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Negative Feedback, Political Attention, and Public Policy

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Abstract

More than 50 years of policy research has provided evidence of negative feedback where self-correcting mechanisms reinforce stability in public policies over time. While such mechanisms are at the heart of understanding change and stability in public policies, little attention has been given to the responses of individual policymakers to public policies as a potential driver of negative feedback. Based on a unique survey dataset of spending preferences of local government politicians covering more than 90 Danish municipalities, three years, seven policy issues, and around 3,000 entries, we find that the expressed spending preferences of politicians are indeed negatively affected by previous spending levels. Moreover, such negative feedback effects are stronger the less political attention and even disappear at high levels of attention. Our analysis thus provides important evidence on the micro foundations and conditions of negative feedback in public policy.

Negative feedback is a strong force in public policy. It refers to self-correcting mechanisms that reinforce stability. Just as a thermostat which adjusts to falling temperatures by putting out more heat, negative feedback in public policy maintains stability. Explicit or implicit, most theories and models of public policy include such homeostatic processes. This includes dominant theories of public policy such as Hall's (1993) theory of social learning and policy paradigms, the advocacy coalition framework proposed by Sabatier (1987, 1988), and the punctuated equilibrium theory developed by Baumgartner and Jones (1993). While these three approaches differ in their conceptualization, description, and explanation of negative feedback mechanisms, they all depict a policy-making process dominated by negative feedback. Also the literature on bounded rationality and incrementalism depicts a policy making process characterized by negative feedback (Lindblom 1959; Wildavsky 1964; Simon 1997). Negative feedback is the world of incrementalism where policy action is kept within narrow bounds because most changes to a policy output at time t are countered by subsequent changes in the opposite direction at time $t+1$ (see also Robinson & Meier 2006).

We address two central questions of negative policy feedback, which have not yet been systematically examined. The first question regards *when* policy at time t loses its predictive power of policy at time $t+1$. Already Wildavsky and colleagues were occupied with variants of this question (e.g. Davis et al. 1974) and the question is also prominent in the three more recent approaches to public policy dynamics mentioned above. In particular, we investigate a core claim by Jones and Baumgartner (2005a, 329): "Attention at the individual and collective levels governs the shift from stasis to the positive feedback processes...". The quote reflects their emphasis of both negative and positive feedback, the latter describing instances where an adjustment from status quo is accentuated by self-reinforcing processes rather than

counterbalanced (Baumgartner and Jones 2002, 13). From that perspective, political attention – often conceptualized as policy agenda setting – is the central variable governing the mode of public policy. According to Baumgartner and Jones, negative feedback is the rule when an issue receives relatively low political attention, but when the issue attracts political attention, the negative feedback mechanism may be weakened or perhaps even replaced with positive feedback (see also Jones 2001, 144). While some case studies have provided examples in support of this claim (see e.g. Baumgartner & Jones 1993; 2002), the conditional effect of political attention on negative policy feedback has never been modelled and examined systematically in large-scale empirical studies. To specify and test this proposition is our first contribution.

The second contribution regards the question of *why*, most of the time, there will be a thermostatic relationship between policy at time t and policy at time $t+1$. A whole array of explanations of this can be identified in the policy literature, including variants of institutional friction and/or opposition from vested interests that benefit from the current policies (e.g. Wilson 1980; Tsebelis 2002). All of these explanations may have merits, but the multiplicity of explanations is also evidence of a need to begin disentangling them. The most obvious place to begin, in our view, is to examine whether negative feedback can be established at the level of individual policymakers. One of the clear strengths of many public policy theories is the explicit micro-foundation. Yet, surprisingly little empirical attention has been given to individual policymakers. Hence, one likely driver of negative feedback in public policy is that individual policymakers respond to public policies in a thermostatic way very similar to how the public has been shown to respond to public policies (see Soroka and Wlezien 2010). Politicians can be expected to have knowledge of current policies, and if, for instance, spending in an area has increased politicians may respond by lowering their preferences for spending in that area.

Similarly, if spending has been decreasing in a given area, politicians may observe this and raise their demands for spending in that area. In that way, politicians can be expected to behave in a way similar to the most “informed” part of the public, which according to Wlezien and Soroka’s (2010) studies are the most responsive to public policies.

Empirically, we address these questions as follows. First, utilizing a unique survey dataset of spending preferences of local government politicians covering more than 90 Danish municipalities, three years, seven policy issues, and around 3,000 entries, we show how the expressed spending preferences of politicians generally respond in a thermostatic, negative feedback style to previous spending levels. This is important individual-level evidence of the negative feedback mechanism postulated by the punctuated equilibrium theory as well as by other models of public policy and public spending.

Second, combining the survey and spending data with a dataset on local government policy agendas, we show how the negative feedback effect disappears as the issue elevates up on the local political agenda. In other words, as political attention to an issue increases, the effect of past spending on current spending preferences wanes. This is support for the claim that political attention governs the mode of policy, but it also raises new questions about the role and conceptualization of positive feedback in public policy. The large-N local government data allow us to control for a wide range of potentially confounding variables, which corroborates the significance of the findings of main theoretical interest. The broader implications of our findings, including questions of generalizability, are discussed in the concluding part of the article.

Negative Feedback in Public Policy

Normally, politics is not explosive. The best predictor of this year's policy is last year's policy. Lindblom (1959) and Wildavsky (1964) were among the first scholars to argue and show this, and even though especially the quantitative findings of Wildavsky and colleagues later came under fierce fire (see LeLoup 1978), it is hard to argue that the basic proposition about marginal adjustments to existing policies is wrong. This is corroborated by the fact that a range of more recent public policy theories and approaches depict similar pictures (Hall 1993; Sabatier 1987; Baumgartner and Jones 1993; Baumgartner et al. 2017). Equally true is it, however, that the negative feedback mechanism can be weakened and at times even be replaced by positive feedback processes, where a given adjustment from status quo is accentuated by self-reinforcing processes rather than counterbalanced (Baumgartner and Jones 2002, 13).

One example of positive policy feedback is the type of second- and third-order changes described by Peter Hall (1993, 278-279). In second-order changes, the policy instruments themselves change, and third-order changes are paradigmatic changes, where the goals behind a given policy change as well. In such cases, where the instruments, their settings, and the hierarchy of goals are altered, current policies may not be a good predictor of future policies. Another example regards instances of change in the beliefs of the central policymakers. The advocacy coalition framework describes how a change in the policy core beliefs of policymakers may involve a change of their causal perceptions of a policy domain (Sabatier 1998, 103). The intuition is that if policymakers alter their understandings of a given policy area then at least temporarily policies may differ so much from previous policies that the latter will lose its influence on current policies.

Among theories of changes and stability in public policy, the punctuated equilibrium theory is the one which most explicitly has theorized and investigated negative and positive feedback in public policy. The punctuated equilibrium theory was introduced in 1993 as an explanation of the development of US politics since the Second World War (Baumgartner and Jones 1993). The first applications were limited to case studies of particular issue areas such as pesticide regulation and nuclear politics (Baumgartner & Jones, 1993; 2002). In these studies, evidence of negative and positive feedback in public policy was mainly based on visual inspection of time series graphs of agenda or policy/spending data supplemented by comprehensive, qualitative case studies of the underlying policy making processes.

The major contribution of the first generation studies by Baumgartner and Jones was to show how politics in the long run can be disrupted by short periods of quite dramatic changes. This was an important correction to the picture of stability and incrementalism, but the emphasis of punctuations and sudden changes to some extent overshadowed later elaborations and modifications of the model. In 2005, Jones and Baumgartner extended the model to be: "...a full-blown and viable model of choice for public policy..." (Jones & Baumgartner, 2005, 325). In this new version of the theory, called *a model of disproportionate information processing*, the emphasis is on information processing and error-correction. This signaled an interest in the full range of policy changes, and not just in the most dramatic bursts of change. The latter development also represented a shift in empirical focus towards output data based on annual public spending changes observed over time and across a large number of policy areas (see e.g. Jones et al. 2009). Furthermore, it is important to note that what started out as a theory of American politics over time has been applied to a broad range of other countries and political systems summing to almost 300 non-US studies by the most recent count (Baumgartner et al.

2017). Central questions about negative and positive feedback remain however. One is *why* policy most of the time displays negative feedback where outside forces are dampened by self-correcting mechanisms of the system. The other question is *when* policy at time t loses its predictive power of policy at time $t+1$.

A Thermostatic Model of Negative Policy Feedback

To get closer at the negative feedback mechanism in public policymaking, we focus on the feedback effect of public policy on the policy preferences of the policymakers and we claim that policymakers adjust their preferences for policy in response to policies. Hence, the argument is that policymakers form their policy preferences in a thermostatic way—much like the public has been shown to do (Soroka & Wlezien, 2010). This means that if spending on a given policy issue, for instance, is high relative to earlier spending or to spending in comparable political units, they will prefer relatively less spending on that issue. On the other hand, if spending on a given issue is low, policymakers will tend to prefer relatively more spending on that issue. This is an important path of negative policy feedback and, if supported by empirical evidence, it is a path that will deepen our understanding of *why* policies most of the time are characterized by negative feedback.

Using the notation of Soroka and Wlezien's (2010) feedback model, this baseline expectation can be written as follows, where policy preferences (R) at time t across a set of policy domains j are a product of policies (P) plus some other factors (X), a random error (ϵ), and an intercept (α):

$$R_{jt} = \alpha_{jt} + \beta_1 P_{jt} + \beta_2 X_{jt} + \epsilon_{jt} \quad (1)$$

If policymakers adjust their preferences thermostatically, we would expect to see a negative effect of policies (P_{jt}) on preferences, and consequently that $\beta_1 < 0$. Note, however, that there is nothing in equation 1 that requires β_1 to be negative. If positive feedback is dominant, then β_1 will be positive. If negative feedback dominates, as we expect, then β_1 will be negative. The parameter β_1 represents the net effect of positive and negative feedback (see also Soroka and Wlezien 2010, 29).

Equation 1 describes a model, where the policy preferences of the policymakers may be a product of other factors than previous policies. These factors can be individual level characteristics of the policymakers, such as gender, age, and partisan affiliation, but they can also cover system level effects on policy preferences, for instance, sociodemographic needs for a given policy or financial constraints of the given political system. In that way, the negative feedback model described in equation 1 is a more sophisticated one than a model claiming that politicians adjust their policy preferences to previous policies only. In our view, the latter would be too simplistic and too ignorant of what we today know about the multiple drivers of public policy. Furthermore, identifying the negative feedback mechanism in a multivariate setup makes it more credible that negative feedback really works at the individual level of policymakers.

The next question is *when* the policy preferences of politicians are more or less constrained by current policies. Theoretically, the interest has centered on causes of positive feedback including focusing events (Birkland, 1998), mimicking processes (Baumgartner & Jones, 2002), and changes in performance information (Flink, 2017). A common characteristic of such events is that for one reason or another they likely lead to increased political attention to policy issues of relevance to the events. In fact, the perhaps most straightforward and fundamental implication of Baumgartner and Jones' theory is that increased political attention to

an issue weakens the negative policy feedback on that issue. The argument is founded in the bounded rationality of the decision makers. According to Jones (2001, 144), negative feedback is the rule when most actors are not attending in any detail to a program but when a program attracts their attention, bursts of cuts, or increases occur. In other words, what the incremental variant of bounded rationality failed to see is that the serial processing capacities of the decision makers, which in periods of stability serve to prevent policy change, also ensure increased focus on new problem definitions and issues once the attention of the decision makers shifts (see also John & Margetts, 2003, 414). Thus, whatever causes a shift of attention, the proposition is that an increase in political attention weakens the negative feedback effect.

Surprisingly, this central claim has never been subject to systematic, empirical evaluation. Originally, Baumgartner and Jones (1993) used the concept of a macro-political agenda, which referred to instances where an issue attracted political attention outside its normal subsystem environment. Building on this conceptualization, previous studies have examined how policy may change as a consequence of macro-political attention (see Mortensen, 2009; Jakobsen & Mortensen, 2015), but no quantitative studies have examined how macro-political attention conditions the effect of past policies on the policy preferences of policymakers. True (2002) hints at this effect in his study of the changing focus of national security spending, but though his quantitative analysis does reveal a time-varying relationship between policy at time t and policy at time $t+1$, the analysis does not show whether such changes match changes in political attention to the issue of defense. Furthermore, the study by True (2002) did not examine the link between current policies and the policy preferences of the policymakers.

We can summarize the conditional expectation as a simple interaction model:

$$R_{jt} = \alpha_{jt} + \beta_1 P_{jt} + \beta_2 A_{jt} + \beta_3 A_{jt} P_{jt} + \varepsilon_{jt} \quad (2)$$

In this stylized model, β_1 indicates feedback of policies at policy issue j (P_{jt}) on policy preferences (R_{jt}) when no attention is given to the policy issue ($A_{jt} = 0$), with a negative sign indicating negative feedback. The sign of β_3 then indicates whether feedback is reinforced (if the sign of β_3 is similar to that of β_1) or weakened (if the sign of β_3 is different from that of β_1) with increasing levels of attention. In accordance with the standard approach in policy agenda-setting research, we use a continuous and relative measure of political attention in the empirical analysis (see below). Using this relative measure, we expect the negative effect of current policies to diminish as political attention increases, and thus that the combined effect of β_1 and β_3 goes towards 0 as attention (A) to the issue increases.

Modelling it this way we do not look for breaks in the relationship between policies (P_{jt}) and policy preferences (R_{jt}), but for a gradual weakening of the negative feedback mechanism as political attention increases. Note also that the marginal effect of current policies may turn positive as political attention increases, which would imply that positive feedback dominates negative feedback as attention to the given issue increases. More realistically, in our view, is however a less explosive model, where political attention weakens the link between current policies and policy preferences. We return to this question in light of the empirical results of the analyses shown below.

Before introducing the empirical setup of our analysis, it is worth considering whether we violate some fundamental assumptions of the punctuated equilibrium theory by testing one of its core claims in a multivariate, linear modelling universe as implied by equations 1 and 2. Originally, negative and positive feedback were linked to concepts of stability separated by short

periods of dramatic change, often identified based on visual inspections of univariate time series graphs (Baumgartner and Jones 1993; 2002). Variants of this approach are still applied, for instance, when positive feedback is inferred from fat tails of non-normal, leptokurtic distributions of annual changes in public spending (e.g. Jones et al. 2009). Yet, when Jones and Baumgartner (2005) reformulated and generalized their original ideas, they also depicted a different approach to negative and positive feedback inspired by error-correction and error-accumulation models. As claimed by Jennings and John (2009, 841), in their application of the punctuated equilibrium model to agenda-opinion dynamics, the error correction representation: “... implies that feedback is a continuous rather than an intermittent process. This differs from adjustments through punctuations where responses to additive information signals are nonlinear and bring about new equilibria”.

The punctuated equilibrium theory is a model of public policy that has been updated and developed over a period of 25 years, and thus there are different ways of applying and examining the various aspects of the model. In the following, we test a set of central implications that can be derived from the model (equations 1 and 2), but given the richness and complexity of the general model we do not claim that by this study we have examined all relevant aspects of policy and negative feedback. We return to some of these unresolved issues in the concluding section.

Data and research design

Consistent with many previous policy studies, we focus on public spending in the empirical analysis. Budgeting is a core political activity and represents a central output from political systems. Public spending provides clear evidence of how politicians prioritize between the many different services that government provides to the public. Exactly for this reason, Bowman and

Kearney (2014, 202) have described the budget as the most important political manifesto. Furthermore, as also demonstrated by Soroka and Wlezien (2010) it is a quantitative and directional measure of public policy, which is highly useful when testing models of feedback.

The Danish municipalities offer a strong laboratory for testing negative feedback effects on the spending preferences of the politicians. The municipalities spend more than fifty percent of the total public spending in Denmark. They are multipurpose political systems with responsibility and autonomy to carry out services within policy areas such as primary and secondary schools, daycare, elder care, culture and leisure, libraries, roads and infrastructure. They are multiparty systems rather similar to the national level of politics, and representatives are elected every fourth year in competitive elections. The large number of units (98 municipalities) in combination with very precise spending data and highly valid statistical data on the Danish local governments makes it possible to control statistically for a number of potentially relevant confounders. In the following sections, we describe how we measure the three central variables necessary to examine the propositions derived above.

The dependent variable: Spending preferences

To move beyond state of the art in previous research on negative feedback in public policy and public spending, we need to supplement the spending data with data on the spending preferences of the policymakers. To that end, we utilize survey data based on online surveys sent to all elected Danish city council representatives in 2008, 2009, and 2012. The dataset comprises a total of 3,393 observations. Information on the number of valid responses and response rates is reported in table 1. Data are generally representative of the population of Danish city councilors in the two election periods covered (2007–2009; 2010–2013)—though with a tendency for

politicians from the largest municipalities and right-wing politicians to be slightly underrepresented.¹

[Table 1 about here]

The number of politicians who responded to the questionnaire only once was 1,465, whereas 628 politicians answered the questions in two different years, and 224 politicians answered the questions three times. Since only few politicians have responded to the survey more than once and since the dataset comprises only three years, the dataset is best suited to examine between-variation. The large number of different politicians and different geographical units covered by the surveys allows for a simultaneous estimation of multiple determinants of spending preferences (see below).

Our dependent variables measure politicians' spending preferences on a wide range of policy areas where municipalities are responsible for providing services: 1) Schools, 2) day care, 3) elder care, 4) culture and leisure, 5) libraries, 6) administration, and 7) roads. For each area, respondents have been asked about their preferences relative to the current level of spending. Thus, the politicians have been asked to indicate whether they: 1) Prefer much less, 2) less, 3) the same, 4) more, or 5) much more spending on the given policy issue. In order to avoid responses where the respondents do not take the costs of raising levels and tradeoffs between areas into account, the politicians were told to imagine a situation where desired changes all else

¹ Aspects of data have previously been published elsewhere. However, data have never been combined before, nor have they been used in combination with the independent (municipal spending) and moderating (political attention) variables that we focus on.

equal would have consequences for either the tax level or the level of spending on other policy areas.

This relative measure of spending preferences is closely aligned with our research question about the feedback from existing levels of public spending on the spending preferences of the politicians. In fact, we could not test the negative feedback model laid out above without a relative measure of spending preferences. Furthermore, as argued by Soroka and Wlezien (2010, 28), there is good reason for asking about relative rather than absolute preferences, given that this is likely how most people, including politicians, think about most policies. In other words, it corresponds with the marginal character of public budgeting depicted in the budget literature, and at the same time it allows for non-negative feedback effects.

Table 2 summarizes the main descriptives for the survey data on spending preferences. The table shows that some issue areas are more popular than others—in particular schools, daycare, and elder care—but it also shows considerable variation within all issue areas. As is evident from the table, the distribution of spending preferences is generally skewed to the left, which corroborates the massive finding in the budget literature of an asymmetric pressure towards more public spending.

[Table 2 about here]

The independent variable: Spending

Our main independent variables measure annual spending on each of the seven policy areas².

Given the relative measure of spending preferences, negative feedback will show through as a

² Table A1 in Supplementary Online Material gives an overview of the municipal accounts used to construct these spending measures.

negative effect of current spending levels on preferences for more spending on that issue area. This means that politicians from municipalities with high levels of spending will be more inclined to prefer less spending than politicians from municipalities with low levels of spending, who will have a higher propensity to prefer more spending. Thus, the likelihood of responding “more” or “much more spending” is expected to *decrease* with higher levels of current spending; the likelihood of responding “less” or “much less spending” is expected to *increase* with higher levels of current spending.

Given that the exact expenditures are unknown until six months after the year where the money was spent, we use a one-year lag for the spending effect on the spending opinions of the politicians. To increase comparability across large and small municipalities, we use “spending per inhabitant” as a standardized spending measure. Furthermore, we use net spending. This explains why road spending can take negative values in municipalities where revenues within this policy domain exceed the expenditures.³ Table 3 summarizes the main descriptives for the spending measures.

[Table 3 about here]

Conditional variable: Political attention

We use a coding of municipality council agendas as an indicator of the content on the local political agenda. The council agendas come very close to what could be termed a *local governmental agenda*. This includes the issues that are up for active and serious consideration at local council meetings. No nationally defined institutional rules set the local council agendas;

³ We find similar results regardless of whether the analyses are with or without negative spending observations.

each local council puts together its own agenda.⁴ From the homepages of each municipality, we collected and counted the number of points on the docket for local council meetings and coded the content of each agenda point. We have done so for all of the council meetings for each municipality in the years 2007–2013. The comprehensive Danish reform of local government in 2007 involving large-scale municipal mergers prevents an extension of the time series further back in time. Furthermore, given the massive task of content coding these ~200,000 agenda dockets, the time series end in 2013 where the data collection process was initiated.

For the content coding, we build on the issue coding scheme of the comparative agendas project (<https://www.comparativeagendas.net>), which identifies the substance of an item on the agenda. Each item on the council agendas has been further coded into one of 189 different subcategories.⁵ For this study, we constructed seven issue categories that match the survey questions and the spending categories introduced above. Since our theoretical interest is in how much attention the local council devotes to a given issue, we focus on the absolute number of agenda dockets per issue. The alternative would be a relative measure where attention per issue is divided by the total number of agenda points. Using this relative measure, however, would imply that attention to an issue could change merely as a consequence of changes in attention to other issues in the council. Thus, our measure of political attention is: A_{ijt} = Absolute number of agenda dockets on issue category j in municipality i in year t . Summary statistics for the local policy agendas are shown in table 4.

⁴ National-level regulation may require that some issues—such as an annual local school performance report—are placed on the council agendas, but this is the exception, and it basically affects all municipalities equally.

⁵ Trained student assistants coded the material in combination with machine coding. See Loftis and Mortensen (2018) for a detailed description of the coding strategy and intercoder reliability tests.

[Table 4 about here]

Control variables and statistical estimation

With respect to confounders, it is useful to return to equations 1 and 2 above. When applied to the local politician surveys, the base model for each policy domain can be written as (3) and the interaction model as (4):

$$R_{rit} = \alpha - \beta_1 P_{it-1} + \beta_2 W_{rit} + \varepsilon_{it} + \varepsilon_{rt} \quad (3)$$

$$R_{rit} = \alpha - \beta_1 P_{it-1} + \beta_2 W_{rit} + \beta_3 A_{it} + \beta_4 A_{it} P_{it-1} + \varepsilon_{it} + \varepsilon_{rt} \quad (4)$$

where α represents the grand intercept, ε_{it} the error term for the municipality level, and ε_{rt} the error term for the individual level. W designates a variety of drivers of R ⁶, A is the number of dockets on the council agendas, and P indicates spending. Subscript r denotes respondents, i is the municipality, and t is the year of the survey. We include the subscript $t-1$ to indicate that spending is measured prior to preferences. The most important part of equation 3 is β_1 , which is expected to be negative and to capture the general negative feedback effect. In equation 4, the critical part is the combined effect of β_1 , β_3 , and β_4 , which is expected to dampen the negative feedback effect as A increases.⁷

As indicators of W , we include a broad range of municipality-level and individual-level variables that have previously been shown to influence the relative spending preferences of the politicians (Blom-Hansen, Baekgaard, and Serritzlew 2016; Vabo, 2005). At the municipality level, we include controls to account for differences in the composition of the population, which may explain both spending levels and politician spending preferences. Specifically, we control

⁶ For a similar conceptualization, see Soroka and Wlezien (2010, 28).

⁷ Respondents are observed at particular points in time (t), but due to the lack of repeat respondents and the gaps between the surveys, standard time series specification tests are not applicable.

for population size, population density, debt, tax base, and a standardized index of socio-economic challenges in the municipality. Furthermore, for those areas where objective measures of “need” are available and meaningful, we include them. For instance, we include a measure of the share of the population aged 7–16 years when we estimate a model for primary and lower secondary schools.

Individual-level controls are included to improve the precision of our estimates. Individual-level variables include gender, age, and education of the politicians. Furthermore, we include information about committee membership, both for the finance committee and for the standing committee for the given policy area.⁸ Party affiliation is measured by a 0-1 dummy variable, taking the value 1 if the politician is a member of the Unity List, Socialist Peoples’ Party, or Social Democrats. Finally, year dummies are included but not shown in the model outputs reported.

We estimate a model for each of the seven policy areas. Given the hierarchical character and panel like properties of the data, we employ multilevel mixed-effects models with spending preferences nested at the municipality and individual level, thereby ensuring that repeat respondents are not driving our results, and with standard errors clustered at the municipality level to account for municipal clustering. Since we analyze opinion formation at the level of individual politicians, we cannot meaningfully transform the five-point response variable to a continuous measure. Consequently, we estimate the models using multilevel mixed-effects ordered logit regression. Summary statistics for all control variables are shown in table A2 in the online appendix.

⁸ Information on standing committee affiliation is only available over time for three of the seven policy areas. The analysis produces similar findings if we limit data to the years 2008 and 2009 where such information is available for all policy areas, or if we run analyses without standing committee affiliation included at all.

Findings

Table 5 reports our main findings. With respect to negative feedback, table 5 shows that on all seven policy areas the actual level of expenditures has a negative and clearly statistically significant effect on the spending preferences of the politicians. This is strong evidence of negative policy feedback on politicians' spending preferences.

[Table 5 about here]

The feedback effect is further illustrated in figure 1, which displays average marginal effects of the lagged spending variable on the probability of answering “more or much more spending” or “less or much less spending”. Two important conclusions can be derived from figure 1. First, on all seven issue areas, an increase in spending increases the probability of politicians answering less or much less spending, and it decreases the probability of politicians answering more or much more spending. Thus, we do see the negative feedback effect at work across all seven issue areas. Second, it is noteworthy that the size of the estimated effects is largely of similar magnitude in five out of seven issue areas—culture/leisure activities and libraries being the exceptions. We do find the expected pattern with respect to the latter two spending categories, but the estimated effects are more uncertain as reflected by the wider confidence intervals.

[Figure 1 about here]

Returning to table 5, the results also show that spending levels are far from the only driver of the spending preferences of local politicians. First, politicians are responsive to variation in the issue specific indicators of need—such as the share of children in the school age

(model 1), the share of children in daycare age (model 2), and the share of elderly people (model 3). This responsiveness to various needs variables also adds to the interpretation of the negative feedback effect in the sense that it shows how politicians consider the current problem environment when they make up their mind. On the other hand, we do not detect any average effect of political attention on preferences. Thus, attention is not an independent driver of spending.

Consistent with extant literature (Baekgaard, 2010; 2011; Blom-Hansen, Baekgaard, & Serritzlew 2016; Vabo, 2005), another result of table 5 is that individual-level variables matter as well. In particular, the indicator of party ideology is important. Across all issues, and independently of various spending needs measures, there is a statistically significant effect of the party variable. Except for the issue of roads, politicians from center-left parties prefer higher spending than politicians from center-right parties. This is consistent with the classic politics matter perspective. In fact, the party effects on spending preferences look stronger and more persistent than the mixed results found in many policy output studies (Imbeau, Petry, & Lamari, 2001). This could suggest that the real preference differences between politicians are diluted during the policymaking process and are therefore often hidden when scholars only analyze policy output data (see also Baekgaard, Blom-Hansen, & Serritzlew, 2015).

Partisanship is certainly not the only individual-level determinant of spending preferences. Elderly politicians prefer less spending on schools and daycare than younger politicians but more spending on elder care, libraries, and roads. With respect to gender, the results show that female politicians have a preference for higher spending on daycare and elder care than male politicians.

Finally, according to table 5, institutional variables also correlate with the spending preferences of local politicians. Membership of the local finance committee tends to be associated with a preference for less spending across spending areas although the correlation only reaches statistical significance for the area of elder care. On the other hand, being member of a standing committee has a positive effect on the politicians' spending preference for the area relevant to the standing committee. Thus, for the three areas that could be linked to a standing committee, we find a clear positive relationship with committee membership, which to some extent may reflect self-selection based on preferences (Baekgaard, 2014).

Clearly, as shown in table 5, negative feedback is not the only driver of spending preferences, but it does show up as a notable and consistent effect across a broad range of different issue areas. *This is important individual-level support of the central negative feedback effect postulated by much of the public policy literature.*

We now turn to the second question about whether political attention to an issue can reduce the negative feedback effect observed above. Recall that we measure political attention based on a content coding of all council meeting agendas in the period investigated here. Figures 2.a–2.g show the results. The figures are based on regression models including interactions between policy area attention and policy area expenditures, which are reported in table A3 in the online appendix. As noted by Brambor et al. (2016, 74), one cannot determine whether a model should include an interaction term simply by looking at the significance of coefficient of the interaction term. Thus, we follow the approach advocated by Brambor et al. (2016) and base our conclusions on graphical illustrations of the marginal effects of expenditures on preferences for substantively relevant values of attention. The x-axis range approximates the observed range of variation in council meeting attention to the given issue.

Figure 2 shows that on four out of the seven issue areas, we find the expected pattern where increasing political attention weakens the relationship between spending and spending preferences and at some point offsets the negative feedback effect. These issues are schools, day care, elder care, and culture. Remarkably, for these four issues, the cutoff point is very similar and occurs around 20 annual agenda dockets on the council agenda dedicated to the given issue. If more council attention is given to the issue, the negative effect of current spending levels on the council members' spending preferences becomes statistically insignificant.

Turning to figures 2.e and 2.g at the bottom of figure 2, political attention appears to have a weaker conditional effect. This is consistent with previous research showing that political attention has a different effect on popular and unpopular issues (Mortensen, 2009). However, this interpretation is challenged by the distribution of spending preferences in table 2 above, which shows that the issue of roads is a quite popular spending domain among local politicians. Thus, as discussed in the concluding section, the varying effects across issues do invite further theorizing and examination of more issue-specific dynamics.

[Figure 2.a - 2.g about here]

One important potential criticism of the study at hand is the question of internal validity. Does the correlation between municipal expenditures and spending preferences reflect a causal effect, or is reverse causality affecting our estimates? Given the use of lagged spending data, we consider it unlikely that the individual-level preferences in our study should be influencing past spending. Moreover, we should expect a positive impact going from preferences to spending levels. Thus, if relevant at all, reverse causality would tend to curb the negative feedback effect.

To assess the robustness of our results, we re-estimated all analyses using budget measures instead of outlays. Given the timing of the budget data, these budget variables have not

been lagged one year. Using these budget measures do not substantially change any of the main findings reported above. In fact, the expected interaction effects of political attention become slightly stronger, which may reflect that budgets are closer to the political decision-making process.⁹

Conclusion

This article provides individual-level evidence of the negative feedback effect claimed in much previous public policy research. This is important given the discrepancy in public policy research between theories of individual-level decision making and empirical studies of aggregated policy output measures. Identifying the underlying individual-level dynamics is crucial in order to further advance our understanding of feedback in public policy. Substantially, the results show that spending preferences do adjust to current levels of public spending, and they do so very similarly and consistently across seven different policy areas.

That said, the analysis also reveals that other determinants are relevant as well. Indicators of current needs and problems matter too—as do institutional variables and especially individual-level characteristics such as party affiliation, seniority, and gender. In combination, this depicts that spending preference formation may be constrained by cognitive limitations and strong ideological and institutional filters.. In other words, it is a more sophisticated negative feedback mechanism we have observed here than one where preferences respond to current (previous) policies only.

Moreover, we provide empirical support for the perhaps most basic claim of the policy model developed by Baumgartner and Jones, namely that political attention offsets the negative

⁹ See tables A4, A5, figures A1 and A2.a – A2.g in the online appendix.

feedback effect. The more political attention to an issue, the less effect of current policy (spending). This is a remarkable finding that lends credence and validity to the basic motivation underlying the broader research field on policy agendas, namely, that agenda changes matter to public policy in a rather predictable and important way.

This finding also sparks new and important questions. First, what happened to positive feedback? While allowing for the possibility of positive feedback, our findings clearly indicate that negative feedback overwhelms positive feedback. We show more or less negative feedback, but we see no evidence of a net positive feedback effect, which in the modelling approach used here would imply $\beta_1 > 0$ (see equation 1). This does not preclude the possibility that for certain politicians in certain municipalities, more spending on an issue may lead to more, rather than less, demand. Observing $\beta_1 > 0$ as a general, average effect would however reflect a quite explosive spending process, and when we did not observe this in the models it may have to do with the fact that we look at public spending observed at yearly intervals (see also Loftis and Mortensen 2017).

Negative feedback is expected to predominate public policy-making, and this is what we observe at the level of individual policymakers. Yet, the fact that increased political attention dampens the negative feedback effect raises the question of what replaces the negative feedback effect? The theory of Baumgartner and Jones does not give a clear guidance here since it joins Schattschneider's (1960) dictum that the result of attention increase is largely unpredictable. However, reality is that the question has not been subjected to systematic, large-N empirical analysis. One possible answer is that policy preferences in times of increased attention and debate will be affected by the tone of the debate and the prevailing issue definitions. Issue definitions imply that agenda setting is not just about changes in the saliency of a given issue; it

is also about how that issue is discussed and defined in the political discourse. Thus, a more comprehensive agenda measure sensitive to the tone of the local political debates might provide us with a more precise estimate of the conditional agenda effects, and a better understanding of what happens once political attention to an issue increases.

To what extent do our findings generalize to other institutional settings? Bearing in mind the remarkably stable nature of negative feedback across issues ranging from topics of utmost importance to many people's lives such as elder care and public schools to issues of much less importance such as libraries, and bearing in mind the general important nature of Danish municipalities to the Danish welfare state, we would expect findings to generalize to other systems including higher-level political systems. However, it must be an empirical question to what extent the negative feedback effects observed in this study depends on, for instance, general financial trends and particular institutional characteristics.

Relatedly, the question about issue variation deserves attention in future research of feedback effects. The main finding here is one of similar effects of policies and attention across issues. Nevertheless, the analysis also reveals variation across issues. The weakest negative feedback effects are identified in the areas of culture and leisure, libraries, and roads. Such issue variation revokes the long-standing interest in issue variation in the public administration and policy literature (Wilson 1980). The fact that the clearest results come from the three largest spending areas and the three areas of most importance to the local electorate, may imply that the other spending areas are used partly as buffers, and may be subject to more residual politics. We cannot know, however, and this should be a reminder that every model of policy must strive to take into account variation across policy issues.

References

- Baekgaard, Martin. 2010. "Self-Selection or Socialization? A Dynamic Analysis of Committee Member Preferences." *Legislative Studies Quarterly* 35 (3):337–359.
- Baekgaard, Martin. 2011. "Committee Bias in Legislatures with a High Degree of Party Cohesion: Evidence from Danish Municipalities." *European Journal of Political Research* 50 (3):315–335.
- Baekgaard, Martin. 2014. "Within-Party Allocation of Committee Seats: Evidence from Danish Local Elections." *Scandinavian Political studies* 37 (4):385–405.
- Baekgaard, Martin, Jens Blom-Hansen, and Søren Serritzlew. 2015. "When Politics Matters: The Impact of Politicians' and Bureaucrats' Policy Preferences on Salient and Nonsalient Policy Areas." *Governance* 28 (4):459–474.
- Baumgartner, Frank R., and Bryan D. Jones. 1993. *Agendas and instability in American politics*. Chicago, IL: University of Chicago Press.
- Baumgartner, Frank R., and Bryan D. Jones (eds.) 2002. *Policy dynamics*. Chicago, IL: University of Chicago Press.
- Baumgartner, Frank R., Bryan D. Jones, and Peter B. Mortensen. 2017. "Punctuated equilibrium theory: Explaining stability and change in public policymaking." In *Theories of the policy process*, edited by Christopher M. Weible and Paul A. Sabatier, 59-103. New York, NY: Westview Press.
- Birkland, Thomas A. 1998. "Focusing events, mobilization, and agenda setting." *Journal of public policy* 18 (1):53–74.

- Blais, André, Donald Blake, and Stephane Dion. 1993. "Do Parties Make a Difference? Parties and the Size of Government in Liberal Democracies." *American Journal of Political Science* 37 (1):40–62.
- Blom-Hansen, Jens, Martin Baekgaard, and Søren Serritzlew. 2016. "Shaping Political Preferences: Information Effects in Political-Administrative Systems." *Local Government Studies* 42 (1): 119-138.
- Bowman, Ann O. M., and Richard C. Kearney. 2014. *State and Local Government*. Tenth edition. Boston, MA: Wadsworth/Cengage Learning.
- Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. "Understanding Interaction Models: Improving Empirical Analyses." *Political Analysis* 14 (1):63-82.
- Davis, Otto A., Michael A. Dempster, and Aaron Wildavsky. 1974. "Towards a predictive theory of government expenditure: US domestic appropriations." *British Journal of Political Science* 4 (4):419–452.
- Flink, Carla M. 2017. "Rethinking Punctuated Equilibrium Theory: A Public Administration Approach to Budgetary Changes." *The Policy Studies Journal* 45 (1):101–120.
- Hall, Peter A. 1993. "Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain." *Comparative Politics* 25 (3):275-96.
- Imbeau, Louis M., Francois Petry, and Moktar Lamari. 2001. "Left-Right Party Ideology and Government Policies: A Meta-Analysis." *European Journal of Political Research* 40 (1):1–29.
- Jakobsen, Mads L. F., and Peter B. Mortensen. 2015. "How politics shapes the growth of rules." *Governance* 28 (4):497–515.

- Jennings, Will, and Peter John. 2009. "The Dynamics of Political Attention: Public Opinion and the Queen's Speech in the United Kingdom." *American Journal of Political Science* 53 (4):838-54.
- John, Peter, and Helen Margetts. 2003. "Policy Punctuations in the Uk: Fluctuations and Equilibria in Central Government Expenditure since 1951." *Public Administration* 81:411-32.
- Jones, Bryan D. 2001. *Politics and the architecture of choice: Bounded rationality and governance*. Chicago, IL: University of Chicago Press.
- Jones, Bryan D., and Frank R. Baumgartner. 2005. "A model of choice for public policy." *Journal of Public Administration Research and Theory* 15 (3):325–351.
- Jones, Bryan D., Frank R. Baumgartner, Christian Breunig, Christopher Wlezien, Stuart Soroka, Martial Foucault, Abel François, et al. 2009. "A General Empirical Law of Public Budgets: A Comparative Analysis." *American Journal of Political Science* 53 (4):855-73.
- LeLoup, Lance T. 1978. "The myth of incrementalism: analytical choices in budgetary theory." *Polity*, 10 (4):488–509.
- Lindblom, Charles E. 1959. "The Science of "Muddling Through"." *Public Administration Review* 19 (2):79-88.
- Loftis, Matt W., and Peter B. Mortensen. 2017. "A dynamic linear modelling approach to public policy change." *Journal of Public Policy*:1-27.
- Loftis, Matt W., and Peter B. Mortensen. 2018. "Collaborating with the Machines: A hybrid method for classifying policy documents", *Policy Studies Journal* (forthcoming).

- Mortensen, Peter B. 2009. "Political attention and public spending in the United States." *Policy Studies Journal* 37 (3):435–455.
- Robinson, Scott E., and Kenneth J. Meier. 2006. "Path Dependence and Organizational Behavior Bureaucracy and Social Promotion." *The American Review of Public Administration* 36 (3):241–260.
- Sabatier, Paul A. 1987. "Knowledge, Policy-Oriented Learning, and Policy Change: An Advocacy Coalition Framework." *Knowledge* 8 (4):649-92.
- Sabatier, Paul A. 1988. "An Advocacy Coalition Framework of Policy Change and the Role of Policy-Oriented Learning Therein." *Policy Sciences* 21 (2/3):129-68.
- Sabatier, Paul A. 1998. "The advocacy coalition framework: revisions and relevance for Europe." *Journal of European Public Policy* 5 (1):98-130.
- Schattschneider, Elmer E. 1960. *The Semisovereign People: A Realist's View of Democracy in America*. New York, NY: Holt, Rinehart and Winston.
- Simon, Herbert A. 1997. *Administrative Behavior: A study of decision-making processes in administrative organizations*. 4th ed. New York, NY: Free Press.
- Soroka, Stuart. N., and Christopher Wlezien. 2010. *Degrees of democracy: Politics, public opinion, and policy*. Cambridge, NY: Cambridge University Press.
- True, James L. 2002. 'The Changing Focus of National Security Policy.' In *Policy Dynamics*, eds. Frank R. Baumgartner and Bryan D. Jones. Chicago, IL: University of Chicago Press, Chapter 7, 155–183.
- Tsebelis, George. 2002. *Veto players: How political institutions work*. Princeton, NJ: Princeton University Press.

- Vabo, Signy Irene. 2005. "Committee structure and political preferences: The case of Norwegian local government." *European Journal of Political Research* 44 (4):563–592.
- Wildavsky, Aaron B. 1964. *Politics of the budgetary process*. Boston, MA: Little, Brown.
- Wilson, James Q. 1980. *The Politics of Regulation*. New York, NY: Basic Books.

Tables and figures

Table 1. Information on the three surveys

	Year conducted	Valid responses	Response rate
Survey 1	2008	1,325	52.4%
Survey 2	2009	802	NA ¹
Survey 3	2012	1,266	51.6%

Note¹: The 2009-data collection was conducted right up to the municipal elections that year. Candidates who did not get elected were excluded from the dataset. The sample consisted of candidates to the municipal elections for whom electronic contact information was available. For that reason, an exact response rate among elected members has not been calculated. The 802 valid responses correspond to 32.7% of all elected candidates.

Table 2. Summary statistics for spending surveys

	Mean	Standard deviation	Minimum	Maximum
1) School spending preference	3.55	0.79	1	5
2) Day care spending preference	3.38	0.74	1	5
3) Elder care spending preference	3.35	0.79	1	5
4) Culture and leisure spending preference	3.22	0.74	1	5
5) Library spending preference	2.82	0.67	1	5
6) Administration spending preference	2.31	0.72	1	5
7) Road spending preference	3.24	0.75	1	5

Note: The response categories are: "Do you prefer 1) much less spending, 2) less spending, 3) same level of spending, 4) more spending, 5) much more spending on issue xx?"

Table 3. Summary statistics for spending measures

	Mean	Standard deviation	Minimum	Maximum
1) School area expenditures	6.56	0.96	3.40	10.73
2) Day care area expenditures	4.80	1.18	2.48	8.68
3) Elder care area expenditures	8.59	1.46	5.05	16.82
4) Culture and leisure area expenditures	0.85	0.30	0.25	2.02
5) Library area expenditures	0.49	0.15	0.29	1.13
6) Administration area expenditures	4.36	0.79	2.52	9.46
7) Road area expenditures	0.90	0.34	-0.11	2.82

Note: Spending in 1,000s per inhabitant (fixed prices using the level of year 2012 as baseline).

Table 4. Summary statistics for the local policy agenda measure

	Mean	Standard deviation	Minimum	Maximum
1) School area attention	12.97	7.02	1	43
2) Day care area attention	9.77	6.39	0	35
3) Elder care area attention	9.07	5.63	0	33
4) Culture and leisure area attention	16.48	8.87	0	56
5) Library area attention	0.83	1.13	0	8
6) Administration area attention	6.50	4.18	0	34
7) Road area attention	14.56	10.41	0	100

Note: The numbers refer to the absolute number of council agenda dockets in each issue category per year (2007 to 2013).

Table 5. The effect of policy area expenditures on preferences. Multilevel ordered logistic regression with mixed-effects and cluster-robust standard errors (municipality level)

	(1) Schools	(2) Day care	(3) Elder care	(4) Culture and leisure	(5) Libraries	(6) Administra tion	(7) Roads
Policy area expenditures (lagged)	-0.273** (0.101)	-0.211** (0.077)	-0.195** (0.064)	-0.843** (0.266)	-1.485* (0.652)	-0.230* (0.108)	-0.563* (0.262)
<i>Municipality-level controls:</i>							
Population size (ln)	0.314* (0.126)	0.241 (0.159)	0.252+ (0.145)	0.014 (0.153)	-0.091 (0.139)	-0.727** (0.161)	0.091 (0.175)
Population density	38.358 (69.117)	22.909 (36.897)	-49.623 (48.150)	-52.935 (64.369)	118.357** (38.323)	23.233 (40.100)	-160.424** (39.603)
Policy area attention	0.005 (0.009)	0.009 (0.009)	0.012 (0.010)	-0.004 (0.008)	-0.034 (0.054)	-0.009 (0.019)	0.009 (0.009)
Socio-economic index	0.028 (0.353)	-0.199 (0.289)	0.347 (0.257)	0.046 (0.371)	-0.338 (0.391)	-0.236 (0.330)	0.101 (0.517)
Debt	0.023 (0.046)	0.038 (0.050)	-0.027 (0.067)	-0.036 (0.070)	0.036 (0.078)	-0.017 (0.060)	-0.039 (0.080)
Tax base	-0.001 (0.003)	0.003 (0.002)	0.002 (0.002)	0.006+ (0.004)	0.001 (0.004)	0.007* (0.003)	-0.000 (0.004)
Share of 7–16 year-olds	0.328** (0.089)	--	--	--	--	--	--
Share of 0–6 year-olds	--	0.206* (0.090)	--	--	--	--	--
Share of 67+ year-olds	--	--	0.202** (0.042)	--	--	--	--
<i>Individual-level controls:</i>							
Gender	0.111 (0.109)	-0.413** (0.124)	-0.279* (0.111)	0.514** (0.109)	-0.054 (0.132)	-0.307** (0.105)	-0.023 (0.124)
Age (years)	-0.014** (0.005)	-0.020** (0.005)	0.029** (0.005)	-0.001 (0.005)	0.017** (0.006)	-0.001 (0.006)	0.018** (0.006)
Education	0.170+ (0.100)	0.114 (0.102)	-0.339** (0.118)	0.029 (0.108)	0.257* (0.115)	-0.154 (0.116)	-0.394** (0.112)
Finance committee member	-0.097 (0.106)	-0.074 (0.118)	-0.424** (0.115)	-0.033 (0.099)	-0.159 (0.121)	-0.077 (0.108)	-0.071 (0.106)
Standing committee member	0.476** (0.094)	0.574** (0.113)	--	--	--	--	1.040** (0.120)
Party affiliation (left-wing party = 1)	0.882** (0.112)	1.185** (0.139)	0.790** (0.124)	0.321** (0.102)	1.177** (0.131)	1.352** (0.136)	-0.427** (0.097)
Member of the mayor's party	-0.421** (0.106)	-0.547** (0.118)	-0.590** (0.110)	-0.001 (0.093)	-0.075 (0.104)	0.375** (0.107)	0.068 (0.110)
City council seniority	-0.017* (0.007)	-0.016* (0.007)	0.001 (0.007)	0.007 (0.007)	0.015+ (0.008)	0.010 (0.008)	-0.004 (0.009)
<i>Wald Chi²</i>	453.970**	330.557**	356.284**	132.102**	336.921**	201.108**	151.516**
Observations (individuals)	2047	2045	2039	2044	2040	2041	2048
Observations (prefs.)	2935	2932	2926	2925	2915	2924	2927

Note: Standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Figure 1. Average marginal effects of lagged spending

Note: The figure shows the average marginal effects of lagged spending on preferring either “less/much less” or “more/much more” spending. 95% confidence intervals shown.

**Figure 2.a – 2.g. The conditional effect of political attention
(marginal effect of spending on preferring more or much more spending)**