK and French systems, so the focus of evaluation falls mainly on the comparison between the UK and the French budgets. The estimates based on sequential resampling violates the proposition by ranking French budgetary allocations as less punctuated than the UK. The differences are only closed when $n$ goes above 20. On the other hand, the estimates based on discrete resampling is consistently aligned with the proposition where the UK national budgets are marginally less punctuated or less disproportionate than the
French national budgets. These outputs point to two main issues. First, discrete resampling appears to be more stable than sequential resampling across all resampling sizes. Second, the relatively inconsistent results from the sequentially resampled data suggests something different about the nature of the French data. It is specifically an indication that the underlying probability distributions generating the data are structurally different, and that the randomly segmented blocks are in fact drawn from across different distributions.

The fact that increasing the size of sequential resamples lead to significant changes in the outcome motivates questions about the conceptual justification for the chosen length of the window of observation. According to the central limit theorem, the mean of the sample means approaches the population mean as sample size increases. As Figures 3.4 and 3.5 illustrate, the mean of the $L$-kurtosis estimates based on discrete resampling stay relatively close to the full-sample $L$-kurtosis value. If there is no important discontinuities in the data, the corresponding estimates based on sequentially segmented data should follow a similar pattern of convergence with the full-dataset $L$-kurtosis value estimate. However, sequential resampling returns mean estimates, as shown in Figure 3.3, that fail to converge at comparable pace to the $L$-kurtosis value computed from the full sample. The source of the relative variability in the mean of $L$-kurtosis estimates is the discontinuities in the institutional configuration of the French polity.

These guidelines are meant to be used with flexibility because data availability is often an arbitrary condition beyond the control of the researcher. The discussion here highlights two questions: whether the analytic output is credible when the window of observation is too short and whether system characterization is statistically more conservative with the use of resampling techniques. To the first question, the question is easily settled. Owning to the unique pattern of disproportional change, short windows of observation tend to yield biased estimates. This finding
satisfies the intuitive understanding of the data and the statistical techniques for measuring disproportionate changes. With the second question, it appears that resampling provides the basis for simple and well-understood significance tests of the $L$-kurtosis estimates. As we have seen in the case of the French national budgets, estimate variability increases with the number of constitutional and institutional discontinuities of the political system. The resampling technique helps draw attention to the potential impact of these discontinuities and guide researchers in segmenting the data stream to align the analysis with what the data substantively represents.

While the $t$ test on the general mean of $L$-kurtosis estimates is not to be confused with the use of bootstrap kurtosis to obtain interval estimates of moment statistics, the former already fulfils the theoretical purpose of system characterization through cross-system comparison. On the other hand, bootstrap kurtosis estimates are more directly applicable when the statistical properties of individual distributions are the subject of investigation (Wright & Herrington 2011). Although bootstrap standard errors and confidence intervals for kurtosis “are more accurate than traditional approach” due to the latter’s reliance on the assumption that the original data are drawn from a normal distribution (Wright & Herrington 2011, p.43), the bootstrap techniques are “still imperfect” in their they produce “erratic results” (Efron & Tibshirani 1993, p.160) and are still oversensitive to outliers (Chernick 2008). In contrast, for comparative punctuated equilibrium, the real issue is not whether the analysis yields substantively accurate estimates of the distributional properties, but whether the different systems are meaningfully different and consequently whether the inter-system variability follows the theoretical propositions on the effects of institutions on the dynamics of government attention allocation.

In conclusion, these guidelines do not be viewed as rigid methodological and analytical guidelines. How the data should be processed and analyzed is as much a technical as a
theoretical choice. These rules serve largely as pointers to underlying conceptual and theoretical implications of the choice of methods. When the present task is to characterize system through cross-system comparison, the analysis covers the entire dataset to ascertain the overall level of disproportionality. When the goal is to characterize the pattern of disproportionate change in one time period against another in the same system, the dataset is broken into smaller subsets to align with the transitional history that motivates the analysis (Lam and Chan forthcoming; Robinson and Floun’say 2006). In applying these technical ground rules, researchers should also accommodate the conceptual and substantive side of the investigation. Because institutions change over time, they should pay attention to the fact that simply expanding the window of observation does not necessarily give more usable estimates insofar as the proper characterization of the subject political or policy system is concerned. In the 134 years of national government budgets covered in the French dataset, France underwent the creations of the Third (1875-1940), Fourth (1945-1958), and Fifth Republic (1958-present), two World Wars (1914-1919 and 1939-1945), and the decentralization and territorial administration reforms since the 1980s (Thoenig 2005). The UK and the US constitutions experienced far less political upheavals in the period covered by the respective datasets, but considerable changes in the level of centralization and the institutional framework for national-local government relations have been documented: devolution of power to local governments in the United Kingdom (Bogdanor 2001) and the shifting balance of power between the federal government and the States in the United States (Feiock & Scholz 2010; Stephens 1974). While these changes do not fundamentally shift the systems away from being the archetypes of the Westminster and presidential model of government, they do point to the potential risk of blindly enlarging data size at the expense of substantive coherence; it can become unclear whether the aggregate
statistics describe one system or the mean of multiple systems. The estimates of disproportionality rank the UK and French budgets differently because of the temporally structured (i.e. phased) transition in government institutions is better preserved by sequential resampling.

**Problem 3: classifying punctuations**

Robinson et al. (2007) model punctuation as a function of organizational structure (see also Robinson 2004; Robinson et al. 2014). Individual budgetary changes are categorized by size. The categorization is reliant on the distributional characteristics of disproportionate change and they structural deviation from the theoretical Gaussian distribution, which retains consistent proportionality with changing mean and variance. The empirical distribution of changes is compared with the Gaussian distribution assuming the same mean and variance of the empirical. By overlaying the Gaussian distribution on the empirical density distribution, the x scale is carved into three regions where the density curves of the two distributions intersect. Budgetary changes are classified as large, medium, and small changes. Figures 3.12-4 visualize this technique.⁹

Clustering about the means of the two distributions, small changes are those that are located in between the inner intersections. These are the instances of change that cluster around

---

⁹ Because the size of the left-hand side tail is more restricted than the right, the left-hand side outer intersection may be missing, leaving only three intersections. In those cases, only instances beyond the outer intersection on the right are considered large changes, i.e. there are no large negative changes, only medium negative changes to the right of the left-hand side inner intersection.
the leptokurtic “peak”, which exceeds the expected density of the Gaussian equivalent of the observed distribution. Large changes are located on either side of the outer pair of intersections at the beginning of the “tails”. Medium changes are observations located between the inner and outer pairs of intersections. In a non-normal distribution, there are more large changes than expected under the Gaussian distribution, i.e. heavy tails. Overall, the leptokurtic empirical distribution of budgetary allocation has more small changes, less medium changes, and more large changes than the theoretical expectation based on the incrementalist postulate.

FIGURE 3.6. The Distribution of the UK, US, and French Budget as Yearly Percentage-Percentage Differences with Cutpoints.

Once these large changes (punctuations) are identified, the probability of punctuated change can be estimated. Scott Robinson and colleagues originally applied punctuation classification to the data from the Texas school budgets collected by Kenneth Meier and colleagues (Meier and Bohle 2000). They focused on per pupil spending and pooled the data of annual changes in spending from more than 1,000 schools. In their regression model (Robinson et al. 2014), the probability of experiencing punctuation increases by about 500% if the school has experienced punctuated change in spending in the past 5 years. The punctuation probability is also found to be associated with organization size and the degree of structural centralized (Robinson et al. 2007; 2014).
In view of the substantive focus on political systems, I translate the application to national government budgets of the United Kingdom, the United States, and France. They meet the requirement of sample size and comparability; all of them are budgetary changes.

Returning to the question over the characterization of instability in problem 1, I consider the extent that the impact of switching between different measures of change, with a particular focus on percentage-percentage differences and count-percentage differences since they capture different sources of instability. Figure 3.15 shows that some large percentage-percentage differences are not large count-percentage differences, and vice versa. Focusing on the large changes, the data pooled from the three countries yield 49 instances of large percentage-percentage change and 37 instances of count-percentage change. Of the 49 instances of large percentage-percentage change, the US data has 15 large changes (1.38% of all observations), which is lower than the UK (14 large changes or 1.83%) and France (20 large changes or 1.88%). Though the ranking here does not conform to the proposition that US has the highest punctuation in attention allocation than the UK and France, punctuated changes are rare events by definition and the pairwise differences are too small relative to the sample size to be statistically significant (Robinson et al. 2014).

Even when the comparison extends to other categories, the ordering of the budgetary systems is still inconsistent with what we know about the level of instability in the US, UK, and French systems of attention allocation. Table 3.6 presents the ratios of large and small changes to medium changes, in percentage and count differences, for each of the countries. Since leptokurtosis signifies excess peakedness and heavy tails, higher ratios mean more punctuated pattern of budgetary change with more instances falling into either the categories of near-stasis or dramatic disruption. The rankings are largely misaligned with what the thesis of institutional
friction suggests as well as what we empirically know about the underlying probability
distribution of the budgetary processes.

FIGURE 3.7. Classification of Budgetary Allocations: Percentage-Percentage Differences and
Count-Percentage Differences.

This comparison helps specify a key limitation of the conversion of continuous measures
of change into discrete levels. Although the conversion transforms the data structure for
modeling punctuation in the regression framework, the analysis here shows that the classification
does not accurately reflect the structural properties of the underlying probability distribution
revealed by the L-kurtosis estimates. The distribution of small, medium, and large changes does
not lead to correct rankings; using the percentage measure, the UK is ranked above the US by
degree of instability, while the US falls to the bottom using the count measures. As a consequence, it may become problematic to use model types exploiting the multiclass information of the full classification, such as multinomial logistic regression used by Robinson et al. (2007). On the other hand, rare event logistic regression focusing on the large changes alone should be preferable in view of the rarity of large changes as sporadic moments of disequilibrium (Robinson et al. 2014).

FIGURE 3.8. The Distribution of the UK, US, and French Budget as Yearly Count-Percentage Differences with Intersections.

TABLE 3.4. F1 scores.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Test outcomes / predictions</th>
<th>Size category</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count changes</td>
<td>Percentage changes</td>
<td>Small</td>
<td>US</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>UK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large</td>
<td>France</td>
</tr>
<tr>
<td></td>
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<td>US</td>
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<tr>
<td></td>
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<td>Medium</td>
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<td></td>
<td></td>
<td>Large</td>
<td>France</td>
</tr>
</tbody>
</table>

For punctuated equilibrium, whether the two classifications of individual changes are consistent relates to the general idea that percentage change, which measures distributional pattern of attention allocation, may capture only instability arising from shifts in proportions. Count-based measures of attention allocation draw on instability in the absolute amounts of attention allocation. Because the two measures differ in focus, large percentage changes are not necessary large count changes. For this reason, I further transform the classifications into vectors
of binary outputs and produce individual series of classification results for the percentage
changes and count changes categorized by size. That is, each category is represented as a binary
variable with two values: positive and negative cases. I compute the F1 score comparing the
binary outputs as condition and test outcome alternatively. The F1 score, or the harmonic mean
of precision and sensitivity, is used to compare predictions and conditions in classification
statistics. A high F1 score means that the classifications are consistent. Lower F1 scores indicate
less consistency across the two classifications. It is defined as

\[
F1 = \frac{2 \cdot true\ positive}{2 \cdot true\ positive + false\ positive + false\ negative}
\]

The F1 statistics are computed using the R package ROCR. While alternative measures
of classification consistency are available, F1 scores are more suitable where the statistic
imbalance is skewed for the positive cases, i.e. \( P \gg N \). In this application, I use the categorized
percentage changes as the predictions and the categorized count changes as the conditions to be
predicted. Table 3.6 shows that in all cases, the classifications are not matched precisely. While
the classifications are relatively consistent for the small changes, consistency goes down for both
medium and large changes. The drop in F1 scores is particularly serious for the UK and French
data. The inconsistency reinforces the lesson from problem 1; choosing between quantification
alternatives should not be an arbitrary decision based on convention. They capture different
sources of instability in policy processes and have different conceptual and theoretical
implications.

**Conclusion**
This chapter reviews some methodological issues associated with the choice of measures, the length of observation, and the modeling of large changes. For the first problem, switching between alternative quantification methods affects the fundamentals of comparative punctuated equilibrium. Because percentage-based measures capture instability in the distribution of attention while count-based measures capture instability in the absolute volume of attention, the interpretation of the statistical estimates should be sensitive to what these properties are and how they are conceptually linked to the theory of punctuation. Moving from count values to percentages, we also shift from domain-specific changes to changes in policy priorities. The difference does not impact on the theoretical foundations of punctuated equilibrium, as the evidence indicates that both forms of instability are punctuated with excess kurtosis. However, the characterization of political and policy systems changes substantively depending on which measure is used, meaning that a system can be highly punctuated in priority distribution changes but relatively mild in terms of changes in absolute allocations of attention. Whether one kind of instability is more relevant to the current understanding of punctuated equilibrium remains inconclusive based on a general reading of the literature, but realizing the distinction means that theorists should pay closer attention to the underlying causes of punctuated equilibrium with respect to different dynamical properties of the policy process.

As for data collection, the evidence shows that it is statistically problematic to rely on data series that are either too long or too short. Long data series of attention allocation may straddle major changes in the underlying probability distribution generating the observed changes (Baumgartner et al. 2006); theory entails that the level of punctuation varies with constitutional configuration (Jones et al. 2003; Jones et al. 2009a). Short data samples may be a poor representation of the general behavior of the policy process because they could fall between
the rare events of punctuation, in which case the level of instability is underestimated. Alternatively it can also become overestimated if it falls on clustered punctuated events. The randomized resampling of shorter windows of long attention data series lends empirical support to this argument. The interpretation of results based on shorter windows of observation should be received more conservatively, and more attention should be paid to the substantive problems of very long series of attention data.

We turn last to the problem of change classification. First, as the field begin to consider models of punctuation as discrete events (Robinson et al. 2007; 2014), the new technique using overlaying distributions to categorize changes is examined. The evidence shows that the distribution of categorized changes in national budgetary data does not accurately reflect the level of instability of the probability distributions to which the empirical changes converge. That means the technique as it stands may be problematic for models that take multiclass information due to the distortion introduced by the conversion from continuous values to discrete classification. It concludes regression models should focus on the large changes as rare events. Secondly, the analysis also adds to the argument that the choice between count values and percentage values can lead to different classifications of the changes. Focusing on the large changes, there is a reduction in consistency over the classification of large changes relative to the classification of small changes.

In conclusion, these methodological issues are relevant to the development toward comparative punctuated equilibrium. Specifically, they have roots in conceptual ambiguities and should be addressed with better theoretical elaboration on the theoretical meaning of change in priorities v. change in overall topic-by-topic allocations in absolute values and on the substantive and conceptual definition of policy instability; insofar as the methodological practices persist as
arbitrary choices made in the past, treating them as technical problems will only lead to limited attenuation of the problem. Indeed, the rules of thumb recommended here, such as using intermediate lengths of data series and avoiding multiclass models for discretized changes, are meant to drive further the discussion over the substantive aspect of statistical analysis and result interpretation. The broader methodological point remains that statistical analysis in the study of punctuated equilibrium is delicately balanced on substance, theory, and data, and that choices in data analysis must be explained in terms of their implications for theoretical and substantive relevance to the extent possible.
Chapter 4

Punctuated Equilibrium and the Authoritarian’s Information Disadvantage

Scholars have long argued that punctuated equilibrium arises from institutional decentralization. Because the minority’s ability to launch effective challenges to agenda control in policy processes is supported by decentralized institutions, more centralized governments can manage how attention is allocated with relative ease. While the theory is supported by evidence from liberal democracies, it fails to explain why attention allocation in colonial Hong Kong and contemporary China, both representative of contemporary authoritarianism, is more punctuated than virtually all systems documented in the literature. Perplexingly, the colony’s transition to greater decentralization was followed by a significant drop in punctuation. In China, level of punctuation varies significantly across provinces despite institutional uniformity across regional administrations.

I attribute the increase of punctuated instability to the information disadvantage of autocratic governance and point out two empirical implications. First, because opposition is actively contained, the autocrat does not have sufficiently independent and diverse information sources to identify emerging problems, leaving these issues undetected until they become too advanced for anything but radical shifts. The lack of veto point in the policy process prevents opposition from organizing effective mitigation for the autocrat’s reform initiatives. Second, it follows that autocratic response should become marginally more efficient with increasing exposure to policy information. Within-case variation in Hong Kong and China appears to comport with these implications.
**Introduction**

Punctuated equilibrium theory was originally developed to make sense of the long periods of stasis and short lurches of change in the US political system (Baumgartner and Jones 1993; Workman et al. 2009) and to account for similar pattern of non-incremental change in other liberal democracies (Eissler et al. 2014). Jones et al. (2003) argue that democracies may actually be purposively structured to induce a manageable level of punctuated instability “the key may be to think of tuning a system toward regular disruption, suffering dislocations but avoiding the catastrophe”.

In theory, punctuated equilibrium is a feature of democratic institutions, specifically institutions that promote decentralized politics, competition, and accessibility. Such institutions have conflicting consequences for decision-making in government. On the one hand, they raise transaction costs and make it difficult to coordinate change. On the other hand, they also sustain competition and keep current policy under constant threat of change. In other words, democratic institutions may make current policy more resilient because minority groups can block most challenges to the status quo in the short run, but they also make attacks on current policy more frequent, more relentless, and impossible to completely contain in the long run. In an open policy setting, policy entrepreneurs do face considerable resistance to conflict expansion, but the relative accessibility of the democratic policy process allows them to exploit the opportunities inherent in dispersed decision-making whenever favorable conditions arise (Baumgartner and Jones 1993; Kingdon 1984; Pralle 2003; 2006).
Both theory development and empirical analysis suggest that the inefficiency in attention allocation arises from institutional friction. It follows that centralizing power could introduce greater gradualism in the policy process. Evidence shows that more centralized parliamentary systems experience less punctuated instability than the institutionally more fragmented system of the United States (Jones et al. 2009a). In authoritarian systems, the usual institutions supporting minority challenges to unilateral initiatives to change are absent, leaving the dictator with uncontested control of attention allocation processes. With the common sources institutional friction contained, punctuated equilibrium should become less intense.

This chapter considers the possibility of punctuated equilibrium under autocratic institutions. Whether attention allocation in autocratic regimes exhibits similar disproportionality depends on how institutional conditions antithetical to the liberal democratic polity may shape the organization of government attention, an issue that current theory has not explored. A key institutional condition that differentiates liberal democracies from authoritarian regimes concerns political representation and policy access (Olson 2000). Authoritarian politics is defined by the absence of the very institutions that give shape to democratic competition, such as fair and regular elections, citizen participation, policy advocacy, and the right to express grievances and dissent enabled by a free press. Variability on this dimension among liberal democracies is clearly limited. In authoritarian systems, the press is closely monitored, elections (if any) are tightly controlled, and channels for grievance representation are few and restricted. Most importantly, policy decisions are made unilaterally by the political leadership and implemented by coercion if necessary. In short, authoritarian institutions radically reshape how opposition is organized, information is filtered, and coordination is achieved in the policy process. In the following section, I outline the institutional foundations of the political systems of the U.S., the
Due to the absence of data representing government information processing in non-democratic regimes, however, it is unclear whether and how government information processing operates when the source of institutional friction is different. In the next section, we examine the theoretical possibilities given the institutional hypotheticals. Based upon an expansion of the logic underlying the theory of government information processing, we argue that attention allocation is even more punctuated in non-democratic regimes where the lack of effective competition exacerbates the limitations of human cognition and pushes attention allocation to longer periods of stasis and even larger, less mitigated shifts.

Attention allocation and punctuated equilibrium

Central to punctuated equilibrium is the idea that government allocates attention inefficiently (Jones and Baumgartner 2005). In contradiction to the incrementalist models proposed by Lindblom (1959) and Wildavsky (1964; see also Davis et al. 1974), Baumgartner and Jones (1993) argue that government attention allocation is inherently punctuated. The inefficiency in government attention allocation is said to arise critically from two sources: bounded rationality and institutional friction.

Bounded rationality contributes to punctuated equilibrium because human cognition relies on heuristics to economize on the computational costs of problem solving. The bureaucrat is unable to process all the information in the decisional setting, so information processing is selective and targeted (Baumgartner and Jones 2014; May et al. 2008). The individual decision-
maker processes information under these cognitive and informational constraints, so that changes in attention allocation is not the result of random errors but systematic distortion of information (Padgett 1980; Jones 2001). The scarcity of attention and computational limitations lead to the exceptional staying power of heuristics (Simon 1978). Problem frames are vulnerable to emotional arousal because it presents a powerful facilitator for “the shift from the cognitive to the intendedly rational” band of problem solving; however rare and abrupt, once the shift takes place, “impressions are likely to be severely challenged or discarded rapidly as the process of examining the problem space and generating alternatives proceeds” (Jones 2001, p.106). Jones and Baumgartner (2005, 336-7) successfully simulate punctuated equilibrium in attention allocation when the decision-maker, as the theory describes, “locks choice into a set of facts based in the past” and cling on to them until “the information is exposed as faulty… far beyond its utility”.

As for institutional friction, organization theorists argued long ago that an important function of institutions is help individuals cope with cognitive limitations (Simon 1978). However, government institutions often mirror the cognitive structure of the individual and even exacerbate biases in human information processing (Jones 2001; March 1994). The political system is defined by a diffusion of power into subsystems or subgovernments (Baumgartner and Jones 1993). On the one hand, the separation of power among subsystems and the specialization of policy venues enable parallel problem solving. On the other hand, these institutional features prevent efficient policy response; where decision-making is dispersed, minority obstruction—itself strengthened by incomplete selective solution search and serial processing—becomes a critical barrier to policy response and adjustment (Jones 1999; Tsebelis 2002). Decentralized institutions are biased toward the status quo because mobilizing against current policy requires
actors to overcome high institutional costs such as regulatory restrictions, overlapping jurisdictions, majority requirements, and other institutional features associated with “interinstitutional dynamics and delegation in the policy process” (Workman et al. 2009, p.75; see also Jones 1999; Jones et al. 2003).

Policy subsystems are designed to deal with well-defined problems. To deliver preformulated policy solutions with minimal variance and remove any debilitating ambiguities due to issue aspect incommensurability (March 1978; Jones 2010), such systems are technically focused, operationally standardized, and ideologically unified. While these features help contain conflicts and maximize efficiency, they often lead to low capacity adaptation in the short run. Major events such as replacements of key officials following elections, successful lobbying by advocates against existing policy, and other typical political maneuvers in democratic politics may in some instances radically reshuffle the policy priorities of the government; in between these disruptions, the subsystems are usually incapable of initiating change on any meaningful scale.

These mechanisms collectively give rise to punctuated shifts in attention allocation. The pattern of government information processing is characterized by long periods of stability interspersed infrequently by abrupt and disjoint movements between equilibria (Jones and Baumgartner 2012). The resultant stick-slip dynamics entails disproportionate changes:

“At any given time, the response to the pressure is out of synch with the level of pressure applied: friction causes the linkage between inputs and outputs of the system to be disproportionate—underresponse because of friction, then overresponse in response to built-up pressures. (Baumgartner et al. 2009)”

The intense competition between conflicting views of problem issues is also a critical feature of information processing in democratic governments. Jones (2001) argues that
“in open democracies, if one problem space is constructed for voters by one candidate, a second candidate may put forward a second frame of reference. In effect, that democracy offers competing understandings of a problem space provides a mechanism for allocating attention to the panoply of problems that face a citizenry.” (103)

Given these theoretical considerations, the dynamics of government information processing is arguably contingent on the various mechanisms and institutions that define modern democracies. Replications of the original US studies in other democracies (e.g., Baumgartner, Foucault, and François 2006; Baumgartner et al. 2009; Breunig 2006; Jennings and John 2009) show that the thesis of punctuated equilibrium is applicable to political systems where these critical institutional features are also present. Punctuated equilibrium in government attention allocation is a universal phenomenon insofar as democratic institutions are present.

This chapter looks at four political systems to illustrate how attention allocation varies with important constitutional characteristics. The United States and the United Kingdom are archetypes of the liberal democratic state, with the former running on the principle of power separation and the latter on better coordination through centralized control of the legislature and the bureaucracy by the administration. The competition in the US system increases the cost of coordination across government branches and contributes to punctuated instability in attention allocation. Information processing in the UK system is relatively efficient and experiences less punctuation as a consequence.

Hong Kong and China are representative of key forms of autocratic politics. In Hong Kong, the imperial constitution was fully reinstated at the end of the war but then underwent abrupt changes to increase participation and advocacy over time. In China, the Communist Party of China (CPC) maintained autocratic control over society. In both cases, the autocrats were able to exercise centralized power without the challenge of coordination found in liberal democracies.
Attention is presumably more efficiently allocated in the absence of institutional friction. But the advantage of better coordination is purchased at the cost of considerable information disadvantage. Exposure to policy information varies longitudinally in the case of Hong Kong and cross-sectionally in the case of regional government in the China (see Lam and Chan forthcoming; Chan and Zhao forthcoming). Table 4.1 organizes the four systems along two dimensions of structural attributes.

Decentralized presidentialism in the United States

Woodrow Wilson called the US political system a “government out of antagonisms” (cited in Cameron 2000, 1). Rather than an expression of partisanship, these antagonisms are sustained by a structure of checks and balances. James Madison ([1788] cited in Ball 2003, 251) expounded in The Federalist no. 51 that the the constitutional foundations of the republic should purposely create multiple centers of power (Ostrom 1994), rendering the domination of “an unjust combination of a majority of the whole very improbable”. Specifically,

“In a single republic, all the power surrendered by the people is submitted to the administration of a single government; and the usurpations are guarded against by a division of the government into distinct and separate departments. In the compound republic of America, the power surrendered by the people is first divided between two distinct governments, and then the portion allotted to each subdivided among distinct and separate departments. Hence a double security arises to the rights of the people. The different governments will control each other, at the same time that each will be controlled by itself.”

The institutional considerations for dispersed decision-making define the U.S. system as one prone to long periods of stasis as well as short lurches of change (Baumgartner et al. 2009; Kingdon 1984). Baumgartner and Jones (1993) argue that four sources of instability shape change in policy agendas in the U.S. system of policymaking. First, interest groups have grown
into more expansive and diffuse networks and coalitions of advocates (Walker 1983; 1991). Interest groups enable what the authors call “the mobilization of bias” (see also Schattschneider 1975), where “interests are well mobilized on one side of an issue and poorly organized on the other” (Baumgartner and Jones 1993, p.190). With the mobilization of bias stable most of the time (Jones 2010), the task to undermine the bias is difficult. In the U.S. context, the institution of divided government encourages minority obstruction. The strength of minority obstruction is strongest in decentralized systems where institutional costs are the highest (Jones et al. 2009a), “these costs are associated with declining representation of the public’s policy preferences—as institutional costs increase, the priorities of the public are increasingly represented in the policy actions of American policymaking institutions” (Ibid., p.86).

Workman et al. (2009) argue that the U.S. political experiences punctuated attention allocation because its institutions create inefficiencies in the policy process. In particular, inter-institutional dynamics increases the supply of independent information through a diffuse system of jurisdictional overlaps encouraging competition between different committees, agencies, and interest groups on issues of common interest, “each struggling to redefine the issue in terms of their favored dimensions” (Ibid, p.84). Minority control over information processing, such as the case of subgovernment, generates “an ‘echo chamber’ effect where each new bit of information amplifies attention to particular information streams to the exclusion of others” (Ibid, p.84). Ultimately, this disproportionate allocative pattern “may contribute to the volatility associated with limited attention or punctuated distributions of policy change” (Ibid, p.84). As for delegation of power, it gives the bureaucracy considerable influence on attention allocation because their preferences set “the parameters of choice at higher levels of government” (Ibid, p.86). Dispersed decision-making causes information processing to be punctuated
Single-veto player parliamentarianism in the United Kingdom

The U.K. government belongs to the parliamentary model that critically differs from the presidential model of the U.S. political in terms of veto player bargaining (Tsebelis 2002) and institutional friction (Jones et al. 2009a). George Tsebelis (2002) considers the United Kingdom as a “single veto player” system because it is constitutionally defined that the political party in control of the parliamentary majority “can implement any policy change it wishes, and no policy change that this party disagrees with will be implemented” (p.79). High policy instability in the U.K. arises from the constitutional features of the Westminster model. Parliamentarianism concentrates power in the lower house majority, which in turn vests its power in the cabinet led by the party leader as prime minister. This arrangement of cabinet dominance is made possible because the majority’s control of the cabinet is only theoretical, in the sense that cabinet ministers are leaders “of a cohesive majority party in the House of Commons” and so “it can confidently count on staying in office and getting its legislative proposals approved” (Lijphart 1999, p.12). For Tsebelis (2002), a weak legislative increases agenda setting powers for the executive and expands the set of outcomes that can replace the status quo, i.e. more policy instability in the short run but less episodic shifts in attention allocation in the long run.

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10 It is important to note that more instability, in the PE terminology, means less punctuation. More changes in the short run mean less punctuated attention allocation in the long run because error accumulation is frequently interrupted in the presence of smaller adjustments. Policy stability means more episodic instability in attention allocation because the political system underlying is unresponsive to short- and medium-term perturbations (Jones et al. 2003).
Depending on the policy issues, interest groups activity and policy advocacy are more contained in parliamentary government (Boucher 2013). Where the process is dominated by the bureaucracy, advocates have few alternative channels for communication, especially when the legislative majority is not warm to agenda change in the first place (Constantelos 2010). The Westminster bureaucracy “may involve a narrower terrain of conflict and more instances of venue-shopping restrictions than in the presidential system, with its multiple veto points” (Boucher 2013, p.362). The scope of political conflict, thus constrained, removes a source of instability that allows policy entrepreneurs to push ahead change in episodes of great disequilibrium (Kingdon 1984).

In analyzing fluctuations in the UK government expenditure, John and Margetts (2003) make the observation that policy processes were governed by “stable policy communities, in the form of producer interest groups and central government departments”, making massive policy changes impossible (p.418). The prevalence of power concentration facilitates change, but in such a way that punctuations rarely occur except as a manifestation of “the evolution of British government policy-making” or, in some cases, due to the presence of “ambitious ministers and civil servants” aided by “a rapid law-producing legislature” (Ibid, p.418). Otherwise, the dominance of “iron triangles” in specific policy domains has the similar effects on attention allocation. The control of policymaking marginalizes challengers to the status quo more effectively than the relatively open and unpredictable U.S. system where partisan conflicts are sustained if not reinforced by institutional competition.
In conclusion, the U.S. and U.K. systems stand at the opposite ends of the spectrum of
democratic regime types (Lijphart 1999; Stepan and Skach 1993; Tsebelis 2002). The
parliamentary model of government is a system of mutual dependence (Stepan and Skach 1993,
pp.3-4). Power is shared among party leaders, but the rivalry within the policy coalition is
contained by pre-selection screening (Kam et al. 2010; Strom 2000) and strong party cohesion
and discipline (Diermeier and Feddersen 1998; Kam 2009). Power sharing does not extend to
rival policy coalitions; the losing party is assigned to the role of the opposition and completely
removed from decision making. In the American presidential system, mutual independence
creates a dispersion of power. Congress and President draw legitimacy from separate electoral
mandates, so that the two can veto one another. Power dispersion creates additional veto players,
adding to policy stability at the expense of responsiveness (Tsebelis 2002).

Colonial paternalism in Hong Kong

The constitutional design of the postwar government of Hong Kong was effectively dictatorial,
enabling the governor to exercise absolute control over the legislature, the civil service, and the
political elite at large (Tsang 1988, 2007). Due to the political exigency to remain neutral in the

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11 The descriptive focus on democratic regime types falls exclusively on the executive and legislative
branch. While veto players such as the judiciary, major corporate leaders, and retired but influential party
elders may also exist in political systems, I follow Tsebelis’s (2002) example and “consider them as
random noise” at the constitutional level of analysis while arguing that “they should be included in
analyses of specific policy areas, or case studies” (p.81). The discussions in this section are sufficiently
abstract to allow a more confined analysis.
conflict between the Communists in mainland China and the Kuomintang-controlled government in Taiwan as well as the evident lack of interest and vigorous participation in the municipal council elections, the colonial administration decided against major democratic reforms and to keep the postwar institutional configurations more or less unchanged (Tsang 1988). Most importantly, the influence of the administration extended to other sectors through elite co-optation (King 1975). Under a system of advisory committees, consensual politics and closed deliberations prevailed against contentious politicking associated with developed democracies. The interdependencies between government officials, civil servants, and members of the community elite fostered a sense of unity against skeptics outside of the policy establishment (Scott and Burns 1984).

Even more interesting is the fact that the colonial constitution and the accompanying political order actually disappeared over time. In the 1960s, the colonial government decided to put in place a system for public involvement in policymaking through citizen consultation, district-level elections, and elite engagement via policy committees after its rule was threatened by extensive social unrest and riots (King 1975). In the 1980s, the outgoing British administration initiated wide-ranging political reforms in anticipation of the handover to Chinese rule in 1997. In less than two decades, the legislature evolved from a loyal assembly of senior civil servants and political appointees into a fully elected body controlled by lawmakers hostile to the policy agenda of the administration (Chung 2001). The rules of engagement also brought a more divergent set of interests into the policy-making process.

After the handover, the Chief Executive lost much of the Governor’s prerogative to override the bureaucracy (Lam 2005). Government ministers, as political appointees recruited from outside the bureaucracy, faced similar limitations in exercising the powers formally
accorded to them (Burns 2002). While expanding the source of recruitment to increase
diversification and bureaucratic representativeness, aggressive administrative reforms also
undermined the solidarity of the senior civil service (Burns 2004). At the lower reaches of the
bureaucracy, fewer individuals were appointed to multiple policy committees to facilitate cross-
venue communication and develop close professional and personal relationships with those
outside of their home venue (Chung 2001; Scott 2000). The political order at the end of this
transformation exhibited unprecedented levels of fragmentation and contention (Cheung 2007).
The drastic and substantial shift in the regime configuration and the associated rise in
institutional friction are ideally matched with our question concerning the role of institutional
friction.

TABLE 4.1 Case classification.

<table>
<thead>
<tr>
<th>Regime type</th>
<th>Government structure</th>
<th>Case</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal Democratic</td>
<td>Centralized</td>
<td>The United Kingdom (1946-2003)</td>
<td>Parliamentary systems like the U.K. “are supposed to reflect voter demands, at least those reflected in parliamentary majorities” (Baumgartner et al. 2009, p.605). The motivation to be responsive is furthered by conditions favorable to centralized organization of government attention. The U.K. has “strong executive dominance, a centralized state… and only weak bicameralism” (Jones et al. 2009a, p.869).</td>
</tr>
<tr>
<td>Decentralized</td>
<td>The United States (1945-2012)</td>
<td>“Some designs, like the United States, are explicitly designed to be less than fully responsive. The framers of the U.S. Constitution did not want the system to react to every small social movement—concurrent majorities, overlapping electoral mandates, and shared control of government by independently elected or appointed institutions were all seen as mechanisms to ensure that the system responded only to public pressures and feelings above some threshold” (Baumgartner et al. 2009, p.605).</td>
<td></td>
</tr>
<tr>
<td>Authoritarian</td>
<td>Centralized</td>
<td>Hong Kong (1946-1985)</td>
<td>Hong Kong’s postwar constitution was directly inherited from early imperial rule (Miners 1981; Tsang 1988). Before the political reforms of the mid-1980s, “power is concentrated in the hands of a</td>
</tr>
</tbody>
</table>
royal governor, advised by a nominated executive council whose advice he can ignore, and laws are still passed by a nominated legislative council in which he can command a majority of the votes, just as was the case in 1843" (Miners 1981, p.xv).

The single-party state has entered into a period of “illiberal adaptation” in the post-Mao era. Pei (2006) observes that the CPC “develop, refine, and implement more subtle and effective means of maintaining political control” through a strategy “of strictly limited political reform, selective repression, improved technical capacities for dealing with social unrest and emerging technological challenges, and co-optation of new social elites” (p.81).

The post-reform government remained non-elective, although constitutional changes led to serious structural fractures in the political order (Lam 2005; Lee 1999): “the relationships between the executive, the legislature and the bureaucracy today are uncoordinated, poorly developed, fractious and sometimes dysfunctional... each pursue their own agendas, punctuated by occasional skirmishes on the boundaries of their domains and by subterranean campaigns to extend their jurisdictions” (Scott 2000, p.29).

One-party state in the People’s Republic of China

In Pei’s (2006) assessment of China’s transition, the major political and governance institutions remain “underdeveloped” in spite of years of strong economic growth. Although there are positive signs indicating the rise of “institutional pluralism, tolerance of limited public space, and emergence of democratic grassroots participation”, they are tentative, instrumental adaptations that answer the short-term objectives of the Communist Party rather than the long-term goals of moving away from a political economy predicated on the monopoly of the single-party state (Liu 2004). Against the prospect of democratic transition is a set of limits that “have stunted the
development of an effective legal system, constrained the constitutional role of legislative branch, obstructed the growth of rural self-government, and restricted the emergence of a civil society” (Pei 2006, pp.6-7). Power in contemporary China remains largely concentrated in the hands of the autocratic leaders. This is particularly pronounced in the regional governments due to the decentralizing trend towards greater autonomy for decision making by provincial governments (Lieberthal and Lampton 1992).

These imbalances pose specific threats to the effective processing of policy information. The autocratic control of agendas and active marginalization of opposing views in China encourage “private grievances” to accumulate and find “violent expressions when institutional mechanisms for resolving them—such as the courts, the press, and government bureaucracies—are unresponsive, inadequate, or dysfunctional” (Pei 2006, p.15). Mechanisms for political censorship are specifically designed to contain collective action (King et al. 2013) so that the appeals system (xinfang zhidu), a prohibitively costly and unpredictable procedure for grievance redress sanctioned by the government and the CPC (Cai 2004), serves as the only practicable platform for citizens to challenge current policy. Yet, citizens have not real alternative because alternative modes of policy participation are either poorly supported by underdeveloped legal framework (Zhang 2008) or actively suppressed as boundary-spanning threats to social stability (Chen 2012). These restrictions on the content and scale of policy feedback are unimaginable in liberal democracies, as the institutions purposely expose the policy process to external disruption in the form of policy advocacy and electoral challenges (Jones et al. 2009).

All in all, post-Mao reformism has led to a “redistribution of information flow” undermining the influence of state ideology in policymaking. Labelled by Pei (2006) as a form of “illiberal adaptation”, the Chinese blend of utilitarian authoritarianism has created a new
dynamics for policy change. Lieberthal and Lampton (1992) contend that the Chinese bureaucracy will enforce major policy changes only on the condition “either that one leader emerge as a new strongman or that strong agreement be reached among all the top leaders”. Further attempts to centralize the administrative systems, the authors argue, would leave administrators “in a position quietly to achieve greater degrees of freedom through manipulation of information that goes to the leadership” (Ibid, p.27). The contemporary autocracy of the PRC is therefore a somewhat self-contradictory system. On the one hand, government attention is allocated exclusively by the political leaders; citizens are prevented organizing collective action and generally from operating collectively outside of the administrative hierarchy. Yet, on the other hand, the political leaders’ ability to formulate policy change is compromised by the very institutions of managed participation because policy signals from discontented communities are actively suppressed by grassroots bureaucrats to preserve the status quo (Cai 2004).

Punctuation without friction?

The extension of punctuated equilibrium to the unfamiliar setting of autocratic order is primarily concerned with the joint impact of centralization and perturbation on attention allocation. Liberal democracies such as the U.S. and the U.K. are regularly subject to leadership changes brought about by elections, participative rulemaking (Yackee 2006), and venue shopping (Pralle 2003; 2006). Even for Westminster system, advocates can still make use of vote and access points to shape policy processes and outcomes from the outside (Boucher 2013). For a procedural definition, Clague et al. (1996) suggest that, in a democratic regime

“the chief executive and the legislature are both elected in competitive elections and the legislature is effective, in the sense that it has considerable autonomy. In
this definition both presidential and parliamentary systems can be fully democratic. A regime falls short of full democracy if the elections are not fully competitive or if the executive’s power is so predominant that the legislature does not provide an effective check on that power.” (Ibid, p.251)

It follows that the instability of the democratic process rests with the maintenance of certain important freedoms. Democratic institutions entail

“free speech, the right to campaign freely, the right to form political parties, the right of peaceful demonstration, and freedom from arbitrary arrest… The only fully competitive elections are those in which event the opponents of the party in power have the rights they need to compete and to survive” (Ibid, p.251).

The autocratic system is critically different. It lacks open, fair competition and free participation (Slater 2003), the absence of which is nothing more than a corollary of autocratic rule (Olson 2000; Magaloni 2008). The autocratic political order precludes arrangements of power dispersion and autonomy that constitute the very institutional and operational foundations of the Western democratic process (Ostrom 1969; Wagner 2005). Of course, executive dominance can also be achieved in liberal democracies, but the true difference is, again, pertinent to the more fundamental aspects. In a full-fledged autocracy, there is no provision for the replacement of the executive government through competitive elections and the legislature is either chosen non-electively or rendered ineffective by a dominant and non-elective executive (Bollen 1990; Clague et al. 1996). According to Magaloni (2008; Magaloni and Kricheli 2010), regime survival rests with the autocrat’s ability to credibly commit to power-sharing agreement in the absence of any independent third party for agreement enforcement. Change, inevitably unilateral when power is institutionally centralized, may undermine the autocrat’s ability to make credible commitment. Therefore, the goals and mechanisms for establishing and maintaining stability in autocratic systems are radically different.
Both colonial Hong Kong and contemporary China represent the institutional opposites of the liberal democracy. The flow of information is heavily regulated in the administrative systems of both cases. In Hong Kong, the colonial regime relied on co-opted business and community elite in decision-making processes where the scope of deliberation was restricted and the extent of power sharing limited (King 1975). In the PRC, similar restrictions were in place to remove dissent from policy discourse and to channel conflicts into government-sanctioned modes of grievance representation and redress (Cai 2008). As for institutional centralization, the London-appointed governor of Hong Kong had “dictatorial” control over the bureaucracy and the legislature through a system of colonial patronage (King 1975; Miners 1981; Scott 2000). As a single-party state, political power in China is concentrated in the Politburo, a body that controls both the nomination of legislative candidates and agendas (Pei 2006). The National People’s Congress cannot effectively monitor, let alone challenge, the Politburo.

In restricting information flow and reducing institutional friction at the same time, the autocratic government presents a puzzle to information processing theory. Abstracting from the Chinese and Hong Kong cases, institutional friction, at least the type that is typically found in liberal democracies, is largely absent in the autocratic system. Attention allocation may become less punctuated in autocracies because autocrats are empowered to undertake reforms without facing opposition from dissenting branches of government over which their democratic counterparts can exert no immediate or direct control. The high concentration of decisional power prompted Gordon Tullock to observe that “it’s very hard to prevent [the autocrat] from doing what he wants, provided he concentrates on it” (Tullock 1987, p.116, emphasis added). Yet, the frequent and widespread suppression of open expression of grievances and policy participation by disaffected interests mean that the autocrat has to rely on sanctioned channels to
collect information (Olson 2000). The difficulty for information processing in the autocratic system rests with the fact that indications of emerging problems is actively filtered out by officials who benefit from the status quo (Chan 2014); conflict containment, though not unique to autocratic politics, is substantially more complete as it becomes the corollary of the constitutional logic of autocratic rule (Pei 2006; Tong 2002) rather than a strategic option for conflict management in the democratic process (Pralle 2003; 2006; Schattschneider 1975).

This unfamiliar combination of conditions under autocratic rule situates the research question beyond the current scope of information processing theory, but the framework of punctuated equilibrium provides the basic building blocks to theorize the scenario where bounded rationalists attain autocratic control of the policy process. Two questions stand out so far. First, is punctuated equilibrium relevant in institutional settings where friction is absent? Second, if attention allocation is still punctuated under authoritarian institutions, what are the microfoundations of the instability? I outline such a scenario below.

_The autocrat and their information disadvantage_12

As far as attention allocation is concerned, the autocrat’s problem is not that they face too much friction. Autocratic institutions give the autocrat greater freedom to change the distribution of government attention, but the very absence of the institutional constraints attendant to democratic politics creates new cognitive and institutional barrier to allocating attention

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12 The “autocrat” may refer to one political leader or a collection of key leaders forming a small but close-knit power center (e.g. the Politburo in the PRC or the Governor-in-Council in colonial Hong Kong) in an autocratic regime.
efficiently. It is my contention that autocratic institutions increase inefficiencies because giving
the autocrat the freedom to undertake change also necessarily means that they can choose not to
undertake change; apart from the autocrat, no one else can force the decision either way. The
counterintuitive rise in punctuation levels under autocracy has to do with the unexpected way in
which bounded rationality and institutional friction interact in the autocratic system.
Undisciplined by the institutional constraints of liberal democracy, the autocrat as a bounded
rationalist will choose to avoid change rather than voluntarily exploit the freedom to achieve
greater attention efficiency, i.e. incrementalism.

To ensure uniformity in an expansive political system that the autocrat has limited
capacity to monitor (Lieberthal and Lampton 1992; Pei 2006), the need to ensure policy control
is fulfilled by a system of simple, if sometimes incomplete and inchoate, doctrinal beliefs
(Cassinelli 1960). State ideology critically shapes and legitimates public policy in autocratic
regimes and transforms into “maintenance doctrines” focusing on maintaining the power and
influence of the autocrat (Kinne 2005, p.116), whereas major ideological shifts were necessary to
channel policy changes in particular directions as desired by the autocrat. Olson (2000) refers to
the ideological shift following Stalin’s adoption of collectivization, a policy that he had initially
rejected before his position in the Soviet leadership was sufficiently consolidated. Because the
autocrat relies on doctrines to regulate administrative behavior, autocratic ideology has a lock-in
effect: for the autocrat, policy ideology represents the policy ideal and should be consistently and
fully enforced. Ideological integrity also has the additional utility of underpinning the autocrat’s
agenda control and legitimacy. For the administrator, covert collaboration against rather than
open confrontation with the autocrat’s policy would minimize the risk of detection and serve
their interest better; Soviet corruption was successfully organized once officials found a way to
reduce transaction costs for collusion (Olson 2000). Not only is the autocrat uninterested in change without a corresponding shift in preferences, she is purposely led by her administrators to believe that current policy works well and changing it would undermine performance. What emerges from these contradictory motives is an equilibrium state that tends toward extreme stability in the autocratic policy process.

Barring power struggle, the autocrat dictates policy choice. Change occurs rarely because the autocrat does not have an incentive to shift policy away from its current position as long as their preferences are satisfied by current policy. Since current policy is set to the preference of the autocrat, instability associated with transitive preferences in the collective choice paradox simply does not apply (Riker 1982). While the public choice becomes more rational because it is fully based on dictatorial preferences embodied by the autocrat’s agenda, it also turns policy decisions into something more stable than they would have been had the problem space been open to contestation (Jones 1999; 2010). Due to slow behavioral adaptation to changes in the task environment (Jones 2003), the autocrat as bounded rationalist rarely revises their attention allocation.

13 The autocrat’s choice can be the aggregation of powerful oligarchs and other important members of the ruling elite. Citing Remmer’s (1989) research on Latin American regimes, Tsebelis (2002) observes that in non-democratic structures “one individual is responsible for political decisions, while in others many players are endowed with the power to veto decisions… [T]he situation is not unlike decisionmaking inside political parties in democracies” (p.77). I argue that collective choices made in such small elite circles are often reinforced by shared values and perspectives and therefore qualitatively different from collective choices aggregated from larger, anonymous populations. Moreover, I focus on autocratic regimes where clear formal and informal mechanisms and institutions support unitary leadership.
In the democratic process, current policy is contingent on the outcome of strategic advocacy (Rochefort and Cobb 1993), conflict management (Schattschneider 1975), coalition building (Riker 1962), and aggregation rules (Riker 1982), all of which are either internally unstable or prone to external disruption. Public choice in liberal democracies is set only tentatively because current policy exists in a broader system of institutions that sustain and even encourage diversity and competition (Jones 2001). In the autocratic regime, the autocrat’s decision is final in the sense that current policy is set within a broader system of institutions protecting the status quo; forcing change will inevitably undermine the very foundations of autocratic rule (Svolik and Boix 2013). Policy change can become a costly, risky, and therefore undesirable exercise when the autocrat’s ability to make credible commitment to governance agreements with potential challengers can appear compromised. Greif (2006) contends that modularity in “institutional complexes” was essential to the transition toward more efficient, self-enforcing modes of impersonal transactions (see also North et al. 2009). The same did not take place in systems where the institutions of trade were insufficiently compartmentalized from religious restrictions on trade activities.

So far I have presented the idea that the usual bottom-up causes of punctuation in democratic processes are absent in or inapplicable to the autocratic system, but what about the autocrat as the initiator of policy change? Policy preferences may change due to policy learning (Sabatier), the autocrat still has considerable incentives to learn about the preferences of the

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14 Policy learning is the “relatively enduring alterations of thought or behavioral intentions which result from experience and which are concerned with the attainment or revision of policy objectives” (Sabatier 1991, p.133; see also Heclo 1974 which inspired Sabatier’s formulation). Critically, the theory of policy learning presupposes competition between advocacy coalitions pushing for competing agendas and
citizenry and align his policy choice accordingly (Tullock), but restrictions inherent in the logic of autocratic rule do not make learning easy for the autocrat. In an open political system, multiple channels of communication and the right of free speech ensure the free flow of information from independent sources so that decision-makers in government can detect emerging and changing issues (Jones 1999) and in doing so adjust the frame of reference with which the problems are defined and addressed (Agranoff; Sabatier). However, apart from the absence of incentives, learning in the autocratic system is severely limited because information flow is curtailed. Information flow in autocracies is censored to block expressions of dissent and subversion, but the aggressive suppression of contradictory information tends to remove legitimate concerns as well. Even if contradictory information is tolerated, expectations of ideological conformity often prove to reinforce the dominant cognitive frame against all alternative value systems.

Recent development in punctuated equilibrium has strengthened the information-theoretic foundations of this proposition. Frank Baumgartner and Bryan Jones (forthcoming; also see Boydstun et al. 2014) argue that attention allocation in government is subject to the laws of information and communication: diversity and variance in signals add to uncertainty, which in turn contributes to high entropy and results in transmission inefficiency (Shannon 1948; Shannon and Weaver 1964). Bureaucratic attention is cognitively allocated to minimize the problem of noise in information processing. This involves a tradeoff between diversity and clarity by the decision-maker faced with “numerous messages from potentially competing sources”, which proposals: policy actors “will resist information suggesting that their basic beliefs may be invalid and/or unattainable” (Ibid.). In autocratic systems, inter-coalition competition underlying the selective pressures on belief systems is institutionally mitigated.
create an incentive for censorship by setting up “clear rules of standing, strong norms of who is allowed to participate, [and] powerful barriers to keep outsiders out of the decision-making environment” (Baumgartner and Jones forthcoming, pp.42-3). Of the two “pathological” extremes, the autocrat suffers from “the temptation of clarity” (Ibid, p.44) in that their decisions are based on clear (i.e. noise-free) but low quality information that simply fails to capture the dynamism and complexity of the task environment. Even when the autocrat is actively in search of information, they often find themselves trapped in decisional settings with low supply of what Baumgartner and Jones call “entropic information”, or information that is drawn from multiple non-redundant sources (forthcoming, p.40). As we have seen in the case of the PRC, the dilemma of centralization is that it enables and motivates lower level administrators to manipulate information as it travels up the bureaucratic hierarchy (Lieberthal and Lampton 1992).

In conclusion, disproportionality is expected to become more pronounced in attention processes in the autocratic regime because autocratic institutions amplify rather than temper the effects of bounded rationality by giving political leaders low utility for policy change in the short term. The payoffs for inertia are more significant than the payoffs of regular adjustment approaching the theoretical efficient equilibrium of incrementalism. Given the suboptimal choice, autocracy as a system for government attention allocation is also a classic self-undermining institution (Greif and Laitin 2004); neither the autocrat nor their administrators are motivated to undertake incremental change, increasing the long-term risk of episodic disequilibrium. The information-theoretic extension of punctuated equilibrium speaks to the dilemma of information processing in autocracies.
Hypotheses

In liberal democracies, punctuated equilibrium is the outcome of cognitive bias and institutional friction linearly combined. The linearity works like this: as friction declines, the policy process becomes less punctuated because initiatives for change face reduced resistance. As a more extreme version of the centralized democracy, the authoritarian state affords few institution-based opportunities for minorities to resist reforms even when they are undertaken by political leaders unilaterally.

But the decision-making process in the authoritarian regimes reviewed above entails a more complicated theory on why attention allocation is punctuated. First, we hypothesize that budgetary processes in authoritarian regime still experience episodic instability because the political leaders in authoritarian governments are just as susceptible to cognitive biases as the officials and policymakers in liberal democracies. Cognitive factors that lead to punctuated equilibrium in liberal democracies should remain potent determinants of the volatility of policy change in spite of the significant reduction in institutional friction. Decision, transaction, and information costs can be reduced but not eradicated with more streamlined institutions for centralized control (Jones & Baumgartner 2005).

H1: Attention allocation is punctuated under autocratic institutions.

In fact, contrary to what might be a restrictive interpretation of what we know about punctuated equilibrium and institutional friction (Jones et al. 2009a), policy instability should really become more serious in authoritarian regimes because authoritarian systems, unlike liberal democracies,
actively suppress disruptions and challenges of any kind. The government try to maintain social
harmony by marginalizing dissent and enforcing compliance within the administrative apparatus.
These practices leave the political leaders in a precarious position. On the one hand, they have to
deal with far less resistance to policy change thanks to low institutional friction. On the other
hand, typical policy feedback mechanisms such as elections, advocacy, and citizen participation
are absent and the alternative channels for grievance representation are highly restrictive.
Political leaders lack the information and incentive to learn about and act on new problems; with
contradictory signals filtered out, the optimal strategy is inactivity most of the time. But when
the problems are neglected long enough to grow to dangerous levels, they scramble to address
them and undertake radical changes, which often go unopposed without minority obstructionism.
Even more severe forms of policy inertia and over-response occur because authoritarian
institutions are defined by the very absence of mechanisms inhibiting these excesses.

Due to these theoretical reasons, we hypothesize that the budgetary process in China
should exhibit even greater punctuation than comparable policy processes in liberal democracies.

\[ H1': \text{Attention allocation in autocracies is more punctuated than comparable processes in liberal democracies.} \]

The expectation of increased punctuated instability in autocratic systems may first strike
as an antithesis to current theory. If centralization leads to a reduction in institutional friction by
depriving minority groups the institutional protection for the mobilization of agenda bias, then
the autocrat should theoretically possess the maximum capacity to effect timely changes in
attention allocation. This expectation however is founded on two assumptions that apply only to
liberal democracy. First, it assumes the autocrat, like leaders in liberal democracy, is motivated to allocate attention to policy issues responsively. For the democratic officials, elections have to be won (Erickson et al. 1989; McDonald et al. 2004) and legal challenges to policy decisions have to be avoided (Yackee 2012). Attention allocation is the liberal democratic system is continually perturbed changes in government personnel, advocacy activities, and a broad range of participation by individual citizens. While the autocrat operates under similar pressures, the institutional challenges of regime survival curtails their ability to act upon such pressures (Magaloni and Kricheli 2010). The autocrat is prevented from exercising their considerable discretionary power in the interest of stability and regime survival (Magaloni 2008).

Second, it assumes that the autocrat obtains and processes policy information in the same way information is obtained and processed in liberal democracies. While the autocrat can obtain high-quality information in specific cases, generally autocratic institutions undermine the independence and diversity of information sources. In punctuated equilibrium theory, the problem of information quality does not relate to reliability, but whether established focus is being challenged sufficiently to engender new agendas and perspectives challenging the entrenched policy arrangements (Baumgartner and Jones forthcoming).

The autocratic regime is a severe case of low-quality information processing in this perspective.

**H2: In autocracies, the level of instability varies with exposure to information.**

Because authoritarian systems have few sources of institutional friction, punctuation in attention allocation should be largely determined by the system’s exposure to information. Such
systems are highly punctuated relative to liberal democracies, but more information exposure brings down punctuation marginally. The thesis that instability in autocratic policy processes should be supported by empirical patterns. First, Hong Kong’s exposure to information increased considerably over time due to a series of institutional reforms since the resumption of British sovereignty in 1946. The colonial administration but did not pursue reforms toward democratization in the following decades for geopolitical reasons (Tsang 1988). Instead of enfranchising the local citizenry, the colonial authorities expanded the advisory system to co-opt business and community leaders. Officials would consult with “unofficials” in the creation and management of government programs in order that policy decisions would generate the least controversy when announced. The system expanded during the tenure of reformist governors such as MacLehose (Miners 1981) before the handover agreement set in motion the constitutional transition toward greater democratization and decentralization (Lam 2005; Scott 2000).

**H3: In Hong Kong, expansion of the advisory system and democratization were followed by significant reduction in the level of punctuated instability.**

In China, the citizen appeals system captures considerable amount of information on policy problems submitted by discontented individuals and groups. The more frequently the appeals system is used, the more exposed the regional government is to information on policy problems. Attention allocation changes more often in provinces where the exposure is greatest. Following Breunig and Koski’s (2006) study of punctuated equilibrium in the US state governments, I argue that regional variation in punctuated instability arises from institutional characteristics in
the case of China’s regional governments in the provincial rank and equivalents. Focusing on the appeals system as a channel for managed participation, the popularity of the appeals system should be correlated with the pattern of attention allocation by the regional governments.

**H4:** *In China, provincial budgets are relatively less punctuated if the government leaders receive policy information in greater frequency and diversity.*

**Findings and discussion**

H1 suggests that the effect of institutional centralization is moderated by regime type. Attention allocation in the U.S. and the U.K. should be less punctuated than attention allocation in colonial Hong Kong and Communist China. The data in Table 4.2 indicates strict alignment of the L-kurtosis estimates with the theoretical expectation. The Chinese budget is the most punctuated of the four series with the average L-kurtosis at 0.845. The least volatile provincial budget series comes from Guangdong (0.723), a relatively modernized and prosperous province where new policies are often experimented first before replication in other administrative jurisdictions (Montinola and Weingast 1995). The most punctuated series in the provincial budgets is from the province of Hubei (0.998), which is an agrarian province.

On top of the comparison with the U.S. and the U.K. in Table 4.2, the budgetary allocation processes in Hong Kong and the Chinese provincial administrations are substantially more punctuated than the appropriations (0.49) and outlays (0.43) of the Danish government (1964–2004), the annual budget changes (0.42) of the German national government (1963–1989), and the national budget series (0.57, or 0.493 excluding the war years) of France (1820–
Budgetary changes in state governments in the United States have an overall average L-kurtosis of 0.402 (Breunig and Koski 2006) and the local governments in Denmark have a pooled L-kurtosis of 0.363 (Jones et al. 2009). Attention allocation in autocratic systems is consistently more punctuated even after extending the comparison to the specific variations of the Westminster and presidential archetypes, both at the national and local levels.

For agenda setting, the Hong Kong data also exhibit more punctuation compared to the liberal democracies. Baumgartner et al. (2009) find that the United States equivalents to Hong Kong’s “input” and “process” stages, including House and Senate bill introductions, executive orders, and statutes, have L-kurtosis values between 0.21 and 0.33. The Danish and Belgian figures similarly range from 0.26 to 0.35 and from 0.23 to 0.38, respectively. There is a considerable gap between these estimates and the Hong Kong figure at 0.42 for the deliberations in the legislature.

**Figure 4.1 Countries ranked by L-kurtosis values.** There is a clear clustering of L-kurtosis estimates by regime type. The liberal democracies (DKL: Danish local governments, UK: United Kingdom, USS: United States state governments, DE: Germany, DK: Denmark, US: United States, and FR: France) have the lowest intensity. The Chinese figures (CNL: lowest estimate from Guangdong, CNM: mean region kurtosis value, and CNH: highest estimate from Hubei) take up the top places in the list. In between these two extremes is Hong Kong (HKI: 1946-1984, HKII: 1985-2007), a political system starting a restituted colonial constitution in 1946 but adopted important democratic changes since the 1980s, declined significantly in punctuated intensity.
H2 is applied to the within-case variation in Hong Kong’s punctuated instability throughout the colony’s transformative experience from a colonial “administrative state” to a partly democratized system (Lee 1999). While suggestions of extensive democratization were initially entertained in the late 1940s, the Grantham administration overruled these proposals in favor of “benevolent autocracy” due to geopolitical concerns (Tsang 1988). Writing in the early
1980s, Miners referred to the contemporary political system as a “living fossil of early imperial government”. It retained defining features of nineteenth-century colonial paternalism under which

“power is concentrated in the hands of a royal governor, advised by a nominated executive council whose advice he can ignore, and laws are still passed by a nominated legislative council in which he can command a majority of the votes, just as was the case in 1843” (Miners 1981, p.xv).

H3 further entails that the level of punctuated instability in the post-reform period was reduced following drastic institutional decentralization. That institutional status quo was abruptly ended by a rapid succession of major democratic reforms in the second half of the 1980s; reforms that undercut the dominance of the executive, forced the opening of the policy process to marginalized players (Rosegrant 2006), and weakened conflict resolution among policy elites. The smoothing mechanisms that had enabled coordination in the colonial government were undone by the institutional transition (Lam 2005). Scholars have characterized the post-reform order as institutional incongruity (Lee 1999). The government structure became sufficiently decentralized for rival centers of power to pursue conflicting agendas. Calling the post-reform system “disarticulated”, Scott (2000) finds that

“the relationships between the executive, the legislature and the bureaucracy today are uncoordinated, poorly developed, fractious and sometimes dysfunctional... each pursue their own agendas, punctuated by occasional skirmishes on the boundaries of their domains and by subterranean campaigns to extend their jurisdictions” (Scott 2000, p.29).

The constitutional reforms abruptly and fundamentally remodeled the institutional setting of Hong Kong, enabling the comparison of attention allocation straddling two radically different regime configurations. Moving beyond the momentous electoral reforms in the 1980s to more
limited institutional reforms, I consider a different chronological segmentation of the data by taking account of two additional junctures. First, the MacLehose administration established an expanded system of advisory and consultation committees in the aftermath of the Leftist riots of 1967—1968. Cheung (1997) attributes the transition to the post-crisis “active search by top administrators, under the leadership of the reformist governor, MacLehose, for innovative solutions to the political crisis” (p.723). In spite of the limited progress on constitutional arrangements,¹⁵ the solutions transformed “colonial rule into a relatively more responsive administration that claimed to govern by public opinion” (Ibid.). Second, the handover to China saw the rapid devolution of executive power in the post-1997 regime. Lam’s (2005; see also Scott 2000) argument is that the post-handover institutional adaptations were critical; not only was the legislature becoming a critical challenger to executive dominance due to the independent mandate enjoyed by the lawmakers, but cohesion among government agencies was considerably undermined by the Political Official Accountability System (POAS) introduced in 2003 (Ma 2007). Instead, a fragmented political system with multiple veto points came into being, making

¹⁵ Some historical accounts downplay the significance of the McLehose reforms. Tsang (1988) reports the view that the reforms were strictly confined to “that part of the general machinery of government which provides services,” while “the British Government’s policy towards Hong Kong is that there shall be no fundamental constitutional changes for which there is, in any event, little or no popular pressure” (p.31). Miners (1981) also concludes that the riots of 1967 had led to, at least in the short term, reduced enthusiasm for the proposed devolution of power to local municipal authorities controlled by grassroots elements. Cheung (1997) similarly argues that the new arrangements “were all administrative in nature mainly because more fundamental political means were ruled out… the traumatic experience of the 1967 riots may have convinced the colonial administrators that political reforms could easily lead to an ungovernable local polity” (p.729).
noncooperation the equilibrium state (Lam 2005). Table 4.4 shows the level of punctuation declined in close correspondence to each of the institutional junctures.

Table 4.2. Policy instability in Hong Kong before and after democratization.

<table>
<thead>
<tr>
<th>Period</th>
<th>Agenda setting</th>
<th>Budgetary allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946—1985</td>
<td>0.468</td>
<td>0.713</td>
</tr>
<tr>
<td>1986—2007</td>
<td>0.331</td>
<td>0.490</td>
</tr>
</tbody>
</table>

The case of Hong Kong presents some highly suggestive evidence in support of the hypothesis that exposure to external disruption attenuates punctuated volatility in autocratic systems. The within-case drop in punctuation corresponded closely with the development and consolidation of a more open system of governance in which the dominant administration became more accessible by challengers to the status quo. However, since the expansion of participation through policy committees and legislative elections was accompanied by a limited but genuine development toward more decentralized policy institutions, the impact of the former cannot be sufficiently isolated from the impact of the latter even though increasing decentralization should raise rather than lower punctuation. At any rate, more critical comparison of autocratic governments similar in the extent of centralization but confronted with varying levels of exposure to external disruption will further elicit the impact of the access to policy information on the dynamics of attention allocation. This is made possible using the data from the regional governments in the People’s Republic of China.

The Chinese case of punctuated equilibrium enables the application of H2 to variation in punctuated instability on the spatial dimension. Not only is the pattern of provincial budgetary allocation far more volatile than similar policy processes in Hong Kong, the U.K., and the U.S., the cross-provincial variation in policy instability reveals vast disparity in the dynamics of
attention allocation. In particular, H2.2 expects provinces more exposed to external disruption to exhibit relatively more frequent (but less volatile) changes in current policy.

Figure 4.2. **Punctuated intensity: interregional differences in the PRC.** Darker colors mean more intense punctuations. *Note:* the municipal governments of Beijing, Tianjin, Shanghai, and Chongqing, are not included in the analysis.
The appeals system (xinfang) is considered the most popular and effective means of grievance representation in China (Cai 2004). Alternative modes of participation, such as administrative litigation (Zhang 2008) and social mobilization (O’Brien and Li 1995) are marginalized because the legal framework is underdeveloped and the threat collective action poses to authoritarian rule (King et al. 2013). Therefore, unlike liberal democracies where the government’s control over what and how information enters into the policy process is relatively limited (Baumgartner and Jones 1993), the citizen appeals system in China absorbs most of the policy feedback into a single mechanism, thus enabling officials to manage the scale and filter the content of policy information that gets actual attention from the authorities. As the volume of appeals increase, the government is faced with more diversified information and has to address a greater range of challenges to current policy. The exposure to such disruption is reduced if officials choose to block citizen appeals from entering into the system; policy stability is sustained and prolonged at the risk of more dramatic shifts in the long run because errors accumulate rather than dissipate when government policy is not adjusted to accommodate changing policy aspirations.

Given the centrality of the appeals system in China, the dynamics of attention allocation should follow cross-regional variation in the volume of appeal cases. As a tentative analysis, the number of appeals (per 100,000 citizens) appears to be negatively correlated with the estimate of punctuated instability in government budgetary allocation. In Figure 4, our data shows that this claim only holds for regional governments with relatively underdeveloped mechanisms for citizen participation; these regions experience significantly less intense punctuated instability if there are more labor disputes. More disputes do not lead to a significant decrease in punctuated intensity for regions with more developed capacity to receive and process citizen complaints and
views. The result indicates that governments exposed to less disruption through the citizen appeals system experience more volatile changes in attention allocation. According to the theory of autocratic attention allocation, inertia is a common feature of centralization but its effect can be attenuated to a limited extent.

Figure 4.3. **Intensity of punctuated attention allocation and frequency of labor disputes.**
Regional administrations are sorted into two groups based on information capacity. The Pearson’s product-moment correlation is significant in the low-capacity group at $p < 0.05$ while the high-capacity group estimate is not ($p = 0.36$).
The result suggests that the exposure to external disruption in autocratic systems may be critical; the leptokurtosis in budgetary allocation is systematically related to the extent of government exposure to policy information. Where the number of appeals goes up, the policy process is less likely to experience radical shifts compared to other provincial governments. Punctuation increases in provinces with lower number of citizen appeals. The analysis here is only tentative because it does not control for the effect of alternative sources of instability. Factors such as protests and mass mobilization, economic performance, social stability, and interference from the central government can also shape policy attention at the provincial level. Yet, as a substantively neutral statistic, appeal numbers can broadly reflect the extent governments are exposed to citizen demands for attention to be allocated to existing as well as emerging policy problems. Also, provincial autonomy has grown considerably in the post-Mao era (Lieberthal and Lampton 1992), so there is also a theoretical basis to attribute only a small portion of the overall instability in attention allocation to interference from the central government.

Conclusion

Current research on policymaking and regime transition points to the rise of “stickiness” in the policy process following democratization. The idea that moving from autocratic rule toward more decentralized power and divided government leads to more reactionary policymaking is prevalent in the literature. For example, Aparicio et al. 2005 find that in the post-reform Mexico, “policymaking is increasingly wedded to the status quo” because “checks and balances are permitting old and new parties and interest groups to veto agreements on key reform areas” (p.4).
A critical contribution of this analysis is to empirically challenge this thesis. In Hong Kong, attention allocation became less punctuated after the adoption of democratic institutions. Both the Hong Kong and China figures reveal that autocratic systems are less responsive in attention allocation compared to the US and UK governments.

However, the results presented in this chapter do not challenge the view that bargaining creates stability by blocking unilateral decisions. Attention allocation is difficult to change incrementally when decision-making is dispersed and the status quo cannot be moved without extended mobilization. Rather, the findings run against the implicit mischaracterization of autocratic regimes as more efficient in decision-making relative to liberal democracies. Though the autocrat may have relative ease in decision-making, it appears that they are unable to exercise their discretionary power to effect efficient change. And that inefficiency appears to have much to do with the extent that independent information on policy problems is available. Autocratic institutions create information disadvantage that more than undo the potential advantage of removing minority obstructionism by suppression diverse and independent sources of policy information (Wintrobe 1998).

A theory of punctuated equilibrium in autocratic regimes is outlined and illustrated with case evidence. This chapter points out why institutional friction, a central concept in the punctuated equilibrium literature, cannot explain punctuation in autocratic governments. In democratic governments, decentralized institutions increase the costs for transaction. Thus more centralization means less punctuated pattern of attention allocation. If the concept is directly applied, it would follow that autocratic regimes experience even less punctuation because the usual sources of costs for coordination are absent. Such an expectation is based on two important assumptions about the upkeep and exercise of centralized power in the autocratic state.
These assumptions do not apply to the autocratic state, where centralized power is achieved at the cost of drastic reductions in information exposure. Wintrose (1998) observes that in suppressing collective action and dissent, autocratic institutions create disincentives for citizens to reveal true policy preferences. If the assumptions about institutional friction cannot be applied, it is unclear how attention allocation works under autocratic institutions and whether punctuated equilibrium describes the pattern of attention allocation under autocratic institutions at all.

With the right case selection strategy, the implications of this expanded research program run far beyond the punctuated equilibrium literature, which has so far been parochially applied to the US system and similar liberal democracies. The concept of government information processing can be used to characterize different regime conditions. It shows that apart from the problem of succession crises and credible commitment, severe information processing inefficiency could be another significant source of threat to autocratic regime survival (Magaloni 2008; Magaloni and Kricheli 2010). It moves beyond the simple challenge of gathering reliable and comprehensive information on well-defined and focal issues; research has suggested that autocracies can do so where the information goals are clear. Rather, the real challenge concerns whether autocracies can efficiently process information about complex, multifaceted problems whose nature, severity, and even relevancy defy top-down characterization and definition. With respect to the information challenge, the deficiencies of bounded rationality become more pronounced because autocratic institutions encourage the temptation of clarity (Baumgartner and Jones forthcoming) at the expense of content diversity and source independence. Democratic agenda competition attenuates the problem by exposing bounded rationalists to frequent perturbations.
Because agenda competition, like market exchange, operate with severe inefficiency in the absence of democratic institutions (Olson 2000), the challenge of inefficient attention allocation appears to be inherent in the design of autocratic institutions. To protect centralized power, autocrats must exercise discretionary power sparingly and suppress collective action. This is the dilemma of autocratic governance that has been discussed in the comparative politics literature. In sum, liberal democracies face the challenge of efficient attention allocation because there is limitation on the extent that political leaders can shift agenda focus between issues. The less control they have on the agenda process, the more punctuated attention allocation becomes. For the autocratic ruler, the very microfoundations of punctuated equilibrium are critically different.
Chapter 5

Signals and Noise in Organizing Bureaucratic Attention

This chapter shifts the focus of analysis from broad characterizations of separate processes of attention allocation to how they interact. Because institutional centralization creates a stronger attention “vortex” for the authoritarian, policy signals and bureaucratic attention do not punctuate jointly when those signals are insulated by centralization from policy-specific contingencies. Prioritization becomes difficult when signals become noisy; with increased uncertainty, attention adjustments become frequent but more moderate in scale. These effects of policy signals on bureaucratic attention should vary contingent upon the political structure regulating administrative control and exposure to agenda challenges.

Despite Hong Kong’s “executive-led” system, punctuations in executive attention were not significantly linked to agency reorganization. Instead, reorganization punctuates with radical changes in legislative attention. This unexpected alignment is attributed to the legislature’s greater exposure to diverse or “entropic” information, much of which is excluded from the centralized executive priorities. Being functionally specialized, government bureaucracies are similarly responsive to domain-specific events. An increase in noise in executive signals corresponded with less punctuations in administrative reorganization, but more noise in legislative attention increased punctuations in administrative reorganization. These contrasts highlight how bureaucrats process signals differently in a highly centralized system that also seeks to include potential policy challengers in marginal decisional settings.
Introduction

A recurring problem that the punctuated equilibrium literature has examined only indirectly is whether and how punctuations arise from interactions inside the government. Jones and Baumgartner (1993) tested the claim that punctuated equilibrium varies progressively; the plethora of rules and lack of direct exposure to external challenges render policy processes towards the end of decision-making far more punctuated than the less accessible and institutionally constrained processes, such as elections and legislative proceedings. This interpretation entails that these processes are relatively independent from each other and that punctuated equilibrium arises internally depending on how aggregative the decision-making process is or how the process has behaved historically (Baumgartner et al. 2009; Robinson 2004).

There are few studies on the interactions underlying government attention allocation. In the United States, the bureaucrat is answerable to institutional rivals, including the President, Congress, and the judiciary (Mayhew 2005). Furthermore, constitutional decentralization in liberal democracies creates institutional friction by enabling minority groups to obstruct change in policy processes (Coglianese 1997; Salamon 2000). It follows that bureaucratic attention experiences punctuated instability because the process essentially compresses a large number of decisions into policy outputs through “complex” mechanisms for decision-making (Baumgartner et al. 2009; Jones 2001). In other words, punctuations in bureaucratic attention arise due to “native” agency institutions determining the number of principals and how they can influence bureaucratic decisions.
This chapter considers the exogenous influence of policy signals in the special context of authoritarian governance. Without effective institutional support for minority obstruction and institutional rivalry under authoritarian rule, how can punctuated equilibrium arise? In the last chapter, I have studied the constraints of centralization on information exposure as the primary source of punctuated instability in authoritarian systems taken as a whole, but the theory does not deal with attention allocation inside the system as interacting processes. It is my contention that key attributes of policy signals—punctuations and noise in particular—critically influence the dynamics of bureaucratic attention via such interacting processes. In the extant literature, signals are often treated as a constant so that variation in institutions explains just about everything in punctuated equilibrium; I have shown in the case analysis on Hong Kong and China that this position has limited generalizability. Scholars have argue recently that theory should be more explicit on the attributes of policy signals and how those attributes determine the dynamics of bureaucratic attention under varying institutional constraints (Baumgartner and Jones 2014; Boydstun et al. 2014). In response to that, this analysis will contribute to a more complete understanding of how punctuated instability directly relates to the structures of power and interaction over information processing under authoritarian rules.

In Hong Kong, the government is headed by a dominant executive. The constitution gives a marginalized legislature limited oversight on expenditure and agency structure (Cheung 2010); this asymmetry is preserved even after important constitutional and administrative changes in the post-colonial era (Lee 1999). As I explain later on, this structural pattern places Hong Kong in regime categories that are not filled by liberal democracies and more autocratic forms of government. The contrast between the powerful executive and the marginal legislature also
provides within-case differences for testing the thesis of authoritarian’s information disadvantage advanced in recent studies (Lam and Chan 2014; Chan and Zhao 2014).

*Cognition, institutions, and information in bureaucratic attention*

In the rationalist conception of information processing in government, the environment is a steady stream of signals reflecting changes in problem nature or policy preferences of the principal, and the bureaucrat’s task is to process these signals and optimize policy response. By comparison, the bounded rationalist begins with the reality that she does not have the cognitive resources to capture and process such signals indiscriminately. Constrained by bounded rationality, bureaucrats resort to crude approximations, limited solution search, and other heuristics or mental shortcuts to avoid the computational costs of information processing required by comprehensive evaluations of problems or exhaustive comparisons of alternative solutions (Simon 1965; Jones 1994). As a consequence, attention is allocated disproportionately; except the very few signals that reflect extreme urgency and seriousness, most information is simply ignored (Simon 1978). In prioritizing only the most salient issues and ignoring all others, decision-makers attend to problems serially and update solutions in an episodic style (Jones and Baumgartner 2014; Jones 2001).

In punctuated equilibrium theory, bounded rationality leads not only to incremental changes in policy agendas but prolonged periods of stasis punctuated by short but dramatic spurts of overreaction. To economize on cognitive resources and attention as a scarce resource, problem solvers use pre-formed response mechanisms for recognized problems and only analyze new issues from scratch when none of them offers a sufficient approximation (Simon 1990).
Another key bias in bounded rationality is that individuals can only handle signals serially. Instead of spreading attention across issues, attention is focused on a single issue at any time point (Jones 2001). Inefficiencies in attention allocation from the bureaucrat’s inability to handle signals efficiently, even assuming that the signals are themselves efficient (Jones and Baumgartner 2005b).

While cognitive limitations form the basis for inefficiencies, punctuations in government attention are shown to vary in intensity with institutional structures (Baumgartner et al. 2009; Jones et al. 2009). Students of government information processing attribute punctuated instability to a range of institutional factors including the structure of decision-making and the extent of institutionalization. Jones (2001, p.170) submits that “the structure of government, in the United States at least, allows a minority to block changes in a status quo. In many situations, it takes extraordinary majorities to change policies. Even if the participants were fully rational, there would nevertheless exist a tendency to follow the status quo… Unlike pure markets, democratic policymaking is not the simple sum of individual decisions. Governments do not just add up individual decisions. They translate individual decisions, weighted in complex ways, into collective ones, binding on members of society. This makes government and politics fundamentally different from market.”

The “complex ways” to which Jones refers are can be measured on a scale of “institutional friction” or the institution-enabled resistance of opposition groups to block and obstruct adjustments in processes including the allocation of bureaucratic attention to policy signals (Jones and Baumgartner 1995). This relates to various forms of stasis, or gridlock, with the strategic exploitation of checks and balances in the political system to obstruct change (Cox and Kendell 1991; Kingdon 1984; Krehbiel 1996). Empirical studies in the field of government information processing suggest that institutional friction, generated by structurally embedded resistance to change in a democratic and participative process of policymaking, is increased
when the system allows minority interests to obstruct changes in the status quo; the delays lead
to short-term stability but dislocations and equilibria due to intensification by long-run error
accumulation (Jones 1994). Studying the stochastic processes in a range of government and
economic domains, Jones et al. (2003; also Baumgartner et al. 2009) find that policy domains
with higher decision and transaction costs experience greatest punctuated volatility. Breunig and
Koski (2006) also contend that variation in the intensity of punctuated equilibrium across US
state budgets is probably a function of institutional heterogeneity.

Although the discussions on cognition and institutions are extensive, information itself
has received relative scant attention in the extant literature. This is because information has been
treated implicitly as a constant. Information is always noisy and voluminous, rendering bounded
rationality and its attendant cognitive constraints a given across all environments. But since
signals can vary in diversity and salience (Shannon 1946), part of the attention outcomes should
depend on these attributes (Baumgartner and Jones 2014; Boydstun et al. 2014; May et al. 2009).
Models of bureaucratic attention should particularly examine how the dynamics of punctuated
instability changes with the quality and intensity of signals. Another issue with the current theory
on bureaucratic attention is that most studies only characterize entire policy processes. At this
level of abstraction, it becomes unclear how information quality, which changes more frequently
across time in comparison with the more enduring institutional features, actually influences the
intensity of punctuation. Recent models of individual events of punctuated instability have
opened analytical possibilities for finding out whether bureaucratic attention interacts with other
information processes in government, rather than attributing its dynamics exclusively to native
institutions (Robinson et al. 2007).
Policy signals and noise

In information-theoretic terms, noise is the random, unstructured discrepancies in signals that interfere with the communication of information (Shannon 1949). Noise in policy signals interferes with the organization of bureaucratic attention in a comparable fashion. Political actors can issue policy statements – such as legislative motions and executive orders – to highlight administrative goals and focuses. Ideally, political actors should set out their priorities by focusing policy statements on issues of interest so that their preferences can be clearly articulated for bureaucrats (Gailmard and Patty 2012), but in the presence of multiparty competition for agenda control and issue ownership, noisy signals such as multi-issue legislations and the use of ambiguous language in directives dilute the focus while in other situations signals become noisy due to gridlock (Boydstun et al. 2014; Goertz 2011; Sinclair 2011). If signals are spread more or less evenly across issues, then most issues receive some degree of bureaucratic attention and noise increases due to a lack of focus. Information becomes “entropic” in that the content of signals cannot be predicted with probabilities of success much higher than random assignment.

Depending on how issue focus is achieved given institutional constraints on information processing, noise can lead to critically different outcomes for bureaucratic attention. Should they choose to do so, authoritarians can unilaterally concentrate attention on particular issues without reference to minority preferences. Therefore, more centralized attention processes entails lower costs for achieving focus. When noise increases, bureaucrats become uncertain as to what the principal wants; to avoid repercussions, bureaucratic attention adjusts more incrementally but also in greater frequency. By contrast, the process can be more decentralized and contentious in other parts of the decision-making process. The costs of mobilization are high in deliberative
settings where multiple parties are involved, each bringing in an issue interest particular to the interests they represent. Since focus is far more difficult to achieve in policy signals arising from decentralized attention processes and it takes considerable impetus to get coordinated on a focused agenda, when it does the bureaucrat—being part of the political system—is likely to experience the same pressure to shift attention allocation radically.

Whether bureaucratic attention corresponds with noise in policy signals varies with institutions, in particular the institutions regulating the signal sender’s power relations with the bureaucracy and the extent that the sender is exposed to “entropic”, or contradictory, information. In authoritarian systems like Hong Kong’s “executive-led” administration, the impact of noise and signals emerging from the authoritarian’s policy agendas should be very different from those coming from marginalized, fragmented venues with formal powers that are very difficult to harness due to high thresholds for coordination, namely the Hong Kong legislature.

While cognitive biases and institutional friction describe the basis of punctuated equilibria in general government processes, the model of bureaucratic attention requires specification with respect to the role of bureaucrats as consumers and processors of policy signals. Bureaucratic attention is organized to deal with political signals in a dual interplay “between intervening and designing new routines” (May et al. 2008, p.521; see also Workman 2009). Administrators can remodel existing formal rules to accommodation new attention signals and address the policy problems under the current institutional context. The policy problem is delegated to established operations overseen by experts at the lower levels of the agency, an arrangement that dampens the policy signals in the long run. Alternatively, administrators can choose to preserve discretionary power to increase response flexibility by centralizing authority
and adopting informal procedures. Whereas control is ceded to the lower levels of the
government through routinization, the choice of centralization means control is reserved for
those in senior management. Signals become amplified through authority centralization. Their
research reveals that policy outcomes can vary critically depending on the decision to delegate or
centralize authority.

As an extension of the channeling model, we shift the focus to how bureaucratic
organization of attention interacts with the attributes of policy signals, particularly properties that
exacerbate the cognitive limitations reviewed earlier. The information processing theory of
bureaucratic attention revisits the problem of punctuation spillover. Due to the aggregative
nature of punctuated instability, the spillover effect is limited even to individual strata in a
hierarchical system; it follows that punctuations experienced by political leaders do not
automatically create punctuations in the bureaucratic process. In the information processing
perspective, punctuated equilibrium arises from prioritization. Restricting attention allocation to
a few prioritized issues increases clarity in the information decision-makers receive, but the
reduction in diversity sows the seed for punctuations in the long run because information
indicating changes in problem nature and policy inefficacy is likely to be excluded as well.

In this analysis, two important attributes of institutions regulating the sender’s relations
with the bureaucracy and their exposure to information inconsistent with existing priorities are
considered. First, exposure can be diversified with fewer barriers to challenges and a greater
scope for deliberations. Attention allocation that is exposed to more diverse sources of
information is likely to punctuate with bureaucratic attention, i.e. co-punctuation, because
bureaucracies are more functionally diverse and compartmentalized. With respect to institutional
hierarchy, attention processes in political venues to which the agencies are subordinate are
expected to align. Agency problem aside, the bureaucrat follows the political principals in terms of attention allocation.

_Bureaucratic attention under “executive-led” authoritarianism_

Reinstituting the colonial constitution of the 1840s, the post-war British administration in Hong Kong avoided major changes due to geopolitical considerations (Tsang 1988). As a result, many of the authoritarian features were retained by the postwar Hong Kong government and collectively constituted the structural framework for an “executive-led” system in which the governor (or chief executive after the handover to Chinese rule 1997) served both as head of government and administration and, with the support of the administrative departments, exercised expansive powers in both policymaking and implementation (Constitutional Affairs Bureau 2007).

Without an electoral base of support, the Hong Kong government involved leading professional and business figures in government advisory committees and statutory bodies where senior officials consulted industry representatives in an institutionalized setting, with a view of legitimating decisions as the result of multilateral deliberation rather than unilateral dictation (Miners 1981). The development of such a system had a symbiotic implication for government-elite interaction. Involvement of experts would be critical when the issues were too technical for generalist officials to address adequately. Through what Endacott calls “government by discussion” (1964), the involvement of professional and business leaders as partners in decision-making would bring legitimacy to the outcome. King (1975) referred to the design as “administrative absorption of politics”, where political differences were contained through power
sharing with critical allies in different policy domains. Elites were co-opted into a patron-client structure in which policy favors and public honors were dispensed.

Elite participation was confined to a handful of deliberative bodies such as the Legislative Council where decision-making power was shared to a limited extent (Tsang 1988). The executive remained essentially centralized. Assisted by the colonial civil service, the executive leadership oversaw day-to-day government operations and assumed the role of ultimate arbitrator of disputes (Lam 2005). Such an institutional arrangement delimited the scope of elite participation and the centralized aspect of authoritarian governance (Cheung 2000; Scott 2000). The executive was headed by the colonial governor (chief executive after 1997) who made decisions in consultation with the Executive Council, a body of elite decision-makers drawn from the senior civil service and main professional and business interests in the city. While this arrangement was comparable to the pre-reform legislature, the governor-in-council (chief executive-in-council after 1997) enjoyed significantly more direct control of the administration, including the power to propose changes in agency structure and expenditure to the legislature, and oversaw government policymaking based on aggregate outcomes for the society at large rather than the interests of specific groups and businesses (Chung 2001).

Under the “executive-led” framework of public administration, how the executive leadership was formed and what it was tasked to do should have been a critical factor in information processing. If legislative attention was driven by the competition between sectoral interests and spread across issue-specific concerns, executive attention in comparison was channeled to a narrow set of governance priorities – the implications of government policy for social stability, economic growth, and regime survival (Chan 2008; Rabushka 1979). Previous research shows that executive attention was more punctuated than legislative attention (Lam and
Chan forthcoming). Such a contrast could have arisen from the negative impact of restrictive information prioritization and membership on the executive branch’s responsiveness to issue-specific problems (see also Baumgartner et al. 2009). Another major consequence of these constraints on executive attention would lead to poor alignment with the attention shifts of the functionally specialized bureaucracies. Issues underlying major shifts in bureaucratic attention at the agency level might have little relevance for the executive leadership approaching them at the aggregate level.

Institutional and administrative changes since the 1980s reshaped Hong Kong’s political order in important ways. Many of the ministerial positions are now filled by political appointees. Unlike the administrative officers who shared a long-term view of government policy (Tsang 2007), these outsiders are motivated to pursue their own policy objectives, leading to conflict with other departments from time to time (Lam 2005). Cheung (2000, pp. 301-7) argues that policy processes is increasingly exposed to external political forces. “Whereas the colonial form of state interventionism was endogenously driven by bureaucratic reformism”, the post-colonial administration “is clearly more subject to exogenous forces” that “had been able to enjoy direct and favorable access to [central government] officials in Beijing and to influence them in their policies towards Hong Kong and the selection of high-ranking officials”. Despite these changes to the nature of authoritarian politics (Chan et al. 2011; Cheung 2002; Scott 2000), the institutional fundamentals regulating executive and legislative attention are not structurally revised. In fact, by aligning agency incentives with sector interests, they could have even accentuated the discrepancy already present under the more centralized structure in the pre-reform era.
Hypothesis

This analysis focuses on the link between punctuated instability in bureaucratic attention and punctuations and noise in policy signal, as well as the role of institutions in shaping these relationships.

Focusing on punctuated instability in attention allocation, the first hypothesis claims that

\[ H1: \text{The level of punctuated instability in bureaucratic attention changes with punctuations in policy signals.} \]

The punctuations in question are major shifts in policy attention. If the policy attention of the authoritarian elites experiences a punctuated change, then bureaucratic attention over the same policy topic will also punctuate in response. In addition, the relationship should be positive; punctuations in policy signals issued by the elites mean punctuations in bureaucratic attention.

The second hypothesis turns to the effect of noise. It claims that

\[ H2: \text{The level of punctuated instability in bureaucratic attention changes with the level of noise in policy signals.} \]

With more noise, bureaucratic attention is exposed to frequent, uncertain changes in the focus of policy signals. With less noise, the agenda focus becomes clearer and the focus of new signals more stable. Less uncertainty creates the problem of narrow prioritization that leads to more stasis and subsequently greater likelihood of punctuated shifts.
The third hypothesis considers the institutional context and states that

\[ H_3: \text{The impact and direction of change stated in } H_1 \text{ and } H_2 \text{ depends on the institutional origins of policy signals.} \]

More specifically to the case of Hong Kong, punctuated shifts in bureaucratic attention are regulated by policymaking institutions. Under the “executive-led” framework, authoritarian institutions should presumably lead to a close alignment of bureaucratic attention with the executive agenda. However, because punctuated changes differ from the more contained adjustments structurally (Epp and Baumgartner 2014; John and Bevan 2013), punctuated changes might actually have varied with legislative attention instead due to the body’s exposure to a variety of independent, even competing information sources, leading to more aligned punctuated dynamics with the bureaucracy which is also functionally and informationally diversified and compartmentalized.

Data and measures

The dataset is compiled from a large set of archives on legislative deliberations, executive policy statements, agency annual reports with information on budgetary allocations and establishment, and government reports with data on organizational restructuring. The results are cross-checked with available secondary sources (e.g. Ho). Data collection procedures were adapted from the Policy Agendas Project in the United States (citation). For the data on policy attention, research assistants were trained and supervised by expert coders to sort each observation by issue topic.
Any conflicts in coding were addressed by the supervisors and inter-coder agreement analysis was performed to ensure comparable application of the codebook by all assistant coders. Descriptions of the dataset are presented in Table 5.1.

<table>
<thead>
<tr>
<th>Reorganization event</th>
<th>overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>abolition</td>
<td>5</td>
</tr>
<tr>
<td>creation</td>
<td>99</td>
</tr>
<tr>
<td>transformation</td>
<td>51</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>119</strong></td>
</tr>
</tbody>
</table>

Table 5.1. *Descriptions of the dataset.*

Following the examples of existing studies (May et al. 2009), this analysis adopts measures of administrative reorganization as a proxy of bureaucratic attention. Structural reorganization comprises of three event categories: agency creation, abolishment, and transformation (Chan 2008). Agencies are created to accommodate new policy agendas and are abolished from time to time when the policy agendas are no longer valid or suitable. Transformation events, such as agency restructuring and changes in the legal framework, also happen to accommodate major changes in the policy agenda. The dataset contains a total of 119 instances of structural reorganization in the post-war era (see Table 1). The dataset then extends to the annual budget and staff establishment of government agencies. The annual the “percentage-percentage” change in agency expenditure and establishment is computed from

\[ p_{it} = \frac{x_{it} - x_{it-1}}{x_{it}} \cdot 100, \]

where \( x_{it} \) and \( x_{it-1} \) are agency i’s shares of the total government expenditure or the civil service establishment in years \( t \) and \( t - 1 \), respectively. Because these variables capture bureaucratic
attention in different domains, changes in one domain should not have persistent and systematic impact on changes in other domains.

While events of structural reorganization are automatically identified as punctuated changes, punctuated changes in agency expenditure and establishment are isolated using a method previously applied to the analysis of punctuated equilibrium in school budgets (Robinson et al. 2007): I estimate the mean, variance, and probability density of the empirical distribution of the spending and staff changes in each government agency, and then impose the theoretical normal distribution derived from the same mean and variance of the empirical distribution. Since the empirical distribution of punctuated changes is leptokurtic (Jones and Baumgartner 199X), the empirical and the theoretical distributions will intersect at four points. Changes located outside of the outer intersections are classified as punctuated shifts.

The instances of punctuated agency reorganization are grouped by year and policy domain into count variables. The categorization is based on the Hong Kong codebook for policy agendas, which is a customized version of the codebook published by the Policy Agendas Project for the US studies of punctuated equilibrium. To identify punctuated changes in policy signals, I apply the same procedure to the data on political attention in policy address and legislative sittings. The policy address is an annual policy statement delivered by the governor (chief executive after 1997) while legislative sittings comprise of all motions and bills examined by legislators each year.

The measure of noise is Shannon’s information entropy (Shannon 1948):

\[
H = - \sum p(x_i) \log p(x_i),
\]

where \( H \) is a quantification of information in a stream of signals and \( p(x_i) \) is the probability of a signal on issue topic \( i \). Originally developed as an information-theoretic measure, the \( H \) value
can also serve as a measure of noise in the context of government attention allocation. The value of \( H \) decreases when signals are concentrated on a few topics, indicating a focused policy agenda. The value of \( H \) increases when the signals are more uniformly spread across the issue topics, so that none of the issues really define the primary focus of the policy agenda.

*Model specification*

Negative binomial regression is the preferred approach to modeling count dependent variables with over-dispersion. In this application, reorganization events are regressed on policy signals and noise both independently and interactively. To increase result interpretability and structural simplicity, noise and signals of executive and legislative attention are operationalized as separate variables. The signal-noise interaction terms are similarly separated by venue. The regression formula is

\[
P_i^B = \alpha + \beta_1 P_i^L + \beta_2 P_i^E + \beta_3 H_i^L + \beta_4 H_i^E + \\
\beta_5 P_i^L H_i^L + \beta_6 P_i^E H_i^E + \\
\beta_7 C^L + \beta_8 C^E + \beta_9 E_i + \varepsilon_i
\]

Where the dependent variable \( P_i^B \) is the number of punctuations \( P \) in bureaucratic attention \( B \) in policy domain \( i \). Variables on the right hand side of the equation can be sorted into three groups. The coefficients \( \beta_1 \) to \( \beta_4 \) model the relationship between major shifts in bureaucratic attention and punctuations in legislative attention \( P_i^L \), punctuations in executive attention \( P_i^E \), noise in the legislative agenda \( H_i^L \), and noise in the executive agenda \( H_i^E \). The second group contains two interaction terms—\( \beta_5 \) (legislature) and \( \beta_6 \) (executive)—for the joint effect of punctuations and noise on bureaucratic attention. The last coefficients \( \beta_7, \beta_8, \) and \( \beta_9 \) control for changes in the
membership of the legislature $C_L$, changes in the composition of the executive council $C_E$, and expenditure by policy topic $E_i$.

If punctuations in policy attention allocated by the executive and the legislature shape bureaucratic attention as H2 suggests, the estimates of coefficients $\beta_1$ and $\beta_2$ should be positive and significant. If an increase in noise adds to punctuated instability in bureaucratic attention, then $\beta_3$ and $\beta_4$ should be negative and significant. The estimates should be positive if less noise in policy signals means more volatility in reorganization activity.

Findings and discussion

The model indicates that punctuated instability is related to the noise and pattern of policy signals, and that the relationships vary in strength and direction depending on the institutional context in which the signals arose. Despite its constitutional marginalization (Miners 1981), the Hong Kong legislature appears to have held extensive influence on the punctuated instability in agency expenditure and structure. While the executive had the power to shape administrative changes unilaterally, punctuated changes in executive attention do not appear to explain instability in any of the reorganization processes. However, in agency establishment – the one domain of administrative reorganization over which the legislature could exert no direct influence – less abrupt shifts can be expected when executive attention becomes noisier.

While ensuring the executive’s control of the bureaucracy unchallenged on a day-to-day basis, the Hong Kong constitutional framework allows legislature to moderate the executive power in critical junctures, and it is these particular mechanisms that underlie the punctuated instability. Legislative approval was required for fiscal and structural changes, the role of the
The legislature is more pronounced in government expenditure and agency structure; it has no discernible role in agency establishment because in containing the legislature to fiscal and structural issues the “executive-led” constitution also limited the extent that punctuated instability in legislative attention could influence reorganization events outside of these domains. This explains why there was no link between legislative attention and agency establishment, the only domain over which the executive had unshared control.

The governor-in-council (or chief executive-in-council after 1997) held control over agency personnel (establishment). The legislature has the power to authorize government fiscal applications (expenditure) and changes to agency jurisdiction (structure). The statistical estimates for the effects of noise in the two bodies on reorganization reflect this very separation of administrative power in the Hong Kong government (Figure 5.1).

![Figure 5.1. Coefficient estimates on noise and signals.](image)

Executive attention appears to be relatively marginal to punctuated equilibrium in bureaucratic attention except in the area of agency establishment over which executive control was direct and unshared. In agency expenditure and structure, the legislature was a prominent force thanks to its role in approving agency budgetary and restructuring proposals.
### Table 5.1 Coefficient estimates with negative binomial for counts of events of punctuated dislocations.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable</th>
<th>establishment</th>
<th>expenditure</th>
<th>structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$ (Intercept)</td>
<td></td>
<td>1.22</td>
<td>-4.27 *</td>
<td>-10.51 ***</td>
</tr>
<tr>
<td>$P^L$ Legislative punctuations</td>
<td></td>
<td>3.03</td>
<td>2.42</td>
<td>12.32 **</td>
</tr>
<tr>
<td>$P^E$ Executive punctuations</td>
<td></td>
<td>-2.13</td>
<td>0.61</td>
<td>-0.86</td>
</tr>
<tr>
<td>$H^L$ Legislative noise</td>
<td></td>
<td>-0.46</td>
<td>1.19 *</td>
<td>3.12 ***</td>
</tr>
<tr>
<td>$H^E$ Executive noise</td>
<td></td>
<td>-0.77 **</td>
<td>0.38</td>
<td>-0.02</td>
</tr>
<tr>
<td>$C^L$ Legislative composition</td>
<td></td>
<td>1.38</td>
<td>-2.81 ***</td>
<td>0.67</td>
</tr>
<tr>
<td>$C^E$ Executive composition</td>
<td></td>
<td>-1.13</td>
<td>0.95</td>
<td>0.03</td>
</tr>
<tr>
<td>$E$ Budget size</td>
<td></td>
<td>-0.01</td>
<td>-0.01</td>
<td>0</td>
</tr>
<tr>
<td>$P^LHL^L$ Legislative punctuations * legislative noise</td>
<td></td>
<td>-1.31</td>
<td>-0.95</td>
<td>-4.73 **</td>
</tr>
<tr>
<td>$P^EHE^E$ Executive punctuations * executive noise</td>
<td></td>
<td>0.8</td>
<td>-0.33</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Less immediately discernible is why noise works in opposition direction. Noise in legislative attention corresponds to more punctuations in agency expenditure and structure but noise in executive attention corresponds to less punctuations in agency establishment. We attribute the contradiction to institutional contrasts between the executive and the legislature. Inside the executive, decision-making is highly centralized in the hands of the top leadership, even though the chief executive saw its power somewhat undercut by the administrative reforms after the handover (Lam 2005; Scott 2000). When the head of government did not follow a sufficiently focused policy agenda, the momentum for rapid, top-down administrative reorganization would be lost. Policy inertia would dominate as routinization took over the process of bureaucratic attention allocation. Centralized decision-making means that lower-level officials could only negotiate changes on the edges of current policy and lacked the formal power to undertake drastic changes without explicit signals from the top leadership sanctioning such changes.
If attention allocation in the executive branch was shaped by top-down control, legislative attention was more reliant on bottom-up negotiations. Though the pre-election legislature maintained the appearance of unity, the decision process was contentious behind the scene (Chung 2001); the tension only graduated into open confrontation after the introduction of party politics and limited representation in the 1980s (Scott 2000). This contrast explains why agency expenditure and structure punctuated when legislators failed to form a focused agenda while more focused executive agendas were associated with less punctuations in administrative reorganization. The relatively decentralized and passive nature of legislative decision-making makes effective mobilization against any given administrative reorganization a serious challenge; an increase in noise would mean that as a veto player, the legislature could not act as effectively as it could with a focused agenda. Recall that changes in agency budgets and structure (but not establishment) must be initiated by the executive branch as a matter of constitutional prerogative, but the legislature retained the power to reject these proposals. Therefore, noise worked in opposite ways depending on the functions and powers assigned to the executive and the legislature under the constraints of authoritarian power sharing (Boix and Svolik 2013).

The control variables on elite composition and budget size cover other important factors in bureaucratic processes. The stability of elite composition seems to relate significantly only to punctuations in agency expenditure; a more stable legislature means less punctuated instability in agency budget allocations, but the condition is otherwise irrelevant to the punctuations in other aspects of administrative reorganization. Budget size appears to have no significant relationship with any of the reorganization activities, reinforcing the argument that policy-specific attributes may not figure prominently insofar as punctuated dynamics is concerned.
Conclusion

The initial analyses appear to provide some empirical support to all of the four hypotheses. Reorganization dynamics is punctuated, underlining the claim of universality proposed in the PE literature. There is also considerable variation in the level of reorganization volatility across periods (i.e. regime types) and policy domains. The results indicate that the original thesis is also supported.

While the model explains punctuated instability in a localized context, it contains important insights on the general effects of political signals and government attention allocation on administrative reorganization. Focusing on the institutional foundations, this analysis provides ample evidence that institutions matter in government information processing. Modeling different aspects of bureaucratic attention separately, the estimates reveal that only some signals are associated with major shifts in the administrative organization, suggesting that existing research characterizing regime institutions as a whole has captured only the

Secondly, the analysis shows that the presence of noise as an attribute of policy signals matter. Until recently (Baumgartner and Jones 2014), noise has not been carefully analyzed as an important component in punctuated equilibrium. This empirical result is significant to the growth of government information processing theory. Communication theory has always focused on the problem of signals (Shannon 1948; 1949), whereas punctuated equilibrium has always emphasized the institutional and cognitive constraints on attention allocation. The transition from the punctuated equilibrium thesis to the theory of information processing in government requires a thorough theoretical understanding of policy signals and their defining properties and how they
interact with institutions (Jones and Baumgartner 2012). The case study shows that noise in policy signals

The theoretical implications of the case study concern the direction of theory development. The findings corroborate with the broader descriptions of authoritarianism and punctuated equilibrium in contemporary authoritarian states, where the mechanisms for information processing contain perturbations through a restrictive process for policy attention to effect change. The theory has empirical support at the higher level, but the mechanisms for policy information to be processed restrictively and for change to in response cannot be empirically understood. The analysis suggests that why information flows inside government matters to the question about information processing across regimes, responding to a new direction of research that has just begun to receive attention to due growing evidence showing that the foundations of punctuated instability are institutionally diverse and a single theory of punctuated equilibrium is far from sufficiently capturing this diversity (Baumgartner and Jones 2014; Jones and Baumgartner 2012; Lam and Chan forthcoming).

Another implication is that the primary institutional foundations of the day-to-day operation of a regime are unlikely to be those that account for punctuated instability. The case study reveals the overlooked importance of the Hong Kong legislature as a critical force in large-scale agency reorganizations under the “executive-led” framework for authoritarian governance. While the current iteration has not empirically addressed the relative superiority of the executive in small agency changes in comparison to the apparent dominance of legislative signals in punctuated changes, it adds weight to the May et al.’s (200X) argument that bureaucrats discriminate certain policy signals while giving a more specific answer on the role of institutions in bureaucratic signal channeling. The findings here will shift the focus on obvious institutional
contrasts across regime types to the less immediately discernible institutions that are more relevant to the exceptional events of punctuated change (Breunig and Jones 200X).

From a theoretical point of view, bureaucratic attention should be as much a response to political pressure as an outcome of internal deliberations within the departments. A series of studies by Robinson and colleagues () has convincingly shown that punctuated equilibrium can arise from structural conditions. Another direction for future research is to compare these instances of punctuated reorganization with those from democratic governments, where the government branches can be more equal in power and influence (Jones and Baumgartner 199X). These efforts would create a stronger link between the theory of the bureaucracy and policy processes and the study of regime types.
Chapter 6

Discussions

This dissertation began with a theoretical nonstarter: does punctuated equilibrium become more intensified with less effective minority obstruction? According to standard theory, punctuated equilibrium is synonymous with institutional friction, in that the less resistance there is to changes in the status quo, the more efficient the process of attention allocation becomes. In an attempt to increase the durability of current policy, sectoral interests exploit veto points, restrictive access, and subsystemic decomposition to block change in the status quo. It follows that structural fragmentation extends delays in response, and more centralized systems are less vulnerable to this form of inefficiency. This has been the consensus in the field, with support from extensive comparative studies showing how friction varies positively with the intensity of punctuated equilibrium.

The opposition group’s function as the force of obstructionism is especially pronounced in decentralized systems such as the United States, where the institutions are explicitly designed to sustain institutional rivalry (Mayhew 1991). In comparison, more centralized democracies such as the United Kingdom and other mixed parliamentary systems should and do experience less punctuated instability because opposition groups are institutionally marginalized and their resistance to change is inevitably less effective (Tsebelis 2002). Given a wealth of evidence pointing to a strong positive correlation between institutional friction and punctuated intensity in liberal democracies, to expect the abatement of punctuated equilibrium in authoritarian states,
where common sources of institutional friction are necessarily absent, requires but a small leap of faith.

So why does the data show that punctuated equilibrium grows in intensity under authoritarian institutions when theory predicts the exact opposite? My dissertation has made a significantly contribution towards resolving this puzzle. Like the disruptive, non-incremental shifts in the early incrementalist research on government budgets, it turns out that the intensification of punctuated volatility under authoritarian institutions is more than just an atheoretical anomaly. My work presents a new theory of punctuated equilibrium under authoritarian institutions and it argues that institutional friction is a narrow conception of what minority or opposition groups do in policy processes. The fundamental issue is that current theory is built upon an imbalanced emphasis on minority obstruction. While how minority groups work as veto players is extensively analyzed, their contributions as challengers to established order is absent from current discussions with respect to punctuated equilibrium. Revisions towards a more balanced conception of the opposition in attention processes are required as researchers start to look at unfamiliar regime settings and interactions between attention processes inside the political system, both of which are addressed in this dissertation.

The findings point to is a review of foundational research that explains how advocates promote change in attention allocation, especially with respect to the temptation of clarity that troubles decision-makers in authoritarian and democratic systems alike (Jones, Baumgartner, and Talbert 1993; Worsham 2006). Democratic institutions mitigate the problem of narrow prioritization by exposing officials and their attention priorities to the uncertainty of periodic elections and advocacy challenges (Jones, True, and Baumgartner 1997; Kingdon 1984). When these perturbations disappear under authoritarianism, cognitive bias against entropic information
is amplified and punctuations in attention allocation are necessarily intensified. Cowperthwaite’s resistance to gathering economic statistics underlines the capacity of authoritarians to exclude selected pieces of information entirely from the policy process and how the temptation to control information processing arises from the need to protect existing priorities from challenges. In particular, Cowperthwaite’s efforts to resist calls for systematic collection of data on economic performance were motivated by a comprehensive economic program aimed at minimizing rent-seeking by minority groups representing business and agency interests (Goodstadt 2005).

Similarly, the Chinese regional administrations struggle to contain social mobilization through coercion and censorship. Prioritizing regime survival reduced the impact of dissent, limiting the government’s exposure to only views that are consistent with existing priorities and contributing to considerable inefficiencies in attention allocation as a consequence. The comparison between regional administrations reveals how frequent signals indicating threats to social stability lower punctuated instability when the mechanisms in place perform poorly in detecting other issues of concern (Wintrobe 1998).

Another new front of theory development is the transition towards an information-theoretical framework for analyzing the mechanisms of attention allocation. Researchers traditionally focused on characterizing entire attention processes in order to associate high-level institutional attributes with cross-system variation in punctuated intensity (Baumgartner et al. 2009; Jones et al. 2009). Although information processing is the crux of the theoretical work that drove these studies, information itself was assumed away in the analysis because it could be treated as a non-varying factor in models concerned primarily with institutional friction. To a certain extent, the theory justifies the assumption that policy information comes in far greater quantities than what
is manageable, and bounded rationalists pay “inattention” to most of the signals and focus serially on the few that matter (Jones 1994). Adopting this assumption in the interest of analytic simplicity is sufficient for theoretical debates at the highest level of abstraction, such as how incrementalism is incompatible with the basic features of bounded rationality (Jones 2001), why classical rationality is descriptively inadequate for models of information processing (Baumgartner and Jones 2005), and why the intensity of punctuated instability declines with more centralized institutions (Jones et al. 2009).

This assumption needs to be re-examined in preparation for the general shift of focus to internal mechanisms of attention allocation (May, Workman, and Jones 2008; Robinson 2004). Information varies in intensity (May…), clarity (Baumgartner and Jones…), and scale (Robinson…). In fact, information is a highly variable factor and such variation can be characterized on multiple dimensions. As such, I applied a mix of more traditional and innovative quantifications of information depending on the context: as labor disputes in Chinese regional government to capture the regime’s sensitivity to signals indicating threats to regime survival and as political pronouncements of the Hong Kong elite rulers to capture the information environment of the bureaucrats processing these indications of changes in the political agendas. With some context-specific modifications, standard analysis in the punctuated equilibrium literature can model government attention processes as the communicative interactions between senders and receivers; the relationship applies to external communication of signals (citizen appeals and disputes as signals for the regional administration in China) as well as internal communication of signals (political agendas as signals for bureaucrats in assigning attention to issues).
Recent works in government information processing have offered greater specification of the role of information (Baumgartner and Jones 2014). What the original theory has done is to uncover the cognitive and institutional foundations of attention allocation; this only deals with the processors of information and the structural context in which the processing of information takes place. Lacking in this approach is the recognition that information itself can shape attention outcomes. In this dissertation, I have considered the role of noise or diversity in policy signals using the Shannon’s entropy statistic (Boydstun, Bevan, and Thomas 2014). In the cognitive perspective, an increase in noise creates greater uncertainty for the receiver in the sense that the content of each signal is effectively random. I further characterize the strength or saliency of signals by measuring their relative distance from the average level of change. Information processes that are institutionally linked punctuate jointly. In the case analysis of bureaucratic attention in Hong Kong, bureaucratic attention shifts correspond with events of punctuated instability in legislative attention over agency budgets and agency structure whereas bureaucratic attention shifts correspond with punctuations in executive attention over agency establishment. These interactions highlight the institutional links the Hong Kong legislature has in shaping budgetary and structural changes in the bureaucracy in spite of its otherwise constitutional marginalization in the “executive-led” political system (Bianco, Chan, and Smyth 2014).

Information entering into the government from the political elites and information entering into the government from the grass-roots actors are analyzed separately in this dissertation. In the case of Hong Kong, I model bureaucratic attention as a response to two separate streams of elite attention allocation. In the case of China, I model official attention shifts as a function of the intensity of signals of social unrest. In the first scenario, information comes down from the top of the administrative hierarchy; information emerges from external actors in
the latter. Future iterations should model the two levels of information processing as co-occurring streams. As the literature on agency shows (Besley 2007), administrators are answerable to multiple parties. What matters is not only how they individually engage these actors, but also how the influences aggregate to shape bureaucratic performance (Gailmard and Patty 2012). Information processing theory should make this transition from univariate characterization of punctuated instability given a better theoretical and analytical framework for multivariate and dynamical modeling of attention allocation.

Finally, the true mark of a field’s maturity is the development of a sophisticated ontological map that shows how standard observations can be linked to the key dimensions or aspects of the primary concepts (Goertz 2006). The critical evaluation of some methodology in this dissertation shows that some serious ambiguities concerning quantification of attention allocation and the classification of events as punctuated shifts rather than incremental adjustments remain. These ambiguities are the result of arbitrary choices that would not have affected the core thesis of punctuated equilibrium thesis, but as the field progresses in the directions towards more sophisticated models (Jones and Baumgartner 2012), the problems can lead to indeterminate outputs.

My methodological critique focused on three aspects. First, broad characterizations of political processes and systems can change depending on whether change is normalized. Current theory is silent on what attention allocation means with respect to operationalization. I argue that measuring attention allocation based on within-topic percentage changes is conceptually different from measures that derive the changes in topic-specific attention already normalized as shares of total attention allocated. In the latter case, the dynamical nature of attention allocation
is confined to the proportionality of topic-specific attention, so that it captures attention allocation holding the capacity of information processing constant, whereas the dynamics in attention allocation comes from absolute changes in the former. Current theory has dealt with both sources of instability, but inflation in attention capacity introduces an additional aspect that has a relatively marginal value for current debates and can lead to unnecessarily analytical complications. The implications for analytical outcomes are shown by replications of representative studies in the field; the outcomes for claims about institutional friction as a contributor to punctuated instability become indeterminate.

Second, the choice of time frame or window for measuring change in attention allocation is often an arbitrary decision shaped by data availability. In some cases, we use long dataset to characterize political systems and processes when they are available. In other cases, data are not available for extended period of time. The problem rests with the fact that the pattern of punctuated equilibrium is by definition shaped by rare events, so that the characterization of a system based on too long or too short an observation window could bias the estimates. I demonstrate the problem of estimation using data from representative studies in the field.

Lastly, the choice of quantification method also causes different classification of events. This implication is reinforces the argument proposed respecting the arbitrariness of quantification strategies currently available.

In sum, the dissertation offers important theoretical and methodological lessons for the study of punctuated equilibrium. The point is that theoretical and methodological advances come hand in hand. First, because case selection has been confined to liberal democracies, punctuated equilibrium theory has never truly captured the full range of functions of the opposition but as
obstructionists. In authoritarian states, that function is not what causes punctuated instability in attention allocation; far from it, the intensification of punctuated dynamics arises from their disempowerment. Second, analytical sophistication is required to moving the research program from univariate characterization of political systems and policy processes to multivariate and dynamical modeling of information processing as interactive outcomes; the transition is necessarily for models to align with the extensive theoretical work on the microfoundations. Third, it seeks to highlight outstanding analytical challenges arising from conceptual ambiguities, the clarification of which would improve the theoretical foundations of future empirical studies and theory development.

This dissertation connects the information processing and punctuated equilibrium research to the study of authoritarian politics by showing empirical implications that are consistent with classical theories of autocracy, and to bureaucratic control through the demonstration of interactions between bureaucratic attention with political signals. Making these connections will be important for the growth of the field and keep the outcomes of research relevant to political science at large. It shows that the concept of punctuated equilibrium can contribute to multiple research programs other than information processing theory and both can profit from the discovery of these connections.
Chapter 7

Conclusion

The dissertation concludes with future research initiatives to connect the research program for authoritarian information processing with a variety of political phenomena of interest in comparative politics, policy theory, and the emerging theory of the politics of information. In doing so, I attempt to increase the relevance of a literature that has considerable untapped potential to reshape our fundamental understanding of politics. On top of these contributions to academic research, some of these initiatives will also contribute to professional training for workers in the public sector in search of new ideas to understanding how information is processed and what factors depend the policy and organizational outcomes of these processes.

It has been argued that authoritarian institutions are inherently unsustainable because dictators are limited by their absolute control to effectively stabilize opposition in the long run (Geddes 1999; Wintrobe 1998). However, the unexpected resilience of authoritarian regimes has motivated recent research on the strategic adoption of democratic institutions by electoral authoritarian regimes (Gandhi and Lust-Okar 2009; Gandhi and Przeworski 2006; Svolik 2013). At the same time, my research findings indicate that although authoritarian systems are more susceptible to episodic punctuations than liberal democracies, although this vulnerability can be mitigated through the adoption of limited electoral representation to expose the policy process to more “entropic”, or diverse information. Future research focusing on competitive elections, civic engagement, and citizen participation under authoritarian settings will move towards reconciling these conflicting conclusions, with an emphasis on how democratic adaptations enable
authoritarians manage to organize effective containment and stabilization of opposition groups as well as handling information at an efficiency level comparable to the more centralized democratic systems.

Knowing that punctuated equilibrium grows in intensity in the authoritarian context reveals an important anomaly, but the quantitative analysis can push the research program only so far. Jones and Baumgartner’s (1993) original inspection of disruptive change across policy domains establishes institutional friction as a common condition leading to widespread instability in the US policy process. Their analysis is supported by a series of qualitative case studies, while the quantitative data serves to characterize punctuations at a much higher level of abstraction. The research program of authoritarian information processing is in need of comparable in-depth qualitative research to tease out the underlying “nuts and bolts” of information processing. I am in collaboration with case researchers to compare the organization of bureaucratic attention on two focal events in pre and post-handover Hong Kong. In the colonial period, the influx of refugees led to drastic reforms in immigration rules although the change unfolded strictly within existing agency parameters. The post-colonial surge of immigrants from Mainland China created similar pressures on the Hong Kong government to address the demographic and economic consequences. The programs that came out of due to his patronage, however, did not change the existing immigration regime substantively; while the proposals are innovative and the problem came to be radically redefined, actual changes have been very limited in comparison to the colonial reforms. The transition towards more decentralized, democratic, and participative structures of governance appears to explain the diverging approaches and outcomes to setting the policy agenda and organizing attention.
The field of informatics has applied advanced computational methods to the study of information processing in a variety of contexts. Political scientists are interested in the substance of specific events or theoretical insights within the domain of politics, whereas informaticians are often motivated to identify general patterns in social phenomena and to relate them to abstract theories about complexity and systems. Combining the broad theoretical thinking about general dynamics with the substantive focus of political science research, we will reexamine some of the basic concepts in information processing to make sense of the mechanisms of emergence and evolution in the formation of issue frames, in particular the polarization in issue frames and the use of in-group signals, or “dog whistles”, in political discourse (Correia, Chan, and Rocha 2014). We will further model the interactions between ontological and institutional structures as co-evolving multiplex structures and expand the scope of analysis to information processes outside of the realm of formal government to include communication in social movements.

Lastly, more specific studies of information processing at the agency level will help tease out and, for the purpose of teaching, illustrate the effects of institutions on the flow, exchange, and consumption of information in large organizations. Going back to the vignette in the introductory chapter, do rules on information processing—such as those set up by Cowperthwaite to prohibit statistical analysis of the Hong Kong economy—really affect policymaking; if so, how? As government officials are faced with a daily deluge of information, what kind of institutions have emerged to contain exposure? Once new information reaches the frontline bureaucrat, what rules apply in bringing the issues to the upper level and what information is filtered out? Given the tradeoff between information load and policy responsiveness, what are the common practices for developing more sustainable information systems? Some of these are common topics and issues in communication and information
management studies (Kooper, Maes, and Lindgreen 2011; Parush et al. 2011; White, Vane, and Stafford 2010), but the discussions can be made more relevant to practitioners in the public policy and public management perspective. Research in this direction will bring the theoretical focus from macro institutions to basic procedures that regulate information processing at the individual level in relatively contained and definable task environment (Jones 1994).

To produce in-depth case analysis for these research and pedagogic purposes, my future research will adopt a domain-specific analysis of information processing, focusing on the information-theoretic substance of issues as a determinant of the dynamics of punctuated equilibrium. Environmental politics and governance represents a unique combination of challenges for information processing because the problem definitions are more contested, issues less defined, and institutions more transient than average. In terms of theory development, the findings of this analysis will set the groundwork for systematical typifying policy issues, continuing a long-standing quest in the policy process literature for a more generic conceptualization of policy nature (Gormley 1986; Lowi 1972).
References


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