

In the Shadows of Great Men: Leadership Turnovers and Power Dynamics in Autocracies

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Abstract

Political leaders differ considerably in the degree to which they consolidate power, but what gives rise to these variations still remains under-theorized. This article studies how informal political constraints associated with leadership turnovers shape intra-elite power dynamics. We argue that aging leaders' efforts to manage the succession problem create an important, yet impermanent check on the power of subsequent leaders. To test this argument, we use the massive text corpus of Google Ngram to develop a new quantitative measure of power for a global sample of autocratic regime leaders and elites between 1950 and 2019, and employ a research design that leverages within-leader variations in predecessors' influence for identification. We show that incumbent leaders' ability to consolidate power becomes more limited when operating in an environment where influential former leaders are present. Further analyses suggest that the presence of former leaders is most effective in reducing incumbents' ability to unilaterally appoint or remove high-level military and civilian personnel. These findings have implications for our understanding of the dynamics of power-sharing and institutional change in autocracies.

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“Even from my sickbed, even if you are going to lower me into the grave and I feel that something is going wrong, I will get up. Those who believe that after I have left the government as prime minister, I will go into a permanent retirement really should have their heads examined.”

— Lee Kuan Yew, on National Day Rally of 1988, two years before he stepped down as the Prime Minister of Singapore.

1 Introduction

Contrary to the popular perception that they are all almighty despots with unchallenged authority, political leaders in authoritarian regimes exhibit wide variations in personal power (Baturu [2014](#); Geddes [2003](#); Svobik [2012](#)). While some leaders manage to achieve an unparalleled level of dominance and rule for decades, others have to regularly share power with other elites and step down “on time” after a few years in office. The varying configurations of power balance within authoritarian regimes can have profound consequences for domestic governance (Bueno de Mesquita et al. [2003](#); Frantz et al. [2020](#); Wright and Escribà-Folch [2012](#)), as well as for international relations (Colgan and Weeks [2014](#); Weeks [2012](#)).

A rapidly expanding body of scholarship has ventured to explain what gives rise to the different levels of power among autocratic leaders (Boix and Svobik [2013](#); Brownlee [2007a](#); Gandhi [2008](#); Geddes [2003](#); Gehlbach and Keefer [2011](#), [2012](#); Frantz and Stein [2017](#); Magaloni [2008](#); Meng [2020](#); Reuter [2017](#)). Most of the existing studies take a regime’s formal institutions as the starting point. The prevailing view in this literature is that authoritarian regimes with strong organizations and institutional procedures tend to be more successful at curbing incumbent leaders’ despotic tendencies and sustaining power-sharing arrangements among ruling elites. However, other studies have noted that, to the extent that institutions are ultimately human creations, their emergence (or the lack thereof) may be endogenous to deeper, less observable political and coalitional dynamics (Pepinsky [2014](#)) and their effectiveness as constraints cannot always be taken for granted

(Levitsky and Murillo 2009; Meng 2019). Empirically, we also observe considerable variations in personal power among leaders from the same regime or even over the tenure of the same leader: Both Mahathir Mohamad and Xi Jinping, for example, took office under highly institutionalized party regimes, but managed to build up their personal authority in a way that their immediate predecessors never could (Li 2016; Slater 2003). Other leaders, like Jiang Zemin in China and Islam Karimov in Uzbekistan, were initially seen as only weak, transitional figures, but later went on to rule their respective countries for many years (Ilkhamov 2007; Kuhn 2004). How do we make sense of these ebbs and flows of power in individual leaders when the broader institutional variables were largely held constant?

In this article, we provide a new perspective on authoritarian power dynamics by shifting the focus from the formal institutions to the *informal constraints* in high-level elite politics. We conceptualize informal constraints as the deeper, and sometimes covert, configurations of actors, networks, and coalitions among the ruling elites that exist and operate relatively independent of the incumbent ruler's control. We argue that such constraints define important parameters of elite politics, such as the amount of discretion the incumbent enjoys in making key political decisions, the size and the kind of patronage resources s/he can control, and the potential consequences for breaking power-sharing pacts with other elites. Unlike institutions, which are relatively stable over time, these informal constraints are often dynamic and can constantly evolve in response to many internal and external factors. The nature and strength of the constraints that incumbent autocrats face at a given moment set the scope for feasible political strategies, and in turn their ability to successfully consolidate power.

To demonstrate the utility of this perspective, we study how a particular set of informal constraints common in many durable autocracies—the presence of influential senior political figures from earlier generations—shape incumbent rulers' power in those regimes. Leadership turnover is a profoundly important yet highly sensitive issue in authoritarian politics (Burling 1974; Huntington and Moore 1970; Treisman 2015; Tullock 1987). In regimes that have survived one or more rounds of successions, new top leaders often enter office with one or several of their predecessors

still alive and active. Despite having relinquished much of their formal power, those retired leaders often retain substantial informal influence over politics and policies through the contacts and networks they cultivated during their time in office. We argue that they can place an informal, yet important check on the incumbent ruler by serving as the potential key focal points for other elites to coordinate counter-balancing actions.

We construct a global sample of autocracies between 1950 and 2019 to examine whether the presence or absence of influential retired leaders affects the personal power of incumbent ruler vis-à-vis other elites. Empirically, studying intra-regime power dynamics faces two main challenges. The first one is measurement: It is usually difficult to measure a political leader's power precisely and objectively, let alone to compare it across time and different country settings. To overcome this challenge, we develop a novel measure of personal power for top national leaders by making use of two massive online databases: Google Books Ngram (Google Ngram hereafter) and Wikidata. Our approach builds on a burgeoning body of recent literature that uses printed publications to make inferences about political actors' power (e.g., Ban et al. 2018; Jaros and Pan 2017). We first compile a comprehensive list of prominent living politicians for each country-year spell covered in our sample based on biographical information from Wikidata, and then use Google Ngram to compute a power index based on the ratio between the number of publications that mention a top political leader's name and the number of publications that mention other influential (living) political figures from the same country and same year. Through a number of case-by-case comparisons and systematic validation tests, we show that our measure not only exhibits strong consistency with the existing measures of regime types, institutional constraints, and personalism, but also does a better job than the existing measures at capturing the subtle yet important variations in personal power over a leader's tenure. We also show that our measure correlates well with various other outcomes and metrics that are often used as proxies of power, such as tenure length, vote share in elections, centrality in elite networks, the size of a leader's personal coalition/faction, and experts' assessments of leaders' political influence.

In addition to measurement, the second empirical challenge is causal identification. The pres-

ence or absence of retired leaders may be correlated with various other regime characteristics that can affect an incumbent's personal power. To overcome this problem, our main empirical design exploits within-incumbent variations in retired leaders' strength that come exclusively from the deaths (mostly natural) of retired leaders. This design essentially removes all the unobserved heterogeneity across incumbent leaders, and enables us to focus solely on the change in power within the same leader before and after the passing of his/her most influential predecessor.

Our empirical results provide strong evidence that retired leaders play a significant role in limiting the personal power of the incumbents. According to our preferred within-person specification, the presence of a former leader from the same political regime on average reduces the incumbent autocrat's power by about 19% of a standard deviation in the short run, and by about 29% of a standard deviation in the long run. Through a series of additional tests, we show that our findings are robust to various modifications to the sample coverage, model specifications, and coding of the dependent and independent variables. We also demonstrate that the estimated effects are not driven by unobserved shocks common to all leadership turnovers, but are only present for within-regime transitions wherein predecessors exit power in a relatively consensual fashion.

Finally, we provide some suggestive evidence on how predecessors retain and exercise their influence in retirement. Our analysis draws on not only the existing measures for regimes' leadership and institutions but also several new measures of power distribution within regimes' ruling cabinets, built by applying our Ngram-based method to a newly available global dataset on cabinet members (Nyrup and Bramwell 2020). We find that instead of affecting the features of general formal institutions, such as elections, legislatures, or parties, the constraining effect of former leaders is often exerted in a highly specific and informal way—through limiting the successor's personal discretion over the appointment and removal of key supporting elites that are essential to his/her consolidation of power.

This study advances our understanding of power dynamics in authoritarian regimes in two important ways. First, we offer a new way to think about *how* power is shared in authoritarian regimes. Existing literature typically conceptualizes authoritarian power-sharing in a context-free

way as the interaction between a dictator and a group of lesser elites who want to protect their power from the encroachment of the dictator (Magaloni 2008; Meng 2020; Myerson 2008; Svoblik 2009). By contrast, we show that there is a different mode of power-sharing wherein the central cleavage is organized between current and former autocrats. We provide evidence that the inter-generational model may be more effective in constraining the behaviors of incumbents than an intra-generational one because of the involvement of more senior political actors. However, these inter-generational constraints are also inherently uncertain and impermanent because they depend heavily on the personal conditions of former leaders.

Second, our analysis provides a new explanation for *why* significant power consolidation happens under some leaders but not under others, even when those leaders appear to face the same kind of institutional constraints. While the conventional narratives of power consolidation typically attribute successful power grabs to relatively idiosyncratic factors, such as a leader's luck (Svoblik 2012, 62) or his/her use of certain political tactics (Slater 2003), our findings suggest that structural factors in the political environment also play a role: Incumbent leaders are more likely to secure and expand their dominance when there is no influential retired leader in the elite circle to act as a counterweight against their strategic maneuvers.

Moreover, by offering a new, Ngram-based measure of world leaders' power, our paper also makes a methodological contribution to the comparative study of power and leadership. Compared with the existing measures (e.g., Gandhi and Sumner 2020; Geddes, Wright, and Frantz 2019), our approach provides a more disciplined and fine-grained way to depict the ebbs and flows of political leaders' power that does not depend on subjective judgment. By incorporating extensive biographical records from Wikidata, our measure also enables researchers to examine, on a common scale, the relative influence of a large group of individuals, including not only national leaders but also cabinet members, sub-national leaders, and leaders of key industries and ethnic/religious groups. This unique feature can potentially be used to construct more sophisticated measures of intra-elite power balance and shed light on the distribution of influence both within a state and between the state and society.

2 Informal Constraints in Authoritarian Power Politics

Autocracies are highly heterogeneous in terms of their internal distribution of power. The literature often explains the variation in power concentration across autocratic leaders through the lens of regimes' institutional features. A large body of research argues that regimes with a strong ruling party tend to do a better job at curbing the personalistic tendencies of top leaders (Boix and Svolik 2013; Geddes 2003; Kroeger 2018; Magaloni 2008). Other works examine the constraining role of semi-competitive elections, legislatures, and constitutions, arguing that these institutions impose a cost for rulers to expropriate property from the elites and limit rulers' discretion over policies and allocation of patronage goods (e.g., Albertus and Menaldo 2012; Blaydes 2010; Gandhi 2008; Gandhi and Lust-Okar 2009; Gehlbach and Keefer 2011, 2012; Miller 2015; Wright 2008). More recently, some studies suggest that concrete organizational rules, such as those that govern leadership successions and elite appointments, can constrain the ruler by shaping the underlying power distribution among the elites (Frantz and Stein 2017; Meng 2020).

This institution-centered perspective offers valuable insights into what affects the power balance between rulers and elites, but it also raises a number of further questions. First of all, what enables institutions, which are ultimately man-made artifacts, to emerge and function properly in the first place? This question is especially relevant for autocracies because autocratic rulers typically enjoy much greater leeway in altering, modifying, and manipulating existing institutions than their democratic counterparts (Pepinsky 2014). Some theoretical works suggest that authoritarian institutions can only work under certain conditions, such as when there is a balance of coercive power within the ruling coalition (Boix and Svolik 2013; Meng 2020); yet it still begs the question of what factors contribute to or undermine this balance of power among the elites. Second, and more importantly, this perspective cannot explain why some dictators are able to accumulate more power than others, even though the formal institutions under which they take office are more or less the same. For example, in Malaysia, Romania, and more recently China, there have been episodes of significant power consolidation by ambitious leaders under highly institutionalized regime parties (Fischer 1989; Li 2016; Slater 2003). In other cases, top leaders came to office

with a low-profile, collegial persona, but went on to achieve a stunning degree of dominance over their colleagues. How do we make sense of these marked within-regime (and even within-leader) variations in top leaders' personal power?

We argue that to better understand these variations, researchers need to look beyond the characteristics of formal institutions and pay greater attention to a broader set of informal constraints that operate within or alongside the formal aspects of the regime. These constraints, usually less visible to outsiders than the overt institutions, are based on the deeper configurations of networks, coalitions, and resources among elite actors. They can come from “the political dynamics of rivalries, factions, and power plays within a regime; the need to hold together a diverse coalition of supporters; or the need to gain cooperation of key economic actors” (Barros 2002). Unlike written rules and procedures, which specify the formal boundaries of an incumbent's authority, informal constraints mainly impose *de facto* limits on what a top leader can and cannot do in intra-elite interactions. These constraints can determine, for example, whom the autocrat can seek as an ally, the amount of resources s/he can marshal, and the payoffs associated with various strategic choices. A leader who has strong preexisting ties to elites controlling key military and civilian offices may be more effective at consolidating his/her position in the ruling coalition than someone who is not yet deeply embedded in the elite network.¹ Likewise, an autocrat's strategy to divide and conquer the elites may work less well when there are other influential figures who can coordinate elites in different parts of the network and act as a focal point for their collective resistance (Luo and Rozenas 2016).

Our conception of informal constraints differs from the concept of informal institutions, which often refers to the unwritten but largely *stable* norms and expectations governing actors' behaviors (Helmke and Levitsky 2004; Grzymala-Busse 2010). Although informal institutions can sometimes be a crucial constitutive part of informal constraints, not all constraints are necessarily stable or constant over time. Instead, many can change dynamically in response to contingent events. Small perturbations in the distribution of power among the ruling elites can sometimes result in

¹According to Dittmer (1978), for example, this is the reason why Deng Xiaoping emerged victorious in the post-Mao power struggles over a number of junior figures, despite Mao's preference for the latter.

radical shifts in the alignments of political coalitions (Acemoglu, Egorov, and Sonin 2008); external economic or political shocks, moreover, may increase the bargaining power of certain elite groups while decreasing the leverage of others (Pepinsky 2015). These changes are often not directly controlled or willed by the ruler (or any member of the ruling elites), but can nonetheless have important bearings on how the power game plays out among the elites.

3 Leadership Turnovers and Inter-Generational Power Constraints

While informal constraints can take many forms in different political context, in this article we focus on a particular set of constraints that arise from leadership turnovers. The transfer of power from one leader to another is a major challenge common to regimes that do not select leaders via competitive elections (Huntington and Moore 1970; Spearman 1939). Aging leaders who anticipate their eventual departure will sometimes try to plan and manage the succession process through a series of formal and informal measures (Burling 1974). We argue that these measures can sometimes cast a long shadow over the successors and shape the intra-elite power balance for years to come.

At the heart of the autocratic succession challenge is a credible commitment problem: To prevent destabilizing power struggles after the old leader's death, a successor usually needs to be designated in advance and given sufficient authority to rule on his² own upon the predecessor's eventual departure (Kokkonen and Sundell 2014; Kurrild-Klitgaard 2000). However, if a successor grows too powerful too quickly, he may become a threat to the old leader (Burling 1974; Tullock 1987). Once in office, the successor may have the incentive to change the course of policy set by the predecessor in order to make his own mark on history (Bunce 2014), or to replace the predecessor's appointees with his own supporters in order to consolidate power.³ Sometimes, the need to establish his own reputation and authority may even motivate the new leader to stage direct

²For clarity, we will use the female pronoun to refer to the predecessor and male pronoun to refer to the successor in this section.

³In theory, after the successor comes to power, elites who previously supported the predecessor may choose to switch their allegiance and join the successor's coalition. However, this is not always feasible in reality due to the lack of mutual trust between the elites and the new leader.

attacks on the predecessor and her associates.

The presence of this thorny commitment problem is an important reason why many dictators hold office until their death. However, it also means that, when pre-mortem successions do happen, as they did in many durable autocracies, the departing leader is often eager to find ways to tie her successor's hands in order to protect her own legacies and post-retirement interests. In some cases, it involves creating additional formal institutional constraints (or strengthening the existing ones), such as high-level supervisory bodies, mandatory collective decision-making procedures, or explicit term limits on top leaders' tenure (Ma 2016; Meng 2020). Lee Kuan Yew, the former Prime Minister of Singapore, for example, created a new advisory position for himself before stepping down in 1990 to make sure that he could continue to stay abreast of the next leadership's major decisions and intervene when necessary (Mauzy and Milne 2002). More recently, Nursultan Nazarbayev, the long-serving autocrat in Kazakhstan, also began a managed succession process by initiating a series of reforms that would significantly strengthen the institutional oversight on the chief executive office that he intended to pass on to his successor.⁴

Apart from altering the formal institutions, many other constraining measures that departing leaders take are non-institutional in nature. Appointing trusted allies to critical military and political positions, for example, is one of the most commonly used strategies to dilute the successor's power and prolong the old leader's influence beyond her formal tenure. When Julius Nyerere, the founding father of Tanzania, retired in 1985, he left behind an extensive network of loyal supporters in the military and security apparatus. This group of officers, drawn predominantly from the ethnic group of Kurya and owing their allegiance to Nyerere personally, acted as a significant counterweight to Nyerere's successor, Ali Hassan Mwinyi, in the subsequent administration. This enabled Nyerere to remain an influential player in Tanzanian politics long after he retired (Southall 2006). Similarly, Deng Xiaoping and Jiang Zemin, the two leaders who oversaw the Chinese Communist Party's first two peaceful, pre-mortem successions, both planted trusted proxies in high-level political and military offices before they stepped down, and used those appointees to monitor and

⁴See Maia Machavariani, "Power Succession in Kazakhstan, Who is Next?", *Around the Caspian*, January 16, 2019, shorturl.at/isA27.

counterbalance their successors' actions (Li 2016).

In addition to senior civilian and military appointments in general, one specific area in which departing leaders will often try to limit their successors' discretion over is the selection of the successors' own heirs. When powerful Chinese leaders like Mao Zedong and Deng Xiaoping planned their respective retirements, they not only designated an immediate successor, but also made deliberate efforts to cultivate younger figures who were expected to eventually take over from that immediate successor (Vogel 2013; Zhang 2011). In Singapore and Malaysia, strong leaders like Lee Kuan Yew and Mahathir Mohamad similarly made plans for the next two generations of successors when they were going into retirement (Brownlee 2007b; Chin 2015). For the successor, the prospect that he will eventually pass power to a younger leader closer to the retired predecessor limits the extent to which the successor can/is willing to deviate from the predecessor's legacy. The presence of alternative power centers within the reigning leadership also gives the retired leader a unique leverage to exploit the intra-elite cleavages and act as the ultimate adjudicator/mediator between competing factions in the sitting leadership.

While the inter-generational constraints may involve a diverse set of formal and informal arrangements, their effectiveness in constraining the successor ultimately still depends on the amount of political capital that the predecessor personally possesses. A healthy, active former leader with extensive networks throughout key state and military sectors can play a central role in organizing collective resistance against the successor's personalistic tendencies. When Miguel Alemán Valdés was mulling over a second presidential term, which would have broken Mexico's convention of a one-term presidency, Lázaro Cárdenas, one of the regime's most eminent former presidents alive at that time, defended the institution of term limits by mobilizing a group of alienated elites within the Institutional Revolutionary Party (PRI) to support an alternative candidate for presidency; this quasi-opposition movement eventually forced Alemán to backtrack and offer a compromise candidate instead (Smith 1991).⁵

⁵In another related example, when Jiang Zemin was wavering in his commitment to step down as the paramount leader of China in 2002, his hesitation was met with fierce resistance from an elite coalition within the top echelon of the party, led by prominent revolutionary veterans who had deep personal networks in both the government and the military (Dittmer 2003, 106).

By contrast, these constraints will have limited efficacy when the predecessor is politically weak or becomes physically incapacitated (or even dies). Being the leader of an elite coalition often requires very specific human capital endowment (e.g., seniority, charisma, personal networks, etc.) and this role cannot be easily taken up by another person when the current leader is gone. Without a commonly recognized figure to resolve disputes and coordinate actions, it could become much more difficult to hold together a cohesive elite coalition against the incumbent. In some cases, the former leader might even deliberately keep her associates at a distance from one another in order to secure an exclusively central position for herself in the coalition. This may further reduce the likelihood that those associates will continue to band together after the passing of the former leader.⁶ Internal rivalries and disagreements may be exploited by a tactically savvy successor to his own advantage. Xi Jinping's quick consolidation of power within the Chinese Communist Party (CCP) after 2012, for example, was to a large extent aided by the political weakness of his predecessor, Hu Jintao, and Hu's long-standing grudges with his own predecessor; these opportune conditions allowed Xi to purge rivals and place supporters in key party and state positions without provoking significant elite resistance.⁷ Several other notable episodes of power consolidation in party-based regimes, such as those by Nicolae Ceausescu, Mahathir Mohamad, and Daniel arap Moi, also took place in an environment where the most dominant figure from the early generation had either died or been seriously ill.⁸ Although nothing can fully guarantee the success of an attempted power grab, an environment in which the old guard is weak or absent is likely to give the incumbent more room for strategic maneuvering than one in which it remains healthy and active.⁹

⁶Padgett and Ansell (1993), for example, find that this practice was adopted by the Medici family to secure their central brokerage position among the Florentine elites. Chen and Hong (2020) also show in the context of China that rivalries and competition exist among members of the same political faction. Theoretically, formal models on coalition-building suggest that a trade-off often exists between a coalition's strength and its self-enforceability. Powerful coalitions are usually difficult to maintain and vulnerable to exogenous shocks (Acemoglu, Egorov, and Sonin 2008).

⁷James Palmer, "The Resistible Rise of Xi Jinping", *Foreign Policy*, October 19, 2017, <https://bit.ly/20sRTeW>

⁸For Ceausescu, see Fischer (1989). For Mahathir, see Slater (2003) For Moi, see Throup and Hornsby (1998)

⁹The dynamics we discuss here are most applicable to a situation in which a successor is faced with one major predecessor. The presence of multiple major predecessors in a non-democratic setting is rarer and can potentially create more complex power dynamics. On the one hand, the personal power of the incumbent may be further diluted by an

Taken together, the preceding discussion suggests that the presence or absence of retired leaders (and their political strength) is one of the key constraints that can influence the power of the incumbent leader. This leads to the following hypothesis:

Hypothesis 1. *All else equal, incumbent leaders face greater constraints over their power when operating in an environment in which their predecessors are alive and active. Moreover, a predecessor with greater political clout should be more effective at tying the hands of her successors.*

4 Empirical Design

4.1 Sample Construction

To evaluate the above hypothesis, we analyze a panel dataset of authoritarian regimes in the Post-World War II era. Our dataset builds on an updated and expanded version of the authoritarian regime spell dataset by Svobik (2012), and merges in additional country-level institutional and socioeconomic information from several other existing datasets.¹⁰ We follow the convention to identify the de facto head of the executive branch as the leader of an authoritarian regime. Generally speaking, this means presidents in presidential or semi-presidential systems, prime ministers in parliamentary systems, and general secretaries in communist regimes. In some cases, we have to deviate from this rule either because these positions are not available/unoccupied or because leaders serving in these positions are considerably more junior than senior contemporaneous figures in other positions. We handled these special cases with extra caution, often consulting a number of

even more fragmented power structure. On the other hand, however, the presence of multiple former leaders may mean that some elites could free-ride on others' constraining efforts, and the competition between former leaders (and their respective factions) may reduce their combined power relative to the incumbent, giving the latter the opportunity to consolidate power through a divide-and-rule strategy. Empirically, therefore, we may expect a non-linear relationship between the number of predecessors and their overall effectiveness in constraining the incumbent. These issues are further explored in Appendix F.

¹⁰ Authoritarian regimes are defined as regimes that (1) are not occupied by a foreign power and (2) do not conform to the minimalist definition of democracy, which requires the presence of free and regular elections with meaningful political opposition and alternation of power. A regime is an uninterrupted period of reign by a stream of affiliated elites who are either personally connected or share a common association with, and a fealty to, the same government, ruling party, or military organization. The additional datasets include the Political Institutions and Political Events dataset (Przeworski 2013), the Autocratic Regime dataset (Geddes, Wright, and Frantz 2014), the Democracy and Dictatorship dataset (Cheibub, Gandhi, and Vreeland 2009), the Penn World Table, and World Development Indicators from the World Bank.

biographical sources and existing datasets (e.g., Cheibub, Gandhi, and Vreeland 2009; Goemans, Gleditsch, and Chiozza 2009; Przeworski 2013; Svobik 2012) before making a decision. Typically, we require the person identified as the de facto leader to hold at least some kind of senior formal position (in government, party, or military) to avoid relying purely on subjective judgment.¹¹

The full dataset includes 4,438 country–year observations from 265 regimes in 122 countries between 1950 and 2019. Since we are interested in power dynamics in an inter-generational setting, we exclude observations where the incumbent leaders are regime founders (i.e., the first leader of a regime), who naturally do not have any predecessor. This effectively also excludes regimes that did not survive beyond the death of the founding leader. The remaining regimes are thus the relatively more institutionalized ones that have undergone at least one round of top leadership change. This trimmed sample covers 127 regimes from 101 countries. Compared to an average autocracy, these regimes tend to be larger, wealthier, more durable, and are the more significant players on the world stage. Collectively, they account for about 66% of the population and 82% of the GDP in the entire sample of autocracies.¹²

4.2 Measuring Political Leaders' Personal Power

A key challenge to our empirical analysis is to accurately measure top leaders' personal power. To the extent that power is not directly observable and can manifest itself in different ways in different settings, it is often difficult to devise a general measure applicable to a large set of countries. There are two prominent recent contributions to the literature that have endeavored to offer such measures. One is the personalism index developed by Geddes, Wright, and Frantz (2019) (GWF), which measures the degree to which power is concentrated in the hands of an individual leader. This measure is generated by running an Item Response Theory (IRT) model on several sub-indicators for, among other things, whether a leader personally controls high-level appoint-

¹¹For example, we code Deng Xiaoping as the de facto chief executive of China during the late 1980s even though he was not the party general secretary. We do so because (1) there is clear evidence that he was politically active during that period and was considerably more senior than his junior general secretary colleagues (Vogel 2013), and (2) he remained the chairman of the party's military commission at that time (the top military command organ in China).

¹²In the conclusion section, we discuss how the general insights from this sample can travel to other (more personalist) contexts.

ments and key organizations such as the ruling party, the military, and the security apparatus. Another related measure is the power consolidation index offered by Gandhi and Sumner (2020) (GS). They similarly adopt an IRT approach to estimate a latent measure of power consolidation effort by incumbents based on observable actions/events such as purges, cabinet reshuffles, appointments of family members in government, and creation/elimination of political parties or other collective-ruling institutions.

While these two measures have made important advances in the empirical operationalization of a concept as elusive as power, there is still significant room for improvement. One important limitation of the GWF personalism index, for example, is that it relies heavily on the subjective judgment of human coders. This problem is further complicated by the fact that most of the sub-indicators are evaluated on a yearly basis. Even for a country expert, it would be difficult to tell with great precision whether a leader is more or less powerful in a given year than in the previous year.¹³ The contribution by Gandhi and Sumner (2020) addresses the problem of subjective coding by relying mainly on objective information as input. However, their focus on power consolidation *actions* raises a different kind of concern: Such actions are typically rare, highly strategic, and sometimes occur along off-equilibrium paths. It is therefore unclear whether they necessarily have a monotonic relationship with the actual *degree* of power a leader enjoys. Weak leaders who feel insecure about their position may be more inclined to engage in power consolidation actions than those who are more powerful and secure.

In this paper, we seek to develop a new measure of autocratic leaders' power that builds on the strengths of both existing approaches while avoiding their limitations. Conceptually, we conceive of our measure as something closer to GWF's idea of personalism (but potentially applicable to more than just the top leaders), in that it should vary monotonically with a leader's underlying power. Methodologically, however, we share with GS the preference for using relatively objective information that does not require too much personal judgment to process. Our own approach, simply put, is to track the number of times an autocrat's name(s) is mentioned in printed publications

¹³In some cases, this index may remain constant for years or even decades across several rounds of leadership turnovers, making it difficult to capture subtle power shifts both within and across individual leaders.

relative to other senior political elites. This approach is motivated by a growing body of recent literature that uses media sources to infer political actors' power (e.g., Ban et al. 2018; Jaros and Pan 2017). We believe that name appearances in publications reveal important information about political leaders' power for at least two reasons. First, national leaders' de facto power partially stems from their charismatic appeal, which is often correlated with their fame and publicity. Second, the frequency of media appearances can also reflect the number of executive activities that a leader engages in. A leader who is frequently involved in major domestic and international affairs is usually more powerful than one who is not.

We construct a power index by combining information from two sources: Google Ngram and Wikidata. Google Ngram is a massive linguistic database that provides yearly counts for billions of words and short phrases (up to five words in length) from 28 million publications in Google Books' digital catalogue. The publications are drawn from the collections of Google's partner libraries (i.e., major university and public libraries in the United States); they are roughly evenly divided between (a) regular academic and popular books and (b) a diverse set of "non-book" items such as policy memos and reports, pamphlets, manuals, government documents, yearbooks, magazines, journals, and newspapers.¹⁴ The Ngram database was initially developed to study the evolution of language and culture over time (Michel et al. 2010), but has turned out to be a valuable tool for exploring other important socioeconomic trends and assessing public reactions to major natural or social events.¹⁵ Wikidata is a central storage of structured data from Wikipedia, containing extensive information on the identity and biographical information of prominent public figures in a wide range of countries (Vrandečić and Krötzsch 2014).

We first use Wikidata to compile a list of *living* politicians (including incumbent chief executives) for each country–year spell based on occupational information. We then search each politi-

¹⁴While there is no official information on the types of publications included in the Ngram corpus, we provide in Appendix B.1 some descriptive statistics from a random sample of all (publicly searchable) Google Books items that contain names of top leaders in our dataset.

¹⁵Ngram has become a widely used tool in the current "computational turn" in many social sciences and humanities disciplines, such as history, linguistics, anthropology, sociology, communication, and cultural studies. However, it is still relatively under-used in political science. For recent political science applications, see Richey and Taylor (2019) and Shea and Sproveri (2012).

cian's name (official name as well as various aliases, also available from Wikidata) in the Ngram database and record the number of new publications produced in each year that mention his/her most commonly used alias.¹⁶ The Ngram-based power index is computed using the following formula:

$$\text{Power index}_{ict} = \log \left(\frac{\text{Leader's own Ngram}_{ict}}{\max(\text{Living non-CE Politicians' Ngram}_{j \notin L, c, t})} \right),$$

where i , c , and t index the incumbent leader, country, and year, respectively, and L denotes the set of politicians who had served as the chief executive of country c for at least one year. Essentially, this index is the (logged) ratio between the Ngram publication counts for the incumbent leader in a given country–year spell and the publication counts for the highest living, non-chief-executive (non-CE) politician in the same spell.¹⁷ We exclude all former chief executives from the calculation of the denominator so that the death or weakening of a predecessor will not lead to a mechanical increase in the index (through reducing the value of the denominator). Normalizing a leader's Ngram by that of his/her most influential non-CE colleague serves two purposes. First, it helps to address the potential bias due to differential coverage, as some countries and periods may have more publications stored by Google Books than others. Second, to the extent that power is a largely zero-sum quantity, using a relative count is conceptually attractive because it captures how much

¹⁶While the Google Ngram corpus is available in eight different languages, we make all queries in English for two reasons. One is that the volume of Ngram's English corpus is much larger than that of other languages (16.6 million publications in English vs. 11.4 million in the other seven languages combined). The other is comparability: Since the criteria, style, and speed of printed publications may differ widely for different languages, using publication in a common international language helps to ensure that Ngram counts for leaders in different countries are based on items that are produced following similar (and comparable) publication standards and processes. In Figure A.2 of the Online Appendix, we show that there is a strong correlation between a politician's English Ngram and his/her native-language Ngram. Our main results of this paper are also robust to using an alternative power index constructed on each country's native-language Ngram (see Table A.23).

¹⁷One potential concern is whether the relationship between Ngram and personal power is indeed contemporaneous. To address this issue, we compare leaders' Ngram counts with the number of times their names appear in (more timely) newspapers articles (collected from the Google News Archive and New York Times Archive). The results consistently suggest a strongly contemporaneous relationship (Tables A.4 and A.5). Other existing studies have also found that change in Ngram is highly responsive to major current public events, such as epidemics and weather shocks (Grant and Walsh 2015; Michel et al. 2010). A detailed discussion of this issue is available in Section "Assessing the Extent of Temporal Lag" of Appendix B.1.

attention a top leader receives from publications *relative* to his/her colleagues. The identities of the non-CE politicians whose Ngrams are used as the denominator are quite diverse, but typically belong to one of the following groups: (1) the president in a parliamentary system or the prime minister in a semi-presidential system, (2) vice presidents or prime ministers, (3) cabinet ministers, (4) members of the legislature, (5) governors of major states or provinces, or (6) other authoritative figures such as kings, sultans, or religious leaders (see Figures A.5 and A.6 for details). The average ratio between the chief executive's Ngram and the highest non-CE figure's Ngram is 3.1 (logged ratio = 1.13) in our non-regime-founder sample, with a standard deviation of 5.4.

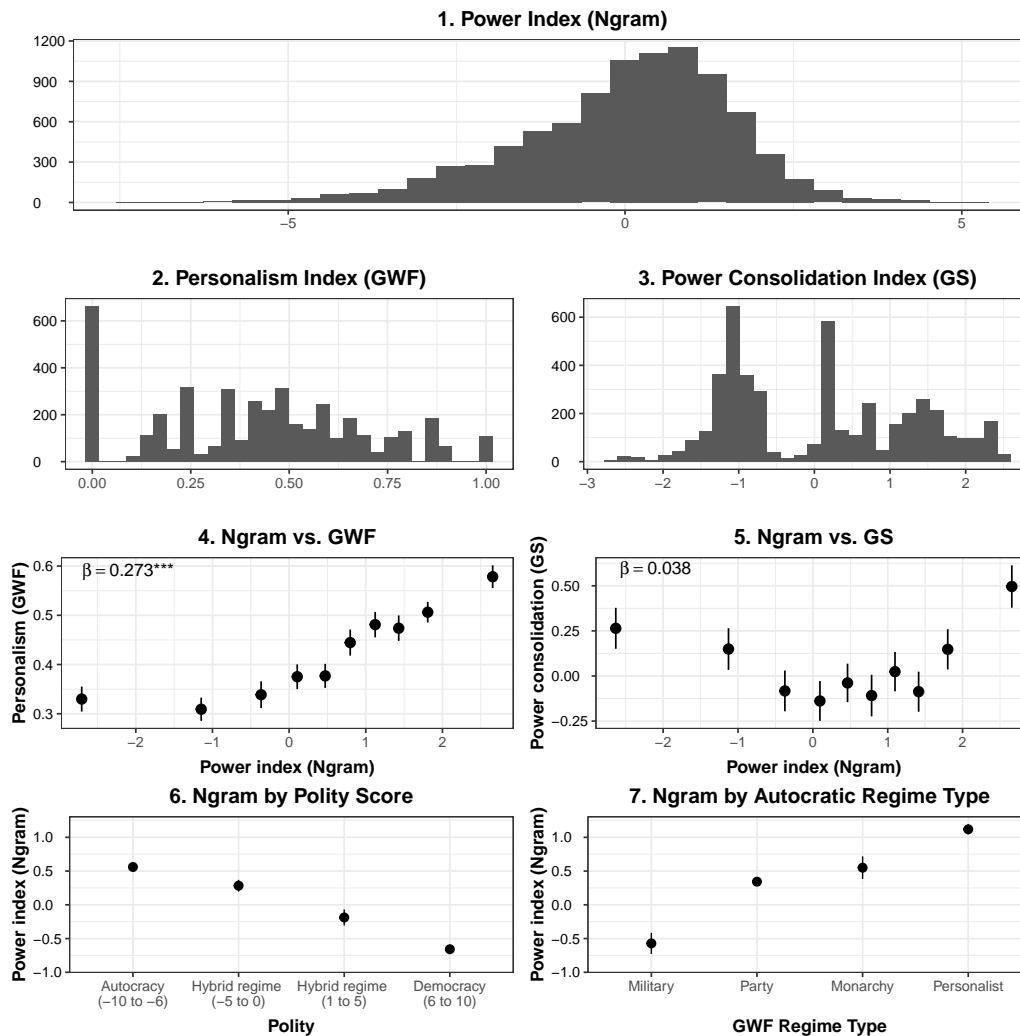
We conduct a number of validation tests to evaluate the quality of our measure against existing data and variables. In the interest of space, we leave most of the details to Appendix C, but discuss several key tests here. First, we compare our measure with the two existing measures from GWF and GS. The upper part of Figure 1 presents the respective distributions of the three measures. We can see that both the GWF and GS measures tend to have a sizable number of observations clustered around a relatively small value (0 for GWF and -1 for GS). This is most likely because there were not enough visible political events in those country-year spells for coders (or algorithms) to precisely determine incumbent leaders' power. By contrast, our Ngram-based measure follows a more natural, bell-shaped distribution and contains a good amount of variation, even for leaders located at the lower end of the distribution. The bottom row of Figure 1 shows the correlation between our measure and the two others. We see that our measure is strongly and positively associated with the GWF personalism index. A one standard deviation increase in the power index is associated with about a 27% of a standard deviation increase in GWF personalism ($p < 0.001$). By contrast, there appears to be a U-shaped relationship between our measure and the GS measure. These patterns are broadly consistent with our intuitions: The Ngram-based measure is conceptually closer to GWF's idea of personalism, whereas power consolidation actions are more distinct and do not always have a monotonic relationship with leaders' underlying power.

Second, we examine how our Ngram measure varies across different regime types. Generally speaking, we expect democracies to have stronger constraints on incumbent leaders than

non-democracies. Within non-democracies, Geddes (2003) suggests that military and party-based regimes may have a more collectivist style in exercising power than personalist regimes. In the bottom row of Figure 1, we plot the average power index of national leaders by the Polity score (Marshall, Gurr, and Jagers 2018) and Geddes' (2003) autocratic regime classification. We see that as countries become more democratic, the power index of their chief executives becomes smaller. We also see that top leaders in military and party-based regimes on average have lower power index than those in monarchies and personalist regimes. These patterns are consistent with the conventional view of how the levels of power concentration should vary across regime types.

In Appendix C, we use several qualitative examples to illustrate how our Ngram measure captures the over-time variations in leaders' power for selected countries and compare it with other measures (Section C.1). We also report additional validation tests using both cross-country variables and within-country data from major autocratic regimes in Africa, Asia, Europe, and Latin America. We find strong relationships between our measure and a number of commonly used proxies for political power, including the seniority of formal positions (Section C.2), the length of political leaders' tenure (Section C.3), candidates' vote margins in competitive elections (Section C.4), expert assessment of politicians' power (Section C.5), the network centrality of political elites (Section C.6), and the size of senior leaders' ethnic or factional coalitions (Section C.7). The fact that our measure tracks closely with power proxies from a variety of settings gives us confidence in its utility as a general indicator of leaders' power in cross-country analysis.

Figure 1: Comparing Ngram-based Power Index with Existing Measures



Note: The top two rows of this figure present the distribution of our Ngram-based power index and the two existing measures by Geddes, Wright, and Frantz (2019) and Gandhi and Sumner (2020). The third row visualizes the relationship between Ngram and the two other measures in a binned scatter plot. The circles indicate the averages for the 10 equal-observation bins, and the vertical bars indicate the 95% confidence intervals. The numbers printed on the top-right corners are standardized regression coefficients based on Column 3 of Table A.12 and Table A.13. The bottom row reports the mean power index by Polity score and GWF regime type.

4.3 Identification Strategy and Model Specification

The key quantity of interest that we want to estimate is the effect of retired leaders on the personal power of the current chief executive. A major challenge to identification here is that the presence or absence of influential retired leaders in a regime is likely to be correlated with many other (unobserved) country- or regime-level factors that can also affect the incumbent's ability to con-

solidate power. For example, more institutionalized regimes may have both stronger constraints on incumbents and a larger number of living predecessors due to the presence of established norms that require leaders to step down after a period of service. Sometimes, leaders who plan to initiate pre-mortem transitions may also deliberately choose weaker successors who are less threatening and easier to control. Given that these factors are not all observable, a simple cross-regime or even cross-leader comparison may yield spurious correlations.

Our main strategy to address this endogeneity problem is to include several different types of fixed effects in regression models. We can include fixed effects for each unique political regime within a country, assuming that leaders coming to power under the same regime face a more or less similar political and institutional environment. A more restrictive approach is to include fixed effects for every unique incumbent leader. The main advantage of the latter approach is that it eliminates the confounding influence of all unobserved factors that only vary across individual leaders but not within each leader. This enables us to make weaker identifying assumptions than a within-regime design (we discuss these assumptions below). However, a potential drawback of this approach is that it reduces the effective sample size to only those observations where such variations exist, and this may raise generalizability concerns. In the analysis presented below, we use the within-leader design as the preferred specification, but also report results from other models to evaluate the robustness of our findings.

Our main specification is as follows:

$$\begin{aligned} \text{Incumbent power}_{ict} = & \alpha_k \sum_{t-k}^K \text{Incumbent power}_{i,c,t-k} \\ & + \delta \text{Predecessor power}_{ict} + \mathbf{X}\boldsymbol{\beta} + \eta_i + \tau_t + \epsilon_{ict}, \end{aligned}$$

where i , c , and t index individual leader, country, and year, respectively. η_i is the leader fixed effects that capture heterogeneity across incumbent leaders, and τ_t is the year fixed effects that capture common, world-wide shocks to the power index. The dependent variable, *Incumbent power*, is the Ngram-based power index. Since power is likely to be path-dependent in nature, we also

include lagged dependent variables in the model to capture its persistence over time. A common concern with including lagged dependent variables in a panel fixed-effects setting is the so-called Nickell bias (Nickell 1981), which is especially worrisome if the panel has a large number of units but a relatively short time period. However, since our dataset spans several decades, this issue is mitigated considerably. As a robustness check, we also run regressions using General Methods of Moments (GMM) estimators (Arellano and Bond 1991) and obtain largely similar results. The standard errors in all models are clustered at the country level to account for common unobserved factors that may affect the power of leaders from the same country.

The key explanatory variable, *Predecessor power*, is computed as follows:

$$\text{Predecessor power}_{i,r,t} = \log \left[\max \left(\overline{\text{Power as CE}}_{j|j < i,r} \times \mathbb{I}(\text{death year}_j > t) + 1 \right) \right]$$

For the i th ($i \geq 2$) incumbent leader in regime r at year t , $\overline{\text{Power as CE}}_{j,r}$ is the average power index of his/her predecessor j during j 's own tenure as the chief executive.¹⁸ We choose to focus on the predecessor's *past* influence because of endogeneity concerns: Compared to a predecessor's contemporary influence (i.e., at t), his/her past influence is less likely to be affected by the incumbent's current power. We also restrict the set of predecessors to those who belong to the same political regime r with the incumbent for the obvious reason that incumbents are unlikely to be constrained by predecessors from a rival regime. $\mathbb{I}(\text{death year}_j > t)$ is an indicator function for whether j is still alive at t . The variable *Predecessor power* is therefore the logged average power of the most powerful predecessor if there is one or more retired leaders alive,¹⁹ and 0 if all within-regime predecessors are deceased by time t (i.e., $\text{death year}_j \leq t$ for all j). In our sample, about 50% of the country–year spells have at least one living predecessor present, and the average value of a predecessor's power is about 0.95.

¹⁸We use an unlogged version of the power index and only take log later on the average value.

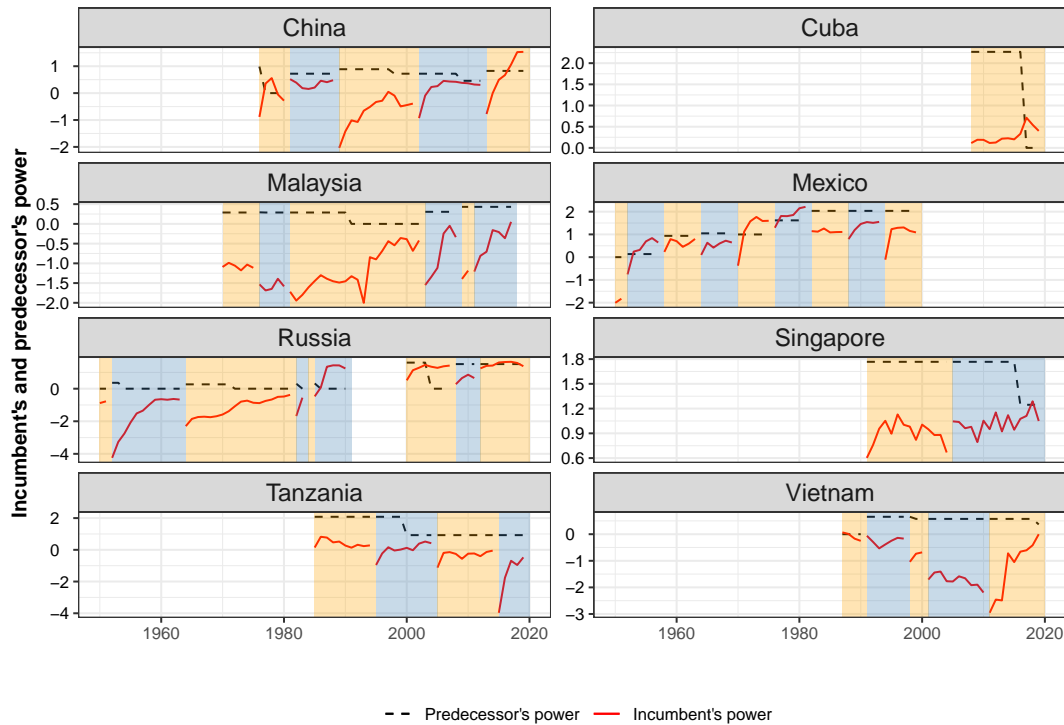
¹⁹For example, Singapore's chief executive Lee Hsien Loong (prime minister) faced two living predecessors in 2005: Lee Kuan Yew and Goh Chok Tong. The average of Lee Kuan Yew's power index over his tenure (1950–1990) is 4.854, whereas the same figure for Goh is 2.478 (tenure length: 1991–2004). Since Lee Kuan Yew has the highest average power index of the two, the predecessor power for Lee Hsien Long in 2005 is $\log(4.854 + 1) = 1.767$.

Since the average power index is computed based on each predecessor's time in the top executive office, its value does not change for the same predecessor throughout her successor's entire tenure.²⁰ The only variation in *Predecessor power*, therefore, comes from the change in the identity of the most powerful predecessor, which happens when the predecessor who previously had the highest average power index passes away. As long as we are willing to assume that the deaths of retired leaders are largely exogenous events, this design allows us to identify the causal effect of losing a predecessor on the incumbent's personal power. A close look at the data suggests that this assumption is reasonable: The vast majority of predecessors' deaths in our sample (~76%) were due to natural illness, and less than 7% were due to assassinations or other premeditated plots. As a robustness check, we later rerun our analysis on a sample in which all the variations in predecessors' power are caused by natural death only, and our results still hold (see Figure 4).

To provide an intuitive illustration of the variations that we use for identification, Figure 2 plots the co-variation between the incumbents' power (red, solid lines) and the power of the most influential predecessors (black, dashed lines) for a selected group of non-democracies. Each shaded interval represents an uninterrupted period of reign by one incumbent leader. A quick perusal of the trends suggests that, overall, incumbents' current power does seem to be negatively correlated with their predecessors' past influence, both across and within administrations: When an influential predecessor is present (i.e., the black, dashed line shows a positive value), the power index of the incumbent tends to be relatively low. The passing of the influential predecessor in the middle of an incumbent's tenure is usually associated with a notable subsequent increase in the incumbent's power. These visual patterns are consistent with our hypothesis about the role of predecessors as informal constraints. In the next section, we provide a more systematic test of this relationship using regression analysis.

²⁰We do recognize that predecessors' *actual* power may not stay constant over their successors' tenure. We present robustness checks using time-varying measures of predecessors' power in Table A.21.

Figure 2: Variations in Incumbent and Predecessor Power for Selected Countries



Note: This figure presents the co-variation between *Incumbent power* and *Predecessor power* for selected countries between 1950 and 2019 (excluding observations of regime founders). The red, solid lines denote incumbent leaders' power and the black, dashed lines denote predecessors' power. Shades of different colors represent the periods ruled by different incumbent leaders. Appendix G provides a full visualization of all leaders in all autocratic regimes.

5 Results

5.1 Baseline Results

Table 1 presents the baseline results. We begin with a parsimonious model that only controls for the lagged dependent variables. The second model adds year and regime fixed effects, and the third model adds controls for incumbents' tenure length and countries' economic and population sizes. The fourth model replaces the regime fixed effects with the more restrictive leader fixed effects, and the fifth model uses the GMM method to address the Nickell bias in dynamic panel estimation. Consistent with our hypothesis, we see that, throughout all models, the presence of an influential retired leader is strongly and negatively associated with the incumbent's power. The estimated

coefficient is somewhat smaller in the more parsimonious model (Column 1), but becomes more pronounced when fixed effects are included. We also note that the size of the estimate becomes somewhat smaller when we shift from a model with regime fixed effects (Column 3) to one with leader fixed effects (Column 4), suggesting that there does exist some confounding influence from unobserved regime-specific factors. The difference between the leader fixed-effects model and the GMM estimate, by contrast, is relatively small, which is consistent with our conjecture that the scale of the Nickell bias is not too large given the relatively long temporal coverage of our data.

Table 1: Baseline Results

	Incumbent personal power (Ngram)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power	-0.194** (0.044)	-0.391** (0.064)	-0.388** (0.068)	-0.278** (0.085)	-0.276** (0.082)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	100	100	94	94	94
Observations	2004	2004	1792	1792	1772

Note: This table presents the baseline regression results using incumbent leaders' Ngram-based power index as the dependent variable. The independent variable is the power of the living predecessor measured by the average power index during his/her own tenure as the chief executive. When multiple living predecessors are present, the maximum value is used. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

To provide a more substantive interpretation of the magnitudes of the estimates, we compute the short-term and long-term effects of changes in the predecessor's influence on the incumbent's power.²¹ Table 2 displays these effects in standard deviation terms. We see that while the presence

²¹ Given the regression coefficients, the cumulative effect in the t th year can be computed in an iterated fashion:

$$\begin{aligned}
\Delta_t &= \delta + \Delta_{t-1}\alpha_1 + \Delta_{t-2}\alpha_2 + \Delta_{t-3}\alpha_3 \text{ if } t \geq 4, \text{ with} \\
\Delta_1 &= \delta, \\
\Delta_2 &= \delta + \Delta_1\alpha_1, \\
\Delta_3 &= \delta + \Delta_2\alpha_1 + \Delta_1\alpha_2,
\end{aligned}$$

and the long-term multiplier is $\frac{1-\delta}{(1-\alpha_1-\alpha_2-\alpha_3)}$. See Boef and Keele (2008) for information on how to compute the long-term effects.

of an average former leader reduces the power of the incumbent by about 19% of a standard deviation each year, the cumulative effect is much larger: Compared to a scenario wherein the former leader dies before the incumbent assumes office, the power of the incumbent will be about 29% of a standard deviation lower if the predecessor lives for another five years after retirement. The long-term effect is quite close to the five-year cumulative, suggesting that most of the predecessors' constraining effect materializes in the first five years after they leave office.

Table 2: Cumulative Effects of Living Predecessor's Strength on Incumbent's Power

	Incumbent power index (Ngram)
	(1)
Immediate predecessor effect	-0.18937** (0.058)
Cumulative effect: 5 years	-0.29208** (0.094)
Cumulative effect: 10 years	-0.29429** (0.096)
Cumulative effect: maximum	-0.29430** (0.096)

Note: This table presents the simulated constraining effects of predecessors on incumbents' power based on Model 4 of Table 1. The results illustrate the difference in an incumbent's power between the scenario of no predecessor and the scenario of one predecessor with average strength (i.e., average power index as CE = 0.95). The coefficients are normalized by the standard deviation of the dependent variable to facilitate interpretation.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

5.2 Event-based Estimation

A central assumption of our empirical strategy is that, conditional on the within-leader design, the death of a predecessor is orthogonal to other leader- or regime-level confounders. This assumption might be violated, however, if incumbent leaders who experience deaths of predecessors during their tenures are systematically different from those who do not experience such events, if predecessors' deaths are correlated with certain secular trends in incumbents' power, or if such deaths are full anticipated in advance.²² To verify this assumption, we adopt an event-study approach to

²²For a discussion of the potential anticipation effect of dictators' deaths, see Hummel (2020).

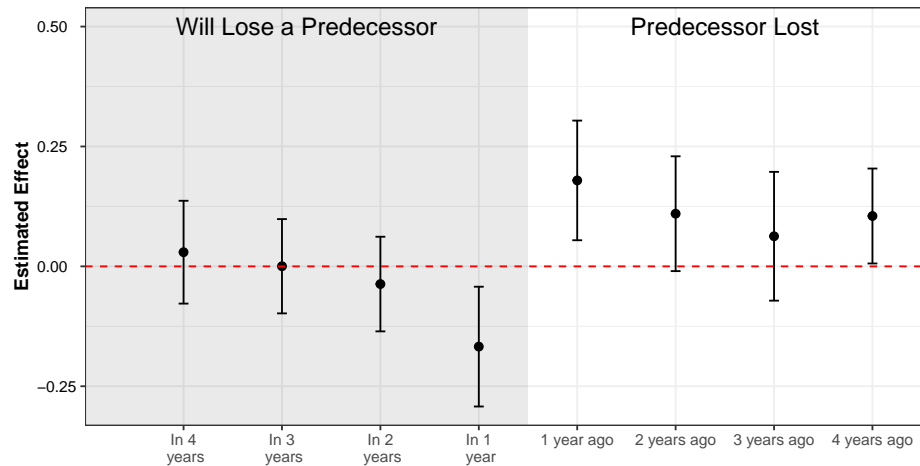
examine the change in incumbent leaders' power in the few years before and after the death of their most influential predecessor. Specifically, we estimate the following regression equation:

$$\begin{aligned} \text{Incumbent power}_{ict} &= \alpha_k \sum_{k=1}^3 \text{Incumbent power}_{i,c,t-k} \\ &+ \sum_{\tau=-4}^{+4} \delta_{\tau}^D \mathbb{1}\{t - D_{ic} = \tau\} + \mathbf{X}\boldsymbol{\beta} + \eta_i + \tau_t + \epsilon_{ict}, \end{aligned}$$

where D_{ic} denotes the year in which the event (death of the most influential predecessor) happened under a given leader i from country c . $\mathbb{1}\{t - D_{ic} = \tau\}$ is an indicator function that assigns 1 to the observation from country c that is τ th year relative to the event, and 0 otherwise.

The results from the event-study regression are visualized in Figure 3. We can see that for incumbent leaders who will soon see the death of their most influential living predecessor, they do not exhibit significantly different trajectories of power compared to other incumbents (who either do not have any predecessor at all or face no imminent death of one) prior to the event. After the passing of the predecessor, however, there is a notable surge in the former group's power in the years that immediately follow. This suggests that the constraining effect we observe is highly specific to the presence or absence of influential predecessors—a finding that testifies to the credibility of our identification strategy.

Figure 3: Results from an Event-Based Study



Note: The figure presents regression estimates from an event-based study. It shows how incumbent leaders' power changes dynamically before and after the event of a death of a within-regime predecessor. The vertical bars indicate 95% confidence intervals.

5.3 Subsample Results

In addition to the general proposition of living predecessors as a source of informal constraints, our theoretical argument also suggests specific predictions for when and where the predecessor-induced constraints will be most clearly observed. We verify some of the key predictions through subsample analyses. To begin with, we know that not all predecessors' deaths happen at random, and some of them may be endogenous to factors that influence the incumbent's power. If our theory is correct, we should expect the results to continue to hold for predecessors who died of natural causes. In addition, we also expect that a predecessor's ability to impose constraints will depend on how the transition takes place: The constraints are more likely to be in place and effective when the predecessor's departure was voluntary and consensual, but may be weak when the predecessor was removed by force (either by the successor or other elites). We evaluate these predictions by replicating the baseline analysis on (1) a subset of observations in which all the deaths of predecessors were due to natural illness, and two subsamples where the most influential living

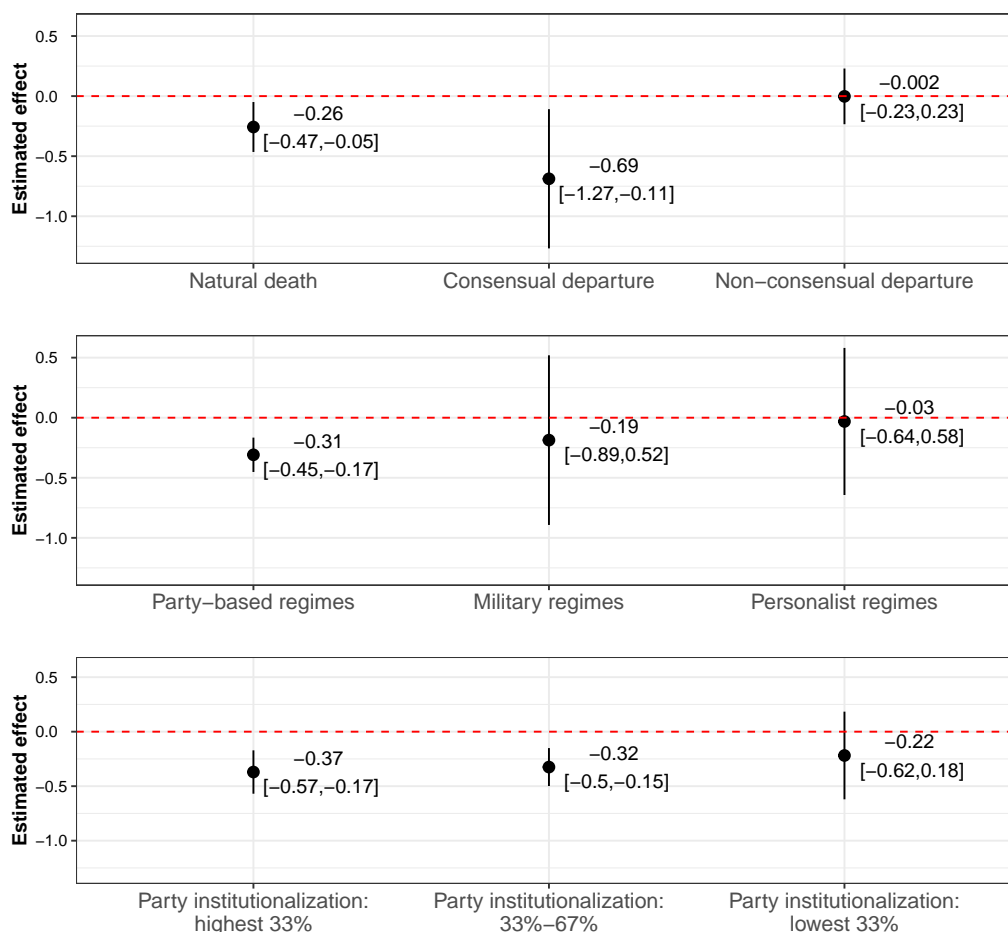
predecessors left office through (2) consensual vs. (3) non-consensual means.²³ The results are presented in the first row of Figure 4. We can see that the main result continues to hold within the plausibly more exogenous natural death sample, and that the estimated effect of predecessor is sizable for the sample of consensual departures but virtually zero for the non-consensual departure subsample. These patterns are consistent with our theoretical expectations about the kinds of political circumstances that are conducive to producing inter-generational constraints.

Next, we also take a closer look at how our results vary with a regime's institutional characteristics. As discussed above, managed, pre-mortem successions that produce living predecessors are typically more common in more institutionalized polities. Our argument also suggests that predecessors can sometimes constrain successors by creating new institutional arrangements or empowering the existing ones. This implies that the presence and effectiveness of inter-generational constraints may be conditioned by a regime's level of institutional development. We measure regime institutionalization in two ways. In the middle row of Figure 4, we report the subsample results using the three main authoritarian regime types from Geddes (2003) as proxies for institutionalization. The results show that the predecessors' effect is most pronounced in party-based regimes and military regimes (albeit noisier), both of which tend to have relatively strong rules and institutions for regulating intra-elite interactions. The bottom row of Figure 4 presents results using the Party Institutionalization Index from the V-Dem Project (Bizzarro, Hicken, and Self 2017) as an alternative sub-setting variable.²⁴ Again, we see that the effect of predecessors is strong in regimes with medium or high levels of institutionalization, but small and non-significant in the least institutionalized one third of the sample. Taken together, these results suggest that an interesting complementarity may exist between the personal and institutional sources of constraints: Predecessors get to play a greater role in constraining their successors when the political system is at least moderately institutionalized.

²³Data on predecessors' modes of exit are drawn from Svobik (2012). Non-consensual exits include coup, revolt, and civil war, and consensual exits include resignation, term limit, and no contest.

²⁴The index measures the strength and durability of party organizations in a country. In an authoritarian context, this usually weighs most heavily on the characteristics of the ruling party.

Figure 4: Key Subsample Results



Note: The figure presents regression estimates for the effect of predecessors on incumbents' power from several key subsamples (denoted by the text on the x axis). The vertical bars indicate 95% confidence intervals. The numerical results can be found in Table A.14 of the Online Appendix.

5.4 Robustness Checks

We conduct a number of additional tests to ensure the robustness of our results. In the interest of space, we leave the details of the tests to Appendix E and briefly summarize the key findings here. First, we check whether our results are sensitive to the way the dependent variable is constructed. We rerun the baseline analysis using modified versions of the Ngram-based power index (see Tables A.15 and A.16) and several other commonly used proxies for incumbent leaders' power, including the overall length of their tenure as chief executives (Table A.17) and the

two existing power measures discussed earlier (Tables A.18 and A.19). Most of these alternative measures yield results very similar to the baseline finding.

We also evaluate the robustness of our independent variable by estimating regressions using three different measures of the predecessors' influence: (1) predecessors' power index based on the median Ngram as chief executive (as opposed to the mean), (2) a binary indicator for whether there is *any* living predecessor from the same regime, and (3) a count variable for the *number* of living, within-regime predecessors. The results we obtain are all substantively the same as the baseline (Tables A.20). In addition, we also introduce two modifications to account for the possibility that predecessors' power may change over their successors' tenure. One modification is to allow predecessors' power to decline following some exponential decay functions after they leave office, and the other is to simply use the *current* Ngram index of the most influential living predecessor. Again, our main findings turn out to be highly robust to these modifications (Table A.21).

Since the operationalization of the definition of authoritarian regimes sometimes varies across datasets, one concern is that the results may be driven by our sample choice. To address this concern, we re-run our main analyses on several alternative authoritarian regime samples, such as Geddes, Wright, and Frantz (2019) and Cheibub, Gandhi, and Vreeland (2009), and find very similar results (Tables A.25 and A.26). Moreover, we also try to benchmark our findings with a placebo test. We construct a similar a power index measure for predecessors who are from the same country but a *different regime*. The coefficient for the placebo variable is much smaller in size compared to the original estimate (Table A.27).

6 Evidence on Mechanism

6.1 Evidence from Sub-measures of Personalism and Institutions

The preceding analysis has shown that in durable autocracies where pre-mortem successions are being practiced, retired leaders often function as a key informal constraint on the power of in-

cumbents. Yet, it still remains unclear as to how exactly this constraint works. We probe this question further in several ways. To begin with, we examine how the presence of influential predecessors affects the institutional and non-institutional aspects of authoritarian politics using several existing cross-country indicators. For the institutional aspect, we use Svobik's (2012) data on authoritarian institutions to measure the presence of key semi-democratic institutions (e.g., executive elections, legislatures, and multiple political parties). For the non-institutional aspect, We use five sub-measures of the GWF personalism index, which capture, in a general sense, the extent to which autocratic incumbents personally control key sectors such as the military, the regime party, and the state bureaucracy.

The regression results are presented in Table 3. We see that the presence of an influential predecessor is associated with a significant reduction in the incumbent's personal discretion over high-level appointments in the government (Column 1) and the military (Columns 3). These patterns are broadly consistent with previous studies' argument that the de-personalization of personnel matters is key to limit the power of incumbent leaders in non-democracies (Magaloni 2008; Slater 2003). Yet, paradoxically, what drives the de-personalization here appears to be precisely the *personal power* of the predecessors. Meanwhile, there is much weaker evidence that the predecessors' presence helps to change the characteristics of a regime's formal institutions, either in terms of the competitiveness in executive and legislative elections or the extent of multi-party competition (Columns 6 to 8). In other words, it is in the covert, rather than the overt, domain of politics that the predecessors' influence can be most readily observed.

Table 3: Effect of Predecessor Power on Sub-measures of Personalism and Regime Institutions

	Aspects of personalism					Attributes of institutions		
	(1) Access to high office based on personal loyalty to incumbent ruler	(2) Incumbent ruler controls ap- pointments to party executive committee	(3) Incumbent ruler promotes military loyal to him/her personally	(4) Incumbent ruler impris- ons/kills military officers	(5) Incumbent ruler personally controls security apparatus	(6) Competitive executive selection	(7) Competitive legislative selection	(8) Multi-party competition
Predecessor power	-0.070* (0.023)	-0.058 (0.030)	-0.095* (0.031)	-0.089* (0.027)	-0.043 (0.025)	0.020 (0.068)	0.015 (0.056)	-0.001 (0.017)
Leader and year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
# of countries	69	69	69	69	69	72	72	72
Observations	1331	1331	1331	1331	1331	1353	1340	1367

Note: This table presents the standardized regression coefficients on the effect of predecessors' strength on sub-measures of personalism (Geddes, Wright, and Frantz 2019) and the presence/competitiveness of semi-democratic institutions (Svolik 2012). Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

6.2 Evidence from Cabinet Appointments

In addition to showing a general pattern with broad-stroke indicators, the highly granular nature of our Ngram-based measure also enables us to go a step further in unpacking the internal power dynamics associated with inter-generational constraints. Specifically, since similar Ngram name counts can in theory be obtained for every politician in a regime, we can go beyond current and former top leaders and examine how this constraint affects the power distribution among a broader set of political elites. To do so, we make use of the recently published WhoGov dataset (Nyrup and Bramwell 2020), which provides a comprehensive collection of cabinet ministers for 177 countries between 1966 and 2016. Research on authoritarian cabinets suggests that they are important venues for incumbent autocrats to form ruling coalitions and co-opt potential rivals (Arriola 2009). Cabinet seats provide elites with access to state resources and influence over government policies; in some cases, cabinet members also form the critical candidate pool from which a regime's future top leaders will be selected. For former leaders, one way for them to retain power over key policies and personnel matters during retirement is thus to maintain a critical mass of allies and followers in high-profile cabinet posts. This means that a closer look at cabinet appointments is likely to provide important insights into how inter-generational checks and balances actually work.

We match the WhoGov dataset with our autocratic regime sample and run the same algorithm to construct an Ngram-based power index for each cabinet minister based on the number of publications that mention his/her name in a given year. We then compute the average power index separately for two groups of cabinet members: (1) those who are first appointed to a cabinet position by the incumbent leader (*Average Ngram of Incumbents' Appointees*) and (2) those who have been previously appointed to the cabinet by the incumbent's within-regime predecessors (*Average Ngram of Predecessors' Appointees*).²⁵ We use the same baseline model (Column 4 of Table 1) to estimate how predecessors' power affects these patterns of cabinet appointments.

²⁵For country-year spells where no cabinet member is appointed by predecessors, we treat the average Ngram for predecessors' appointees as 0. A similar procedure is used to deal with the (rarer) cases where there is no new appointee by the incumbent leader. The general patterns of our results are robust to simply treating such observations as missing.

Table 4: Effect of Predecessor and Incumbent Power on Cabinet Appointments

	Share of incumbent's first-time appointees		Average Ngram of incumbent's appointees		Average Ngram of predecessors' appointees	
	(1)	(2)	(3)	(4)	(5)	(6)
Predecessor power	-0.138** (0.021)	-0.128** (0.023)	-0.660** (0.167)	-0.598** (0.180)	1.018** (0.163)	0.933** (0.179)
Incumbent power		0.053** (0.016)		0.337** (0.117)		-0.466** (0.118)
Control variables	✓	✓	✓	✓	✓	✓
Leader and year fixed effects	✓	✓	✓	✓	✓	✓
# of countries	86	86	86	86	86	86
Observations	1395	1395	1395	1395	1395	1395

Note: This table presents the regression results on the effects of the incumbent's and predecessors' power on the patterns of cabinet appointments. Data on the characteristics of cabinet members are drawn from Nyrop and Bramwell (2020). Control variables include the incumbent leader's tenure length, log GDP per capita, and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table 4 presents the results from cabinet-level analyses. Columns 1 and 2 use the percentage of first-time cabinet members (i.e., those appointed exclusively by the current leader) as the dependent variable. We see that the predecessors' power is strongly and negatively associated with the incumbents' ability to make fresh appointments to the cabinet. A one standard deviation increase in the predecessors' power (+0.68) is associated with a 9.4 percentage point, or 34% of a standard deviation decrease in the share of the incumbents' first-time appointees. The second column further adds the variable for incumbents' power. We see that a more powerful incumbent does tend to make more fresh appointments to the cabinet. Columns 3 to 6 further examine how the inter-generational power balance shapes the relative influence of the two different groups of cabinet members. The results show that the presence of powerful predecessors weakens the influence of cabinet members who are exclusively appointed by the current leaders, but increases the influence of those appointed by the predecessors themselves. Meanwhile, powerful incumbents appear to have the exact opposite effects, raising the profiles of the incumbents' own appointees while limiting those of the predecessors' appointees. Taken together, these patterns suggest that an important method by which predecessors constrain their successors is by limiting the latter's ability to unilaterally change the lineup of supporting elites in organizations that are critical to top

leaders' effective exercise of power.

7 Conclusion

The allocation and contestation of power lie at the heart of elite politics. While much of the existing literature on authoritarian power politics focuses on institutions, we study how informal, personalized constraints affect incumbent autocrats' ability to consolidate power. We demonstrate that the constraints posed by retired leaders have a discernible negative effect on incumbent leaders' power, and that the relaxation of such constraints following a predecessor's death gives the incumbent an opportunity to expand personal influence. We also provide suggestive evidence on how this constraint works: It works less by altering the formal and conspicuous aspects of political institutions and more by limiting successors' discretion over the subtle yet crucial domain of personnel control.

Although the specific inter-generational arrangement that we study here may not necessarily be present in all autocracies, the central insight that effective constraints on power holders ultimately requires others to hold a commensurate level of power is relevant to a broad set of regimes. According to the study by Barros (2002), for example, even in a seemingly personalist regime like Chile under Augusto Pinochet, powerful generals from other branches of the military acted as key informal checks on Pinochet's power, and their influence helped to create an effective constitutional framework that paved the way for the subsequent democratic transition. These findings serve as a cautionary note for the rapidly growing body of literature on authoritarian institutions (Boix and Svolik 2013; Brownlee 2007a; Gandhi 2008; Magaloni 2008): To the extent that formal institutions are often deeply intertwined with, and endogenous to, political maneuvering undertaken by powerful political actors, one needs to be extremely careful when making inferences about the independent effect of institutions (Cheibub, Przeworski, and Saiegh 2004; Pepinsky 2014). As our study suggests, institutions sometimes emerge in tandem with the need to cope with succession challenges, and the effectiveness of institutions as a form of executive constraint depends crucially on the informal political clout of retired leaders. Ignoring this hidden dimension can lead us to

overstate the institutions' actual ability to constrain incumbents.

This study also has implications for understanding the interplay between authoritarian leaders' personal power and regime institutionalization. The prevailing view in the literature is that personalism is antithetical to building strong and robust political institutions (Geddes, Wright, and Frantz 2019; Levitsky and Ziblatt 2018). Prominent recent studies have similarly argued that weak leaders are more likely to pursue the strategy of institutionalization as a way of making credible commitments to other elites (Meng 2020). Our findings, however, suggest a more nuanced and dynamic interpretation: In some cases, powerful leaders may in fact be a blessing for building binding institutions if the political exigencies give them the right incentives. As illustrated by the case of leadership succession, departing leaders who are concerned with protecting their interests and legacies in retirement may want to put in place strong institutions that will tie the hands of their successors (rather than themselves). Those with greater personal power are more likely to succeed because they have greater capacity to defend and enforce nascent institutions and cultivate a norm of institutional compliance among the elites. Systematic explanations of how strong institutions take root in a regime, therefore, need to take into account the role played by prominent political figures, such as George Washington in the United States, Chiang Ching-Kuo in Taiwan, and Deng Xiaoping in China.

Recognizing the importance of the personalistic input to executive constraint also suggests a different prediction of long-term institutional dynamics. Contrary to the commonly held view that institution-building is a path-dependent process whereby institutions, once put in place, become incrementally stronger as time goes on (Pierson 2000), the fact that effective executive constraints also need support from strong individuals suggests that strengthening institutional constraints in the short run may paradoxically sow the seeds for de-institutionalization in the long run: When the constraints over prior leaders are too strong, those leaders may no longer be able to accumulate enough power to effectively check their own successors. Therefore, instead of being on a unidirectional path of progression, the rise and fall of institutions may be a cyclical phenomenon over the long historical *durée*.

Future research can extend this study in at least two ways. First, researchers can further explore how this specific informal constraint that we identify—the presence or absence of former leaders—affects incumbent leaders’ behaviors in areas other than power consolidation, such as policy directions, economic performance, or interstate relations. Second, researchers can try to explore other sources of informal constraints in autocratic systems. While ex-leaders as a form of informal constraint may be most applicable to relatively institutionalized autocracies, other types of constraints, such as the breadth and depth of the ruler’s personal networks, the configurations of the ethnic and regional interests within the ruling elites, and the relative influence of political leaders vis-à-vis prominent military, business, and religious figures, may play a greater role in less institutionalized settings. A better understanding of how those constraints work will shed important light on both the nature of autocratic power and what limits it in the absence of binding institutions.

References

- Acemoglu, Daron, Georgy Egorov, and Konstantin Sonin. 2008. “Coalition Formation in Non-Democracies.” *The Review of Economic Studies* 75 (4): 987–1009.
- Albertus, Michael, and Victor Menaldo. 2012. “Dictators as founding fathers? The role of constitutions under autocracy.” *Economics & Politics* 24 (3): 279–306.
- Arellano, Manuel, and Stephen Bond. 1991. “Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations.” *The Review of Economic Studies* 58 (2): 277–297.
- Arriola, Leonardo R. 2009. “Patronage and Political Stability in Africa.” *Comparative Political Studies* 42 (10): 1339–1362.
- Ban, Pamela, et al. 2018. “How Newspapers Reveal Political Power.” Online First, *Political Science Research and Methods*: 1–18.

- Barros, Robert. 2002. *Constitutionalism and Dictatorship : Pinochet, the Junta, and the 1980 Constitution*. Cambridge, UK New York: Cambridge University Press.
- Baturo, Alexander. 2014. *Democracy, Dictatorship, and Term Limits*. University of Michigan Press.
- Bizzarro, Fernando, Allen Hicken, and Darin Self. 2017. *The V-Dem Party Institutionalization Index: A New Global Indicator (1900–2015)*. University of Gothenburg, Varieties of Democracy Institute, Gothenburg, Sweden. <https://bit.ly/3fLEbR9>.
- Blaydes, Lisa. 2010. *Elections and Distributive Politics in Mubarak's Egypt*. Cambridge University Press.
- Boef, Suzanna De, and Luke Keele. 2008. "Taking Time Seriously." *American Journal of Political Science* 52 (1): 184–200.
- Boix, Carles, and Milan Svolik. 2013. "The foundations of limited authoritarian government: Institutions, commitment, and power-sharing in dictatorships." *The Journal of Politics* 75 (2): 300–316.
- Brownlee, Jason. 2007a. *Authoritarianism in an Age of Democratization*. Cambridge University Press.
- . 2007b. "Hereditary Succession in Modern Autocracies." *World Politics* 59 (4): 595–628.
- Bueno de Mesquita, Bruce, et al. 2003. *The Logic of Political Survival*. MIT Press.
- Bunce, Valerie. 2014. *Do New Leaders Make a Difference?: Executive Succession and Public Policy Under Capitalism and Socialism*. Princeton Legacy Library. Princeton University Press.
- Burling, Robbins. 1974. *The Passage of Power: Studies in Political Succession*. New York: Academic Press.
- Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2009. "Democracy and Dictatorship Revisited." *Public Choice* 143 (1-2): 67–101.

- Cheibub, Jose Antonio, Adam Przeworski, and Sebastian M. Saiegh. 2004. "Government Coalitions and Legislative Success under Presidentialism and Parliamentarism." *British Journal of Political Science* 34 (4): 565–587.
- Chen, Ting, and Ji Yeon Hong. 2020. "Rivals within: Political Factions, Loyalty, and Elite Competition under Authoritarianism." *Political Science Research and Methods*: 1–16.
- Chin, James. 2015. "A Decade Later: The Lasting Shadow of Mahathir." In *Malaysia Post-Mahathir: A Decade of Change*, ed. by James Chin and Joern Dosch. Singapore: Marshall Cavendish International.
- Colgan, Jeff D., and Jessica L.P. Weeks. 2014. "Revolution, Personalist Dictatorships, and International Conflict." *International Organization* 69 (1): 163–194.
- Dittmer, Lowell. 1978. "Bases of Power in Chinese Politics: A Theory and an Analysis of the Fall of the "Gang of Four"." *World Politics* 31 (1): 26–60.
- . 2003. "Chinese Factional Politics Under Jiang Zemin." *Journal of East Asian Studies* 3 (1): 97–128.
- Fischer, Mary. 1989. *Nicolae Ceaușescu : A Study in Political Leadership*. Boulder: L. Rienner Publishers.
- Frantz, Erica, and Elizabeth A. Stein. 2017. "Countering Coups: Leadership Succession Rules in Dictatorships." *Comparative Political Studies* 50 (7): 935–962.
- Frantz, Erica, et al. 2020. "Personalization of Power and Repression in Dictatorships." *The Journal of Politics* 82 (1): 372–377.
- Gandhi, Jennifer. 2008. *Political Institutions under Dictatorship*. Cambridge University Press.
- Gandhi, Jennifer, and Ellen Lust-Okar. 2009. "Elections under authoritarianism." *Annual review of political science* 12:403–422.
- Gandhi, Jennifer, and Jane Lawrence Sumner. 2020. "Measuring the Consolidation of Power in Nondemocracies." *The Journal of Politics* 82 (4): 1545–1558.

- Geddes, Barbara. 2003. *Paradigms and Sand Castles: Theory Building and Research Design in Comparative Politics*. University of Michigan Press.
- Geddes, Barbara, Joseph Wright, and Erica Frantz. 2014. "Autocratic Breakdown and Regime Transitions: A New Data Set." *Perspectives on Politics* 12 (2): 313–331.
- . 2019. *How Dictatorships Work*. New York: Cambridge University Press.
- Gehlbach, Scott, and Philip Keefer. 2011. "Investment without Democracy: Ruling-party Institutionalization and Credible Commitment in Autocracies." *Journal of Comparative Economics* 39 (2): 123–139.
- . 2012. "Private Investment and the Institutionalization of Collective Action in Autocracies: Ruling Parties and Legislatures." *The Journal of Politics* 74 (02): 621–635.
- Goemans, Henk E., Kristian Skrede Gleditsch, and Giacomo Chiozza. 2009. "Introducing Archigos: A Dataset of Political Leaders." *Journal of Peace Research* 46 (2): 269–283.
- Grant, Will J., and Erin Walsh. 2015. "Social evidence of a changing climate: Google Ngram data points to early climate change impact on human society." *Weather* 70 (7): 195–197.
- Grzymala-Busse, Anna. 2010. "The Best Laid Plans: The Impact of Informal Rules on Formal Institutions in Transitional Regimes." *Studies in Comparative International Development* 45 (3): 311–333.
- Helmke, Gretchen, and Steven Levitsky. 2004. "Informal Institutions and Comparative Politics: A Research Agenda." *Perspectives on Politics* 2 (4): 725–740.
- Hummel, Sarah. 2020. "Leader age, death, and political liberalization in dictatorships." *The Journal of Politics* 82 (3): 981–995.
- Huntington, Samuel P., and Clement Henry Moore, eds. 1970. *Authoritarian Politics in Modern Society: The Dynamics of Established One-Party Systems*. Basic Books.
- Ilkhamov, Alisher. 2007. "Neopatrimonialism, Interest Groups and Patronage Networks: The Impasses of the Governance System in Uzbekistan." *Central Asian Survey* 26 (1): 65–84.

- Jaros, Kyle, and Jennifer Pan. 2017. "China's Newsmakers: Official Media Coverage and Political Shifts in the Xi Jinping Era." *The China Quarterly* 233:111–136.
- Kokkonen, Andrej, and Anders Sundell. 2014. "Delivering Stability: Primogeniture and Autocratic Survival in European Monarchies 1000-1800." *American Political Science Review* 108 (02): 438–453.
- Kroeger, Alex. 2018. "Dominant Party Rule, Elections, and Cabinet Instability in African Autocracies." *British Journal of Political Science*: 1–23.
- Kuhn, Robert. Lawrence. 2004. *The Man who Changed China: The Life and Legacy of Jiang Zemin*. Crown Publishers.
- Kurrild-Klitgaard, Peter. 2000. "The Constitutional Economics of Autocratic Succession." *Public Choice* 103 (1-2): 63–84.
- Levitsky, Steven, and María Victoria Murillo. 2009. "Variation in Institutional Strength." *Annual Review of Political Science* 12 (1): 115–133.
- Levitsky, Steven, and Daniel Ziblatt. 2018. *How Democracies Die*. Crown/Archetype.
- Li, Cheng. 2016. *Chinese Politics in the Xi Jinping Era: Reassessing Collective Leadership*. Brookings Institution Press.
- Luo, Zhaotian, and Arturas Rozenas. 2016. "Ruling the Ruling Coalition: Information Control and Autocratic Governance." *SSRN Electronic Journal*.
- Ma, Xiao. 2016. "Term Limits and Authoritarian Power Sharing: Theory and Evidence from China." *Journal of East Asian Studies* 16 (1): 61–85.
- Magaloni, Beatriz. 2008. "Credible Power-Sharing and the Longevity of Authoritarian Rule." *Comparative Political Studies* 41 (4-5): 715–741.
- Marshall, Monty, Ted Gurr, and Keith Jaggers. 2018. *Polity IV Project: Political Regime Characteristics and Transitions, 1800-2017*. Center for Systemic Peace.

- Mauzy, Diane K., and R. S. Milne. 2002. *Singapore Politics Under the People's Action Party*. Routledge Chapman Hall.
- Meng, Anne. 2020. *Constraining Dictatorship: From Personalized Rule to Institutionalized Regimes*. Cambridge University Press.
- . 2019. "Ruling Parties in Authoritarian Regimes: Rethinking Institutional Strength." *British Journal of Political Science*: 1–15.
- Michel, Jean-Baptiste, et al. 2010. "Quantitative Analysis of Culture Using Millions of Digitized Books." *Science* 331 (6014): 176–182.
- Miller, Michael K. 2015. "Elections, Information, and Policy Responsiveness in Autocratic Regimes." *Comparative Political Studies* 48 (6): 691–727.
- Myerson, Roger B. 2008. "The Autocrat's Credibility Problem and Foundations of the Constitutional State." *The American Political Science Review* 102 (1): pp. 125–139.
- Nickell, Stephen. 1981. "Biases in Dynamic Models with Fixed Effects." *Econometrica* 49 (6): 1417–1426.
- Nyrup, Jacob, and Stuart Bramwell. 2020. "Who Governs? A New Global Dataset on Members of Cabinets." *American Political Science Review* 114 (4): 1366–1374.
- Padgett, John F., and Christopher K. Ansell. 1993. "Robust Action and the Rise of the Medici, 1400–1434." *American Journal of Sociology* 98 (6): 1259–1319.
- Pepinsky, Thomas. 2014. "The Institutional Turn in Comparative Authoritarianism." *British Journal of Political Science* 44 (03): 631–653.
- Pepinsky, Thomas B. 2015. *Economic Crises and the Breakdown of Authoritarian Regimes*. Cambridge University Press.
- Pierson, Paul. 2000. "Increasing Returns, Path Dependence, and the Study of Politics." *The American Political Science Review* 94 (2): 251–267.

- Przeworski, Adam. 2013. *Political Institutions and Political Events Data Set*. Department of Politics, New York University.
- Reuter, Ora John. 2017. *The Origins of Dominant Parties: Building Authoritarian Institutions in Post-Soviet Russia*. Cambridge University Press.
- Richey, Sean, and J. Benjamin Taylor. 2019. "Google Books Ngrams and Political Science: Two Validity Tests for a Novel Data Source." *PS: Political Science & Politics* 53 (1): 72–77.
- Shea, Daniel M., and Alex Sproveri. 2012. "The Rise and Fall of Nasty Politics in America." *PS: Political Science & Politics* 45 (03): 416–421.
- Slater, Dan. 2003. "Iron Cage in an Iron Fist: Authoritarian Institutions and the Personalization of Power in Malaysia." *Comparative Politics* 36 (1): 81–101.
- Smith, Peter H. 1991. "Mexico since 1946: Dynamics of an Authoritarian Regime." In *Mexico since Independence*, ed. by Leslie Bethell, 321–396. Cambridge University Press.
- Southall, Roger. 2006. "Troubled Visionary: Nyerere as a Former President." In *Legacies of Power : Leadership Change and Former Presidents in African Politics*, ed. by Roger Southall and Henning Melber, 233–255. Uppsala, Sweden: The Nordic Africa Institute.
- Spearman, Diana. 1939. *Modern Dictatorship*. Columbia University Press.
- Svolik, Milan. 2012. *The Politics of Authoritarian Rule*. Cambridge University Press.
- Svolik, Milan W. 2009. "Power Sharing and Leadership Dynamics in Authoritarian Regimes." *American Journal of Political Science* 53 (2): 477–494.
- Throup, David, and Charles Hornsby. 1998. *Multi-party Politics in Kenya : The Kenyatta & Moi States & the Triumph of the System in the 1992 Election*. Oxford: Ohio University Press.
- Treisman, Daniel. 2015. "Income, Democracy, and Leader Turnover." *American Journal of Political Science* 59 (4): 927–942.
- Tullock, Gordon. 1987. *Autocracy*. Springer Science & Business Media.

- Vogel, Ezra. 2013. *Deng Xiaoping and the Transformation of China*. Belknap Press of Harvard University Press.
- Vrandečić, Denny, and Markus Krötzsch. 2014. “Wikidata: A Free Collaborative Knowledgebase.” *Commun. ACM* (New York, NY, USA) 57 (10): 78–85.
- Weeks, Jessica L. 2012. “Strongmen and Straw Men: Authoritarian Regimes and the Initiation of International Conflict.” *American Political Science Review* 106 (02): 326–347.
- Wright, Joseph. 2008. “Do Authoritarian Institutions Constrain? How Legislatures Affect Economic Growth and Investment.” *American Journal of Political Science* 52 (2): 322–343.
- Wright, Joseph, and Abel Escribà-Folch. 2012. “Authoritarian institutions and regime survival: Transitions to democracy and subsequent autocracy.” *British Journal of Political Science* 42 (2): 283–309.
- Zhang, Yongjing. 2011. “The Successor’s Dilemma in China’s Single Party Political System.” *European Journal of Political Economy* 27 (4): 674–680.

Online Appendix (Not for Publication) for
In the Shadows of Great Men: Leadership Turnovers and Power Dynamics in Autocracies

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A Summary Statistics

Table A.1: Summary Statistics for Main Dataset

	Mean	SD	Min	Max	N
Incumbent power	0.27	1.42	-5.75	4.47	2050
Incumbent power (# of mentions)	0.31	1.66	-7.02	5.53	2050
Incumbent power (multi-language)	0.088	1.47	-5.75	4.47	2041
log # of publications mentioning incumbent (numerator)	5.09	1.31	0	9.20	2056
log # of publications mentioning highest non-CE figure (denominator)	4.78	1.62	0	9.91	2089
Incumbent power (Ngram relative to 90th percentile)	2.58	1.33	0	7.69	1777
Incumbent power (Ngram relative to 10th highest non-CE)	2.50	1.43	-2.94	7.65	1776
Incumbent's time in office	9.31	8.95	0	49	2090
Predecessor power	0.47	0.67	0	4.33	2097
Any living predecessor (1=yes)	0.51	0.50	0	1	2097
# of living predecessors	0.82	1.03	0	10	2097
Predecessor power with exponential decay ($\tau = 5$)	0.17	0.34	0	2.92	2097
Predecessor power with exponential decay ($\tau = 10$)	0.26	0.42	0	3.23	2097
Predecessor power with exponential decay ($\tau = 20$)	0.33	0.50	0	3.39	2097
Predecessor power (current)	2.30	2.56	0	8.61	2097
Predecessor power (coarsened)	0.30	0.38	0	1.67	2097
Predecessor power	0.47	0.72	0	5.18	2097
Log real GDP	23.9	1.94	18.5	30.1	1850
Log population	16.0	1.72	11.5	21.1	1967
Official language is English	0.17	0.37	0	1	2095
Personalism index (GWF)	0.37	0.27	0	1	1589
Power consolidation index (GS)	0.087	1.31	-2.47	2.47	1690
Party-based regime (GWF)	0.55	0.50	0	1	1819
Military regime (GWF)	0.097	0.30	0	1	1815
Personalist regime (GWF)	0.13	0.33	0	1	1817
Party institutionalization index (V-Dem)	0.45	0.27	0.0030	0.97	1859
Access to high office based on loyalty to incumbent (GWF)	0.56	0.50	0	1	1642
Incumbent controls appointments to party executive committees (GWF)	0.25	0.43	0	1	1642
Incumbent promotes military loyal to him/her (GWF)	0.41	0.49	0	1	1642
Incumbent imprisons/kills military officers (GWF)	0.24	0.43	0	1	1642
Incumbent controls security apparatus (GWF)	0.58	0.49	0	1	1642
Competitiveness in executive selection (Svolik)	2.29	1.35	1	5	1660
Competitiveness in legislative selection (Svolik)	3.32	1.43	1	6	1657
Extent of multi-party competition (Svolik)	2.21	0.79	1	3	1684
Cabinet: share of ministers appointed only by incumbents	0.68	0.28	0	1	1509
Cabinet: average power of incumbents' appointees	-0.52	2.21	-4.61	5.04	1509
Cabinet: average power of predecessors' appointees	-2.47	2.08	-4.61	4.97	1509

Table A.2: Summary Statistics for Auxiliary Data

	Mean	SD	Min	Max	N
<i>News Articles Analysis</i>					
Log incumbent leader Ngram	5.11	1.30	0	10.5	4746
Log # of Google News with leader name mentions	0.75	1.26	0	7.62	4805
Log # of NYT articles with leader name mentions	3.19	2.43	0	11.5	4492
<i>Correlation with Electoral Outcomes (Democracies)</i>					
Vote margin for the winner's party	0.13	0.14	-0.28	0.79	558
Winner's vote share	0.44	0.12	0.10	0.87	558
Highest loser's vote share	0.32	0.11	0.033	0.54	558
Winner's Ngram (logged, 1 yr before election)	4.73	1.52	0	9.77	572
Loser's Ngram (logged, 1 yr before election)	4.09	1.61	0	10.1	553
<i>Correlation with Expert-rated Power Score for Russian Politicians</i>					
Expert-rated politician power	3.22	1.01	1.66	8.79	2499
Politician's Ngram (logged)	3.41	1.55	0	8.31	1745
<i>Correlation with Network Centrality of Mexican Elites</i>					
Degree centrality	29.7	25.7	0	113	263
Betweenness centrality	0.029	0.030	0	0.18	263
Closeness centrality	0.43	0.11	0	0.68	263
Cabinet member Ngram (English, last year)	2.42	1.63	0	5.96	263
Cabinet member Ngram (English, past 5 years' average)	2.41	1.49	0	5.81	263
Cabinet member Ngram (Spanish, last year)	3.50	1.75	0	5.96	263
Cabinet member Ngram (Spanish, past 5 years' average)	3.42	1.68	0	5.72	263
PRI's presidential nominee	0.042	0.20	0	1	263
<i>Appointments in African Cabinets</i>					
Share of co-ethnics in cabinet	0.29	0.22	0	1	491
Log incumbent leader Ngram	5.36	1.12	0.69	8.48	486
Log GDP per capita	6.56	1.08	4.29	8.98	489
Log population	16.7	1.06	14.3	19.1	490
Democracy	0.28	0.45	0	1	490
<i>Appointments in Chinese Politburo</i>					
Share of clients in Politburo	0.14	0.19	0	0.84	130
Log patron Ngram (current)	5.05	1.41	0.68	7.76	130
Log patron Ngram (last 3-year average)	5.06	1.31	0.85	7.85	130
Log patron Ngram (last 5-year average)	5.04	1.27	0.34	7.79	130
Log patron Ngram (last 10-year average)	4.96	1.23	-0.36	7.62	130
Age	76.4	9.29	56	100	130

B Measuring Personal Power from Google Ngram

In this section, we fill in additional details about the processes by which we constructed the Ngram-based power measure. We begin by discussing the types of publications included in the Google Ngram database (and the associated the Google Books catalogue), and the possibility of a temporal lag between publication and real-world events. We then go through the procedures for constructing the power index and the various key processing decisions that we take at every step. The next

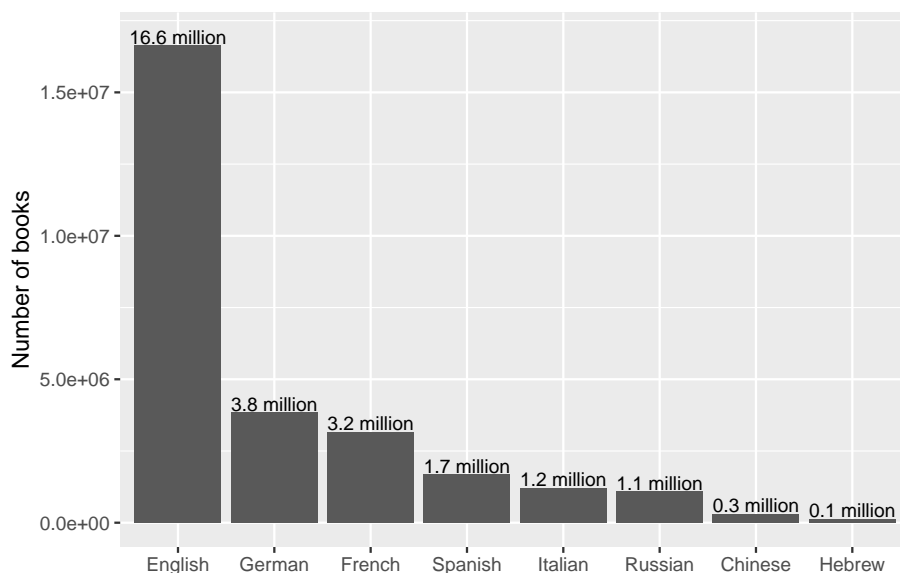
section (C) presents a series of validation tests.

B.1 Details about Publications Underlying Google Ngram

Overview

Google Ngram is a linguistic database that provides information on the number of times a word (unigram) or short phrase (n-gram) appears in printed publications each year (Michel et al. 2010). The database is built on a text corpus of 28 million publications in Google Books' digital catalogue (40 million in total as of 2019).²⁶ The text corpus includes publications produced over two centuries (1800 to 2019), and contains a total of over 3 trillion words and phrases from eight different languages (English, Chinese, French, German, Italian, Hebrew, Russian, and Spanish). Figure A.1 visually illustrates the breakdown of the underlying publications by language. We see that English-language publications have an overwhelming presence (59.3%), much greater than publications in all seven other languages combined. This reflects the fact that Google Books' digitization initiative has so far worked primarily with libraries in the U.S.

Figure A.1: Publication Count by Language



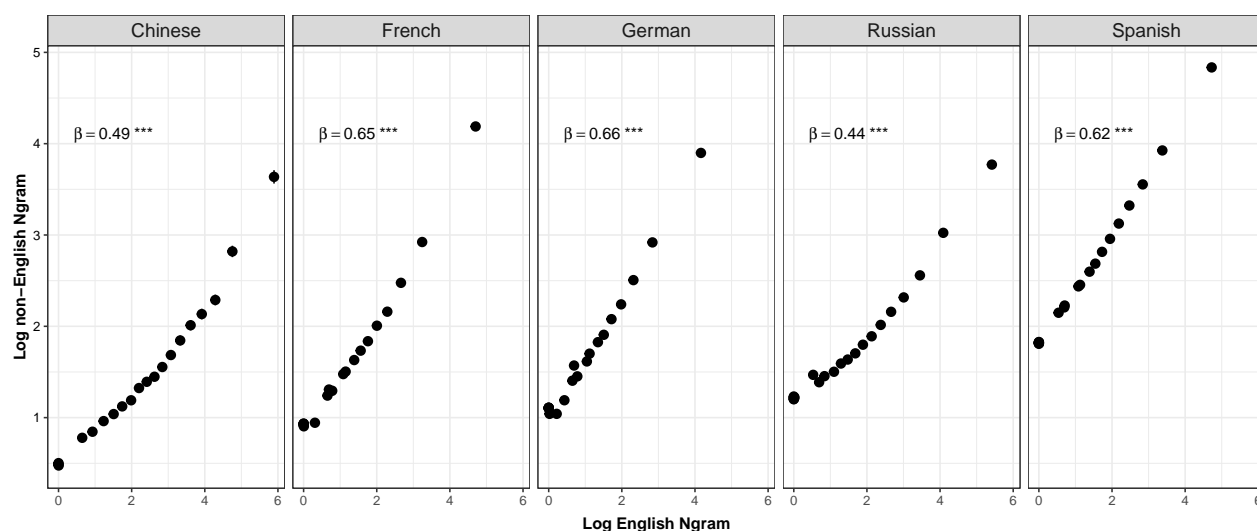
To get a sense of how a leader's annual mentions in English Ngram compare with those in non-English sources, we construct five datasets for countries that speak the following five languages, respectively:²⁷ Chinese, French, German, Russian, and Spanish. Each dataset has a person-year format and records the annual Ngram counts for all regime leaders and elites in both English and the native language. Figure A.2 presents the binned scatter plot for the log-log relationship between

²⁶We use the Version 3 of the Ngram database, which is over three times larger than the previous release (Version 2) and covers up to 2019. The data can be downloaded at <https://storage.googleapis.com/books/ngrams/books/datasetsv3.html>.

²⁷We exclude two other languages, Italian and Hebrew, because no autocratic regimes in our sample use these two languages as their official language.

English Ngram values and non-English ones. The coefficients printed on the top-left corner of each figure are regression coefficients. We see that for all five non-English languages, there is a strong and monotonic relationship between a politician's native-language Ngram and his/her Ngram in English. A 1% increase in English Ngram is on average associated with about 0.44% to 0.66% increase in the native-language one. The correlation is largest for languages that are linguistically closer to English (e.g., French, German, and Spanish), but are somewhat weaker for those that are more distant (e.g., Russian and Chinese). Given the strong association between English and non-English sources, and the fact that the English publications are much more voluminous than other languages, we decided to use only the English-language Ngram when constructing the main power index. As a robustness check, however, we also constructed a multi-language version of the power index, using each country's native-language Ngram (if available) as input. The results using the multi-language Ngram are reported in Table A.23; they are very similar to what we obtain using only the English-language Ngram.

Figure A.2: Publication Count by Language



Note: The figure presents the binned scatter plots on the relationship between the English Ngram for politicians' names and the Ngrams from politicians' native (non-English) languages. Each dataset is in the person-year format, covering all living politicians from countries with the same native language. There are 2 countries/regions in our sample whose native language is Chinese, 19 whose native language is French, 4 German, 4 Russian, and 18 Spanish. The circles indicate the averages for the 20 equal-observation bins. The numbers printed in the top-left of each sub-graph are coefficients from log-log regressions, which can be interpreted in terms of percentage changes.

Publication Types

Our power index essentially relies on counting the number of publications that contain political leaders' names within the Ngram corpus. It is therefore useful to know a bit more about what these publications are. Unfortunately, Google currently does not provide detailed bibliographic information associated with Ngram searches. However, since we know that the Ngram corpus is based on Google Books, one alternative is to query leaders' names in the Google Books catalogue and examine the metadata of publications in the query results. This approach, while indirect,

allows us to get at least some clues about the characteristics of the publications that form the basis of Ngram counts.

We used Google Books' API to search publications that contain the names (or associated aliases) of autocratic leaders in our sample. We were able to identify a set of 280,424 unique publications with at least one leader name mention. Of these publications, less than half (44.5%) turn out to be standard "books"—i.e., publications with an International Standard Book Number (ISBN). The rest (55.5%) include a very diverse set of items that are also commonly found in university libraries, such as policy reports, memos, pamphlets, government documents, yearbooks, magazines, and newspapers.²⁸ The share of English-language publications in this set mirrors the proportion of English-language publications in the entire Ngram corpus (both around 59%).

To look further into the content of these publications, we randomly sampled 2,000 items from this 280,000+ set and manually coded their types. Table A.3 presents the distribution of publication types (in descending order). We see that "academic monographs" and "popular books" are the two leading categories in this sample. Items in these categories are conventional books, which can sometimes take years to write and publish.²⁹ However, these two categories account for less than half of the publications in the sample. Moving down the list, the next six categories (Categories 3 to 8) represent publications that are either published regularly (e.g., magazines, newspapers, yearbooks) or can be published (reprinted) within a relatively short period of time (e.g., official documents, leaders' essays/speeches, policy reports). These relatively more "timely" publication categories make up about 46% of the sample, about the same size as the academic and popular books combined.

Table A.3: Publication Types From a Random Sample of 2,000 Google Book Publications with Leader Name Mentions

	Frequency	Percentage (%)	Cumulative %
1. Academic monographs	524	26.20	26.20
2. Popular books	453	22.65	48.85
3. Magazines and newspapers	260	13.00	61.85
4. Almanacs and yearbooks	178	8.90	70.75
5. Official publications by governments or supranational organizations	162	8.10	78.85
6. Political leaders' writings and speeches	143	7.15	86.00
7. Reports or memos by think tank/research institute/NGO	116	5.80	91.80
8. Reprints of other published works	63	3.15	94.95
9. Textbooks or teaching manuals	43	2.15	97.10
10. Other (unclassified)	37	1.85	98.95
11. Graduate theses/doctoral dissertations	21	1.05	100.00
Total	2000	100.00	

²⁸When constructing the Ngram, Michel et al. (2010) claim to be using a subset of Google Books items *excluding periodicals*. We follow the same restriction in conducting our Google Books queries. However, we still end up finding a non-negligible set of periodicals in search results. This may be due to the inherent difficulties in classifying publications.

²⁹It is worth noting, however, that a book that mentions a leader's name does not necessarily have to be a monograph about that leader. Oftentimes, mentions can be added at a relatively later stage of book production (in preamble or conclusion, for example) in response to changes in current events.

Assessing the Extent of Temporal Lag

A critical issue that we needed to address before using Ngram as a measure of leaders' power is how long it takes for changes in leaders' real power to translate into changes in Ngram values. Given that standard books can sometimes take years to write and publish, one might expect a substantial lag between the two if the underlying corpus predominantly consists of books. However, as shown in the publication breakdown in Table A.3, half of the items that mention leaders' names are non-book publications that can be produced in a relatively short period of time. If the breakdown is accurate, it is possible that changes in Ngram will adjust quickly in response to changes in real-world circumstances.

We assessed the issue of temporal lag in several ways. First, we examined the relationship between Ngram counts and newspapers articles, which are arguably the most timely form of publication. We made use of two major online news databases: the Google News Archive and New York Times Archive. We conducted queries of leader names in these databases to obtain the number of articles that mention incumbent leaders' names (and aliases) in each year.³⁰ We then ran regressions correlating the lagged and current numbers of leader-mentioning news articles with Ngram counts for the same leader. The results are displayed in Tables A.4 and A.5. In both tables, a leader's (logged) Ngram count appears to be strongly and positively associated with the (logged) number of times his/her name appears in both the New York Times and Google News Archive newspaper collections. A 1% increase in a leader's name mentions in either Google News items or NYT articles is associated with an approximately 0.046% to 0.079% increase in that leader's Ngram name count in the same year. More notably, we see that, among various lag structures, the contemporaneous relationship is the strongest of all (i.e., Ngram at t is most strongly correlated with News at t). In fact, as Column 7 of both tables makes it clear, most of the other lagged news variables cease to have a significant relationship with Ngram once the current news variable is included in regressions.

In addition to our own tests, we also consulted a number of published articles that used Ngram in their empirical analyses. In the very first publication that introduced Ngram, for example, Michel et al. (2010) show that Ngram values for words such as "influenza", "cholera", and "infantile paralysis" underwent sharp spikes during years when major flu, cholera, and polio epidemics occurred.³¹ In another study, Grant and Walsh (2015) find that the Ngram counts for the word "earthquake" surged in the years immediately following major earthquakes; they also find that words describing special weather events, such as "heat wave", "drought", and "tsunami/tidal wave", exhibit a close and contemporaneous association with annual variations in global average temperature. Both our own analyses and the findings of the existing studies therefore seem to indicate that Ngram counts can change relatively quickly in response to real-world events. This suggests that the most appropriate proxy for a leader's power in a year is likely to be the Ngram value from the same year. We provide results using alternative lag structures in Table A.29 for interested readers.

³⁰When a leader has multiple names, the one that appears in most articles is used.

³¹See Figure 5A and Figure S14 of Michel et al. (2010) for details. The Ngram for "influenza", for example, surges in 1889–1890 (Russian Flu), 1918–1919 (Spanish Flu), and 1957–1958 (Asian Flu).

Table A.4: Correlation between Ngram Publication Counts and Google News Items

	DV: Log Ngram publication count at t						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log # of Google News items (t)	0.079** (0.008)						0.050** (0.009)
Log # of Google News items ($t - 1$)		0.074** (0.008)					0.030** (0.007)
Log # of Google News items ($t - 2$)			0.063** (0.008)				0.009 (0.007)
Log # of Google News items ($t - 3$)				0.056** (0.008)			-0.003 (0.006)
Log # of Google News items ($t - 4$)					0.055** (0.008)		0.007 (0.007)
Log # of Google News items ($t - 5$)						0.051** (0.008)	0.004 (0.007)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓	✓	✓	✓	✓	✓
Observations	4197	4197	4197	4197	4197	4197	4197

Note: This table presents the standardized regression coefficients for the relationship between the annual Ngram publication count for each incumbent autocratic leader in our sample and the (logged) number of newspaper articles that mention his/her name in the current or previous years. The data on newspaper articles are scraped from the Google News Archive. Each column reports a different lag structure. The results suggest a synchronous relationship: The number of news items at t is most strongly correlated with Ngram publication counts also at t . Standard errors are clustered at the individual level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.5: Correlation between Ngram publication counts and New York Times (NYT) Articles (t)

	DV: Log Ngram publication count at t						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log # of NYT articles (t)	0.046** (0.003)						0.098** (0.007)
Log # of NYT articles ($t - 1$)		0.031** (0.003)					-0.009 (0.005)
Log # of NYT articles ($t - 2$)			0.025** (0.002)				-0.023* (0.005)
Log # of NYT articles ($t - 3$)				0.023** (0.002)			-0.025** (0.005)
Log # of NYT articles ($t - 4$)					0.024** (0.002)		-0.001 (0.004)
Log # of NYT articles ($t - 5$)						0.023** (0.002)	-0.004 (0.004)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓	✓	✓	✓	✓	✓
Observations	3206	3204	3202	3200	3198	3196	3196

Note: This table presents the standardized regression coefficients for the relationship between the annual Ngram publication count for each incumbent autocratic leader in our sample and the (logged) number of New York Times articles that mention his/her name in the current or previous years. The data on NYT articles are accessed through the NYT Article Search API. Each column reports a different lag structure. The results suggest a synchronous relationship: The number of NYT articles at t is most strongly correlated with Ngram publication counts also at t . Standard errors are clustered at the individual level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

B.2 Construction Procedures

Constructing the Politician List

We constructed the global politician database using information from Wikidata, an open knowledge base hosted by Wikimedia Foundation. Wikidata is a structured database that allows researchers to retrieve the basic information about individuals recorded in Wikipedia entries, including their birth year, death year, key occupations, country affiliations, and so on. We created the list of politicians by identifying individuals whose Occupation Property (P106) included Politician (Q82955).³² For each of the politicians we identified, we also collected information on their birth and death years (P569 and P570) and country affiliation (P27).

Once we had a list of politicians, we could further refine it. The basic biographical information provided by Wikidata enabled us to identify those who were working concurrently with the national chief executive in each country–year. Here, a “concurrent” politician is a living figure who is over the age of 20 and working in the same country as the chief executive in that year. Since the Ngram corpus may have different coverages for different countries in different years, a naive approach

³²Wikidata provides a structured form to organize information based on two basic concepts: Item and Property. Item represents topics, concepts, or objects, while property represents the connection type between two items. In our case, we first find all items whose property instance (P31) is Human (Q5). We then take the items whose Occupation property (P106) includes Politician (Q82955). For more details, see the concept section at <https://en.wikipedia.org/wiki/Wikidata>

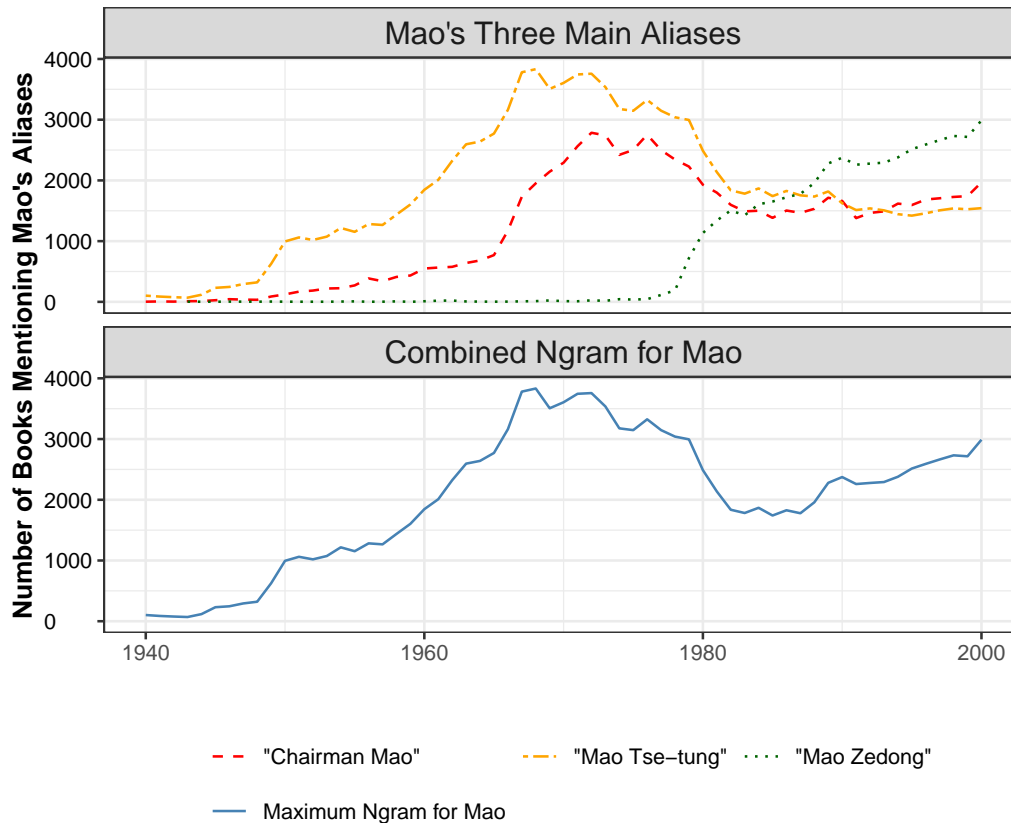
that focuses only on Ngram counts for the chief executive may mistakenly attribute changes in the publication process or in the general interest in a country to changes in the chief executive's influence. This problem can be partially addressed by including the Ngram counts for other active contemporary politicians as a benchmark.³³

Conducting Queries with Google Ngram

After compiling and refining the politician list, we used the list to conduct queries in the Google Books Ngram corpus. We encountered two main problems during the query stage. The first was that a political figure may be called by many names or have the same name presented in different spelling systems. For example, “Mao Zedong”, “Mao Tse-Tung”, and “Chairman Mao” are three common and distinct Ngrams that refer to the same person (see Figure A.3). To address this issue, we took advantage of one nice feature of Wikidata, which is that it stores many different spellings and appellations of the same person in the Also Known As entry. When we conducted the Ngram queries, we went over all the possible aliases for an individual and recorded the highest value of all aliases as the Ngram value for each year. In this particular case, Mao Zedong's combined Ngram is based on the Ngram for two aliases: “Mao Tse-Tung” (most popular until 1987) and “Mao Zedong” (1988 and afterwards). By combining results from these aliases, we could avoid underestimating a person's influence by limiting ourselves to their “official names” only.

³³It is worth noting, though, that Wikidata does have some information about the positions that a politician held, which could be used to create a more refined group of concurrent politicians for some countries (e.g., only the most senior figures at the top of the system). However, such information is not widely available and setting consistent criteria for different countries can be challenging. Therefore, we choose an approach that involves the least amount of human discretion. Our use of the highest Ngram among the non-CE politicians as the denominator partially addresses the comparability problem because those with high Ngrams are usually senior national-level political figures.

Figure A.3: The Mao Example

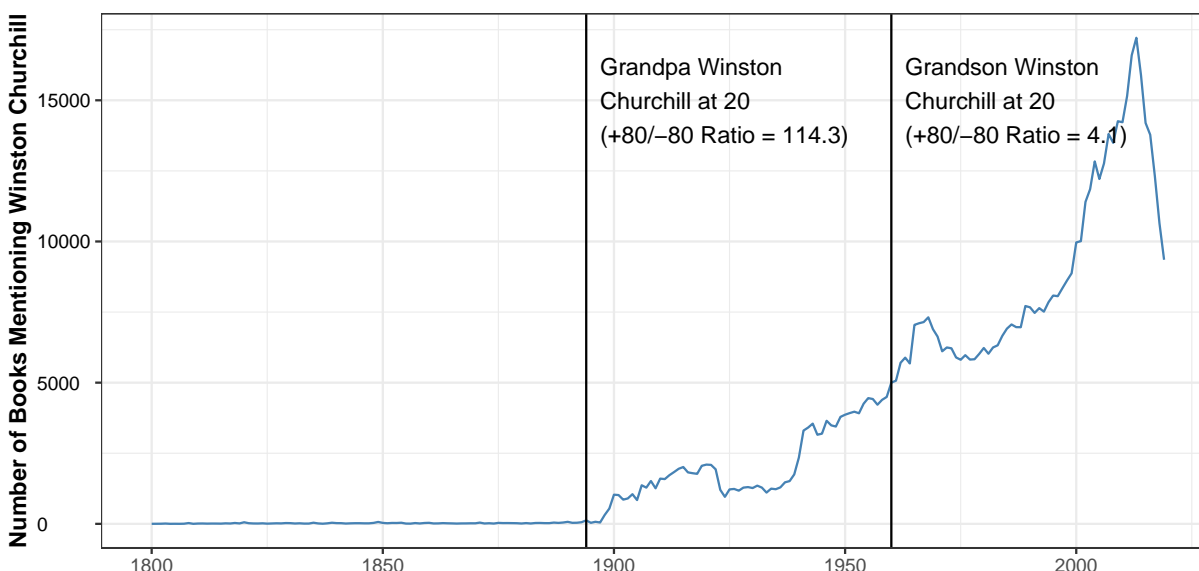


A second and related problem was that sometimes two different politicians might have the same or very similar names. To address this problem, we assigned names and aliases to politicians based on their time of active service. This worked for the vast majority of cases. However, there were still some exceptions where two or more figures with similar or identical names were active during the same period of time (e.g., George Bush is an alias for both George H. W. Bush and George W. Bush). For such cases, we allocated the observed Ngram value in a pro-rated way. For each of the active politicians that share similar names, we first calculated the ratio of the average Ngram for his/her name 80 years after s/he was 20 to the average Ngram 80 years before s/he was 20. This ratio tells us approximately how much a particular politician contributed to the frequency of his/her name Ngram after starting his/her career in politics. We then compared the ratios among politicians with the same name and used them as weights (individual ratio divided by sum of ratios) to allocate the observed Ngram values.

To illustrate how this approach works, we use the example of Sir Winston Churchill, the famous former British prime minister who was born in 1874. Churchill's grandson was born in 1940 and was named after his grandfather. Figure A.4 shows the proportion of the Ngram *Winston Churchill* over time. The first Winston Churchill's 20th birthday was 1894. It is clear from the figure that the average frequency of *Winston Churchill* during the period 1894–1974 is much higher than the average frequency for the same Ngram in 1814–1893 (114 times higher). This suggests that there is a big difference before and after Sir Winston Churchill was 20 years old. By contrast, the ratio of the 1960–2008 average to the 1880–1960 average (the case of Sir Winston Churchill's grandson)

is only 4.1. Therefore, when we assign the Ngram to these two individuals during the period when they were both active (alive and over the age of 20), the lion's share of the Ngram value is given to the grandfather Churchill and only a small proportion to the grandson.

Figure A.4: The Churchill Example



Computing the Power Index

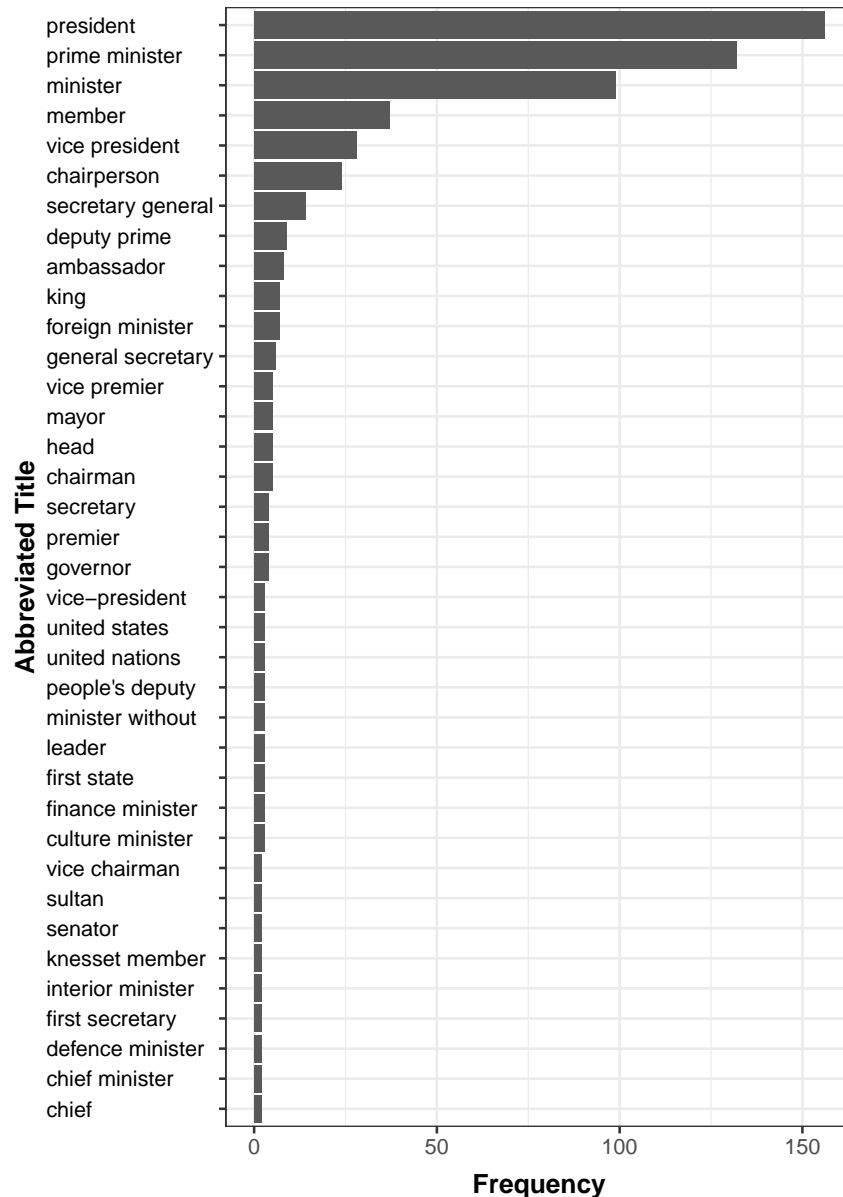
After completing the Ngram queries for all the names and aliases, we aggregated the Ngram values by individual, recording the highest value of all aliases (if multiple aliases exist for a person) for each year. The main quantity of interest is the annual Ngram count for the name of the national chief executive. We focus on the number of publications that mention the chief executive's name rather than the number of mentions per se because being mentioned in a large number of publications is usually more indicative of one's influence than simply being mentioned a lot of times (could be just by a small number of publications). Since the Ngram corpus may have differential coverage of publications from different countries and time periods, we normalize the chief executive's annual Ngram with the highest annual Ngram from the living, non-CE politicians from the same country. The basic idea here is that while a national leader's Ngram may change due to many country and historical factors, it is the leader's prominence relative to his/her colleagues that speaks most about his/her personal power. As a robustness check, we also experimented with using different denominators, such as the 90th percentile or the 10th highest among the non-CE elites. The results remain largely the same (Table A.15).

To give readers a sense of who the non-CE figures (i.e., denominators) are, we plot in Figures A.5 and A.6 the distributions of their (abbreviated) titles.³⁴ We can see clearly that all the titles indicate relatively senior political offices. The most common titles in our autocracy include words such as "president", "prime minister", "minister", and "member" (usually of a legislative

³⁴We collect their titles from the periods in which they are used as the denominators, and pick the first two words of their titles. We remove the second word if it is a preposition.

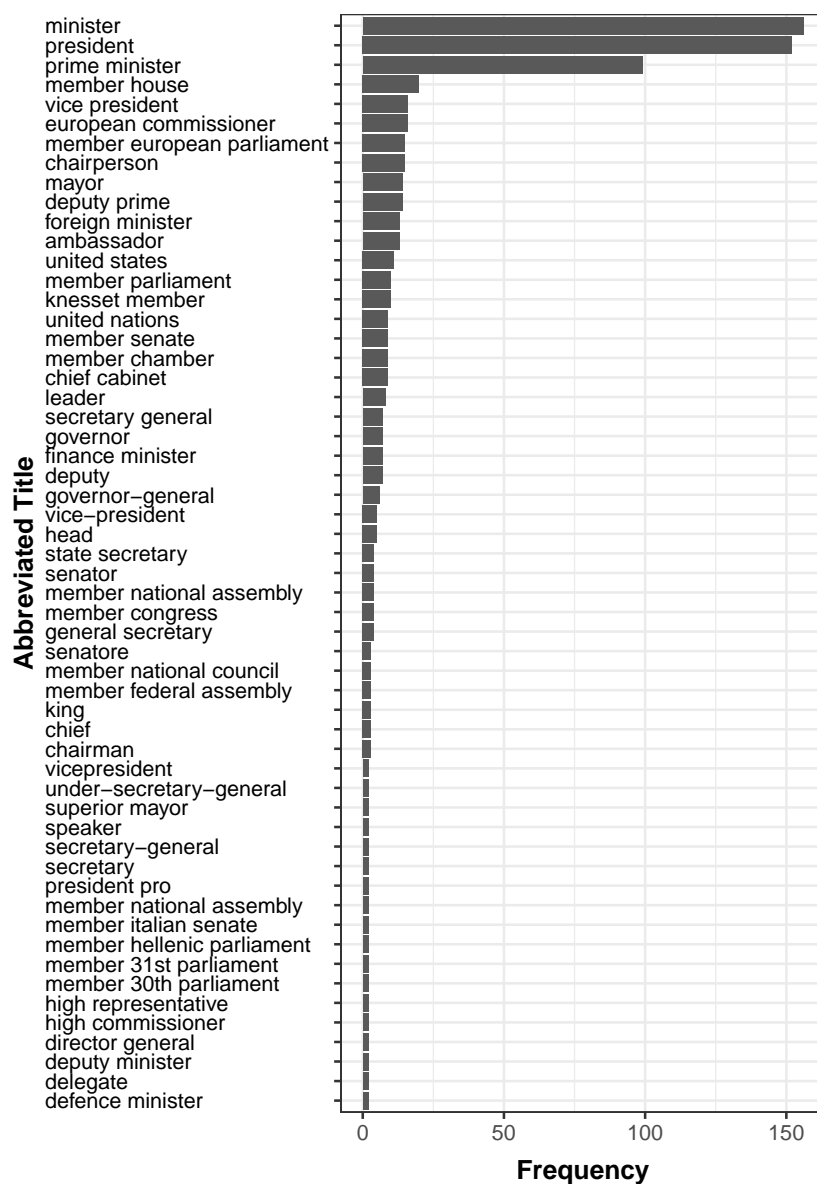
body). Deputy leadership positions, such as vice presidents, vice prime ministers, and vice chairmen, are also quite common. The pattern is similar for the sample of democratic countries: The politicians whose Ngrams were used as denominators often have words such as “minister”, “president”, “prime minister”, or “member (of the) house”, in their official titles. This suggests that we are indeed capturing senior political figures who are a meaningful comparison group for the chief executives in terms of their relative influence.

Figure A.5: Distribution of Titles for the Non-CE Politician with the Highest Ngram (Autocracy)



Note: This figure shows the distribution of titles for those who have the highest Ngrams among non-CE politicians (i.e., the denominators in the incumbent power index). The sample contains only non-democracies. Only the first two or three words of their titles are shown and counted. Prepositions are omitted.

Figure A.6: Distribution of Titles for the Non-CE Politician with the Highest Ngram (Democracy)



Note: This figure shows the distribution of titles for those who have the highest Ngrams among non-CE politicians (i.e., the denominators in the incumbent power index). Only the first two or three words of their titles are shown and counted. Prepositions are omitted.

C Validation Exercises

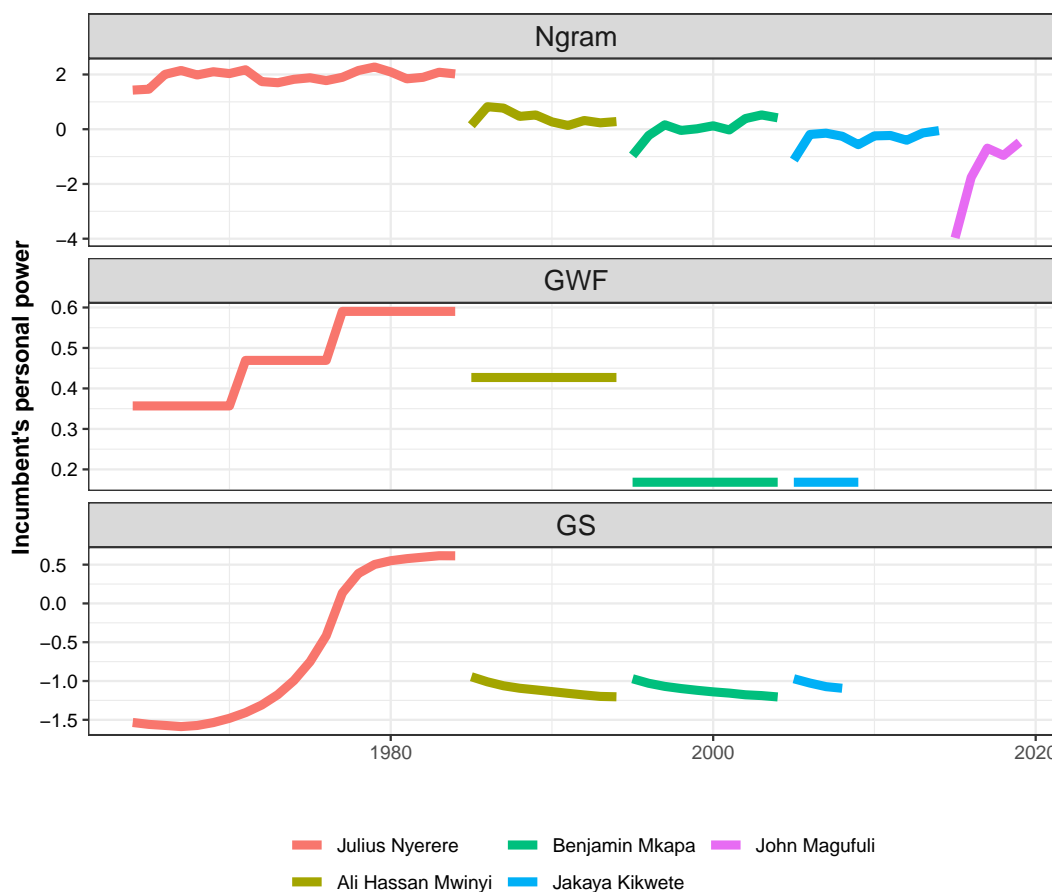
This section provides a series of validation tests on this measure.

C.1 Examples

To get a more substantive sense of how our Ngram measure tracks the rise and fall of autocratic leaders' power, we provide three validating examples. In each example, our measure is examined alongside the GWF personalism index and the GS power consolidation measure.

The first case we examine is Tanzania, a country ruled by the Tanganyika African National Union (TANU) party (later Chama Cha Mapinduzi party) since 1964. Tanzania was originally labeled a single-party regime, but it has held semi-competitive multi-party elections since 1992. Five individuals have served as the chief political executive (President of Tanzania) during this period: Julius Nyerere, Ali Hassan Mwinyi, Benjamin Mkapa, Jakaya Kikwete, and John Magufuli (only available in Ngram). In a way, Tanzania represents a relatively easy case because there is quite a clear difference between the leaders in terms of personal power. As the founding father of both the country and the ruling party, Nyerere was clearly the most influential figure of all. He was the longest serving president in the history of Tanzania and remained highly active after he left office in 1985. He was an open critic of the economic policies of his successor, Ali Hassan Mwinyi, and was also instrumental in ensuring that Benjamin Mkapa was chosen to succeed Mwinyi in 1995. As can be seen in Figure A.7, all three measures broadly agree on the gradations of power: Nyerere clearly overshadows all his successors by a sizable margin, and the personal power of the subsequent leaders becomes progressively smaller as Tanzania moves from one-party rule to a multi-party system.

Figure A.7: Validating Example: Tanzania

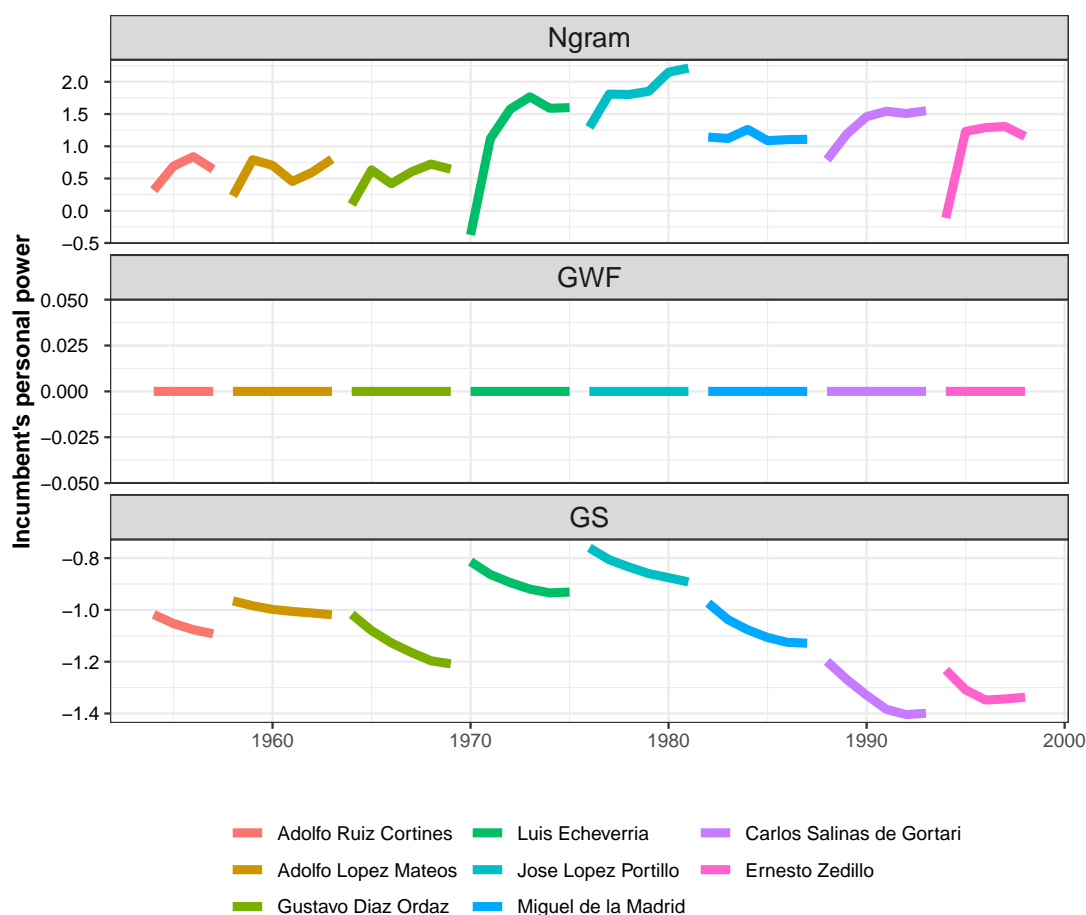


The second case we look at is Mexico, which was ruled by the Institutional Revolutionary Party (PRI) until 2000 (Magaloni 2006). The Mexican case is particularly interesting because historically it is one of the most institutionalized autocracies that ever existed. Presidential successions in Mexico followed what is known as the *sexenio* rule, whereby each president only served a single six-year term without re-election. In the meantime, presidents were also given the power to select their own successor. Figure A.8 illustrates how the power of Mexican presidents varied between 1950 and 2000 according to GWF, GS, and our Ngram-based measure. Here, we can see that all three measures broadly agree on the stability of personal power across the various Mexican presidents, yet some differences are also evident: According to the GWF, Mexico was rated as having zero personalism throughout this entire period. By contrast, both the GS and our Ngram-based measure suggest that, while the overall level of presidential power is stable, some presidents were nonetheless more powerful than others. Luis Echeverría, for example, appears to have notably greater influence than his several predecessors. This seems to be consistent with the general impression that his administration was the one that initiated several major shifts in domestic and foreign policies. Echeverría was also one of the presidents who remained politically active after retirement. After stepping down from office, he even allegedly attempted to overstep the practice of *sexenio* by imposing appointees on his successor and continuing to use the presidential telephone networks (Castaneda and Smithies 2001).

Our Ngram measure, however, disagrees with the GS measure on the variations in power trajectories within each president. According to our measure, each president starts with relatively limited power but gradually builds up his influence as his tenure extends. The GS measure, however, seems to suggest an opposite trajectory: Presidents are more powerful at the beginning of their office but become weaker over time. Intuitively, we believe that an upward trend makes more sense because power is likely to grow over time as a president learns more about his job and develops a larger power base in the cabinet and other key sectors through appointments. Seasoned observers of Mexican politics also seem to agree that presidents reach the peak of their power only toward the end of their time in office (Castaneda and Smithies 2001; Smith 1991).³⁵

³⁵A closer look at the data used in GS further reveals that the cause of their downward-trending estimates may be a mechanical one: Their Bayesian estimation sets a flat prior centered at 0 for each leader's first year in office and then incrementally updates it as a leader's tenure unfolds. For most of the Mexican presidents, there is actually little variation in the underlying component indicators over their entire tenures. However, because the prior becomes more informative over time (due to updating), it mechanically moves the final estimates closer to the "true" (and very low) value of power consolidation. In other words, the downward trend that we observe is likely a result of the algorithm automatically adjusting the priors to the true estimate, rather than updating based on new information/events that occurred in the middle of a president's tenure. In fact, when we examine in detail the component indicators that GS use, it turns out that the changes in the indicators actually agree with our Ngram measure, in that presidential power is increasing over time: For several presidents (e.g., Luis Echeverría, Carlos Salis de Gortari, and Ernesto Zedillo), they only started to engage in more assertive political actions, such as purges and significant cabinet reshuffles, toward the end of their respective administrations. Visually, this is captured by the small uptick in estimates at the tails. However, because such actions are still rare in Mexico and considered to be relatively "mild" forms of power grabbing, they do not significantly alter the downward trend in the overall estimates.

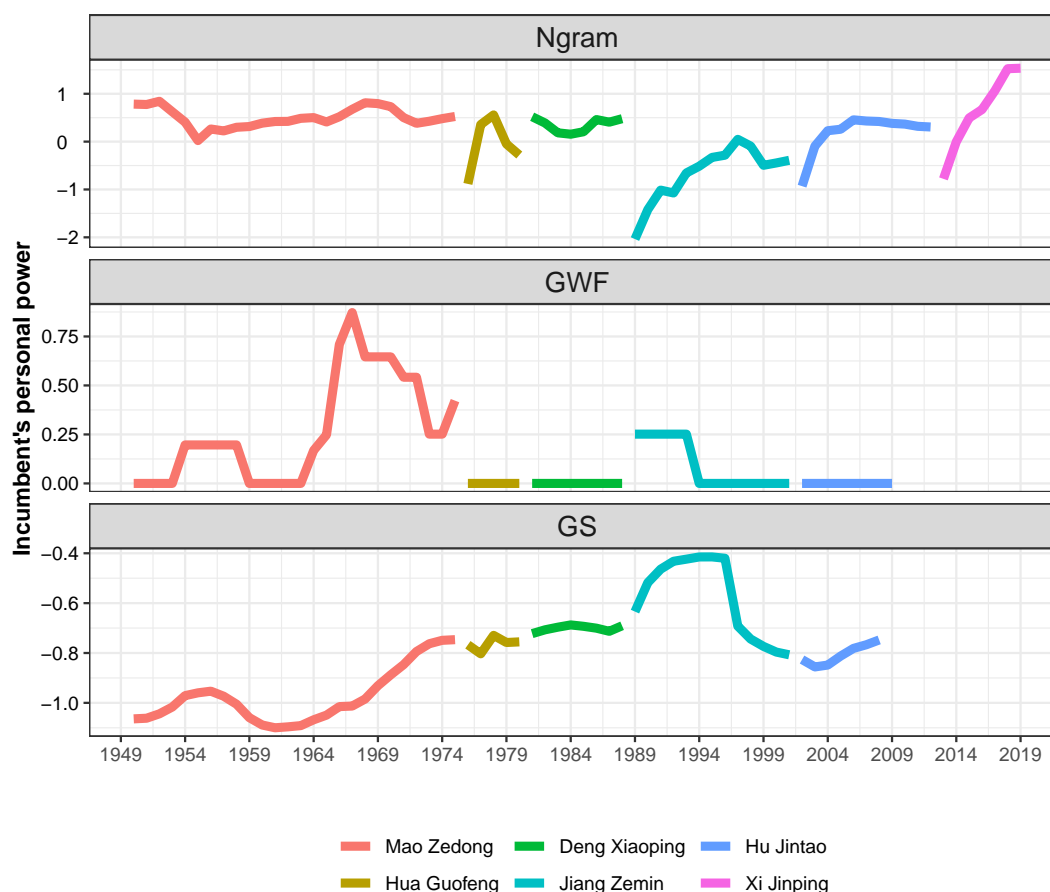
Figure A.8: Validating Example: Mexico



Finally, Figure A.9 presents the third case study: China under the Chinese Communist Party (CCP). The Chinese case is a rather challenging one because there have been many top leaders in the past with substantial variations in their relative power. As we can see, while all three measures agree that the Maoist era was the most personalistic period in the regime's history, their depictions of this period vary in many important respects. According to our measure, Mao was consistently the most powerful figure in China throughout his reign, with an Ngram higher than not only his contemporaries but also most of his successors (with the possible exception of Xi Jinping). Our measure also documents a noticeable increase in Mao's power beginning around 1966, which overlaps with the launch of the Cultural Revolution. There is also an equally noticeable decrease in 1971–1972, which coincides with the defection and death of Lin Biao (Mao's key ally in the Cultural Revolution and designated successor at that time) and the de facto bankruptcy of the Cultural Revolution's political legitimacy. By contrast, while both the GWF and GS measures manage to pick up the increase in Mao's power in the Cultural Revolution (albeit with different degrees of precision), neither seems to provide an accurate depiction of Mao's power for the pre-Cultural Revolution period. According to the GWF measure, Mao before the Cultural Revolution was only slightly more personalistic than his successors (i.e., many years of zero personalism); the GS measure even considers Mao's early years to be *less* consolidated than subsequent leaders like

Jiang Zemin and Hu Jintao.³⁶ These patterns are clearly not very consistent with the conventional understanding of the gradations of power among paramount leaders in China.

Figure A.9: Validating Example: China



Turning to the post-Mao period, we see more disagreements among the three measures. According to both the GWF and GS measures, for most of the post-Mao era, the CCP maintained a minimal level of personalism, except for a brief period between 1989 and 1993. However, most China observers would recognize that the levels of power enjoyed by the four main top leaders during this period were very different. As the “core” of the second generation of CCP leadership and a long-time protégé of Mao, Deng Xiaoping was probably one of the most powerful post-Mao leaders. Deng’s successors, Hu Jintao and Jiang Zemin, served during a more “institutionalized” period of politics and were thus relatively more constrained. For Jiang Zemin, the general consensus is that he began his tenure as a relatively weak, transitional figure, but became substantially more powerful after his predecessor, Deng Xiaoping, passed away in 1997 (Kuhn 2004). For Hu Jintao, he similarly came to office with a low profile but built up his power gradually after assuming office. More recently, Xi Jinping has managed to break away from the institutionalizing trend and

³⁶This particular discrepancy may suggest a potential limitation of the GS measure: A powerful Mao who felt secure about his position (as was the case before 1960) did not have to frequently resort to overt power consolidation measures.

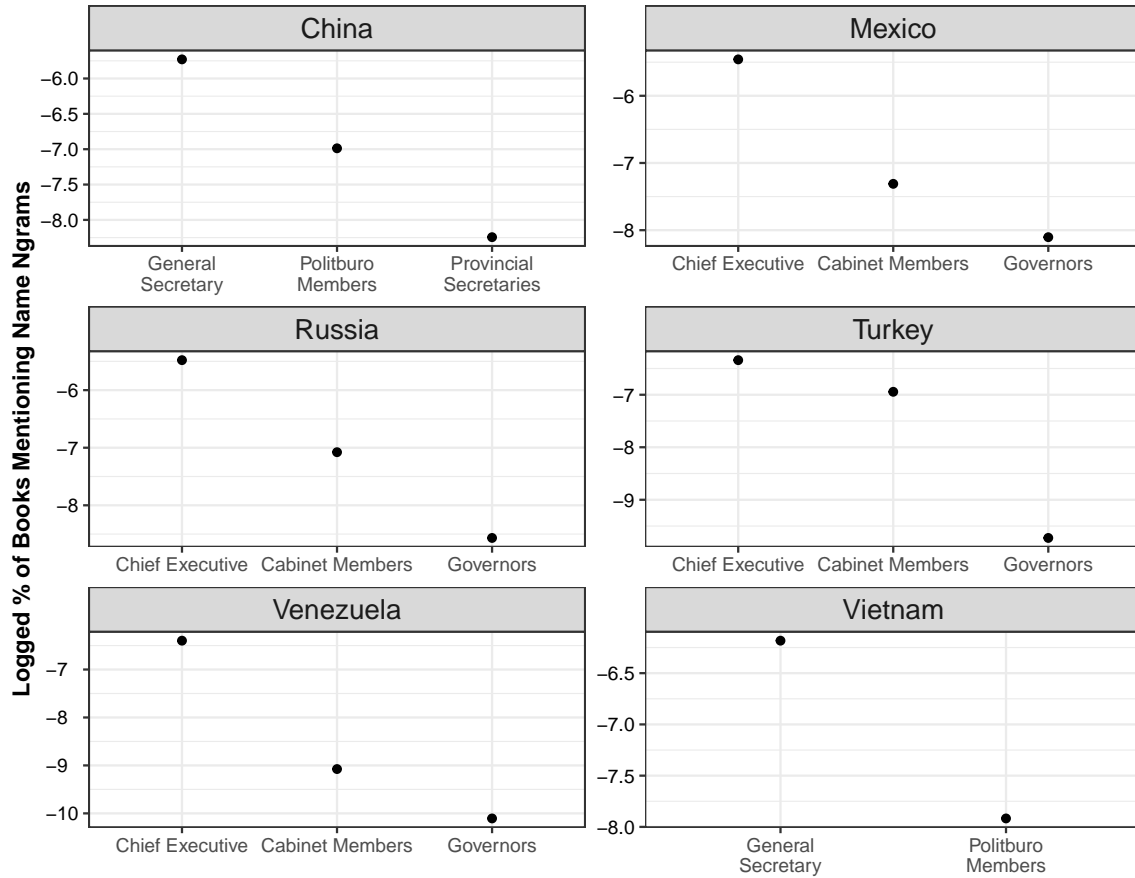
achieve a stunning degree of power consolidation. Many of these subtle cross- and within-leader variations in personal power have been picked up by our Ngram-based measure, but less so by the other two measures.

C.2 Correlation with the Formal Political Hierarchy

The preceding case studies suggest that our Ngram-based measure provides a sensible way to capture the variations in leaders' power in major non-democracies. In this and the following sections, we provide evidence on the validity of our measure by examining its empirical associations with other important indicators of power in a more systematic fashion.

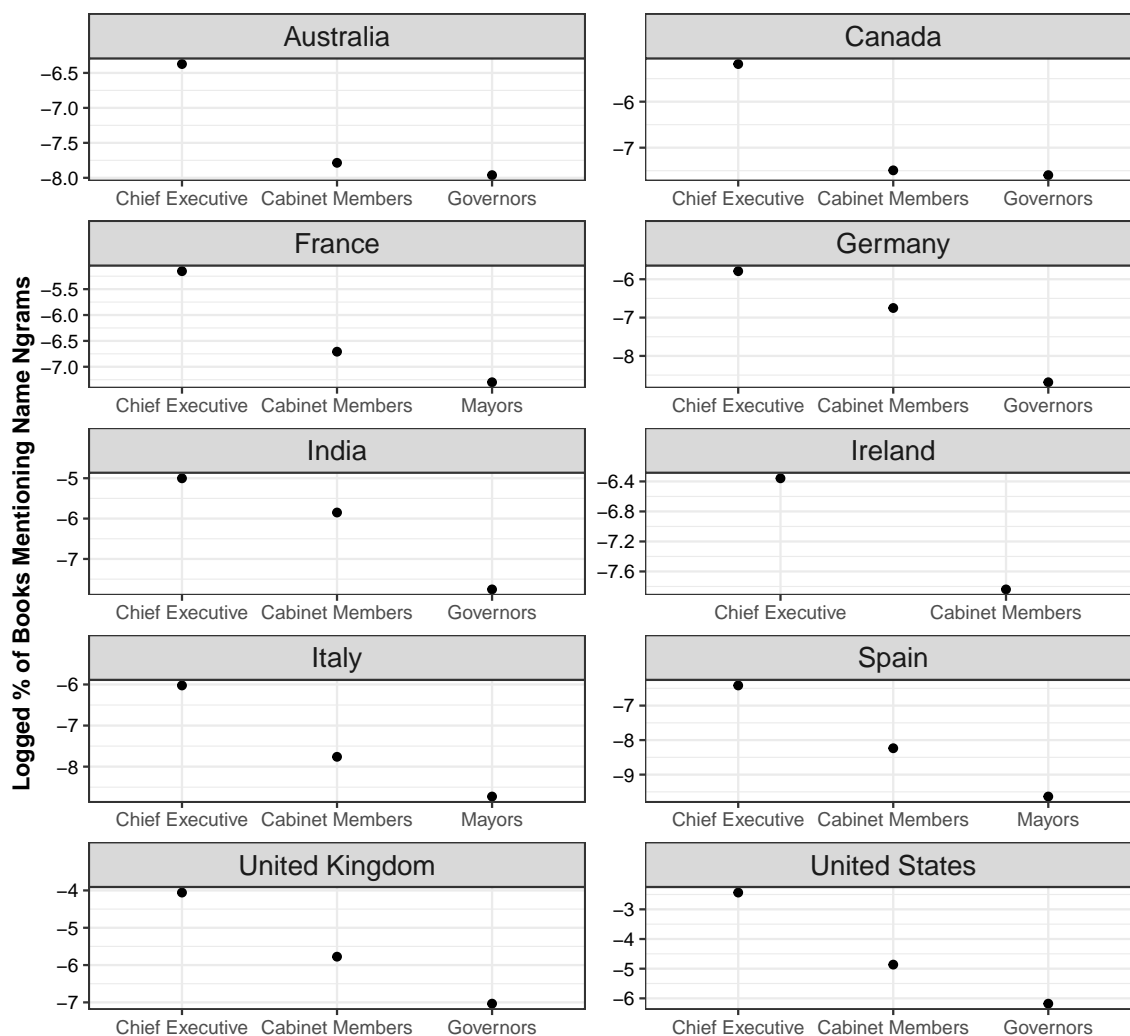
As a starting point, we examine how our measure varies across individuals holding offices with different levels of formal authority. To the extent that formal positions convey political power, our basic expectation is that those who are higher up in the political hierarchy should have higher Ngram values than more junior figures. To verify whether this is the case, we return to the politician list that we constructed. We compile a list of politicians who have held key positions in major countries and calculate the average (book-based) Ngram value for their names during the period when they held those key positions. We focus on positions at three different levels: national chief executives (e.g., presidents, prime ministers), cabinet members, and governors. For some regimes that adopt a communist-style political system, these levels correspond to general secretary, Politburo members, and provincial party secretaries, respectively. Figure A.10 displays the average Ngram of individuals holding positions at these three levels in autocracies, and Figure A.11 is for democracies. Consistent with the expectation, we see that, in both figures, there are clear differences in Ngram values between individuals holding positions with different levels of seniority: Those occupying national chief executive positions have the highest Ngram values in all countries. Cabinet members as a group usually have lower Ngram values than presidents and prime ministers, but higher than governors. In the majority of the countries, it also appears that the difference between cabinet members and governors is much smaller than the difference between the chief executive and cabinet members, suggesting that the rate of change in power as one goes down the hierarchy may sometimes be log-linear instead of linear.

Figure A.10: Variation in Ngram across Formal Positions: Autocracies



Note: This figure presents the Ngram-based power for individuals holding specific formal positions in six non-democratic countries. The y-axis is the (logged) average percentage of books in which politicians' name Ngrams are mentioned (during the period when they held offices at a given level).

Figure A.11: Variation in Ngram across Formal Positions: Democracies



Note: This figure presents the Ngram-based power for individuals holding specific formal positions in 10 democratic countries. The y-axis is the (logged) average percentage of books in which politicians' name Ngrams are mentioned (during the period when they were holding offices at a given level).

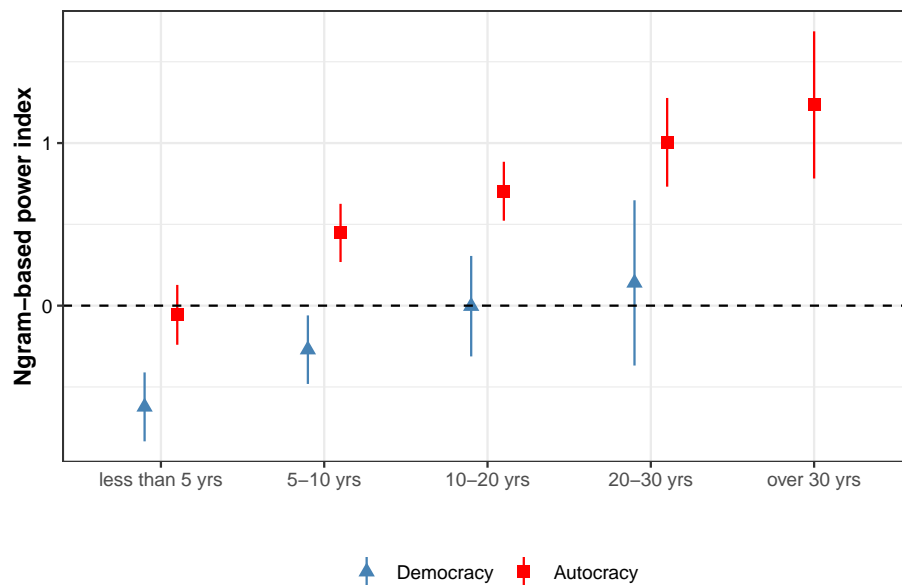
C.3 Correlation with Leaders' Tenure

Another way to evaluate our measure is to examine how it changes within a given leader's tenure. Typically, we expect a political leader's power to become greater as s/he stays in office longer.³⁷ In Figure A.12, we plot the relationship between the Ngram-based power index and national chief executive's tenure. We do so separately for leaders in democracies and non-democracies. Consistent with the prevailing understanding of regime differences, we see that autocratic leaders on average start their office with a higher Ngram than democratic ones. In both types of regimes, leaders become more influential as their tenure extends, but the rate of increase is again more rapid

³⁷For related theoretical discussion, see Chapter 2 of Svobik (2012).

in autocracies than in democracies.

Figure A.12: Variation in Ngram Over Leaders' Tenure



Note: This figure shows the change in Ngram-based power over leaders' tenure. We plot the relationship separately for democracies and autocracies. The vertical bars represent the 95% confidence intervals.

C.4 Correlation with Electoral Outcomes

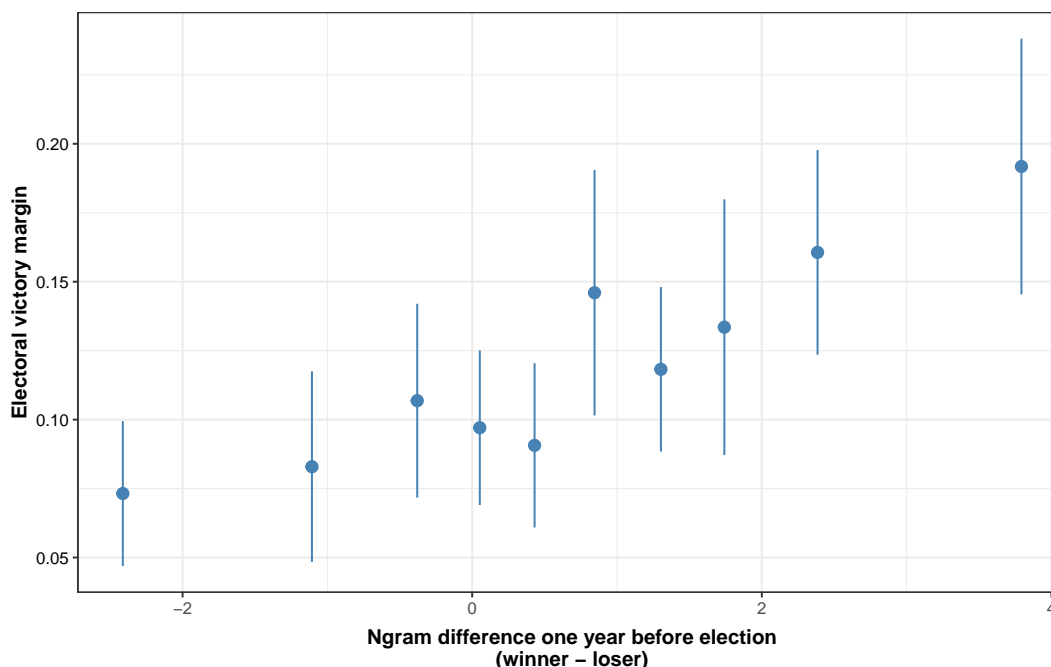
Third, we can also verify our measure by studying how it correlates with electoral outcomes. To the extent that elections are essentially a civilized form of power contest (Przeworski 2018), the outcome of elections should reflect the power parity between contending candidates. Those who have the ability to marshal a great amount of resources or the loyalty of a large group of individuals are more likely to emerge victorious in the electoral arena. We thus expect that such strength will also be reflected in candidates' Ngram values.

To verify whether this is indeed the case, we collect information about the leading candidates³⁸ and outcomes of national-level general elections for all democratic countries between 1950 and 2008. We obtain each candidate's Ngram value one year before the election and examine how these values correlate with candidates' performance in elections. Figure A.13 shows how the difference between the winner's and (closest) loser's Ngram values corresponds to the electoral margin of the winner. We can see that there is a clear, positive relationship. The winner's margin over the closest loser becomes progressively greater as his/her Ngram value gets larger relative to that of the opponent. In Table A.6, we estimate the association between candidates' Ngram and their electoral performance. The first two columns show that the winner's margin is positively associated with the winner's own Ngram value one year before the election and negatively associated with that of the closest loser. This pattern holds even when we limit the sample to open-seat elections in which no incumbent is running. Columns 3 and 4 further examine the vote shares for the winner and the

³⁸For simplicity, we only focus on the two candidates who won the first and second highest vote share.

closest loser separately. Here, we see that a candidate's vote share is more closely associated with his/her own Ngram than with that of his/her opponent's.

Figure A.13: Ngram and Vote Margin



Note: This figure presents the relationship between Ngram-based power and electoral vote margin in national chief executive elections in a binned scatter plot. The x-axis is the difference in Ngram counts between future winners and losers one year before the election, and the y-axis is the winner's vote margin.

Table A.6: Ngram-Based Power and Electoral Outcomes (Democracies Only)

	Winner's vote margin		Winner's vote share	Highest loser's vote share
	(1)	(2)	(3)	(4)
	Full sample	Open seat	Full sample	Full sample
Winner's Ngram (logged, 1 yr before election)	0.023** (0.006)	0.020** (0.007)	0.017** (0.005)	-0.006 (0.005)
Loser's Ngram (logged, 1 yr before election)	-0.019** (0.005)	-0.022** (0.006)	0.002 (0.005)	0.022** (0.004)
Year fixed effects	✓	✓	✓	✓
Adjusted R square	0.06	0.09	0.06	0.09
Observations	533	244	533	533

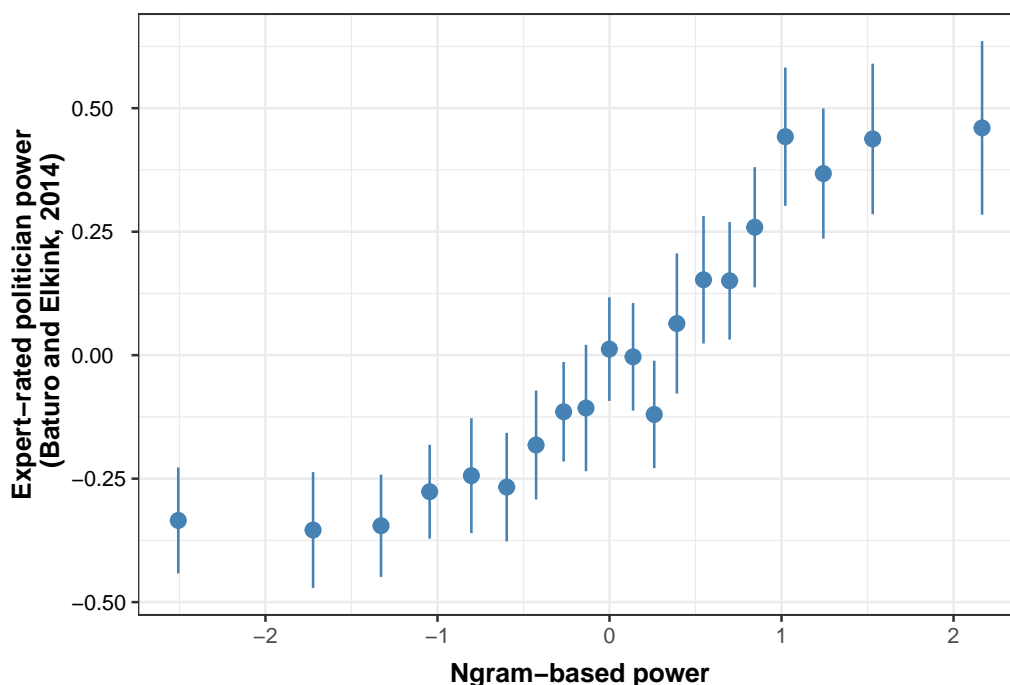
Note: This paper presents the regression results on the association between the antecedent Ngrams of candidates and their performance in elections of national chief executives. The sample focuses only on elections in democracies. The results suggest that candidates with greater power are more likely to win elections and have larger winning margins. Standard errors are clustered at country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed test)

C.5 Correlation with Expert Rating of Politicians' Power

A fourth way to validate the Ngram-based power index is to compare it with country experts' assessments of political leaders' power. While expert-rated data are not available in all countries, one such dataset can be found in the context of Russia. This dataset, *100 Most Influential (Leading) Politicians of Russia*, provides monthly data on the perceived influence of individuals on politics and policies between 1994 and 2011 based on input from a panel of experts. The detailed format and methodology of the survey are discussed in Baturo and Elkind (2014). We aggregate this dataset to individual-year level and match each politician (a total of 484 unique individuals) with his/her Ngram value of that year. Figure A.14 presents the binned scatter plot of the relationship between expert rating and our Ngram-based power measure. We can see that there is a strong, positive, and almost linear relationship between the two. Politicians who are rated as more powerful by experts in a year also tend to have higher Ngram values in that year. Table A.7 further presents the results from a regression analysis where we control for other possible confounders, such as fixed effects for the survey year and the formal office title. In a way, including these controls allows us to separate the power specific to an individual from the power associated with the position s/he holds. Again, we see that the two measures are strongly and positively correlated, and the relationship continues to hold even after the influence of their formal posts is accounted for.

Figure A.14: Comparison with Expert Rating of Russian Politicians



Note: This figure presents the relationship between our Ngram-based power measure and expert-rated scores of Russian politicians' power, controlling for survey and position fixed effects. The expert-rated data are from Baturo and Elkind (2014).

Table A.7: Ngram-Based Power and Expert-Rated Power of Russian Politicians

	DV: Expert-rated power	
	(1)	(2)
Ngram-based power	0.354** (0.050)	0.224** (0.026)
Survey date and position fixed effects		✓
Adjusted R square	0.25	0.70
Observations	1745	1745

Note: This table presents the regression results on the association between the Ngram-based power measure and expert rating for Russian politicians. The rating data are from Baturo and Elkink (2014). The second column includes fixed effects for survey date and politicians' formal positions. Standard errors are clustered at the individual level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

C.6 Correlation with Network-based Power of Mexican Elites

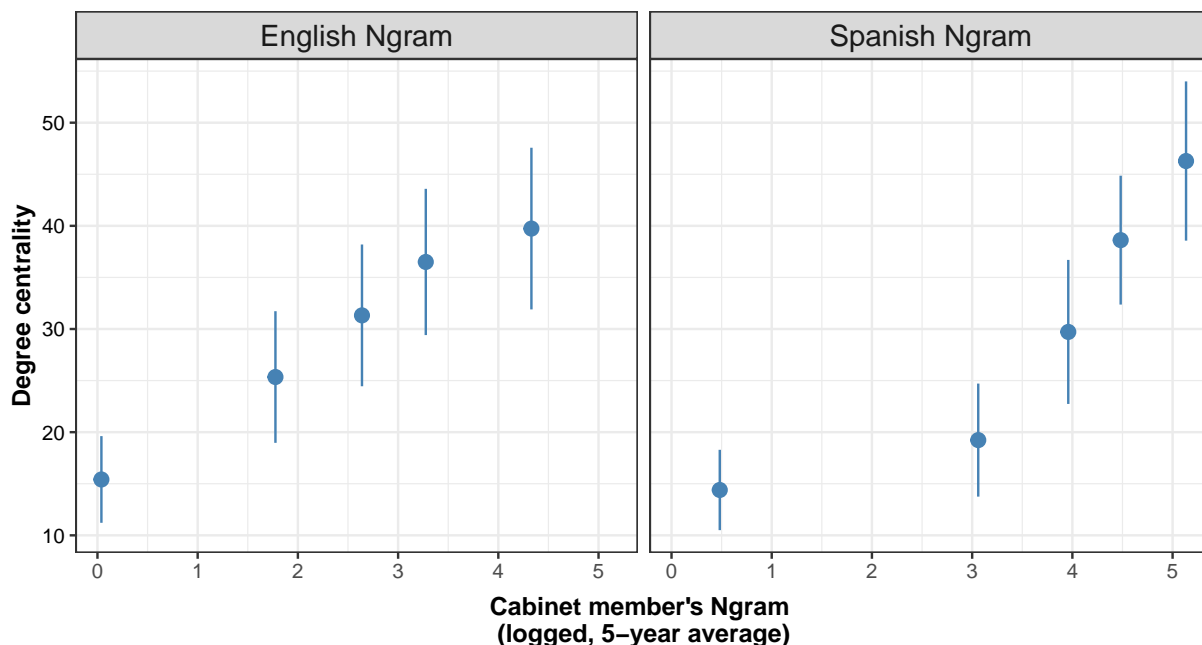
In addition to expert rating, another commonly used proxy for political actors' power is their position within the elite network. Researchers have long postulated that individuals who occupy a relatively central place in a network should have more access to information and coalition-building opportunities than those in marginal or peripheral positions (Faris and Felmlee 2011; Padgett and Ansell 1993). Empirical studies on political networks have also shown, in a variety of settings, network centrality is positively correlated with promotions to more powerful positions (Keller 2016; Van Gunten 2017). However, few studies have yet demonstrated a direct relationship between network centrality and personal power, partly because there are few good measures that can allow researchers to systematically compare the power of all (or majority of the) individuals in the same network. In this validation, we investigate whether our Ngram-based power measure can fill this gap and provide a direct demonstration on the relationship between network positions and personal power.

Our analysis makes use of information from a database on Mexican political elites built by Van Gunten (2017, 2020). The full database contains full educational and career histories for over 2,000 national and local political figures over seven decades of the Institutional Revolutionary Party's (PRI) reign. For our analysis here, we use a subset of the database that includes all cabinet secretaries between 1940 and 2000. This smaller dataset provides detailed information on the social relations between every pair of cabinet secretaries, coded based on their joint work and education experiences as well as family connections (See Table 2 of Van Gunten (2020) for details). Using this information, Van Gunten (2020) further computes several measures of network centrality (e.g., degree, betweenness, and closeness) for sitting cabinet members at the end of each six-year presidential term (sexenio). Our validation will examine how our Ngram index tracks with these centrality measures.

We match each cabinet secretary in this dataset with his/her logged Ngram publications counts for both the previous year ($t-1$) and the past five years' average (mean of $t-5$ to $t-1$). Figure A.15 presents the binned scatter plot of the relationship between a cabinet member's degree centrality

(i.e., number of direct ties with other sitting cabinet members) and his/her five-year average Ngram (logged). We see that there is a strong, positive, and almost linear relationship between the two, and it holds for Ngram counts in both English and Spanish. In Table A.8, we subject the data to more rigorous regression tests, controlling for key career events (i.e., being selected as PRI's presidential nominee) and sexenio fixed effects. The top panel of Table A.8 presents the results using Ngram counts from the English corpus. We examine three different centrality measures and two different Ngram variables (previous year and five-year average). Throughout all models, we see that a cabinet member's Ngram is strongly and positively correlated with his/her network centrality. A one standard deviation increase in Ngram-based power is associated with about 18-20% of a standard deviation increase in degree centrality, 22-26% of a standard deviation increase in betweenness centrality, and 26-27% of a standard deviation increase in closeness centrality. The bottom panel replicates the analysis using Ngram measures constructed from the Spanish corpus, and all the results continue to hold. These patterns demonstrate Ngram's ability to capture power derived from informal networks.

Figure A.15: Comparing Ngram with Network Centrality of Mexican Political Elites



Note: This figure presents the binned scatter plot for relationship between our Ngram-based power measure and the degree centrality of Mexican cabinet members between 1940 and 2000. The circles indicate the averages for five equal-observation bins, and the vertical bars indicate the 95% confidence intervals. The network data are drawn from Van Gunten (2020).

Table A.8: Ngram-Based Power and Network Centrality for Mexican Elites

	Network centrality					
	(1) Degree	(2) Degree	(3) Betweenness	(4) Betweenness	(5) Closeness	(6) Closeness
<i>English Ngram</i>						
Cabinet member Ngram (last year)	0.181** (0.980)		0.216** (0.001)		0.255** (0.005)	
Cabinet member Ngram (5-year average)		0.197** (1.014)		0.264** (0.001)		0.270** (0.005)
PRI's presidential nominee	0.149* (8.256)	0.160* (8.011)	0.066 (0.012)	0.074 (0.011)	0.090* (0.023)	0.107** (0.021)
Sexenio fixed effects	✓	✓	✓	✓	✓	✓
Adjusted R square	0.25	0.25	0.21	0.23	0.12	0.13
Observations	263	263	263	263	263	263
	Network centrality					
<i>Spanish Ngram</i>						
Cabinet member Ngram (last year)	0.269** (0.825)		0.318** (0.001)		0.385** (0.005)	
Cabinet member Ngram (5-year average)		0.279** (0.857)		0.326** (0.001)		0.376** (0.005)
PRI's presidential nominee	0.143* (8.106)	0.151* (8.012)	0.060 (0.011)	0.070 (0.011)	0.080* (0.020)	0.096** (0.019)
Sexenio fixed effects	✓	✓	✓	✓	✓	✓
Adjusted R square	0.27	0.28	0.24	0.25	0.18	0.18
Observations	263	263	263	263	263	263

Note: This table presents the standardized regression coefficients for the relationship between the Ngram-based power measure and several network centrality of top Mexican elites (cabinet members) between 1940 and 2000. The network data are from Van Gunten (2020) and are in person-sexenio format. The top panel displays results from the English Ngram corpus and the bottom panel displays results from the Spanish Ngram corpus. In all regressions, we additionally control for sexenio fixed effects and a variable for whether the cabinet member became PRI's presidential nominee in that year. Standard errors are clustered at the individual politician level.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

C.7 Ngram and Coalitional Power

An important piece of our theoretical argument is that powerful predecessors are more effective at both assembling coalitions of like-minded elites to counterbalance the successors and limiting their successors' ability to build similar supporting coalitions. It is thus important to provide some evidence that our Ngram-based power measure can reflect variations in political leaders' coalitional power. We explore this issue in two different settings: cabinet appointments in African countries and Politburo appointments in China.

C.7.1 Cabinet Appointments in Africa, 1996–2017

We begin by examining how the personal power of African leaders affects their ability to appoint their co-ethnics to high-level cabinet positions. A prominent feature of politics in many African countries is the presence of strong ethnic cleavages. Governments are often founded upon certain configurations of ethnic alliances, and the distribution of valuable resources often follows ethnic lines (Bates 1981; Bratton and Walle 1997; Francois, Rainer, and Trebbi 2015). It is a common practice for top African leaders to recruit their co-ethnics into the elite ruling coalition—usually the cabinet (Arriola 2009; Meng 2020). Making co-ethnic cabinet appointments is both an important manifestation of leaders' power and a common strategy to solidify their position among regime elites (Arriola 2009; Hassan 2017).

We perform the validation tests by making use of the African Cabinet and Political Elite Database (ACPED) developed by Raleigh and Wigmore-Shepherd (2020). The dataset contains information on all cabinet ministers who served in 23 African states between 1996 and 2017. A particularly useful piece of information that this dataset offers is whether cabinet ministers share the same ethnic background as their contemporary national chief executives. We use this information to compute the percentage of cabinet members who are the sitting national chief executive's co-ethnics for each country–year spell.³⁹ We then match the dataset with our Ngram database and calculate, for each national chief executive, his/her Ngram power index for the current year and the average index from the past five years. The latter variable is intended to address the reverse causality concern that a large number of co-ethnic appointments may help boost the national leader's subsequent power and influence. We estimate the following regression:

$$\text{Share of incumbent's co-ethnics in cabinet}_{ct} = \delta \text{Incumbent power}_{ct} + X\beta + \tau_t + \eta_c + \epsilon_{ct},$$

where c and t index country and year, respectively. We include country fixed effects η_c to account for the possibility that national leaders from some countries may receive more Ngram coverage than others, and year fixed effects τ_t to account for time-variant shocks that affect all states in the sample. The vector of control covariates include log GDP per capita, log population, and a binary variable for whether a country is a democracy.

Table A.9 displays the regression results. The first column presents the most parsimonious model, in which we only control for country and year fixed effects. Column 2 further includes the institutional and economic covariates. In Column 3, we address the potential reverse causality concern by using the average Ngram for the past five years as the measure of the incumbent's power. Throughout these models, we find that the Ngram-based measure of incumbent leaders' power is positively associated with the number of co-ethnic appointees in a cabinet. According to the coefficient estimates from Column 2, a one standard deviation increase in an incumbent's power is associated with about a 3 percentage point increase in co-ethnic cabinet share, which amounts to about a 12% change from the sample average (29%). This pattern is consistent with the general impression: More powerful African leaders are more capable of building large co-ethnic

³⁹The original dataset is recorded at monthly level. However, since many months do not record any cabinet personnel changes, using a monthly dataset may artificially inflate the number of observations and lead to overstated statistical significance. To be conservative, we reduce the original data to an annual dataset by only keeping observations recorded in December of each year.

coalitions in their cabinets.

Table A.9: Ngram-based Power Index and Leaders' Coalition Power: The Case of African Cabinets

	Share of co-ethnics in the cabinet		
	(1)	(2)	(3)
Incumbent leader power (current Ngram)	0.034** (0.011)	0.032** (0.010)	
Incumbent leader power (past five year average Ngram)			0.019* (0.008)
Log GDP per capita		0.008 (0.040)	0.004 (0.040)
Log population		-0.166 (0.270)	-0.172 (0.270)
Democracy		-0.040 (0.037)	-0.043 (0.037)
Country and year fixed effects	✓	✓	✓
Adjusted R square (within)	0.06	0.08	0.06
# of countries	23	23	23
Observations	486	484	484

Note: This table presents the regression estimates for the relationship between an incumbent leader's Ngram-based power index and the share of that leader's co-ethnics in the current cabinet. The information on cabinet members' co-ethnic status is drawn from the African Cabinet and Political Elite Database (ACPED) developed by Raleigh and Wigmore-Shepherd (2020). Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

C.7.2 Political Alignment within the Chinese Politburo, 1977–2017

In addition to African leaders' cabinets, we also evaluate the Ngram measure's ability to capture leaders' coalitional power in another context: Politburo appointments in China. The Politburo is formally the highest decision-making organ of the CCP, responsible for deliberating and deciding on key political and policy issues of the country. Given their central position in the political process, appointments to the Politburo are highly coveted prizes for all political factions. Both incumbent paramount leaders and senior retired figures (who are often the leading patrons of their respective factions) have strong incentives to increase the representation of their allies/protégés in the Party's highest decision-making organ. The process of appointment is usually highly competitive, and more powerful patrons typically have a greater edge in getting their preferred candidates nominated and confirmed. Therefore, if our Ngram measure does capture coalition-building power, we should expect there to be a positive relationship between a senior political figure's Ngram and the number of clients or allies that s/he manages to put into the Politburo.

To test this prediction, we construct a dataset recording the political ties between every pair of (living) senior and junior leaders from the 11th to the 19th Party Congress (1977 to 2017). Senior leaders include incumbent general secretaries of the CCP and all (living) retired leaders whose

political seniority is equivalent to or higher than Politburo Standing Committee (PSC) members.⁴⁰ Table A.10 presents the list of political figures who we consider to be potential patrons in each party congress.

Table A.10: Potential Patrons for Politburo Members: 1977–2017

Party Congress	Senior Leaders (Potential Patrons)
11th (1977)	Chen Yun, Deng Xiaoping, Hua Guofeng, Li Xiannian, Wang Dongxing, Ye Jianying
12th (1982)	Bo Yibo, Chen Yun, Deng Xiaoping, Deng Yingchao, Hu Yaobang, Li Xiannian, Nie Rongzhen, Peng Zhen, Xu Xiangqian, Ye Jianying, Zhao Ziyang
13th (1987)	Bo Yibo, Chen Yun, Deng Xiaoping, Deng Yingchao, Jiang Zemin, Li Peng, Li Xiannian, Nie Rongzhen, Peng Zhen, Song Renqiong, Wang Zhen, Xi Zhongxun, Xu Xiangqian, Yang Shangkun, Zhao Ziyang
14th (1992)	Bo Yibo, Chen Yun, Deng Xiaoping, Jiang Zemin, Li Peng, Li Ruihuan, Peng Zhen, Qiao Shi, Song Ping, Song Renqiong, Wan Li, Xi Zhongxun, Yang Shangkun, Yao Yilin
15th (1997)	Bo Yibo, Jiang Zemin, Li Peng, Li Ruihuan, Liu Huaqing, Qiao Shi, Song Ping, Song Renqiong, Wan Li, Xi Zhongxun, Zhu Rongji
16th (2002)	Bo Yibo, Hu Jintao, Jiang Zemin, Li Lanqing, Li Peng, Li Ruihuan, Liu Huaqing, Qiao Shi, Song Ping, Song Renqiong, Wan Li, Wei Jianxing, Wen Jiabao, Zhu Rongji
17th (2007)	Hu Jintao, Jia Qinglin, Jiang Zemin, Li Changchun, Li Lanqing, Li Peng, Li Ruihuan, Liu Huaqing, Luo Gan, Qiao Shi, Song Ping, Wan Li, Wei Jianxing, Wen Jiabao, Wu Bangguo, Wu Guanzheng, Zeng Qinghong, Zhu Rongji
18th (2012)	He Guoqiang, Hu Jintao, Jia Qinglin, Jiang Zemin, Li Changchun, Li Keqiang, Li Lanqing, Li Peng, Li Ruihuan, Luo Gan, Qiao Shi, Song Ping, Wan Li, Wei Jianxing, Wen Jiabao, Wu Bangguo, Wu Guanzheng, Xi Jinping, Zeng Qinghong, Zhu Rongji
19th (2017)	He Guoqiang, Hu Jintao, Jia Qinglin, Jiang Zemin, Li Changchun, Li Keqiang, Li Lanqing, Li Peng, Li Ruihuan, Liu Yunshan, Luo Gan, Song Ping, Wen Jiabao, Wu Bangguo, Wu Guanzheng, Xi Jinping, Yu Zhengsheng, Zeng Qinghong, Zhang Dejiang, Zhang Gaoli, Zhu Rongji

For junior leaders, we focus on all incoming Politburo and Politburo Standing Committee members (excluding the general secretary). For each senior–junior leader pair in a given party congress, we first cross-examine the biographies of the two individuals using the data and algorithm provided in Jiang (2018) to determine if the junior person had received significant promotions in an agency/region where the senior was the leading decision maker. In addition to this machine-based coding, we also went through each of the leader pairs and manually coded more informal/ad hoc relations that cannot be easily gleaned from CVs. The manual coding was done by consulting an extensive set of works by seasoned China experts (cited below).

Once the coding of relations is completed, we aggregate the data to senior leader–party congress level. Essentially, each row in the final dataset tells us for a given senior leader in a given party congress, what percentage of the incoming Politburo members are connected to her/him (i.e., the relative size of that senior leader’s informal coalition). We then obtain the Ngram counts for all senior leaders to see whether it can predict the size of their coalitions. Like before, we also compute the average Ngram for the last 3, 5, and 10 years before the current party congress to address reverse causality concerns. The specification of the regression model is as follows:

⁴⁰This includes not only retired Politburo Standing Committee members but also retired state chairmen, the director/deputy director of the central advisory commission (during the 1980s), and a small number of highly influential revolutionary veterans (e.g., the eight “immortals”).

$$\text{Share of clients in Politburo}_{ip} = \delta \text{ Patron power}_{ip} + \tau_p + \epsilon_{ip},$$

where i and p index individual senior leader and party congress, respectively. We also additionally control for party congress fixed effects τ_p to account for unobserved time-invariant shocks, and a patron's age at the beginning of each party congress to account for the influence of sheer seniority.

The regression results are presented in Table A.11. Consistent with what we found with African cabinets, we see that in China's last nine party congresses, a patron's power (as measured by his/her Ngram publication counts) is positively and significantly associated with the size of the informal coalition that s/he manages to put together in the incoming Politburo. Focusing on Column 5, the coefficient suggests that for a one standard deviation increase in a patron's 10-year average Ngram, the share of that patron's clients in the next Politburo will grow by about 8.6 percentage points. Since an average patron is connected to about 14% of the sitting Politburo members, this effect is equivalent to a 61% increase from the sample average (or 45% of a standard deviation). These results are in line with received wisdom that within the CCP elites, more powerful patrons are better at placing their allies in key decision-making bodies.

Taken together, these validation tests show that there is a strong, positive association between our Ngram-based index and leaders' coalition sizes in the two very different settings. These results suggest that our measure is indeed capable of capturing a leader's coalition-building power.

Table A.11: Ngram-based Power Index and Leaders' Coalition Power: The Case of Chinese Politburo

	Share of clients in Politburo				
	(1)	(2)	(3)	(4)	(5)
Patron power (current Ngram)	0.068** (0.024)				
Patron power (last 3-year Ngram average)		0.068* (0.026)			
Patron power (last 5-year average Ngram)			0.065* (0.027)		
Patron power (last 10-year average Ngram)				0.055* (0.026)	0.068* (0.028)
Covariates					✓
Adjusted R square	0.24	0.21	0.18	0.12	0.27
# of patrons	43	43	43	43	43
Observations	130	130	130	130	130

Note: This table presents the regression estimates for the relationship between a senior patron's Ngram-based power and the share of that patron's clients in the current Politburo. Patrons include all individuals listed in Table A.10. Covariates include party congress fixed effects and a patron's age at the beginning of each party congress. Standard errors are clustered at the patron level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Below is a list of the references consulted for our manual coding of personal ties:

- Lowell Dittmer. 2020. "On the Sixth Generation: Preliminary Speculations about Chinese Politics after Xi." *Journal of Contemporary China* 29 (122): 253–265
- Dorothy Grouse Fontana. 1982. "Background to the Fall of Hua Guofeng." *Asian Survey* 22 (3): 237–260
- Jing Huang. 2000. *Factionalism in Chinese Communist Politics*. Cambridge University Press
- Chien-wen Kou. 2017. "Xi Jinping in Command: Solving the Principal–Agent Problem in CCP–PLA Relations?" *The China Quarterly* 232:866–885
- Willy Lam. 2006. *Chinese Politics in the Hu Jintao Era : New Leaders, New Challenges*. Armonk, N.Y: M.E. Sharpe
- David Lampton. 2013. *Following the leader : ruling China, from Deng Xiaoping to Xi Jinping*. Berkeley: University of California Press
- Cheng Li and Lynn White. 1998. "The Fifteenth Central Committee of the Chinese Communist Party: Full-Fledged Technocratic Leadership with Partial Control by Jiang Zemin." *Asian Survey* 38 (3): 231–264
- Cheng Li. 2002. "Hu's Followers: Provincial Leaders with Backgrounds in the Youth League." *China Leadership Monitor* 3:1–11
- Cheng Li. 2007. "Was the Shanghai Gang Shanghaied?" *China Leadership Monitor*, no. 20
- Cheng Li. 2012. "The Battle for China's TopNine Leadership Posts." *The Washington Quarterly* 35 (1): 131–145
- Cheng Li. 2016. *Chinese Politics in the Xi Jinping Era: Reassessing Collective Leadership*. Brookings Institution Press
- Ezra Vogel. 2013. *Deng Xiaoping and the Transformation of China*. Belknap Press of Harvard University Press
- Ziyang Zhao. 2009. *Prisoner of the State: The Secret Journal of Premier Zhao Ziyang*. Simon & Schuster
- 杨继绳. (2004). 中国改革年代的政治斗争. 香港: 天地图书有限公司
- "The Committee", *Marco Polo*, <https://macropolo.org/digital-projects/the-committee/>
- "Connected China", *Reuters*, <http://china.fathom.info/>

C.8 Correlation with Existing Power Measures

Table A.12: Correlation between Ngram-based Power Index and GWF Personalism at t

	DV: Personalism index (GWF)					
	(1)	(2)	(3)	(4)	(5)	(6)
Incumbent's Ngram at $t + 2$	0.197*** (0.008)					0.031 (0.006)
Incumbent's Ngram at $t + 1$		0.234*** (0.008)				0.035 (0.005)
Incumbent's Ngram at t			0.273*** (0.009)			0.175*** (0.007)
Incumbent's Ngram at $t - 1$				0.240*** (0.009)		0.059*** (0.004)
Incumbent's Ngram at $t - 2$					0.198*** (0.009)	0.005 (0.007)
Country and year fixed effects	✓	✓	✓	✓	✓	
Adjusted R ²	0.61	0.62	0.62	0.62	0.61	0.62
Observations	3934	3934	3934	3934	3934	3934

Note: This table presents the standardized regression coefficients for the relationship between our Ngram-based power index and the personalism index developed by Geddes, Wright, and Frantz (2019). Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.13: Correlation between Ngram-based Power Index and Power Consolidation Index

	DV: Power consolidation measure (GS)					
	(1)	(2)	(3)	(4)	(5)	(6)
Incumbent's Ngram at $t + 2$	0.059 (0.043)					0.052* (0.025)
Incumbent's Ngram at $t + 1$		0.049 (0.045)				0.008 (0.012)
Incumbent's Ngram at t			0.038 (0.047)			-0.032 (0.019)
Incumbent's Ngram at $t - 1$				0.045 (0.045)		0.008 (0.014)
Incumbent's Ngram at $t - 2$					0.051 (0.044)	0.037 (0.026)
Country and year fixed effects	✓	✓	✓	✓	✓	
Adjusted R ²	0.72	0.72	0.72	0.72	0.72	0.72
Observations	4254	4254	4254	4254	4254	4254

Note: This table presents the standardized regression coefficients for the relationship between our Ngram-based power index and the power consolidation measure developed by Gandhi and Sumner (2020). Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

D Numerical Results for Subsample Analyses

Table A.14: Subsample Results

	Incumbent power (Ngram)		
	(1) Natural death	(2) Consensual departure	(3) Non-consensual departure
Predecessor power	-0.257* (0.106)	-0.688* (0.296)	-0.002 (0.118)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓	✓
Leader and year fixed effects	✓	✓	✓
# of countries	91	73	71
Observations	1575	1221	1159
	Incumbent power (Ngram)		
	(1) Party	(2) Military	(3) Personalist
Predecessor power	-0.309** (0.073)	-0.187 (0.360)	-0.031 (0.312)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓	✓
Leader and year fixed effects	✓	✓	✓
# of countries	41	23	18
Observations	784	174	218
	Incumbent power (Ngram)		
	(1) Party institutionalization: highest 1/3	(2) Party institutionalization 33% to 67%	(3) Party institutionalization: lowest 1/3
Predecessor power	-0.370** (0.102)	-0.325** (0.089)	-0.218 (0.205)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓	✓
Leader and year fixed effects	✓	✓	✓
# of countries	40	50	29
Observations	527	520	532

Note: This table presents the regression results using several subsamples. The specifications are identical to Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

E Detailed Results of Robustness Checks

E.1 Alternative Dependent Variables

Table A.15: Using Alternative Ngram-based Power Indices as Dependent Variables

	Incumbent's power based on # of mentions	Incumbent's Ngram relative to the most powerful living predecessor	Incumbent's Ngram relative to the 90th percentile	Incumbent's Ngram relative to the 10th highest
	(1)	(2)	(3)	(4)
Predecessor power	-0.280** (0.084)	-2.478** (0.220)	-0.255** (0.078)	-0.316** (0.086)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓	✓	✓
Year and leader fixed effects	✓	✓	✓	✓
# of countries	83	43	77	77
Observations	1751	635	1469	1469

Note: This table presents the estimated effects of predecessors on four alternative dependent variables constructed from the Ngram data. The first column uses a similar power index based on the number of name mentions instead of the number of books. The second column uses a power index using the most powerful living predecessor's *current* Ngram as the denominator. The third column uses the ratio between an incumbent's Ngram publication count and the 90th percentile value of all living non-incumbent elites in the same country-year. The fourth column uses the ratio between an incumbent's Ngram publication count and the 10th highest non-incumbent elite. The model specifications are otherwise the same as in Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.16: Separating Predecessors' Effect on Incumbents' Publication Count (Numerator) vs. Non-Incumbent Elites' Publication Count (Denominator)

	# of publications mentioning incumbents (numerator)	# of publications mentioning highest non-incumbent elites (denominator)
	(1)	(2)
Predecessor power	-0.231** (0.087)	-0.005 (0.027)
Lagged DV ($t - 1, t - 2, t - 3$)	✓	✓
Leader and year fixed effects	✓	✓
# of countries	83	84
Observations	1751	1785

Note: This table presents the estimated effects of predecessors on the publication counts of incumbent leaders (i.e., the numerator of the incumbent leader's power index) and those of the highest non-incumbent elites (i.e., the denominator of the incumbent leader's power index). The specification is otherwise the same as in Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.17: Effect of Predecessor Power on Incumbent's Total Tenure Length

	DV: Incumbent's total tenure length				
	(1)	(2)	(3)	(4)	(5)
Predecessor power	-3.018** (0.919)	-4.138** (1.367)	-3.501** (1.335)		
Any living predecessor (1=yes)				-4.810* (2.041)	
# of living predecessors					-1.816** (0.689)
Age			-0.252 (0.160)	-0.275+ (0.154)	-0.283+ (0.151)
Year of education			-0.001 (0.262)	-0.037 (0.252)	0.012 (0.239)
Country fixed effects	✓				
Regime fixed effects		✓	✓	✓	✓
R ²	0.38	0.59	0.67	0.67	0.66
Observations	521	521	486	486	486

Note: This table presents the regression results using incumbent leaders' total tenure length as the alternative outcome. The analysis is at individual leader level. The key independent variable for the first two columns is the predecessor power index used in Table 1, evaluated at the first year of the incumbent's tenure. The third column uses a binary indicator for whether a living predecessor was present when the incumbent leader started office, and the fourth column uses the number of within-regime living predecessors. Both variables are also evaluated at the incumbent's first year in office. Standard errors are clustered at country level.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.18: Baseline Results Using the Personalism Index (Geddes, Wright, and Frantz 2019) as the Dependent Variable

	DV: Personalism index (GWF)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power	-0.013 ⁺ (0.008)	-0.028* (0.011)	-0.025* (0.012)	-0.034* (0.014)	-0.034* (0.014)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	82	82	76	76	76
Observations	1560	1560	1340	1340	1318

Note: This table presents the baseline regression results using the personalism index developed by Geddes, Wright, and Frantz (2019) as the dependent variable. The specifications are otherwise identical to those reported in Table 1. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.19: Baseline Results Using the Power Consolidation Index (Gandhi and Sumner 2020) as the Dependent Variable

	DV: Power consolidation index (GS)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power	-0.060** (0.021)	-0.118** (0.030)	-0.112** (0.030)	-0.074* (0.034)	-0.074* (0.033)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	90	90	84	84	83
Observations	1662	1662	1437	1437	1415

Note: This table presents the baseline regression results using the power consolidation index developed by Gandhi and Sumner (2020) as the dependent variable. The specifications are otherwise identical to those reported in Table 1. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

E.2 Alternative Independent Variables

Table A.20: Results from Using Alternative Measures for Predecessors' Power

	DV: Incumbent personal power (Ngram)		
	(1)	(2)	(3)
Predecessor power (median Ngram when as CE)	-0.284** (0.089)		
Any living predecessor (1=yes)		-0.279** (0.085)	
# of living predecessors			-0.148* (0.064)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓
Leader and year fixed effects	✓	✓	✓
# of countries	83	83	83
Observations	1751	1751	1751

Note: This table presents the results using several alternative measures for predecessors' power. The first column uses a variable based on the median (as opposed to mean) of predecessors' in-office Ngram-based power index. The second column uses a binary indicator for whether any living predecessor is present (regardless of his/her power), and the fourth column uses the number of living predecessors. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

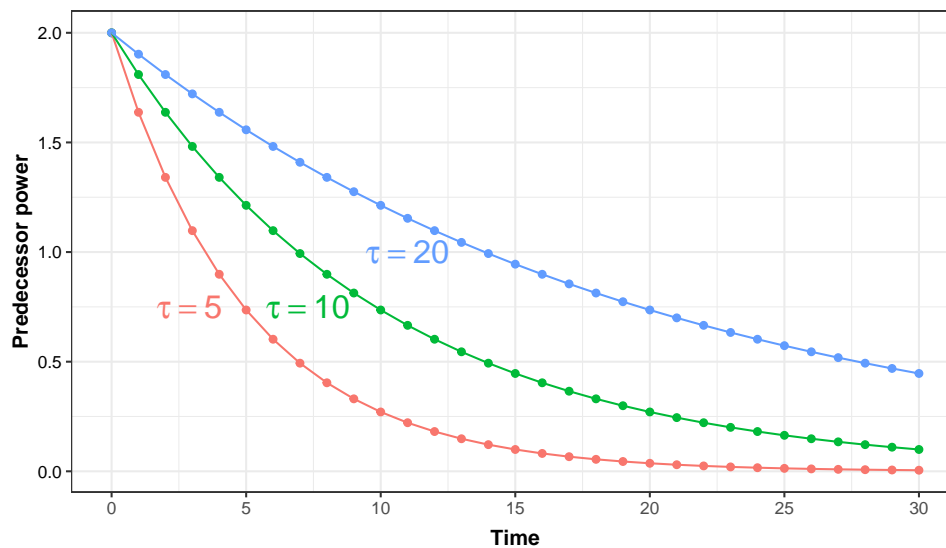
Table A.21: Allowing Predecessors' Power to Change Over Time

	DV: Incumbent power (Ngram)			
	(1)	(2)	(3)	(4)
Predecessor power with exponential decay ($\tau = 5$)	-0.553** (0.070)			
Predecessor power with exponential decay ($\tau = 10$)		-0.490** (0.067)		
Predecessor power with exponential decay ($\tau = 20$)			-0.438** (0.070)	
Predecessor power (current)				-0.077** (0.015)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓
Leader and year fixed effects	✓	✓	✓	✓
# of countries	83	83	83	83
Observations	1751	1751	1751	1751

Note: This table presents the results from using several time-variant versions of predecessors' power. The first three columns use variables that allow predecessors' power to decline (starting from the last year of each predecessor's tenure) following an exponential decay function $y(t) = y(0)e^{-t/\tau}$. $y(0)$ is a predecessor's average power as chief executive, t is the number of years passed since the predecessor stepped down from office, and $y(t)$ represents the predecessor's remaining power at t . τ is the exponential time constant, which is inversely related to the speed of decay. The τ 's for the first three columns are set at 5, 10, and 20, respectively (see Figure A.16 for an illustration of the speed of decay). The fourth column uses the *current* power index of the most influential living predecessor. Standard errors are clustered at country level.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Figure A.16: Illustration of Exponential Decay



Note: This figure provides an illustration of the speed of decay in predecessor power when the exponential time constant (τ) is set at 5, 10, and 20, respectively. $t = 0$ is when a predecessor steps down from office.

Table A.22: Using Ngram Counts Rounded to Smallest Tenth

	Incumbent power (Ngram, coarsened)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power (coarsened)	-0.371** (0.072)	-0.721** (0.122)	-0.749** (0.127)	-0.493** (0.170)	-0.487** (0.165)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	100	100	94	94	94
Observations	2004	2004	1792	1792	1772

Note: This table presents the results using variables constructed from coarsened Ngram publication counts. All Ngram values are rounded to the lowest tenth to address the possibility of idiosyncratic noise in publication counts. The specifications are otherwise identical to Table 1. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.23: Using Power Index Constructed from Multi-Language Ngram

	Incumbent power (multi-language Ngram)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power	-0.177** (0.039)	-0.367** (0.050)	-0.368** (0.057)	-0.187* (0.073)	-0.182* (0.071)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	99	99	93	93	93
Observations	1989	1989	1777	1777	1755

Note: This table presents the regression results using variables constructed from Ngram's non-English corpus. For those countries whose official languages are one of the following, we replace the English-language Ngram with the Ngram in their own language: Chinese, French, German, Hebrew, Italian, Russian, and Spanish. The specifications are otherwise the same as in Table 1. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.24: Results on Alternative Samples

	Official language = English	Official language ≠ English
	(1)	(2)
Predecessor power	-0.190 (0.127)	-0.334** (0.093)
Lagged DV ($t-1, t-2, t-3$)	✓	✓
Leader and year fixed effects	✓	✓
# of countries	14	68
Observations	318	1417

Note: This table presents the regression results using several alternative samples. The first column uses a sample that excludes incumbent leaders who are the founders of their regimes. The second and third columns report results for countries whose official languages include and do not include English, respectively. The specifications are otherwise the same as in Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.25: Results Using GWF Autocratic Regime Sample

	Incumbent power (Ngram)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power	-0.173** (0.046)	-0.369** (0.080)	-0.336** (0.081)	-0.241** (0.085)	-0.241** (0.083)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	94	94	89	89	89
Observations	1723	1723	1503	1503	1482

Note: This table presents the regression results using an alternative sample of autocratic regimes as defined by Geddes, Wright, and Frantz (2019). The specifications are otherwise the same as in Table 1. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.26: Results Using the Autocratic Regime Sample based on Cheibub, Gandhi, and Vreeland (2009)

	Incumbent power (Ngram)				
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) GMM
Predecessor power	-0.162** (0.041)	-0.315** (0.063)	-0.278** (0.067)	-0.183* (0.082)	-0.180* (0.079)
Lagged DV ($t-1, t-2, t-3$)	✓	✓	✓	✓	✓
Regime and year fixed effects		✓	✓		
Leader and year fixed effects				✓	✓
Control variables			✓	✓	✓
# of countries	101	101	96	96	96
Observations	1803	1803	1581	1581	1562

Note: This table presents the regression results using an alternative sample of autocratic regimes based on the regime classification in Cheibub, Gandhi, and Vreeland (2009). Autocracies include three types of regimes: civilian dictatorship, military dictatorship, and royal dictatorship. The specifications are otherwise the same as in Table 1. Control variables include the incumbent's tenure length, log real GDP (in US dollar), and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.27: Results from a Placebo Test

	DV: Incumbent personal power (Ngram)
	(1)
Predecessor power	-0.264** (0.090)
Predecessor power (same country, different regimes)	-0.089 (0.148)
Lagged DV ($t-1, t-2, t-3$)	✓
Leader and year fixed effects	✓
# of countries	83
Observations	1751

Note: This table presents results from a regression that includes a placebo variable for predecessor power. The placebo variable measures the maximum in-office power index for predecessors who are from the same country but a *different regime* than the incumbent leader. The specifications are otherwise the same as in Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.28: Addressing the Issue of Predecessors Deliberately Selecting Weak Successors

	Power index of incumbent X year(s) before entering office		
	(1) $X = 1$	(2) $X = 2$	(3) $X = 3$
Predecessor power	0.112 (0.277)	0.130 (0.378)	0.057 (0.297)
Control variables	✓	✓	✓
Regime and year fixed effects	✓	✓	✓
# of countries	94	94	94
Observations	216	209	207

Note: This table presents the estimated relationship between predecessors' power and the Ngram-based power index of their successors X year(s) ($x \in \{1, 2, 3\}$) before assuming office. Founding leaders with no predecessors are excluded from the sample. The specifications are otherwise the same as in Column 4 of Table 1. Control variables include log GDP per capita and log population. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

Table A.29: Using Different Time Lags in Ngram to Construct the Power Index

	Power index based on incumbent's Ngram at $T + X$ (T = current year)					
	(1) $X = 0$ (baseline)	(2) $X = 1$	(3) $X = 2$	(4) $X = 3$	(5) $X = 4$	(6) $X = 5$
Predecessor power	-0.278** (0.085)	-0.144* (0.055)	-0.066 (0.058)	0.005 (0.056)	0.006 (0.074)	0.003 (0.072)
Leader and year fixed effects	✓	✓	✓	✓	✓	✓
# of countries	94	93	93	91	90	90
Observations	1792	1763	1733	1700	1666	1637

Note: This table presents the regression results using alternative power indices constructed based on leaders' Ngram publication count at $T + X$ (T = the current year). The specifications are otherwise the same as in Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

F Non-Linearity in Predecessors' Influence on Incumbents

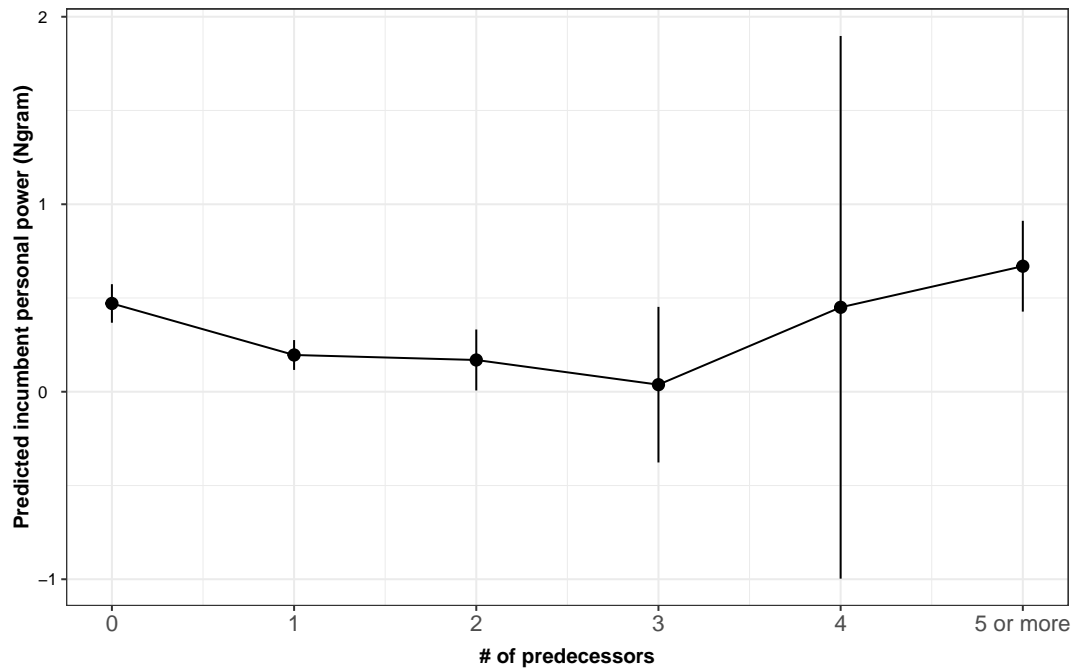
Table A.30: Testing Non-Linear Relationship in Predecessors' Influence on Incumbents' Power

	DV: Incumbent power (Ngram)	
	(1)	(2)
# of living predecessors	-0.324** (0.094)	
# of living predecessors ²	0.069** (0.023)	
Predecessor power		0.061 (0.168)
Predecessor power ²		-0.186 ⁺ (0.098)
Leader and year fixed effects	✓	✓
# of countries	83	83
Observations	1751	1751

Note: This table presents regression results that test for non-linear relationships between the number/strength of predecessors and the power of incumbents. We detect a U-shaped relationship between the number of living predecessors and the power of their successors, but no strong non-linearity in the effect of predecessors' power. The same relationship estimated based on a discrete measure of predecessor number is illustrated in Figure A.17. The specifications are otherwise the same as in Column 4 of Table 1. Standard errors are clustered at country level.

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ (two-tailed test)

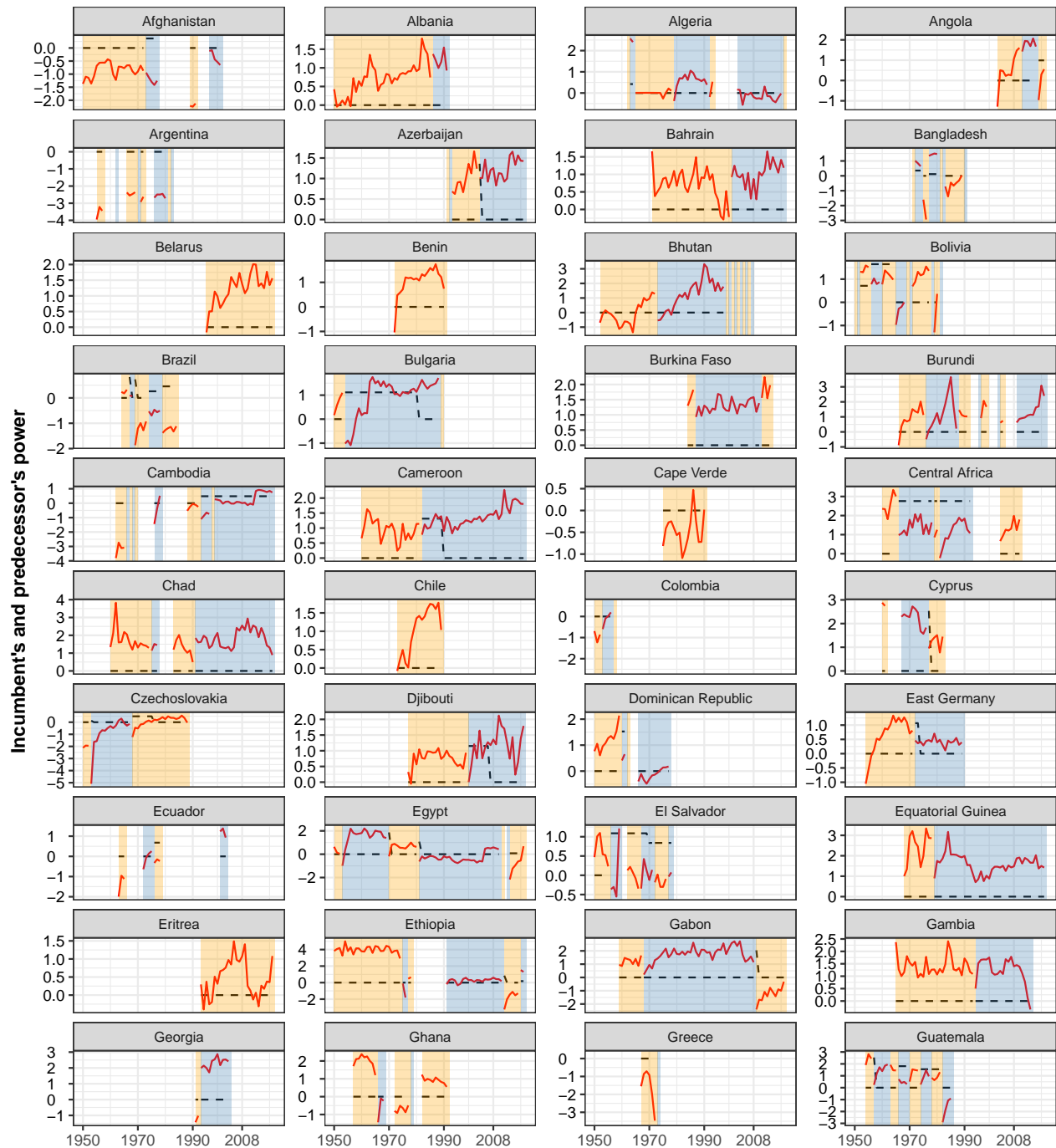
Figure A.17: Visualizing the Non-Linear Relationship between Living Predecessor Number and Incumbent Power



Note: This figure illustrates the non-linear relationship between the number of living predecessors and the power of incumbent leaders. The circles indicate the predicted personal power of an incumbent conditional on a given number of living predecessor present (indicated by the x axis), and the vertical bars indicate the 95% confidence intervals. The estimates are based on the same regression model as Column 1 of Table A.30 except for using a discrete measure of predecessor number to guard against over-fitting.

G Visualization of Power Dynamics for All Autocratic Regimes, 1950–2019

Figure A.18: Variations in Incumbent and Predecessor Power: All Authoritarian Countries



-- Predecessor's power — Incumbent's power

Figure A.19: Variations in Incumbent and Predecessor Power: All Leaders in All Authoritarian Countries (Cont'd)

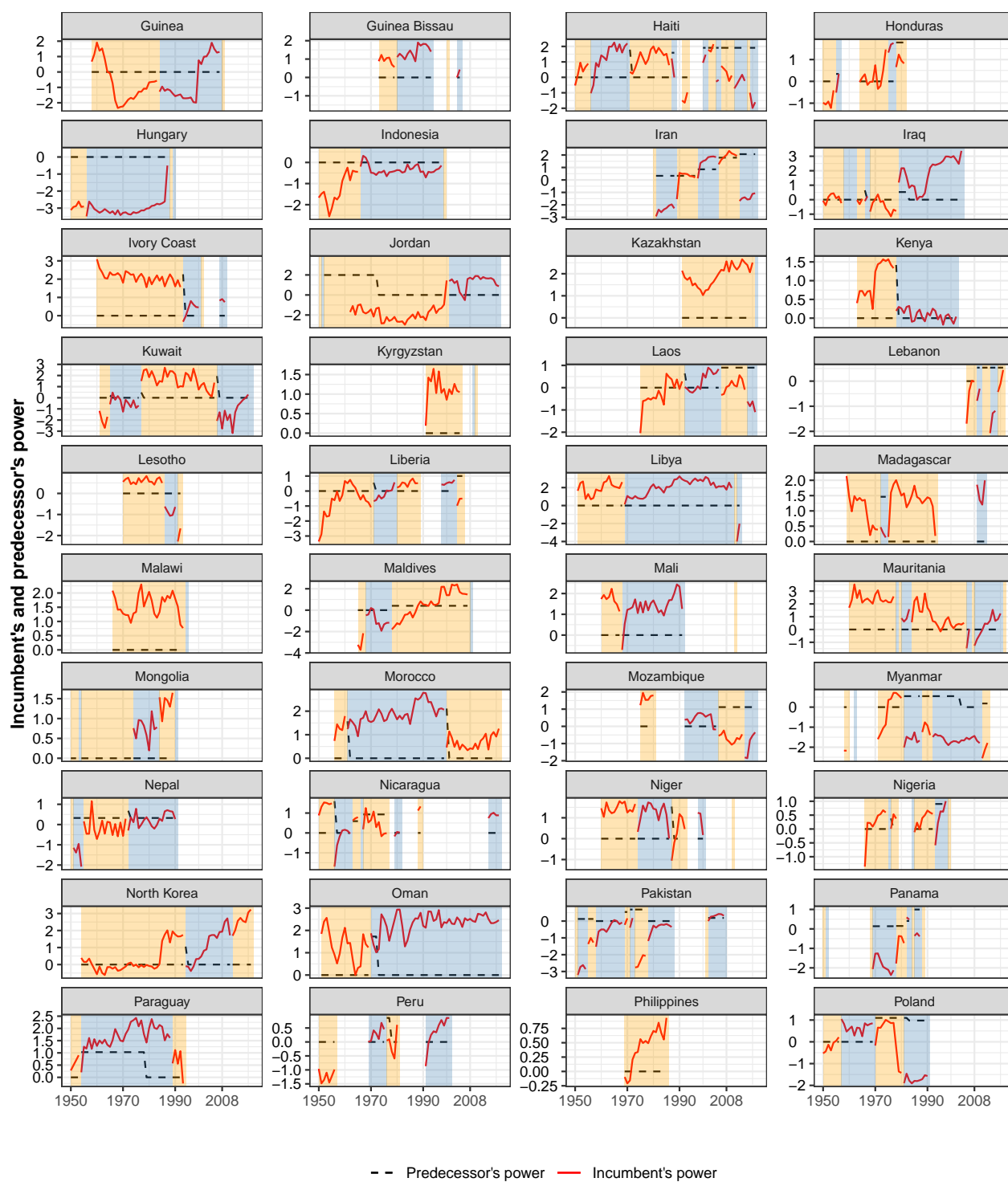
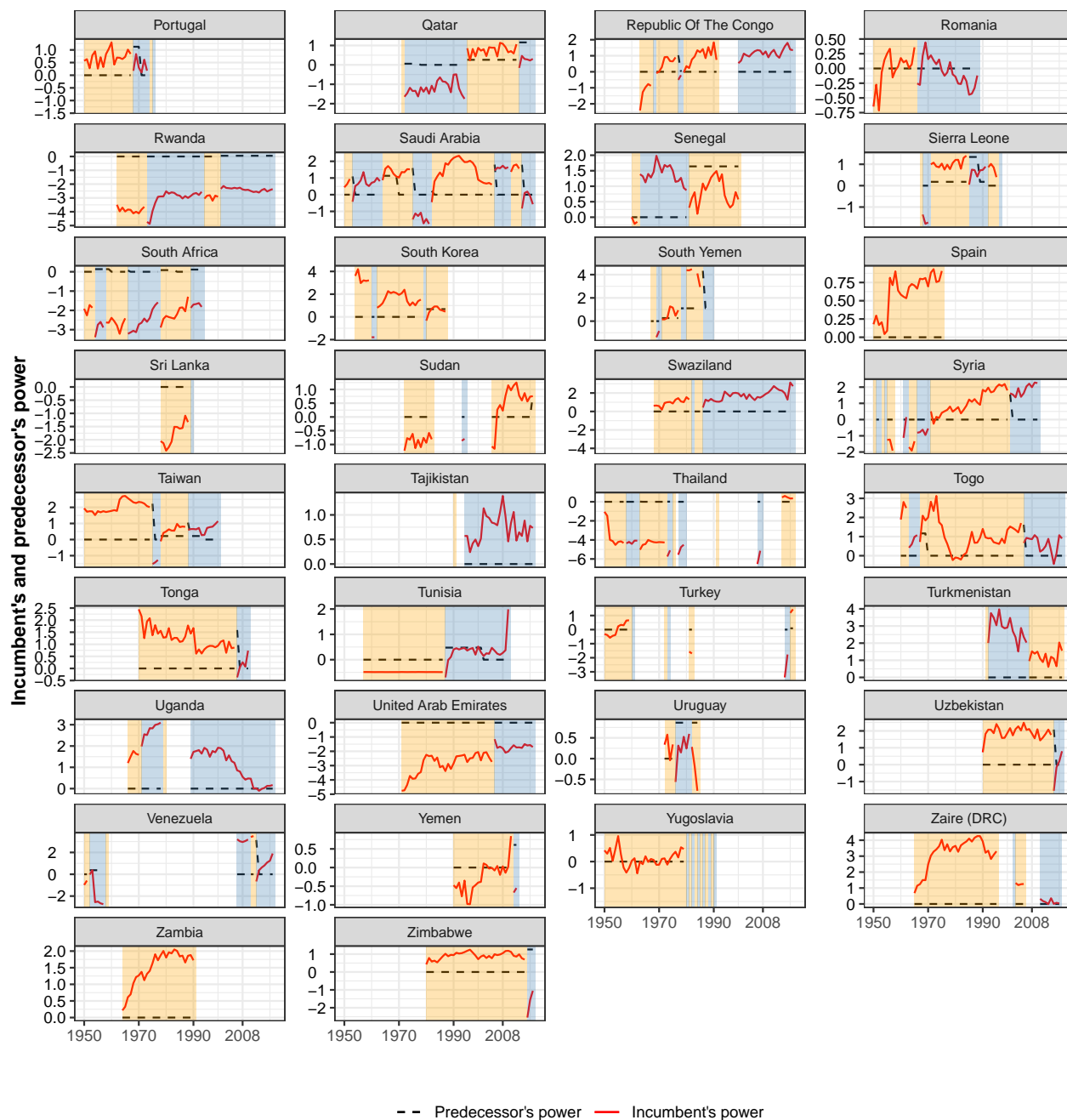


Figure A.20: Variations in Incumbent and Predecessor Power: All Leaders in All Authoritarian Countries (Cont'd)



References

- Arriola, Leonardo R. 2009. "Patronage and Political Stability in Africa." *Comparative Political Studies* 42 (10): 1339–1362.
- Bates, Robert.H. 1981. *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies*. California series on social choice and political economy. University of California Press.
- Baturo, Alexander, and Johan A. Elkind. 2014. "Office or Officeholder? Regime Deinstitutionalization and Sources of Individual Political Influence." *The Journal of Politics* 76 (03): 859–872.
- Bratton, Michael., and Nicholas. van de Walle. 1997. *Democratic Experiments in Africa: Regime Transitions in Comparative Perspective*. Cambridge Studies in Comparative Politics. Cambridge University Press.
- Castaneda, Jorge.G., and Padraic.A. Smithies. 2001. *Perpetuating Power: How Mexican Presidents Were Chosen*. New Press.
- Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2009. "Democracy and Dictatorship Revisited." *Public Choice* 143 (1-2): 67–101.
- Dittmer, Lowell. 2020. "On the Sixth Generation: Preliminary Speculations about Chinese Politics after Xi." *Journal of Contemporary China* 29 (122): 253–265.
- Faris, Robert, and Diane Felmlee. 2011. "Status Struggles: Network Centrality and Gender Segregation in Same- and Cross-Gender Aggression." *American Sociological Review* 76 (1): 48–73.
- Fontana, Dorothy Grouse. 1982. "Background to the Fall of Hua Guofeng." *Asian Survey* 22 (3): 237–260.
- Francois, Patrick, Ilia Rainer, and Francesco Trebbi. 2015. "How Is Power Shared in Africa?" *Econometrica* 83 (2): 465–503.
- Gandhi, Jennifer, and Jane Lawrence Sumner. 2020. "Measuring the Consolidation of Power in Nondemocracies." *The Journal of Politics* 82 (4): 1545–1558.
- Geddes, Barbara, Joseph Wright, and Erica Frantz. 2019. *How Dictatorships Work*. New York: Cambridge University Press.
- Grant, Will J., and Erin Walsh. 2015. "Social evidence of a changing climate: Google Ngram data points to early climate change impact on human society." *Weather* 70 (7): 195–197.
- Hassan, Mai. 2017. "The Strategic Shuffle: Ethnic Geography, the Internal Security Apparatus, and Elections in Kenya." *American Journal of Political Science* 61 (2): 382–395.
- Huang, Jing. 2000. *Factionalism in Chinese Communist Politics*. Cambridge University Press.
- Jiang, Junyan. 2018. "Making Bureaucracy Work: Patronage Networks, Performance Incentives, and Economic Development in China." *American Journal of Political Science* 62 (4): 982–999.
- Keller, Franziska Barbara. 2016. "Moving beyond Factions: Using Social Network Analysis to Uncover Patronage Networks among Chinese Elites." *Journal of East Asian Studies* 16 (Special Issue 01): 17–41.

- Kou, Chien-wen. 2017. "Xi Jinping in Command: Solving the Principal–Agent Problem in CCP–PLA Relations?" *The China Quarterly* 232:866–885.
- Kuhn, Robert. Lawrence. 2004. *The Man who Changed China: The Life and Legacy of Jiang Zemin*. Crown Publishers.
- Lam, Willy. 2006. *Chinese Politics in the Hu Jintao Era : New Leaders, New Challenges*. Armonk, N.Y: M.E. Sharpe.
- Lampton, David. 2013. *Following the leader : ruling China, from Deng Xiaoping to Xi Jinping*. Berkeley: University of California Press.
- Li, Cheng. 2016. *Chinese Politics in the Xi Jinping Era: Reassessing Collective Leadership*. Brookings Institution Press.
- . 2002. "Hu's Followers: Provincial Leaders with Backgrounds in the Youth League." *China Leadership Monitor* 3:1–11.
- . 2012. "The Battle for China's Top Nine Leadership Posts." *The Washington Quarterly* 35 (1): 131–145.
- . 2007. "Was the Shanghai Gang Shanghaied?" *China Leadership Monitor*, no. 20.
- Li, Cheng, and Lynn White. 1998. "The Fifteenth Central Committee of the Chinese Communist Party: Full-Fledged Technocratic Leadership with Partial Control by Jiang Zemin." *Asian Survey* 38 (3): 231–264.
- Magaloni, Beatriz. 2006. *Voting for Autocracy: Hegemonic Party Survival and Its Demise in Mexico*. Cambridge Studies in Comparative Politics. Cambridge University Press.
- Meng, Anne. 2020. *Constraining Dictatorship: From Personalized Rule to Institutionalized Regimes*. Cambridge University Press.
- Michel, Jean-Baptiste, et al. 2010. "Quantitative Analysis of Culture Using Millions of Digitized Books." *Science* 331 (6014): 176–182.
- Padgett, John F., and Christopher K. Ansell. 1993. "Robust Action and the Rise of the Medici, 1400-1434." *American Journal of Sociology* 98 (6): 1259–1319.
- Przeworski, Adam. 2018. *Why Bother With Elections?* Polity Press.
- Raleigh, Clionadh, and Daniel Wigmore-Shepherd. 2020. "Elite Coalitions and Power Balance across African Regimes: Introducing the African Cabinet and Political Elite Data Project (ACPED)." *Ethnopolitics*: 1–26.
- Smith, Peter H. 1991. "Mexico since 1946: Dynamics of an Authoritarian Regime." In *Mexico since Independence*, ed. by Leslie Bethell, 321–396. Cambridge University Press.
- Svolik, Milan. 2012. *The Politics of Authoritarian Rule*. Cambridge University Press.
- Van Gunten, Tod. 2017. *Brokers, Clients and Elite Political Networks in Mexico*. Paper presented at the American Sociological Association Annual Meeting. <https://bit.ly/3nGzXNS>.
- . 2020. *Where Does Power Come From? Elite Networks and the Presidential Succession in Mexico*. Paper presented at American Sociological Association Annual Meeting.
- Vogel, Ezra. 2013. *Deng Xiaoping and the Transformation of China*. Belknap Press of Harvard University Press.

Zhao, Ziyang. 2009. *Prisoner of the State: The Secret Journal of Premier Zhao Ziyang*. Simon & Schuster.