Punctuated equilibrium and the dynamics of political participation: the case of letter writing

Abstract

While extensive research has shown that policy outputs are punctuated, there is a paucity of research about the punctuation of public opinion and political participation. We know that policymakers rely on political participation to understand public opinion, so it is important to understand the patterns and flows of political participation, to help understanding democratic responsiveness, and how policy outputs behave. I advance punctuated equilibrium theory by applying it to individuals' decision to participate. I argue that bounded rationality and disproportionate information processing, driven by the media and interest group coverage of major trigger events, will result in a punctuated equilibrium pattern. Using innovative new datasets on the volume and topic of letters to the Australian Prime Minister and American President, I find consistent evidence of punctuations, using weekly, fortnightly, and annual data, across both Australia and the USA, notwithstanding the significant institutional, cultural, and behavioural differences these countries. These results extend punctuated equilibrium further up the policy process chain than has previously been done, supporting its claim to be a "full theory of government information processing." Doing this helps us to understand the difficulty in translating external environmental and public demands into policy.

Introduction

Punctuated equilibrium research now covers a wide range of policy inputs and outputs, but this theoretical concept has yet to be applied to political participation. This article finds that the same punctuated equilibrium patterns that are well known in policy outputs, are also evident in levels of political participation. These findings respond to the call from Baumgartner et al. (2009) to identify the levels of punctuation in political inputs, such as citizen mobilisation, which in turn can help to understand why there is such difficulty in translating external environmental demands and public demands into public policy.

Every year, thousands of people participate in politics: writing letters; joining campaigns; attending protests. People participate because they want to have an impact on policy, (Verba and Nie 1987) and policy is expected to be responsive, not just to this public opinion, but also to external environmental signals. 'Perfect' responsiveness would mean that policy responded proportionately to the plethora of changing input signals (whether those input signals be public opinion, or changes in unemployment rate, COVID case numbers, or farm gate prices), with policy being constantly tweaked in response to these stimuli. This does not occur, instead, scholars have found long periods of relative equilibrium, followed by sudden jumps/shifts, to 'catch-up' with the changes in the environment (Baumgartner et al. 2009). This 'punctuated equilibrium' pattern, predicted by Punctuated Equilibrium Theory (PET) is based on the impact of individuals' - and therefore institutions' - inability to be comprehensively rational (Workman, Baumgartner, and Jones 2022; True, Jones, and Baumgartner 2019; Koski and Workman 2018; Eissler, Russell, and Jones 2016; Jones and Baumgartner 2012; Baumgartner et al. 2009). In this paper, I use letter writing to political leaders to examine whether the same patterns are present in political participation.

PET seeks to be a "full theory of government information processing" (Workman, Jones, and Jochim (2009), p75), to understand the pattern of policy change. While it was built on theories of individual decision-making (Jones and Baumgartner 2005b), it is yet to be extended to individuals' decisions to participate in politics. This paper advances PET theory by applying this theory to individuals' decision to participate in politics – often a key input into policy change. I also show that PET can be successfully applied using different time scales (weekly; fortnightly; and yearly). I do this using an innovative new datasets on the volume of letters to the Australian Prime Minister, as well as leveraging existing data on letters to the American President. I argue that, theoretically, just as a political system must divide its attention between a myriad of policy issues, an individual must also divide their attention, except what is competing for attention isn't specific policy issues, but rather politics itself, which is competing for attention with home repairs, buying the kids new clothes, demands from work, or a family health crisis.

This article firsts briefly demonstrates why these letters can improve our understanding of the responsiveness and democracy. It then sets out punctuated equilibrium theory and presents my theoretical expectations. I argue that the punctuated equilibrium pattern will be present in this example of the expression of public opinion, but will be less pronounced, compared to that found in institutional

settings, such as Congress or parliaments. I then set out my data and empirical approach, present my findings and discuss their implications, and how it opens a range of new research opportunities to integrate political participation, policy process, public opinion, responsiveness and accountability theories.

Letters, responsiveness & democracy

Democratic theory requires some level of control by the public, the 'demos', over the workings of government. The main institutionalised form of control is through periodic elections, which can both lead to changes in leaders, but also create incentives for representatives to change their behaviour, or be responsive to public opinion, between elections in order to retain office (Weissberg 1976; Stimson, Mackuen, and Erikson 1995). One of the main methods of linking public opinion and political leaders is via various forms of political participation. Contacting a politician or government official is a unique form of political participation. Verba and Nie (1987) considered that 'citizen-initiated-contact,' was a substantively different form of participation, because:

> [t]he individual participant takes the initiative in contacting a government official and, most important, he decides what to contact about. The 'choosing of the agenda'… something that is possible for the contacting activity only – is crucial… it ensures that the subject matter of the participatory act is salient and important to the individual (Verba and Nie 1987)

As such, the letters are a demonstration of the public, and interest groups, attempting to move issues from the 'systemic agenda,' - which includes all issues that may merit public attention - and onto the 'institutional agenda' - which is narrower, and only includes those issues that are "up for the active and series consideration of authoritative decision makers" (Cobb & Elder, quoted in Birkland (2017), 64). Similarly, these letters can be seen as an example of individuals and interest groups attempting to expand the 'scope of the conflict', particularly where the issue has received limited media attention, using a letter-writing campaign in order to influence the 'conflict of conflicts' (Schattschneider 1961). Given that presidents, politicians, and policymakers use these letters as one way of understanding public opinion (Rottinghaus 2012; Dexter 1956; Sussmann 1959), understanding the distribution and change in this input provides an important additional link in the chain to understanding why and how democratic responsiveness works, and how policy outputs behave.

Punctuated Equilibrium Theory – how bounded rationality impacts policy outputs and political participation.

While policy is expected to be responsive, for 'perfect' responsiveness to occur, both individual decision-makers, and the institutions that they are part of, would need to be 'comprehensively rational,' (Lindblom 1959) almost constantly reviewing the situation around them, renewing and reviewing the costs and benefits of each policy option, and seamlessly changing policies with minimal search or transaction costs. The problems associated with these assumptions are extensively set out in the literature (Shannon, McGee, and Jones 2019; Jones 2017, 2003, 1999) - people, institutions and the political process are not

able to react smoothly to the environmental signals around them. Instead, individuals' cognitive processes create limits, or "bounds" on their rationality.

Even if the world around us is changing, we can only adapt when we pay attention to that issue. However, both individuals and institutions have a limited attention scope - individuals and institutions are constantly bombarded with information that may be relevant to decisions, political opinions, and policy options – and we do not have the cognitive ability to collect, assemble, interpret and act on each one of those (Jones and Baumgartner 2012). Instead, issues need to be prioritised and addressed serially (only a few at a time).

Governments attempt to deal with this limitation by creating sub-institutions, or sub-systems (such as departments, committee systems, etc) which can handle issues in parallel, with each sub-system dealing with their own issues serially. Most of the time, most of the issues are handled within these sub-systems. While policy is controlled within a subsystem, existing players, interest groups and institutions manage the policy. In these periods, changes are likely to be minimal, as an 'equilibrium' has been established by the dominant player(s). These issues are unlikely to come onto the agenda of a Prime Minister/President, and instead are more likely to be managed by Ministers/Secretaries, or public servants. Similarly, the public are unlikely to be engaged in the issue (True, Jones, and Baumgartner 2019).

However, occasionally a policy issue can break free of a sub-system and move from the micro to the macro – onto the public agenda, the legislative agenda, and the Prime Ministerial/Presidential agenda. These periods represent an opportunity for major policy change, or "punctuation". A range of factors could lead to these punctuations, moving an issue from a sub-system to macro-politics. However, it is usually based around a change in *attention*, either due to an external shock (e.g. 9/11 or the Global Financial Crisis); when an issue is re-framed; or the conflict is expanded and new participants enter conflict (Schattschneider 1961; Eissler, Russell, and Jones 2016). These exogenous shocks are often precipitated by the media and it is often media coverage that leads to the changing attention of both the public and political elite (Holt and Barkemeyer 2012; Walgrave and Varone 2008).

These shocks can occur because decision-makers are too often 'locked' onto one particular indicator, or source of information, rather than relying on a broad source of data for any particular issue or policy area. Jones and Baumgartner (2005a) mathematically demonstrated, using the central limit theorem, that if individuals or decision-makers pay roughly equal attention to a broad range of indicators, (even if none of them were normally distributed themselves), the result would be a normal distribution of outputs. However, if the output series is leptokurtic, it provides evidence of bounded rationality, because disproportionate information processing, or 'indicator lock,' where decision-makers are too focused on one particular metric, or one particular 'voice', rather than paying attention to all relevant factors. The result is that "suddenly decision makers recognize that previously ignored facet of the environment are relevant and scramble to incorporate them" (Jones and Baumgartner 2005a) 334).

An issue getting onto the agenda ('attention allocation') is only the first stage in what Jones and Baumgartner (2005) termed 'the logic of choice', which is then followed by 'problem definition,' 'alternative generation' and then finally 'choice,' with this model applying equally to individuals and systems. Each stage incurs decision and transaction costs, including the costs associated with the time and opportunity cost of devoting attention to the issue, researching it, and developing proposed actions. When this model is applied to institutions, there are also "institutional costs", which are based on the institutional rules and requirements for new decisions to be made. These costs will vary across stages of the policy process and institutional arrangements. The institutional costs of a budget decision are likely to be higher than the institutional costs of the choice to ask a question in PMQs, or the choice by an individual legislator to introduce a bill (True, Jones, and Baumgartner 2019; Baumgartner et al. 2009). Similarly, across systems, rules around super-majorities or customs around party-line voting will also change institutional costs. These costs create "friction" and mean that there isn't a linear response to changes in the environment (Jones and Baumgartner 2012). As with friction in physical sciences, this means that the pressure coming into the system needs to be enough to overcome the friction before any movement occurs. The greater the friction/costs, the greater the force needed to start any sort of movement (Jones and Baumgartner 2012).

Since being first identified in the United States of America (Baumgartner and Jones 1991), the research has spread significantly: across countries and regions (e.g. USA, France, Hong Kong, Turkey, Russia and the EU – see (Yildirim 2022)); across different regime types (Baumgartner et al. 2017; Chan and Zhao 2016; Lam and Chan 2015); across policy areas (tobacco (Givel 2006), foreign policy (Joly and Richter 2019), drug policy (Rychert and Wilkins 2018) and policy disasters (Fagan 2021)); and across stages in the policy process (election results, media coverage, party platforms, bill introductions, hearings, budgets – see Baumgartner et al. (2009)).

The impact of media and interest groups

The power of the media to influence the agenda has been extensively studied, with perhaps the most famous summary being put forward by Cohen (1963), who said that the media "may not be successful much of the time in telling people what to think, but [they are] stunningly successful in telling its readers what to think about". This agenda-setting power of the media is part of the theoretical basis of punctuated equilibrium, as it recognises that punctuations often require a "focussing event," which is often be dependent on media coverage (Walgrave and Varone 2008; Holt and Barkemeyer 2012). A range of case-study based analysis of punctuations have found that the media was be a key source for driving the attention change that is the sine qua non of punctuated equilibrium theory (Fagan 2021; Jennings et al. 2020).

The media's key roles in society are as "mobilizing agent" "civic forum" and "watchdog" (Norris 2000) and so the mass public, the attentive public and political elite all, to some extent, rely on the media to tell them when they need to engage with politics overall, or with a particular issue (Eissler, Russell, and Jones

2016; Holt and Barkemeyer 2012). Media coverage can be a key cause of both punctuations and equilibria (Walgrave and Varone 2008; Fagan 2021), because individuals and governments generally "do not directly assess social processes, but become aware of them only as they are manifested" through the media, interest groups, or public opinion (Baumgartner et al. 2009).

Interest groups also have a particular function within punctuated equilibrium theory, most of the time helping to maintain the equilibrium, as part of a policy sub-system, but at other times seeking to bring attention to an issue, leading to a punctuation (McFarland 2010). For individuals with a particular interest in a policy area, relying on their preferred interest group is a form of 'delegating to a subsystem,' allowing the interest group to monitor the environment and using their views as a simple heuristic for their own decision-making. This reduces the 'cost' of participation, both by creating a heuristic, and as often by providing standard/template letters for their members to sign. Certain interest groups may be particularly attracted to letter-writing campaigns, where they are unable to get their issue on the political agenda in other ways, such as through the media, or direct lobbying. Thus, while media and interest groups may help to set the political agenda, existing research on media agenda setting does not explain the distinctive punctuated pattern found in the data.

Applying punctuated equilibrium to citizen initiated contacting

Having set out the broad principles behind punctuated equilibrium and why it is expected to apply to decision-making of individuals, and how the media and interest group activity feed into punctuated equilibrium, I now turn to why I expect to find punctuations in political participation in general, and in the letters, in particular.

The intellectual underpinning of bounded rationality were set out Simon (1950), who sought to apply the limits of individual's cognitive processes to the decision making processes of organisations, but "bounded rationality is rooted in individual decision-making processes" (Viale (2017), 599). Thus, while PET has mainly been studied empirically in relation to institutions, the cognitive limitations set out above are not unique to government or policy-making, they are inherent in human psychology and information processing (Jones 2001). Punctuated equilibrium has previously been used to study patterns of political behaviours and political participation. Baumgartner et al. (2009) use data on the change in voter preferences in the US, Denmark and Belgium; Stadelmann and Torgler (2013) use bounded rationality to study how Swiss voters follow advice when voting in referenda; and Goerres (2009) uses "limited rationality" as a frame to study political participation in Europe.

As set out above, *attention* is the key causal mechanism of punctuated equilibrium theory, because of disproportionate information processing (Koski and Workman 2018). The scarcity of an *individuals'* attention, just like the scarcity of an *institutions'* attention, means that the same "logic of choice" applies to individuals who must juggle the many aspects of their lives. While in most PET research, the items competing for attention are different aspects of politics/policy, in this study, politics and policy compete with every other aspect of individuals' lives. An individual "cannot balance one's checkbook, work out at

the gym, pay attention to family, write a book, and teach a class all at the same time" (Jones and Baumgartner (2005b), p34), or in this study 'and write a letter to the President all at the same time'. The competition for attention is not transportation policy vs defence policy vs education policy, the competition is politics/policy vs all other aspects of people's lives. While individuals don't have congressional committees to delegate matters to, individuals have our own sub-systems, which allow them to choose how much time to devote to issues. For example, food and nutrition and the education for children are two issues that may jockey for an individual's attention, but most of the time it is delegated to a sub-system. In these examples, getting fully cooked meals delivered from Snap Kitchen or Diet-to-Go is delegating to sub-system. Similarly, a decision about whether to be involved in the local school board or parents' committee, is a decision about the level of delegation to a sub-system. For people's politics, most of the time they delegate it to political representatives, and individuals take little or no part in it, beyond voting at elections (Schumpeter 1987).

Regardless of an individual's initial decision, occasionally their attention may be forced back to that issue, This could either be because of a gradual drift means your existing 'decision setting' no longer aligns with the external environment, or because of an exogenous shock. Perhaps the quality of Snap Kitchen has been slowly slipping, or your vegetarian partner has moved in. Perhaps a school shooting has forced you to reconsider schooling choices. In these cases, an issue can break free of a subsystem and move to the macro – onto someone's personal agenda, forcing them to reconsider their choices and perhaps take action.

The idea that people only pay limited attention to politics is unsurprising and uncontroversial, in Dahl's famous terms, it is there mere "sideshow" in the "circus" of their lives (Dahl, in Jones (1994)), it "pass[es] by unnoticed most of the time… under ordinary circumstances, political attention is discretionary" (Iyengar, in Jones (1994)). However, even while most people ignore the political, every day they are being bombarded with politically relevant information – access to childcare; price increases at the supermarket; changes in weather patterns impacting their holidays; changes to their employment; or being impacted by crime can all be relevant to one's political views, and whether one chooses to participate in politics. For most individuals, most of the time, this cacophony of inputs is ignored - the signals are being filtered out, because individuals do not have the mental 'bandwidth' to address multiple issues, and they need to be prioritised. In summary, "signals are ignored, responses are delayed" (Jones and Baumgartner 2005b).

Individuals' attention to politics is often based on a heuristic, having been encouraged to pay attention and participate by their preferred media source or interest group. Tversky and Kahneman suggest that individuals use these heuristics or "mental shortcuts" so that they can "behave like actors who have more knowledge of the processes and alternatives" (Viale 2017) – they delegate the information gathering role to a perceived expert. When one actor can encourage numerous people to pay attention and participate, it results in individuals copying others' behaviours, using their behaviour to determine how to respond in a given situation (Boyd and Richerson 2002), resulting in disproportionate information processing, not just

at an individual level, but also at a societal level. This explains the significant spikes, created by this bandwagon, or 'positive feedback loop' which is a signature of punctuated equilibrium. This behaviour, like in institutions, should lead to see the same punctuated, leptokurtic patterns in letters to the Prime Minister and President, because the same underlying bounded rationality is at work.

Hypothesis 1 The change in the total volume of letters follows a punctuated equilibrium pattern

The next issue is what level of punctuation would be expected. As explained previously, the level of friction is expected to increase along each stage of the policy chain. As Figure 2 (below) shows, there are four steps in the policy chain, moving from lowest friction, to highest, where policy outputs (such as budgetary changes, or the passage of legislation) occur.

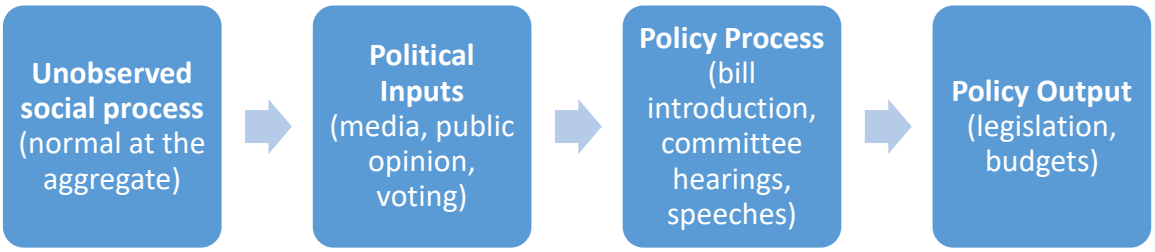


Figure 2: Adapted from Baumgartner et al. (2009)

The driving feature in determining the level of punctuation is the level of friction (Baumgartner et al. 2009). Political inputs, such as deciding to write a letter, have less friction than any actual government policy process, or policy output. This should lead to a lower level of punctuation in the letters compared to actions with a higher level of institutional friction (Baumgartner et al. 2009). I can directly compare my findings on the level of punctuation in letters to America presidents with existing America PET data. While there is limited Australian-specific PET data (Dowding and Martin 2017), my results can be compared to international results, as Baumgartner et al. (2009) found that any cross-country differences were "swamped" by the institutional friction effects, so there was a high level of constancy *within* each stage of the policy process across the countries studied, and consistent increases in the level of punctuation as the empirical domain moves from inputs, to policy processes, to budgetary outcomes. I therefore expect a similar level of punctuation as election results and other political inputs.

Hypothesis 2: The level of punctuation in the total volume of letters will be similar to other policy input processes, but will be less punctuated than policy processes or policy outputs

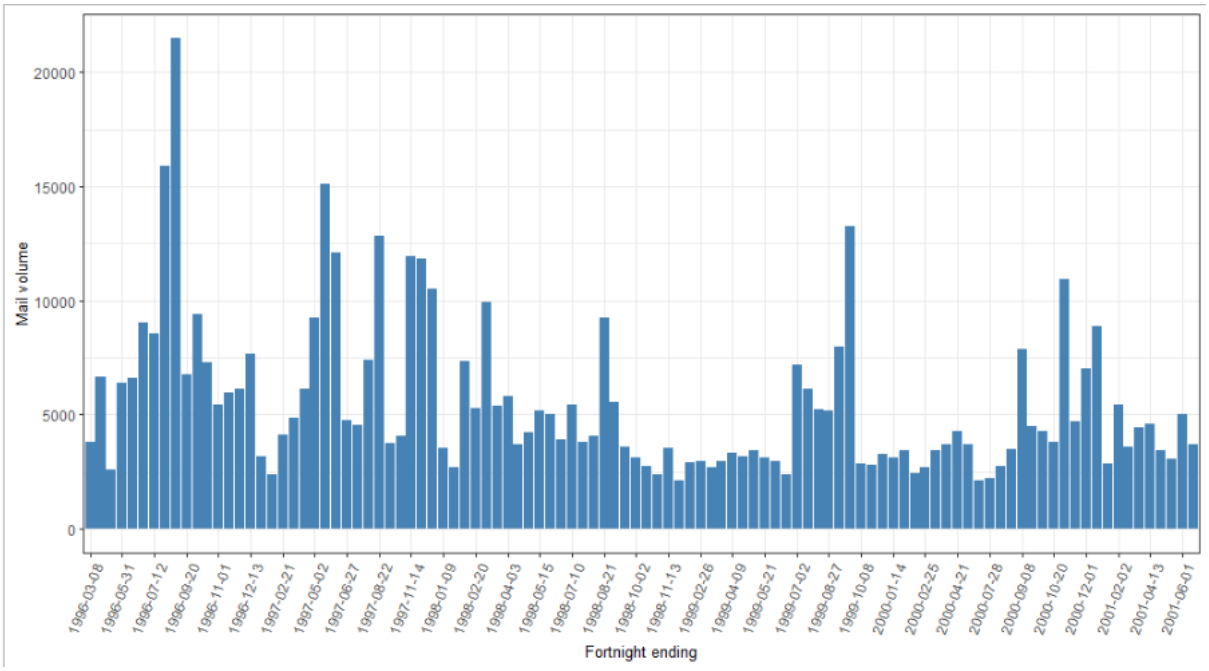
Data and methods

The Australian Prime Minister receives around 150,000 letters each year (a rate of ~110 letters per 10,000 adults) (Casey 2022). While it is hard to ensure comparability, Sussmann (1963) reports that, for every 10,000 literate adults, President Truman received around 104 letters and President Eisenhower received 103 letters. However, there is very little quantitative research on this institution, and none that I have

identified that has been able to develop a comprehensive dataset on the volume and topic of letters to a political leader.

I focus on Prime Minister John Howard, who was Australia's 25th Prime Minister, serving almost 12 years in office for the Liberal Party (a centre-right party), from March 1996 to December 2007, however this research only covers until June 2001, due to data access restrictions. During this period, he received more than 575,000 letters from members of the public. Almost half of these letters were classified as 'pro-forma campaign letters,' where the exact same, or similar, text is sent by multiple people, and were usually driven by interest groups. As can be seen in Figure 1**Error! Reference source not found.**, the number of letters Mr Howard received per fortnight varied significantly, from a low of around 2,000 letters, up to a maximum of more than 21,000 letters, with a mean of around 5,500 letters per fortnight. The peaks (August 1996, May/June 1997, November/December 1997 and September 1999) relate to childcare; chicken meat imports; global warming; and the Indonesian invasion of East Timor, and subsequent UN intervention, which was led by Australian armed forces.

Figure 1 Total mail per fortnight



While we could take a case-study based approach to analyse what 'caused' each spike in the volume of letters – and in many cases it is likely to be a combination of external events; interest group activity and/or media attention. However, like Jones and Baumgartner (2005b) and Lundgren, Squatrito, and Tallberg (2018) my interest is not in identifying causes for individual changes, but rather explaining the overall pattern of letters, and what drives that – "it is the distribution we want to understand, not the historically contingent particulars" (Jones and Baumgartner 2005, 114).

To do this, this paper draws together three datasets of letters to political leaders. The main dataset is a new dataset, derived from archival research at the National Archives of Australia (NAA) (National

Archives of Australia 1996-2007). Each fortnight, Mr Howard received a brief setting out the total amount of mail received in the previous fortnight (allowing for data to be included, even when I did not have the brief for the relevant fortnight), as well as details of the topics where he had received at least 30 items of correspondence.

Two additional datasets were used to further test the hypothesis across different timeframes and institutional settings. Firstly, an annual data series from the annual reports of the Australian Government's Department of the Prime Minister and Cabinet (PM&C) (Department of the Prime Minister and Cabinet 1979-2022). These figures include all mail received by PM&C on behalf of its Ministers. Finally, weekly data for Presidents Reagan, Carter and Ford (Rottinghaus 2012) is also used.

To test the first hypothesis, I use weekly (US Presidents), fortnightly (Mr Howard and US presidents aggregated to fortnightly) and annual (Australian Prime Ministers) data, and across two jurisdictions with different institutional arrangements. This differs from the 'standard' punctuated equilibrium approach, of using annual data. However, as Dowding and Martin (2017) note, the choice of timeframes is ultimately arbitrary, and alternate time periods have been used to test for punctuations, including weekly changes in COVID-19 restrictions (Shafi and Mallinson 2022); quarterly changes in European central bank agenda (Cross and Greene 2020); and quarterly changes in topics in Chinese newspapers (Meng and Fan 2022). The difference in my approach is that I am using multiple different timeframes in the same empirical domain, which help to ensure that any punctuated pattern is not solely an artifice of the measurement period (Dowding and Martin 2017).

To test my propositions, I adopt two related approaches to measuring the distribution of attention. Traditionally the level of punctuation has been demonstrated by the level of leptokurtosis in the distribution, using the L-kurtosis score (Baumgartner et al. 2009). Kurtosis is a measure of the 'fatness' of the tails of a distribution, compared to a normal distribution, it therefore helps to identify if there is an excess of extreme observations. The higher the kurtosis, the greater the number of extreme observations. The very presence of a leptokurtic distribution is the evidence of disproportionate information processing, resulting from bounded rationality (Jones and Baumgartner 2005b, 2005a).

New research also suggests that the Gini co-efficient maybe a useful additional statistical test for punctuated equilibrium, as it is an effective measure of dispersion, or inequality – in this case, the inequality in the size of the policy changes (Kaplaner and Steinebach 2022). A Gini co-efficient of 0 would reflect that every change was of an identical size (a uniform distribution), while a co-efficient of 1 would mean that all the change observed occurred in 1 observation and the other observations would have zero change. A normal distribution would have a Gini co-efficient of 0.414, if a Gini co-efficient above this, it is evidence of punctuated equilibrium (Kaplaner and Steinebach 2022). While I recognise that some of the datasets have small sample sizes, other research has used annual change over quite short periods (e.g. 10 years of annual media coverage, or changes over two elections (Baumgartner et al. 2009)). In addition, L-kurtosis is a robust measure of normality even with small sample sizes of 50-70 (Jain and

Ramu 2022; Malá, Sládek, and Bílková 2021). The Gini co-efficient is also robust with even smaller sample sizes (Davidson 2009), with Kaplaner and Steinebach (2022) tested it with sample sizes of 50, and found it is more robust than L-kurtosis. The Gini co-efficient also has a downwards bias in small samples (Deltas 2003), which means that any errors in this study are more likely to be false negatives (type 1 errors), rather than false positives (type 2 errors). In addition, to provide added assurance to the robustness of the findings, 95% confidence intervals have been calculated for the Gini co-efficient using a bootstrap method (Berger and Balay 2020).

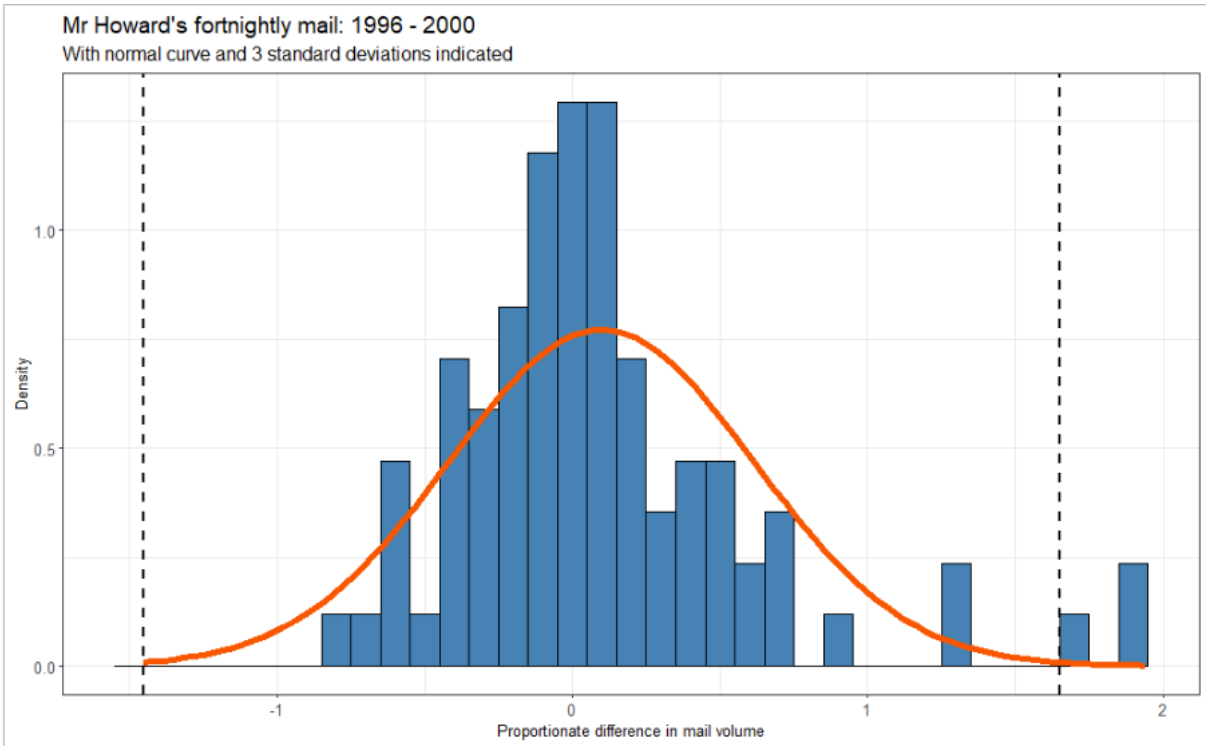
Consistent with Baumgartner and Jones (1993) and Walgrave and Varone (2008), I combine time series quantitative research with qualitatively analysis of two specific issues, and examine the spikes in mail volume that they resulted in. This qualitative analysis helps to elaborate on how the causal mechanisms proposed by punctuated equilibrium have resulted in the empirical patterns identified.

Results

Starting with hypothesis 1, that the change in the total volume of letters follows a punctuated equilibrium pattern. Figure 2 plots the proportionate change distribution of the volume of letters received each fortnight. The proportionate change is calculated consistent with the method set out in Workman, Baumgartner, and Jones (2022) of $(Policy_t - Policy_{t-1})/Policy_{t-1}$. This creates a natural lower limit of -1. A normal distribution would have an L-kurtosis of 0.123 (Baumgartner et al. 2009), and a Gini co-efficient of 0.414.

As expected by hypothesis 1, it demonstrates a very high peak, representing a high number of fortnights with minimal change, well above the expected by the normal distribution. Twenty-four observations (almost 25 per cent) have a change of less than 10 percent. However, there is also a very high standard deviation (0.517), which demonstrates the large number of large changes (Fernández-i-Marín et al. 2020). Finally, almost 3% of the observations are more than 3 standard deviations above the mean, compared with the 0.15% expected, with a change of more than 165%, creating fat tails. This creates a leptokurtic distribution, with an L-kurtosis of 0.2497 and a Gini co-efficient of 0.516.

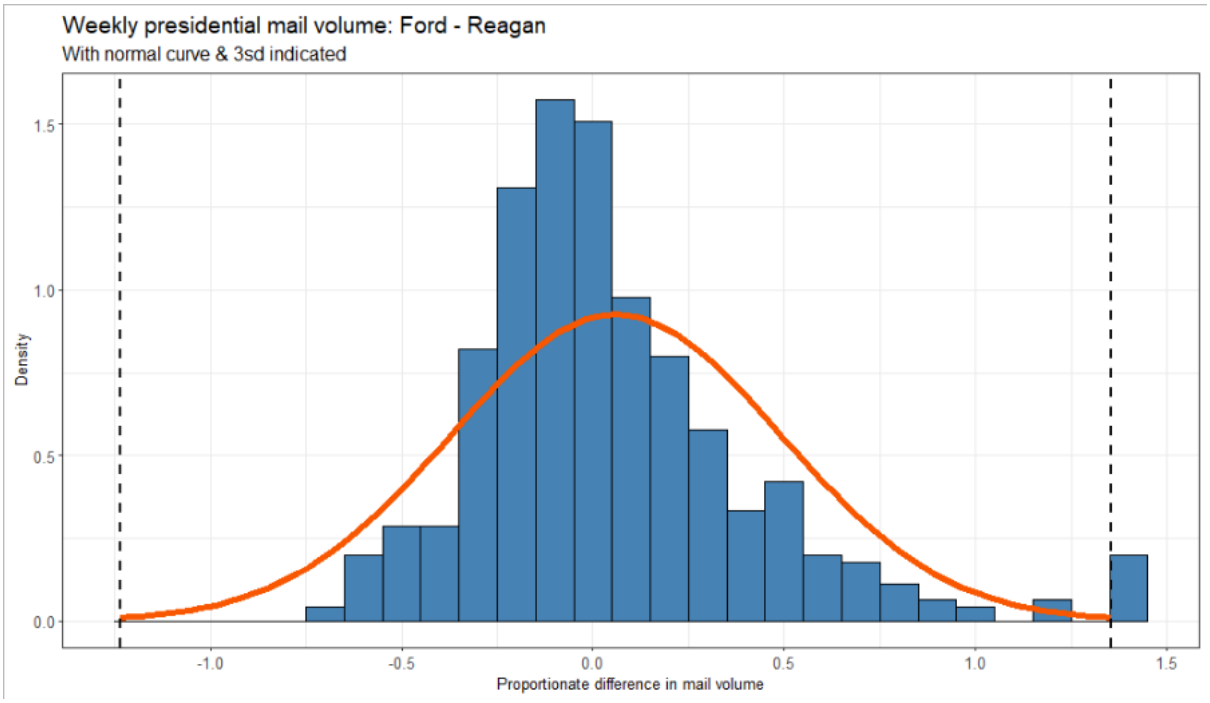
Figure 2 Mr Howard's fortnightly mail - with normal curve and 3 standard deviations indicated



This supports hypothesis 1, that the change in the total volume of letters follows a punctuated equilibrium pattern. To confirm these fortnight-based results, similar tests were undertaken on the other datasets. Firstly, an annual comparison was undertaken, covering the period 1981 to 2022 (which includes the 5 years of fortnightly data analysed above). This period covers 9 Prime Ministers, approximately 45% of the period was Labor (centre left) governments, and the remainder was Liberal/National coalition (centre right) governments. The average volume of letters per 10,000 people is roughly similar across Prime Ministers. Separate analysis not reported here shows there is no statistically significant difference between Labor and coalition Prime Ministers, or between election years and non-election years, or early in a Prime Minister's term and later in that term (Casey 2022). This dataset has an L-kurtosis of 0.2495 (almost the same as the fortnightly data above), and Gini co-efficient of 0.475 - in both cases above the threshold for leptokurtosis (0.123 and 0.414 respectively).

Next, using weekly data from the White House for 1973 to 1984 produces an L-kurtosis of 0.254 and Gini co-efficient of 0.509, which is evident in Figure 3. Like the data above, approximately 25% of the observations display changes of less than 10%, while there is a very high standard deviation (0.43), and there are almost 2% of observations more than 3 standard deviations above the mean, with a change of more than 135%, creating fat tails. As an extra robustness check, the original weekly data was aggregated to create a fortnightly timeseries, to enable a more directly comparison to the Australian fortnightly data. This results in a similar leptokurtic pattern, with an L-kurtosis of 0.241 and Gini co-efficient of 0.504.

Figure 3 Weekly presidential mail volume: Ford to Reagan (with normal curve and 3sd indicated)



Note: for ease of visualisation, all observations beyond 3SD were aggregated at 3SD.

These findings are summarised in Table 1, below. All the datasets support hypothesis 1, that changes in total volume of letters follows a punctuated equilibrium pattern, and none of the confidence intervals for the Gini co-efficient cross the threshold value of 0.414. The consistency of this finding using weekly (presidential data), aggregated fortnightly (presidential data), fortnightly (Mr Howard), and annual data (Australian Prime Ministers), is striking, especially given the significant institutional, cultural, and behavioural differences between Australia and America. It also demonstrates the potential of using different time intervals in PET research.

Next, we turn to comparing the leptokurtosis of these letters, compared to other policy processes. In hypothesis 2, I suggested that letters from members of the public should be closer to normal (and therefore display a lower L-kurtosis and Gini co-efficient) than other policy processes, which are further along the policy cycle. This is because letter writing has lower levels of friction (lower cognitive and decision costs) than activities undertaken by political and bureaucratic decision-makers. Thus, it is likely to be similar to other traditional modes of political participation, such as elections, but lower than activities within government (such as committee hearings or bill introductions), where institutional friction is also a factor. Existing research has found that American election results have L-kurtosis scores of 0.25 (presidential), 0.30 (US House of Representatives) and 0.22 (US Senate) (Baumgartner et al. 2009). The L-kurtosis of letters to the US President (0.254) are similar, which supports hypothesis 2. Punctuated equilibrium research on elections in other countries have found L-kurtosis scores of between 0.14 and 0.30 (Baumgartner et al. 2009). The Australian data sits within this range, also supporting hypothesis 2.

Table 1: Summary of Kurtosis and L-kurtosis for changes in mail volumes

	L-kurtosis	Gini co-efficient (95% CI)	N
Mr Howard – fortnightly (Australia)	0.2497	0.5161 (0.4864 – 0.5529)	85
Prime Minister annual (Australia)	0.2495	0.4754 (0.4235 – 0.5416)	41
Presidential weekly (USA)	0.2537	0.5087 (0.4911 – 0.5261)	504
Presidential fortnightly aggregation (USA)	0.2407	0.5044 (0.4773 – 0.5326)	216[1]

A closer look at individual topics

Most of the spikes in the mail volume can be attributed to specific topics, in the same way that most punctuations in policy output can be explained by specific trigger events, such as the Bhopal chemical spill, the Rio climate change conference (Holt and Barkemeyer 2012), or a particularly heinous crime that attracted national attention (Walgrave and Varone 2008).

The fact that so many of these top topics can be directly traced back to external crises; media frenzies; or interest groups supports the conclusion that punctuated equilibrium dynamics are driving the pattern. As set out above, punctuated equilibrium hypothesises that, given a normal distribution of input signals, if there is a leptokurtic distribution of output signals (as has been found in this case), this will be due to disproportionate information processing, including 'indicator lock' – rather than responding to the constant underlying risk or issue, people respond to the sudden 'crisis'. In these cases, we can readily identify which 'indicators' the public are 'locked' onto (the media and interest groups), rather than the underlying issue. Two brief case studies will help to demonstrate this.

Firstly, deaths in custody of Australia's First Nations peoples has been an ongoing issue in Australia for at least the last three decades and was the subject of a major Royal Commission in 1991 (Cunneen 2001). During the period under study, there was a spike of 2300 letters, over a two-month period in September/October 1997. Both prior to that, and after that, the issue did not re-appear. However, looking at the external environment, 1997 was the year with the lowest number of deaths in custody during the period of this study. Over the subsequent 4 years, the number of deaths *increased* – but the mailbag remained silent. It appears that the triggering event for these letters was a major ministerial-level summit on deaths in custody in July 1997, (Cunneen 2007) which attracted significant media attention.

[1] The n for the fortnightly data is not exactly half the weekly data, because some weeks were missing, meaning it was not possible to aggregate to fortnightly data.

This case shows how the letter-writing dynamics can be separate from the underlying problem, and instead linked to a focussing event and subsequent media coverage. If the expression of public opinion responded proportionately to the problem, the volume of letters would have reflected the changes in the number of deaths, or the level of indigenous incarceration. Instead, we see disproportionate information processing, creating a punctuated equilibrium pattern. The proximate cause is interest group mobilisation, but that mobilisation is an example of bounded rationality, that leads to a punctuated pattern in political participation.

Secondly, the question of allowing dual citizenship, which Mr Howard specifically identified, in my interview with him, as an area where he was influenced by public opinion. Australians were not able to hold dual citizenship prior to 2002, and this restriction was one of the "most contested and contentious areas" of the Citizenship Act (Nolan and Rubenstein 2009). Dual citizenship is an important issue in Australia, because of the large proportion of Australian residents who were born overseas, who may be both eligible for, and desire to hold, dual citizenship (Brown 2002). Despite the relevance of the issue for a large minority of the population, without a trigger event, it did not get onto the agenda. However, in mid-2000, the government released the Australian Citizenship Council report, which recommended changes to dual citizenship rules (Nolan and Rubenstein 2009). This appears to have catalysed attention in effected communities, and lead to more than 300 letters arriving in a short period in late 2000. However, it did not generate much media coverage, with the issue appearing only 9 times in the media in 2000 – less than the 11 times in 1999. While the proximate cause of the letters appears to be the release of the Australian Citizenship Council report, this demonstrates that the influx of letters is likely to be a product of changing *attention*. The impacted individuals had not taken political action because they were not paying sufficient *attention* to the issue. When there was a sudden shift in attention, that prompted their political participation.

In both cases, it appears that the shift in attention came from a government announcement, followed by media coverage and interest group activities. While this aligns with other theoretical paradigms, such as media agenda-setting, it is also demonstrative of bounded rationality. It shows how people's attention to politics is disjointed and uneven, driven by disproportionate information flows. Their decisions to pay attention to politics was driven by heuristics – their 'indicators' are 'locked' onto only one or two trusted sources, the media or preferred interest groups, rather than driven by the underlying environmental indicators.

Discussion

I have shown that there is not a consistent flow of public opinion to political leaders. Instead, the public are usually quiet, with occasional periods of shouting. This finding holds across two countries with significantly different institutional structures (Australia and the USA), as well as across different periods of measurement (weekly, fortnightly and annually). Given the normative expectation that policy be responsive to public opinion, it is important to understand how, and under what circumstances, the

public express opinions – we need to understand both the content of the opinion, but also the pattern of that incoming opinion. Political leaders can only be responsive to public opinion if that public opinion is expressed. If cognitive friction means that expressed opinion does not adequately reflect underlying public opinion, this creates a hinderance to political responsiveness, and feeds into the under-reaction / over-reaction cycle that has been found in the study of policy change.

While significant research has been devoted to different aspects of the policy process, at different jurisdictional levels and in different countries, much less research has been dedicated to whether similar cognitive limitations impact how individuals make policy demands. I have extended punctuated equilibrium theory at the start of the policy process chain, by demonstrating that letters from members of the public to both the Australian Prime Minister and the President of the United States of America demonstrate a punctuated equilibrium pattern. This is the first time that PET has been directly applied to the decision to participate in politics. Existing PET research has, to some extent, 'hand-waved' over the public opinion inputs, relying on the central limit theorem to assume normality (Baumgartner et al. 2009). This research has identified one aspect of those inputs which are not normal. While this research supports the hypothesis that bounded rationality, and the "bottle-neck of attention" impacts individuals' decisions to participate in politics, this does not provide precise answers about what drives these attention shifts in the public. However, the case studies support the idea that it is interest group mobilisation in response to government outputs and announcements.

The data may also help research in government oversight and accountability. These same cognitive limitations that drive PET have also been identified as leading to "fire-alarm" approach to oversight by the US Congress of executive activities (Shaffer 2017; McCubbins and Schwartz 1984). The "fire-alarm" model of oversight is "crisis-based", with oversight in each area "languish[ing] for long periods until third-party actors (usually, citizens or interest groups) draw attention to particular problems." (Shaffer (2017), p90). McCubbins and Schwartz (1984) emphasised that this "fire-alarm" model relied on citizens and interest groups drawing attention to problems. The volume of the letters, and in particular, the volume of the letters on a particular topic, may be one of these theorised fire-alarms.

The data also opens further research opportunities in responsiveness research, to understand whether these punctuations in the expression of public opinion correlate with actual policy punctuations, and if so, in which direction is the causal mechanism. It is not clear from this data whether punctuations in the expression of public opinion precede policy punctuations, or whether the letters are a result of elite agenda setting (Manza and Cook 2002). It could suggest that certain types of political participation, particularly in niche subject areas, could be highly effective.

Conclusion

In this study I examined whether punctuated equilibrium theory applies to individuals' decision to participate in politics. This was achieved through creating an innovative new dataset on the volume, and

topics, of letters to an Australian Prime Minister, on a fortnightly basis. This was then compared to data on the annual volume of letters to Australian Prime Ministers and weekly volume of letters to the America President. My analysis concluded that the total volume of letters follows a punctuated equilibrium pattern, and that the level of punctation was similar to other policy inputs, and lower than policy processes or policy outputs. This extends and supports the general punctuation thesis (Jones and Baumgartner 2012) and these findings were consistent across both the Australian and American datasets, and across the weekly, fortnightly and annual datasets.

Punctuated equilibrium theory advocates stress that PET is designed as a "unified theory of information processing" (Koski and Workman 2018), and has been built by applying individual bounded rationality theories onto political institutions. However, PET scholars had not previously applied those same principles to the individual *qua* citizen, as opposed to the individual *qua* decision-maker. My research brings greater clarity to the unobserved social process found in existing PET research by focusing attention on the *expression* of public opinion, by treating the expression of public opinion as a political input. This is an important gap that has been filled, both because "the relationships between organizational decision making and individual decision making are causal" (Jones 2003) and because any theory of information processing needs to consider the "sender" of the information (the public) just as much as the "receiver" (politicians and the bureaucracy) (Jones 2003). These findings point to the broader application of the punctuated equilibrium theory, beyond what has been studied to date.

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