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ABSTRACT   This study focuses on a central question in the literature on policy agendas and punctuated equilibrium: why are some agendas more punctuated than others, and what causes these punctuations? In particular, is it friction – wherein barriers to change lead to the build-up of tension that finally overflows – or rather cascades that occur owing to positive feedback loops as actors imitate other actors? We hypothesize that both are at work, and that under certain conditions – e.g., the number of actors and the amount of communication between them – one mechanism is stronger than the other. We test our hypotheses with data on parliamentary activities (interpellations and oral questions) and media coverage in Belgium in the 1990s. We find evidence of both friction and cascading contributing independently to the typical punctuated pattern of policy agendas.

KEY WORDS   Agenda-setting; Belgium; friction; mass media; parliament; punctuated equilibrium.

In their *Politics of Attention* Jones and Baumgartner (2005) contend that changes in attention to issues are invariably punctuated. Political actors' attention is irregular and spiked. Long periods of steady attention to issues alternate with short stochastic attention bursts. For example, government devotes a relatively stable amount of attention to a given issue for a long time until, for some reason, the stasis is broken and government suddenly devotes a disproportionate amount of attention to the issue.

Jones and colleagues (2003) established that this 'law' of punctuations applies to a wide range of United States (US) policy agendas. Studies focusing on agendas in other countries confirm the punctuated pattern (Baumgartner *et al.* 2009; Brouard 2009; Jennings and John 2009). Question time, parliamentary interpellations, bills, executive orders, party platforms, laws, budgets, government agreements and even protest demonstrations . . . they are all punctuated in all countries that have been studied. The general punctuation thesis found further support in a comparative budgetary analysis by Jones *et al.* (2009) in seven countries and in a study by Walgrave and Nuytemans (2009) comparing party manifesto change in 25 countries. So, the idea that policy agendas are punctuated – they systemically under-react and then over-react to incoming

signals – has received ample empirical support across agendas, issues and nations.

The precise causes of this ubiquitous pattern of stability and change have only been partially teased out. Several causes have been suggested, but studies so far fail to elaborate how these causes theoretically relate to each other. Further, these studies do not empirically distinguish the different causes of the observed patterns. This paper focuses on explaining *why* policy agendas are punctuated.

According to the literature, the main drivers of punctuations are 'friction' and 'cascading'. Friction implies that barriers to change (and thus a lack of change in attention) lead to a build-up of tension. When the tension becomes too strong it is released as the lack of attention is corrected. This correction causes the system to leap ('punctuate') to a new equilibrium. Cascading, on the other hand, refers to the fact that actors imitate other actors such that an exponentially increasing number of imitators lead to explosive adjustments to the system. The bulk of the extant work has focused on friction (Baumgartner *et al.* 2009; Jones *et al.* 2003; Robinson *et al.* 2007; Walgrave and Nuytemans 2009). Both theoretically and empirically, the cascade mechanism has been largely neglected; especially with regard to under what circumstances political cascades are bound to happen. Hence, we do not have a good grasp on the respective roles played by friction and cascades in generating the irregular attention patterns in politics.

We claim that both mechanisms, friction and cascading, are different sides of the same coin. Both contribute to the punctuated character of policy agendas; both lead to stability *and* both lead to change. Owing to institutional design, some policy agendas are more affected by friction and others more by cascading. The first goal of the study is to elaborate a theory integrating friction and cascading in a common model that allows us to predict the relative incidence of both mechanisms. The paper's second goal is to empirically test this model and propose a methodological design that distinguishes friction and cascading.

We draw on two cases: parliamentary and media attention to different issues in Belgium. We examine weekly parliamentary questions (1993–2000). As the Belgian parliament is highly fragmented and many parties are represented, we can test the imitation (cascading) effect that different parties' Members of Parliament (MPs) have on each other: to what extent is attention by party A generated by imitating previous attention by party B? In the policy literature the press is considered as a political institution in its own right, invariably displaying the typical punctuated pattern (Baumgartner *et al.* 2009). We draw upon systematic, daily data of issue attention in nine media outlets in the same period (1993–2000). The mass media and parliament form very different policy agendas. The mass media are situated at the beginning of the policy cycle; they are not part of the inner political system. MPs, in contrast, are elected political power-holders belonging to a key political institution. Consequently, we theorize friction and cascading to play a different role in the media and in parliament and empirically test whether this is the case.

FRICTION AND CASCADING AS CAUSES OF POLICY PUNCTUATIONS

According to Jones and Baumgartner (2005: 137–70) policy punctuations are mainly caused by two mechanisms: friction and cascades. Both mechanisms entail that incoming real-world signals about issues and problems – the strength of those signals is by definition normally distributed – are reacted to disproportionally. *Friction* is elaborated in great detail and forms the core of their Punctuated Equilibrium Theory. It comes in two guises: cognitive and institutional friction. The cognitive architecture of institutions creates an inevitable bottleneck of attention and makes them deal with only one (important) problem at a time. Institutions can rely on parallel processing when dealing with normal issues, but when important things show up the leadership must attend to them. The short attention span of these human beings means that they can only attend to things one after another while serial processing. Their time, energy and resources are limited and they tend to neglect most issues for most of the time. Consequently, they are forced to catch up quickly when it turns out that the previously neglected signals were important.

Institutions are often severely limited in their responsiveness because of internal rules. To produce a response to an incoming signal, a decision-making procedure has to be followed constraining an immediate and proportional reaction. Approval processes, for example, take time and deliberation. Different institutional costs are implied when political actors change their attention to issues.

The *cascading* mechanism has been elaborated in only broad strokes by Baumgartner and Jones (2002: 16–19; Baumgartner and Jones 2005: 140–2) and by the research following their approach. Cascades are positive feedback processes: one action causes another stronger action that, in turn, causes an even more extreme action in a self-reinforcing chain reaction leading to explosions (see also Baumgartner and Jones 1993). During positive feedback phases the self-correcting negative feedback is absent; there is no return to equilibrium. Panics and crazes are typical examples of cascades leading to extreme behaviour. Cascades in human behaviour are a result of the fact that people sometimes base their behaviour *not* on incoming signals but rather on the behaviour of others. If actors do not primarily monitor the world and its incoming signals but rather other actors and their behaviour, the result may be overreaction.

The reason political actors imitate each other (cascading) is very similar to the reason they do not attend to signals (friction): the limitations of the human mind and the scarcity of cognitive resources. Most political actors the majority of the time do not have direct and unfiltered information about the real state of affairs; they cannot monitor what is happening in society in an unmediated way. Society is simply too complex and difficult to observe systematically. Consequently, individuals use shortcuts, and indirect signals to gather information about the world. The most reliable and least costly cue in a social situation is to look at what other people are doing. When others adjust their attention

this may indicate that something important is going on and that their own attention level also requires adjustment.

We claim that friction and cascades are complementary mechanisms that must be incorporated in a single integrative framework. Both mechanisms *together* affect the way political institutions react to incoming signals and both together lead to the punctuated attention patterns we observe among the diversity of policy agendas. Our general argument consists of three elements: both friction and cascades contribute to stability and to change; both mechanisms follow a fundamentally different logic; some institutions are relatively more affected by friction and others relatively more by cascading.

Jones and Baumgartner (2005) argue that friction leads to stasis and to change. Friction builds up tension because of barriers to change (error accumulation) leading to the release of this tension through large corrective policy shifts (error correction). The real world drifts away from the established political answers as the world moves while policy remains practically stagnant. Eventually, actors become aware that their standing answer is out of sync, leading to a sense of urgency. Error correction via friction entails that actors are in one way or another *directly* informed about the state of affairs and not indirectly via externally observing the behaviour of others. Take, for example, the case of a spectacular traffic accident. Policy-makers suddenly realize that their traffic safety policies need revising. They may review accident statistics and recognize that the standing policy is not adequate or they may be bombarded by traffic safety lobbyists urging them to change their policy. As a consequence, one may see a spectacular spike in attention and dramatic policy change, the government basing its actions on more or less direct information from society.

We contend that cascading can lead to stasis and to change, too. In a cascade, actors observe what other actors are doing and draw inferences about the real state of the world based on this behaviour. Actors do *not* base their reactions on direct information but on the observed behaviour of others. Take the same spectacular traffic accident. Imagine that an MP from an opposition party starts questioning the government about its deficient traffic policy. If MPs from other parties begin to emulate the first MP's behaviour, then a cascade is in progress. These other MPs do not take up the first MP's cause because they suddenly have new information about the real state of affairs but because they expect that the first MP has signalled an important problem. The above suggests that cascading is first and foremost associated with the rare but spectacular spikes of attention and thus disproportionate change. However, cascades may also produce stability. Political actors also emulate each other's passivity and neglect of issues. When they look around and notice that the others are not moving, this may be a strong signal that nothing has changed and that no adjustment to current attention allocation is needed.

Although friction may be intuitively more affiliated with the maintenance of stability and cascading more with the disproportionate changes, we maintain that both mechanisms essentially contain a stability-increasing and a change-generating aspect. Both mechanisms are blended; for example, when actors

base their behaviour on what others are doing *and* at the same time try to directly assess the severity of a problem.

This implies that friction and error accumulation are *no* precondition for punctuations and that cascading on its own can lead to disproportionate change even if a policy has not gotten out of sync with reality. To take up the same example about traffic safety again: it is possible that mass media, for example, 'stampede' following a triggering event and start devoting a substantial amount of attention to traffic safety. This can be the case even when the mass media, in the period before the accident, had been devoting a fair amount of attention to the issue and had reacted more or less proportionally to previous traffic accidents. Even without preceding paralysing friction, the media suddenly and in a punctuated way may increase their attention for traffic safety because they see other media outlets doing the same. There does not have to be accumulated error for a burst of change to occur. Although Jones and Baumgartner (2005) do not argue it explicitly, their treatment of friction and the centrality of friction in the Punctuated Equilibrium Theory strongly suggest that they consider friction to always be the cause of punctuations. We believe cascading has the same function and is a functional equivalent.

INSTITUTIONAL DESIGN AND FRICTION AND/OR CASCADING

Friction and cascading are functions of institutional design. The internal make-up of institutions determines whether there will be relatively a substantial amount of friction and/or cascading. The key distinction is whether actors in institutions are forced to collaborate or rather compete independently. Most institutions are multi-actor environments; different persons, parties and groups play a formal role. In most countries the executive consists of several parties or several ministers; the mass media consist of several newspapers and television stations (which in turn exist of several journalists, editors, etc.); parliament is composed of several parties; parties themselves contain several factions, groups or individual politicians. The way these actors relate to each other determines whether there will be friction or rather cascading in the institution.

Friction occurs when actors are forced to collaborate and are thus dependent upon each other. Change requires consent of all, or most, of the actors. Just the opposite applies to cascading: actors are autonomous and act without the consent of others. The currency in the friction game is power, the possibility to block a decision. The currency in the cascading game is information, the cues about the real state of affairs that can be indirectly derived from observing other actors. While friction is a matter of power *over* other actors; cascading is a matter of information obtained *from* other actors. This suggests that friction and cascades are dissimilar mechanisms following a different logic. While both processes may occur in the same institutions, as actors in an institution may sometimes engage in frictional and sometimes in a cascade process, we contend that institutional design determines the propensity of friction or cascades to play a dominant role.

Economists have extensively studied the role of micro-level mimicking behaviour. Most famously, Nobel Prize winner Thomas Schelling (1978) documents many instances of individuals imitating each other generating large shifts in aggregate 'macrobehaviour'. In organizational sociology, scholars have investigated how the formal structure of successful organizations is emulated by competing organizations in what they call 'mimetic isomorphism' (DiMaggio and Powell 1983). In political science, there is research on mimicking of fiscal policy regimes, examining to what extent local government, states or regions observe each others' fiscal regime and imitate it (e.g., Ladd 1992; Schaltegger and Küttel 2002). Bartels (1988) shows how presidential candidates can gain momentum by winning early primaries, after which subsequent voters follow the herd and reinforce a candidate's initial success. Wood and Doan (2003), show that in turning a 'condition' into a 'public problem', threshold effects and tipping points are important elements. If people know that many others consider a certain situation to be a social problem requiring government intervention, chances are high that they will adapt their own position and consider the situation to be a problem too. This explains, according to Wood and Doan, why aggregate public opinion can sometimes spectacularly sway: when the public is close to a tipping point, it only takes a small initial change to produce a cascading movement.

We apply these general ideas to policy agendas and propose five dimensions that can be used to distinguish institutions. Each of these dimensions is associated with the presence of friction and/or cascading:

(1) *Multiple* actors are a necessary condition for cascades to occur. Parliament is not a unitary actor. Instead, a large number of MPs, all with their own agendas, interact with each other. For some types of parliamentary activities, such as asking a question or introducing a bill, MPs may be relatively autonomous *vis-à-vis* their party. If one MP, or a group of MPs, starts devoting attention to an issue, other MPs may follow. For other parliamentary activities, such as getting a law passed, having multiple actors that need to agree leads not to cascading but to friction. As MPs (parties) need to secure each other's consent, this leads to delays. The more actors there are in an institution the more we expect to see *both* friction and cascading. Friction happens when consent is required, cascading when actors are autonomous.

(2) When actors within the same institution are *competitors*, both friction and cascades are more likely. Friction occurs when actors cannot agree on a common policy or stance. The reason actors do not agree on a common stance is precisely that they are competing with each other. Were they not competitors fighting over the same resources (e.g., votes), they might easily accommodate, as the success of another actor would be unrelated the own success. However, the level of competition is not only an important foundation for friction; it also drives the cascading process when actors are autonomous. The fiscal mimicking literature shows that in a more

competitive environment where voters can actually compare the fiscal performance of several political entities, these entities will engage more in policy imitation (Schaltegger and Küttel 2002). In a competitive environment autonomous actors even more closely monitor the behaviour of others. As soon as an actor seems to be displaying a successful behaviour, others will emulate that behaviour in order not to lose the competition. The mimetic isomorphism literature states that this will occur even if the success of the behaviour of another actor is unknown or unsure (DiMaggio and Powell 1983). Essentially, it still makes sense to imitate, since imitation reduces the risks that one will suffer relative competitive disadvantages. MPs clearly are competitors; votes, media attention and public support are scarce. If an MP – especially a leading one – starts devoting attention to an issue, chances are high that a good many will follow.

(3) Competition implies sanctions and rewards: some lose while others win. Sanctions and rewards may be *immediate* or they may be postponed. The timing of sanctions is a moderator of friction and cascading. If rewards are postponed, actors have the chance to compensate potential loss in the next round. The more immediate the sanctions, the more frictional and cascading behaviour are observed. When sanctions are immediate, players will exert more control on the collective decision and stall change. Cascades are likewise stimulated when sanctions are direct and immediate. In terms of MPs' behaviour in parliament, with elections coming near it is rational to emulate successful MPs immediately. In contrast, when sanctions are postponed, potential imitators can afford to wait and see what happens to the innovator in the longer term. Waiting until the innovation blows over and the hype of the day passes is then a safe option. If elections are still far off, one can take time to wait and see.

(4) *Communication* is a necessary condition for cascading. Only if autonomous actors are able to observe each other can imitation-driven cascades occur. The more transparent the actions of others, the larger will be the chance that imitation effects will occur. Sornette elaborated this argument for the stock market: the more traders can observe each other, the more they will mimic (Sornette 2003: 95). MPs are in the business of communicating with each other and with the public. All things they do are recorded, ordered and published in an accessible way. The communication dimension relates less clearly to friction. As friction entails the explicit consent needed by another party, communication will rarely be absent. Actors needing each others' consent negotiate and the exchange of information and communication is, in most instances, dense. Still, one can speculate that the more that mutually dependent actors communicate with each other, the more easily they will secure an agreement; the less they communicate, the more difficult it will be to locate an agreement acceptable to all parties and the more likely actions of institutions become out of touch with reality. Hence, we posit that there is a negative relation between communication and friction: more communication leads to less friction.

(5) Finally, *low-cost* activities are more susceptible to cascades, while games entailing high costs foster friction. Constant and flexible mimicking behaviour leads to cascades, not the single sluggish action. Dense procedures entailing large investments in terms of time, energy and resources lead to friction. Question time in parliament happens weekly, with many different questions put forth during the weekly session. It is a high-frequency activity with a relatively low cost. In principle, one need only to sit down, formulate a question and get it on the parliamentary calendar (the latter may actually be rather sticky). Law-making, in contrast, entails more costs and, hence, chances are smaller that MPs emulate laws proposed by other MPs; the effort is simply too large. All other things being equal, we expect low-cost activities to be affected by cascading while high-cost activities are more prone to friction.

FRICTION AND CASCADING IN MASS MEDIA AND PARLIAMENTARY QUESTIONING

The examples in the previous section suggest that MPs, in their weekly questioning of government, are to some extent affected by cascades. First and most importantly, MPs and their parties are autonomous actors that do not collaborate. Moreover, they are many – in this study we examine the behaviour of 12 different parties – their actions are transparent and they compete for scarce resources.

But MPs' activities during question time are embedded in political parties and this considerably attenuates the probability that they are very strongly imitating each other. In fact, we expect there to be a good deal of friction. An individual MP, before putting forth a question or interpellation, needs consent from the parliamentary party group leader. MPs do not entirely meet the requirement of being autonomous actors; they work in a disciplined environment and are embedded in a structure with hierarchy and a division of tasks. As they belong to political parties and are elected on party lists, the sanctions that are imposed on them are not immediate and the parliamentary game is rarely low-cost. Indeed, re-election – at least in the Belgian partitocratic system (De Winter *et al.* 1996) – is depends primarily on a candidate's place on the party ticket. Parties distribute delayed rewards and sanctions to their MPs (De Winter and Dumont 2000). This injects friction into the behaviour of individual MPs and mitigates their spontaneous mimicking of others. MPs may be rewarded by their own party for restraining and for not reacting directly to what MPs from other parties are doing. In short, parties impose costs on MPs; MPs must get their actions approved by their party.

Moreover, parties themselves are acting within a heavily structured environment requiring collaboration; they cannot simply engage in any parliamentary action as they see fit. The main collaboration-imposing mechanism is the government coalition. Government parties, in a coalition system, have struck an agreement to govern together and promised not to destabilize the ministers of their coalition partners. This implies that the behaviour of the majority of MPs in parliament is heavily constrained. Opposition MPs are not bound by

the government agreement but they are constrained by the government-opposition conflict and by their party's ideology and programme. Opposition MPs cannot simply embrace any issue that gets attention from other MPs as they must account for the issue's position in the struggle against the government. Thus, their party may consider it disadvantageous to draw attention to some issues. Thus, opposition party MPs are no more autonomous actors than those in government. So, for parliament as a whole, we anticipate MPs questions and interpellations in parliament to be mostly frictional, with cascading processes playing a more minor – yet still extant – role.

News media, by contrast, should be more affected by cascading processes than parliament. They exhibit all the qualities we identify as conducive to cascades. Mass media outlets are autonomous actors that do not depend on each other but decide independently to devote attention to an issue. Mass media are not solitary actors but compete for the same audience in a non-expandable market. Sanctions are immediate. Viewer rates and readership are monitored on a daily or even hourly basis. Sanctions in terms of advertisement revenues are immediate. Media are by definition communicating actors and their activities are highly observable to one another. Finally, the news media game is relatively low cost. Television stations broadcast several newscasts per day, each time the competing news channels doing the same, and each time the newscast of the competitor is monitored. So we expect to find far more cascade processes in the news media. In fact, there is a considerable stream of communications literature establishing that news media imitate each other to a large extent. The concepts of 'pack journalism' (Brants and Van Kempen 2002), 'media hypes' (Vasterman 2005), and 'media frenzy' (Sabado 1991) all refer to processes of extreme media imitation. Vasterman (2005) defines a media hype as a process in which media coverage is not reacting to the real world but is reactive to other media's coverage. This is precisely the process that we expect to cause disproportional reaction and, in agenda terms, punctuated distributions.

We do not only expect media coverage to be affected by cascades, but argue that institutional friction is low. Some institutional friction exists *within* a given media outlet, as these media organizations have a hierarchy and procedures with several actors that do need to give their approval before a story is brought. But on average, decision procedures and command lines are short. The main source of friction in the media probably is cognitive: drawing away the attention (and resources) from other stories that have been getting attention previously. Therefore, compared to parliamentary behaviour, we expect media coverage to be relatively more affected by cascading processes.

We summarize the above discussion in three hypotheses:

H1: Both in media and parliament, friction and cascading contribute to the punctuated attention pattern.
H2: In the media, cascading contributes relatively more to the punctuated attention pattern than in parliament.

H3:   In parliament, friction contributes relatively more to the punctuated attention pattern than in the media.

DATA AND METHODS

We rely on an extensive dataset with longitudinal data of (1) Belgian parliamentary action, oral questions and interpellations between 1991 and 2000, and (2) Belgian news media coverage between 1993 and 2000. For parliament, we coded all interpellations and oral questions of all parties during weekly question time. For this study we consider the 12 parties represented in parliament. We recorded 10,555 oral questions and interpellations. For the media, we content-analysed both French (Walloon) and Dutch (Flemish) print and broadcast media. Our dataset contains three Flemish newspapers, tabloids and broadsheets with different partisan leanings, and two French-speaking newspapers. We also covered two Flemish television channels, public service and commercial, and did the same for the French-speaking television. We coded all front-page newspaper stories, with exception of the newspapers that appeared on Tuesdays and Thursdays, on a daily basis. The daily television news broadcasts are coded in their entirety. Taken together, the Flemish and French-speaking media database contains 180,265 news items.[1]

Data are coded in 25 major issue categories. When MPs from a certain political party did not ask a single question about an issue throughout the research period, the issue is excluded from further analyses. Overall, this results in 279 issue panels for the parties and 225 issue panels for the media. Each panel for parliament is based on weekly observations with on average 44.5 questions/interpellations. A total of 237 weeks are taken into account; in other weeks no questions and interpellations were formulated. Each panel for the media is based on 2,504 daily observations. We use the share (percentage) of attention that is devoted to an issue during a week (parliament) or day (media) from the attention that is devoted to all 25 issues.

Punctuations can be observed by looking at the distribution of changes over time. It is the distribution of the *differences* in attention for an issue at time t compared to time $t + 1$ that indicates whether a series is punctuated. In fact, all differences between adjacent weeks (parliament) or days (media) throughout the research period form an issue attention change *distribution*. We have 279 different attention change distributions, each one grasping to what extent party attention change for each issue by each party is punctuated. We correspondingly have 225 different attention change distributions, each one grasping to what extent the attention change for each issue by each medium is punctuated or not.

A punctuated distribution, in statistical terms, refers to a distribution with (1) predominantly small differences (around 0) – indicating that the level of attention stays more or less stable as the agenda is not reacting to the outside world; (2) few moderate differences; and (3) a larger than normal number of extreme differences – the agenda overreacts and makes a huge leap. A high central peak,

weak shoulders and fat tails in the change distribution form the signature of punctuated agendas. Following Jones and Baumgartner (2005), this pattern can be tapped statistically by the so-called *L-kurtosis* measure. This measure grasps, over an entire distribution, whether that distribution is characterized by many incremental changes alternating with a few dramatic changes and very few moderate changes. Its value lies between 0 and 1, with scores approaching 1 indicating an increasingly 'leptokurtotic' distribution (high centre, low shoulders, fat tails) indicating a punctuated pattern. A normal, Gaussian distribution has an LK of 0.125. An LK between 0 and 0.125 indicates the opposite of leptokurtosis, 'platikurtosis': a relative 'flat' distribution with fat shoulders (in terms substantive to our case: overrepresentation of moderate changes).

Thus far, we have explained how punctuations in agendas can be observed by drawing on the L-kurtosis statistic of attention change distributions. But how can we assess whether it is friction or cascading that determines the punctuatedness of the parliamentary and media series?

First, we assess the L-kurtosis of all separate party*issue and media outlet*issue panels. Subtracting adjacent weekly (parliament) and daily (media) scores we obtain an issue attention change distribution. For each of these frequency distributions we calculate the L-kurtosis, yielding respectively 279 and 225 different L-kurtoses. This is our *primary* series grasping the raw, 'uncontrolled' punctuatedness of the original attention distribution of parties and media outlets.

Second, we estimate various pooled times series fixed effects analyses that assess for each agenda – separately for parliament and media – to what extent punctuated distributions at time *t* are driven by friction and/or cascading. Our dataset takes the form of pooled time series, with weekly (parliament) and daily (media) values as the units of analysis. These observations are for each political party and media outlet 'nested' in issues. A fixed-effects analysis resembles an analysis that has separate intercepts for each of the issues that are included as independent variables.[2] In that way, the model removes all variation *across* issues and independent variables are only used to predict variation *within* issues over time. Since we are interested in the question of what determines the punctuatedness of attention for separate issues, such a model fits our purpose well.

The next question, then, is how to operationalize friction and cascading. We consider the auto-regressive component of the model – to what extent are values predicted by their *own* history – to partially assess the friction mechanism. Specifically, we consider auto-regression to be a useful operationalization of what we called the friction-stability process, the part of friction that leads to stable attention to issues. Other studies have done the same and have operationalized path dependency by lagging the dependent variable (e.g., Robinson and Meier 2006).

But friction not only implies error accumulation (auto-regression) but also error correction, the sudden large leaps in attention as actors realize the standing policy is not in sync with reality. This is what we called the friction-change process. To that end, in our analyses we not only incorporate auto-regressive variables (friction-stability) but also a variable that attempts to tap the error correction component of friction. This variable takes the form of a time 'counter'

for each party*issue and media*issue panel, and increases one unit each time only a small amount of attention is devoted to the issue on an agenda on/in a certain week or day. Only when a large increase in attention is recorded, an increase of more than two standard deviations, the counter is reset to zero. The idea behind this counter is simple: as time goes by, an agenda gets out of sync with reality. The longer an actor waits in adjusting to the changed situation, the larger the gap between the standing answer and the world becomes. The error accumulates with time, day after day, week after week. Error correction happens when this tension is relieved and when an actor's agenda is realigned with reality in a big burst of attention – here operationalized as a surge in attention of more than two-times the standard deviation. The counter is reset on zero; the accumulated error is corrected for and tension can start to build up again.

The second major component of the regressions, the extent to which issue attention by a party/media outlet is determined by previous issue attention by *other* parties/media outlets, grasps the cascading part of the punctuation. If we can predict the change in attention a party/medium devotes to an issue at time t by previous changes in attention for that issue by other parties/media, chances are high that we have emulation. Cascades too have both a stability and a change component. Our operationalization of cascades in terms of cross-correlations captures both: if agenda A exerts a positive significant influence on agenda B, this is likely to mean that higher values of the first result in higher values on the latter, i.e., change, as well as that lower values result in lower values, i.e., stability.

Formally, we estimate the following equations for each party and media outlet separately:

$$\Delta Y_{i,t} = \alpha_i + \sum_{q=1}^{k} \beta_q \Delta Y_{i,t-q} + \varepsilon_{i,t} \quad (1, \text{ friction stability})$$

$$\Delta Y_{i,t} = \alpha_i + \beta C_{i,t} + \varepsilon_{i,t} \quad (2, \text{ friction change})$$

$$\Delta Y_{i,t} = \alpha_i + \sum_{q=1}^{k} \beta_q^1 \Delta Y_{i,t-q} + \beta^2 C_{i,t} + \varepsilon_{i,t} \quad (3, \text{ friction total})$$

$$\Delta Y_{i,t} = \alpha_i + \sum_{q=1}^{k} \beta_q \Delta Z_{i,t-q} + \varepsilon_{i,t} \quad (4, \text{ cascading})$$

$$\Delta Y_{i,t} = \alpha_i + \sum_{q=1}^{k} \beta_q^1 \Delta Y_{i,t-q} + \beta^2 C_{i,t} + \sum_{q=1}^{k} \beta_q^3 \Delta Z_{i,t-q} + \varepsilon_{i,t}$$

$$(5, \text{ friction and cascading})$$

where $\Delta Y_{i,t}$ is the change in attention for issue i at time t, α_i is the constant for

issue i, q the lag, k the number of lags, C the counter variable, ΔZ the average change in agendas of the other parties/media, and ε the residual.

Next, we have to consider how many lags k to include to capture the friction-stability and cascading process. Here, we chose the minimum number of lags that effectively removed the auto-correlation in the residuals of the final model (equation 5) and thus offers in that respect a well-specified model. A Wooldridge test for auto-correlation in pooled time series suggests that for newspapers the inclusion of two lags suffices, for television and parties three lags.

Contrary to what is done in common analyses, we do *not* focus on model fit or the significant influence of different variables but on the distribution of the *residuals* – the unexplained part – of the various analyses. After all, after including the auto-regressive component, capturing friction-stability, in the analysis (equation 1), the residuals should resemble the distribution of series when friction-stability is removed. Comparing LK-scores for the residuals for an issue with the LK score of the raw series of that issue informs us to what extent the punctuatedness of the series is caused by the friction-stability element. The same can be done for friction-change, cascading and any combination of the elements. Again, we calculate the LK score for each agenda/issue combination, giving us again 279 (parliament) and 225 (media) scores.

The third step, then, is to systematically average and compare the LK-scores of the primary series with those of the secondary series. For all party*issue and media outlet*issue panels, we compare the LK-scores of the primary and the secondary series. We expect the secondary series to be less punctuated (smaller LK) than the primary series as, through the analyses, we eliminated two sources of punctuations – friction and cascading. More importantly, the procedure allows us to compare the *decrease* in the LKs of the various models' residuals compared to the original series and to each other. Does the cascading model additionally reduce the LK of a series after controlling for friction and vice versa?

Finally we distinguish different types of parliamentary parties and media outlets to see whether the aggregate findings also apply to specific parties (government vs. opposition and Dutch- vs. French-speaking), and to specific media (newspapers vs. television and Dutch- vs. French-speaking). These more specific analyses are explorative; we do not develop specific expectations as to what parties or media outlets are more affected by friction or by cascading. We simply want to check to what extent the punctuation effects of friction and cascading are robust.

RESULTS

The first question is whether the L-kurtosis scores (LKs) of the raw primary series – the weekly and daily attention change distribution of all parties and all media for all issues – differ from the LKs of the secondary series – the distribution of the residuals after accounting for friction, for cascading and for friction and cascading. Table 1 and Table 2 provide the answer.

Table 1 LKs and differences in LKs between the six series of parliament (N = 279)

	Mean LK (standard deviation) (1)	Primary raw (2)	Friction-stability (3)	Friction-change (4)	Friction total (5)	Cascading (6)	Friction + cascading (7)
Primary raw	0.757 (0.219)		38.934***	14.571***	26.002***	19.618***	26.646***
Friction-stability	0.626 (0.237)			4.227***	12.946***	−1.299	13.389***
Friction-change	0.560 (0.180)				36.289***	−6.082***	35.213***
Friction	0.450 (0.163)					−17.283***	8.710***
Cascading	0.636 (0.194)						17.929***
Friction + cascading	0.446 0.161)						

Note: Values in the table are paired sample t-values and significance: *** = p<.001; * = p<.05.

Table 2 LKs and differences in LKs between the six series of the media (N = 225)

	Mean LK (standard deviation) (1)	Primary raw (2)	Friction-stability (3)	Friction-change (4)	Friction total (5)	Cascading (6)	Friction + cascading (7)
Primary raw	0.606 (0.229)		30.439***	7.576***	16.232***	12.877***	18.701***
Friction-stability	0.521 (0.235)			−1.117	6.114***	−10.605***	8.406***
Friction-change	0.533 (0.184)				26.615***	−2.520*	28.738***
Friction	0.463 (0.187)					−10.176***	9.782***
Cascading	0.559 (0.214)						13.403***
Friction + cascading	0.443 (0.170)						

Note: Values in the table are paired sample t-values and significance: *** = p<.001; * = p<.05.

The first data column of both tables contains the average LKs for all parliamentary party*issue (Table 1) and all media outlet*issue (Table 2) panels. The LK of the primary parliamentary series is 0.757, for the primary media series it is 0.606. These are high LKs, way above the 0.125 score marking a normal distribution. This means that both the parliamentary and media agenda are *very* leptokurtic: long periods of stability alternate with bursts of extreme increases, and moderate changes are underrepresented. Just like any political institution, both Belgian parliament and mass media do not react at all, or they overreact, to incoming signals. As could be expected, on the whole parliamentary attention is more punctuated than media coverage.

Hypothesis 1 held that both friction and cascading would contribute to punctuating parliamentary and media attention. The first data column in both tables indicates the reduction in LK when we 'control' for both aspects of friction (friction-stability and friction-change). The average LKs for both friction conditions goes down compared to the primary series and this applies to parliament and to media. In parliament, the friction-stability condition reduces the LK from 0.757 to 0.626 and the friction-change condition from 0.757 to 0.560. In the media, the friction-stability condition reduces the LK from 0.606 to 0.521 and the friction-change condition from 0.757 to 0.533. Both aspects of friction work in concert and grasp different elements of friction: the decrease in LK is far the largest for the condition that takes both stability and change into account (LKs are 0.450 for parliament and 0.463 for the media). All these reductions in punctuatedness after controlling for friction are significant. This can be observed in the first row of data columns 3, 4 and 5 in the tables; the paired sample t-values all reach conventional significance levels. Hence, after friction, the series are less punctuated than before and thus friction contributes to punctuating parliamentary and media attention to issues.

The same applies to the secondary series controlling for cascading. The first columns document that taking into account cascading decreases the LKs for parliament from 0.757 to 0.636 and for the media from 0.606 to 0.559. Again, these reductions are significant.

To illustrate this general pattern of diminishing LK as one controls for friction, for cascading and for friction and cascading, we generated a histogram showing how the data series gradually, through the different manipulations, move towards normality. Figure 1 contains the evidence of just one of the many possible issue*media panels. We selected the attention on the public broadcaster VRT for the education issue as this issue*media panel closely resembles the general pattern.

The graph documents that the primary series is not at all normally distributed, but has an enormous central peak (no change), weak shoulders (moderate change) and large tails (large change). As one controls for friction, for cascading and for friction and cascading, the central peak diminishes and the distribution gets some shoulders. The series definitely become more normal but never attain normality.

Do friction and cascading work *together* to produce punctuations, as our first hypothesis contended? The data suggest they do. The secondary series
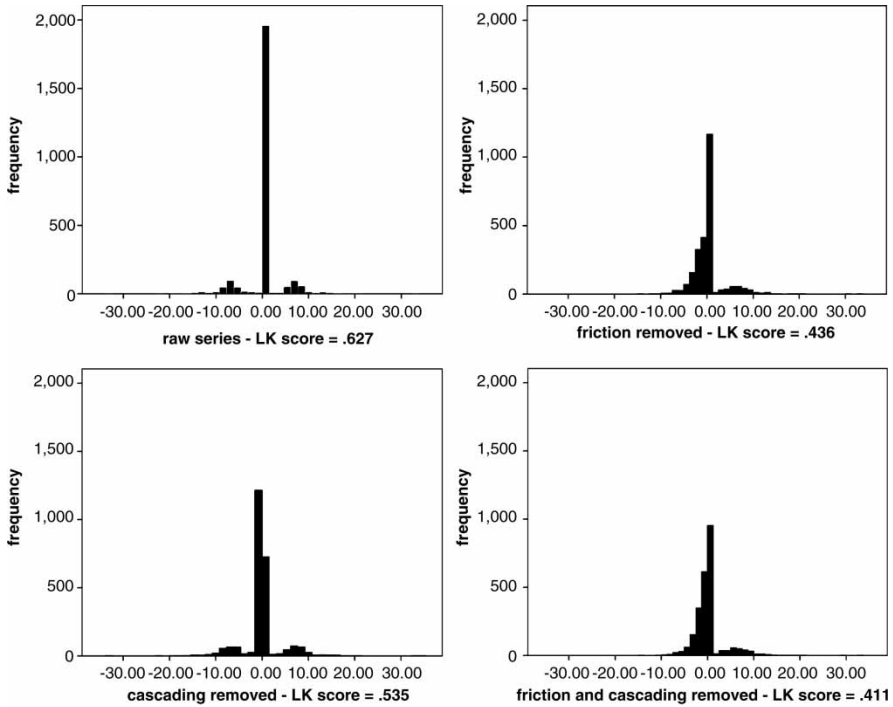
Figure 1 Example of distribution of error terms: education at the VRT broadcast TV news

Note: Upper-left is original series, upper-right is after removing friction (equation 2), lower-left after removing cascades (equation 3), lower-right after removing friction and cascades (friction 4).

combining friction and cascading yields the smallest LKs for both parliament and media (0.446 and 0.443); as data column 7 in Table 1 and Table 2 shows, the differences with all other series are significant. For both agendas, the combined secondary series accounting both for friction and cascades differs most from the primary series. This underscores their complementary character and directly supports the first hypothesis. Friction and cascading both *independently* contribute to the punctuated character of the attention change distribution in parliament as well as in the media.

Note that the LKs of the combined secondary series are still a good way from having a normal LK of 0.125. Even when subtracting the effect of friction and cascading, there remains a good deal of punctuatedness in the series. Friction and cascading are not the only mechanism producing punctuations. Analyses at the individual issue-level indicate that *none* of the LKs for any of the issues approach the normal LK score (not shown in table). This suggest that friction and cascades are probably only part of the punctuation story and that other mechanisms also account for the punctuated change patterns we observe.

Hypothesis 2 and Hypothesis 3 stated that parliament would be relatively more affected by friction while media would be relatively more affected by cascading. Overall, for *both* parliament and media, friction accounts for a larger portion of the irregular pattern of stasis and change. Both for parliament and media, the decrease in LKs is larger when one accounts for friction only than when one accounts for cascading only; for parliament the LK goes down from 0.757 to 0.450 with friction and to 0.636 with cascading; for the media the reduction is from 0.606 to 0.463 with friction and to 0.559 with cascading. Yet the claim that cascading, compared to parliament, is *relatively* more present in the media while friction, compared to the media, is *relatively* more present in parliament, holds.

Two observations support this conclusion. First, we compare the contribution of each mechanism on top of the other mechanism. Comparing LKs in the first data column of Table 1 and 2 accomplishes this. In parliament, when one accounts for friction the LK is 0.450. Incorporating cascades reduces the LK only marginally (but significantly) to 0.446. This means that cascading in parliament only reduces LK by and addition 0.004 beyond what friction already did. Friction, by contrast, contributes much more on top of cascading; cascades reduces the initial LK to 0.636 but friction brings it further down to 0.446, that is an additional reduction of 0.190. In the media, just the opposite pattern is observable: cascading contributes relatively more once friction has been accounted for. On top of friction (0.463) cascading reduces the LK further with 0.020 to 0.443. The reduction in media punctuations owing to friction acting on top of cascading is larger (0.116) but it is smaller than was the case in parliament (where it was 0.190). Both the difference between parliament and media in the additional reduction in the LK score owing to cascading (t-value is 5.362) and owing to friction (t-value is −7.764) is significant.

A second way to demonstrate the differential contribution of friction and cascading is comparing the relative proportional contributions of friction and cascading to reducing the LK score. Friction reduces the LK score in parliament by 41 per cent and cascading by 16 per cent, implying that friction is 25 per cent more effective. Friction reduces the LK in the media with 24 per cent and cascading with 8 per cent, meaning that friction is only 16 per cent more effective in the media. In sum, the second and third hypotheses receive support: parliament and media are both affected by friction and by cascades, both are more affected by friction than by cascades but media are relatively more affected by cascades than parliament.

So far, we examined the effect of friction and cascades on parliament and media as a whole and averaged the LKs across all parties and media outlets. Maybe our findings apply only to some specific parties or to some media outlets? Table 3 provides specific LKs per party and media type.

The pattern of decreasing punctuatedness when accounting for friction and/ or for cascading applies across the board. The pattern holds for all party types (government vs. opposition and Dutch-speaking vs. French-speaking parties) and for all media types (Dutch-speaking vs. French-speaking and television

Table 3 LKs of four series across party types and media types

	Primary raw (1)	Secondary friction (2)	Secondary cascading (3)	Secondary friction + cascading (4)	(1) − (2)	(1) − (3)	(1) − (4)	N
Parliament								
Government	0.75	0.43	0.65	0.43	0.32	0.10	0.32	181
Opposition	0.76	0.46	0.63	0.46	0.30	0.13	0.31	98
t-value	0.396	1.294	−.706	1.294	−0.563	2.543*	−0.621	
Dutch MP	0.73	0.42	0.65	0.42	0.31	0.07	0.31	148
French MP	0.79	0.48	0.62	0.48	0.31	0.18	0.31	131
t-value	2.625*	3.274**	−1.448	3.280**	0.220	9.074***	0.257	
Media								
TV	0.57	0.44	0.49	0.41	0.13	0.08	0.16	100
Newspapers	0.63	0.48	0.61	0.47	0.15	0.02	0.16	125
t-value	1.819[+]	1.499	4.338***	2.424*	1.016	9.828***	0.057	
Dutch media	0.62	0.45	0.59	0.44	0.16	0.03	0.18	125
French media	0.59	0.47	0.53	0.44	0.12	0.07	0.15	100
t-value	0.853	0.861	−2.140*	0.129	−2.837**	4.604***	−1.665[+]	

Note: Values in the table are L-kurtoses, t-values, and significance: *** = p<.001; ** = p<.01; * = p<.05; [+] = p<.1

vs. newspapers). We do note some interesting differences between parties and media outlets that make sense but we cannot elaborate on them here. For example, opposition MPs' activities are more affected by cascades than the actions of government MPs (see the significant difference in LK reduction in column (1)–(3)). Television is more affected by cascading than newspapers etc. All these differences do not in any way challenge the general pattern we established, nor do they reduce confidence that we can corroborate our key hypotheses.

CONCLUSION AND DISCUSSION

Policy agendas are punctuated. Long periods of incremental attention to issues alternate with short, disproportionate spikes in attention. Jones and Baumgartner (2005) were right in suggesting that friction *and* cascades account for this punctuated issue attention pattern. Cascading remains theoretically underdeveloped and is thus under-evaluated empirically. Our study contributes by showing theoretically why and how cascades matter and act in concert with friction. Moreover, we argue that friction and cascades can be integrated in a common theoretical framework, both mechanisms occur under different circumstances that are to some extent each other's negation. Friction occurs when several actors within an institution are forced to collaborate. Cascading happens when actors within an institution are autonomous. We propose five institutional dimensions which contribute to increasing friction and cascading in institutions.

Methodologically, the study introduces a new research design to distinguish friction from cascading and to make both processes measurable. Friction can be operationalized by splitting it up in an auto-regressive (error accumulation) component and a delayed-reaction component (error correction). Cascading can be operationalized by cross-regressing the different actors in an institution. The respective contribution of friction and cascading is estimated based on the reduction of the leptokurtic character of the residuals after auto-regressive (friction) or cross-regressive (cascading) modelling. That our empirical results corroborate our hypotheses increases confidence in the methodological approach. We established that punctuated character of both Belgian parliamentary behaviour as well as mass media is co-produced by friction and by cascades. As predicted by our theory, parliament is relatively more affected by friction, while mass media coverage is relatively more affected by cascading.

We only partially tested the theoretical ideas we put forward. To test the theoretical framework as a whole, we need much more data – more policy agendas with much more variation on the independent variables. Our partial tests generated satisfying results overall and what we believe is a promising beginning for a systematic comparison of friction and cascading in different institutions. Students of policy agenda started to compare the punctuatedness of different agendas only recently. They lacked an integrative theoretical framework producing testable hypotheses and they only took friction into account.

They found higher friction in what they called policy *output* processes and less friction in policy *input* processes (Baumgartner *et al.* 2009; Jones *et al.* 2003; Jones *et al.* 2009). Our framework offers tools to similarly rank-order policy institutions not only for friction but also for cascading.

Although the empirical base of our findings is narrow, two agendas in one country, we believe our core findings may be generalized to other policy agendas and other countries. The theoretical approach can in principle be applied to any type of policy agenda in any country. Most policy institutions, not only parliament and the media, are multi-actor environments. Most political actors operate in a competitive environment – they are invariably engaged in a zero-sum game. In many instances sanctions on political actors are not postponed but immediate. So the underlying factors leading to friction and cascading are omnipresent in the political arena and, consequently, friction and cascades are bound to happen everywhere in the political system.

There is plenty of room for improvement and further progress. Our crude operationalization of friction (auto-regression) and cascading (cross-regression) may need some refinement. Our inertia variable, for example, probably covers part of the change, as change does not come entirely suddenly but builds up quickly but gradually: part of the variation (increase or decrease) is picked up by the change (increase or decrease) in the previous period. A portion of the variance picked up by the cascading variables and cross-regression may be caused by friction as actors may seemingly imitate other actors – they react later – while they are in fact directly reacting to changes in reality – information simply reached them later – and are not mimicking the others. We also note that Belgian parliament and media remained fairly strongly punctuated after 'treatment' with friction and cascading. This may indicate that politics is simply *always* punctuated because political actors are humans and all human behaviour is punctuated owing to cognitive friction. The omnipresent cognitive friction may produce a baseline level of punctuations in all institutions and account for part of the remaining punctuatedness we found. Another track for improvement and further development are the five institutional design variables we proposed in the study. They are probably far from exhaustive. There are most likely additional, yet unknown factors pushing political actors to imitate each other (cascading) or to hinder immediate reaction (friction). The relationship between the presence/absence of these factors and the incidence of friction/cascades may be not linear but be curvilinear or exponential. Moreover, there may be a trade-off between factors so that one factor can compensate for the absence of another.

The greatest challenge for future work is to extend the current approach beyond considering friction and cascading as occurring *within* a single institution, to conceptualizing of friction and cascading as also occurring *between* different institutions. In real world politics actors are affected by what different political actors in other institutions are doing. Consider the relationship between parliament and government. It is evident that these institutions can induce friction and cascading on each other; the tension between them forms the core of parliamentary democracy. Parliamentary majorities constrain government's reaction

and parliaments react to governmental initiatives. An attractive avenue for further research lies in investigating *cross-institutional* friction and cascading. Extant research has yielded evidence of such cross-institutional processes. For example, MPs imitate the mass media agenda (e.g., Walgrave *et al.* 2008). Other accounts have shown that the US President's agenda is influenced by Congress and vice versa (Edwards and Wood 1999). This research suggests that cascades also happen between non-equivalent actors in different institutions.

Possibly most importantly, our findings have broader implications for how democratic political systems function. Most institutions are designed to contain rival actors that share power or compete directly. The idea is that power sharing and competition for scarce resources (e.g., public support) improve the overall output of governing institutions and better reflect popular preferences. We show, however, that these multiple-actor and competitive institutions lead to punctuated outcomes where preferences may be ignored for a substantial period. Because actors hold each other in a paralysis and/or because they imitate each other even though a competitor may not be acting on real information, political attention and subsequent policy change is stochastic and irregular. Politics does not adjust proportionally, but rather systematically under-reacts and then, temporarily, over-reacts. The pattern of long-term neglect and sudden rush is built-in into most institutions. It is hard to imagine this ubiquitous disproportionality in politics reflecting popular preferences, nor that it would square with any measure of 'quality' or balance in policy change. When politics leaps to a new equilibrium and catches up, the rush causes numerous new mistakes and lays the foundation of future accidents and crises.

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NOTES

1 Belgian newspapers are not issued on Sundays. Therefore, for the various television channels a mean score for each issue for Saturdays and Sundays is calculated to

substitute the original Saturday score, while the Sunday score is deleted in order to keep data comparable with the newspaper data. Furthermore, newspaper data for Tuesdays and Thursdays, that are typically not coded, are estimated based on previous and subsequent values. Results in terms of dependencies and imitation across outlets is not affected by this imputation.

2   One could argue that it is not necessary to include issue-specific intercepts, since differencing the original attention score variable already removes large part of the variation across issues. However, given the fact that we have a large dataset at our disposal, we consider it a 'safe' choice to conduct fixed-effect analyses. Furthermore, our data might not meet all the assumptions for linear regression. Especially the normal distribution of errors might be problematic – after all, we already anticipate them to be leptokurtic. However, regression analysis is not very sensitive to violations of this assumption (Hayes 2005: 298). Additionally, problems with non-normality relate to the estimation of the accuracy of confidence intervals of parameters. As we will argue, our substantial interest is in the distribution of the errors, rather than in the causal relationships that are estimated.

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