Dynamics of the inner elite in dictatorships:
Evidence from North Korea

How does the circle of inner elites evolve over time in dictatorships? We draw on theories of authoritarian power-sharing to shed light on the evolution of politics in the Democratic People's Republic of Korea. Yet the evaluation of competing theories is difficult in the North Korean context given the inherent challenges in collecting individual-level data on the formation and dissolution of elite circles surrounding the Supreme Leader. In this paper, we address this shortcoming using data on the evolution of the inner elite under Kim Jong-un (2012-2015). Employing web-scraping techniques to capture inspection visits by the Supreme Leader as reported by the state-run Korean Central News Agency, we assemble network data on the co-occurrence of high-ranking elites in these visits over time. We test the network durability of the inner elite since Kim Jong-un's rise to power in January 2012 to find suggestive evidence of elite shuffling. Our findings contribute to the broader literature on elite dynamics in authoritarian regimes and to subnational studies on the politics of power-sharing in communist states. Importantly, our approach also helps bring the study of North Korean politics more firmly in the mainstream of political science inquiry.

1. Introduction

How does the circle of inner elites evolve over time in dictatorships? In this paper we draw on theories of authoritarian power-sharing to shed light on the politics of North Korea since the ascendency of Kim Jong-un. In particular, we examine whether Kim Jong-un has used techniques evident in many other authoritarian regimes of elite purging, shuffling, or cooptation. However, evaluating competing hypotheses is difficult given inherent challenges in collecting individual-level data on dynamics. We address this shortcoming using data on the evolution of the inner elite in North Korea captured using web-scraping techniques. Parsing inspection visits by Kim Jong-un as reported by the state-run Korean Central News Agency (KCNA), we assemble network data on the co-occurrence of high-ranking elites in these visits over time. We test the network durability of the inner elite during the period since Kim Jong-un's rise to power in January 2012. Our findings contribute to the broader literature on elite dynamics in authoritarian regimes and to subnational studies on the politics of power-sharing in communist states.

A second purpose of this piece is to examine whether North Korea itself can be studied in comparison with other authoritarian regimes. Given North Korea's highly secretive nature, it has been very difficult for political science scholars to study the country's politics systematically. Much of the existing work by political scientists has largely relied on impressionistic "readings of the tea leaves" or broad "strategic" predictions on the future of the regime (often without empirical support). More recently, scholars have examined North Korean politics more systematically, albeit focusing on the state of the North Korean economy, or its nuclear program, or on public opinion using expatriate populations of North Koreans in Manchuria.[1] Can North Korean politics be

profitably examined using the "lens" of theoretical literature developed from other authoritarian regimes? This paper thus examines the North Korean case in a way akin to what Arend Lijphart called an "interpretive case study."[2] Rather than using the North Korean case to test existing theories, we use existing theory derived from the study of other authoritarian regimes to shed light on the North Korean case, and to ascertain whether it is plausible to do so.[3]

In the next section we review three competing theories of how dictators manage their inner elite circle during times of crisis and formulate hypotheses to test in the context of Kim Jong-un's North Korea. We then turn to describing relational data on a select group of elites in Kim's circle and use these data in dynamic network analysis from January 2012 to June 2015, the latest date for which we can collect reliable data. We conclude in section five with a discussion of further applications of these data and how our case can generalize to other personalist dictatorships, particularly those in the post-communist countries.

2. Elite management strategies in dictatorships

The interplay between leaders and their circle of inner elites is one of the foundations of regime stability in a dictatorship. How they manage the composition, responsibilities, and hierarchy of elites can be the determining factor in whether the dictatorship survives or fails. A key debate within this aspect of rule is whether dictators should shore up support from elites by consolidating their power within the state or whether dictators should ensure that no one member of the ruling class obtains sufficient power to overthrow them. Dictators can achieve the former by fostering a sense of permanence and security

regarding the status of elites, such that each member is assured a place within the ruling coalition. Dictators can achieve the latter through purges, rotations, and frequent shuffling of the inner elite.

When do dictators choose one strategy over the other? It could be that variation in dictators' strategies of elite management is determined by the perceived strength of their regime. Consider the sample of entrenched dictators with long time horizons—this would include monarchs, personalist leaders, and in rare cases, military dictatorships. These otherwise strong autocrats may feel it necessary to mix up the hierarchy and composition of their elites if they perceive they are losing their grip on power. Such is the case of Mussolini's oft-cited "changing the guard" strategy of shuffling the posts of his top cabinet members when he felt any one of them was gaining too much support and power within either the elite or the mass public.[4]

A classic debate on how to handle the elite arises from Machiavelli's advice in satisfying the "most powerful classes" while maintaining the throne. One sure-fire challenge to the perceived strength of a regime is economic recession and fiscal instability. But in these situations of crisis, scholars do not agree on which strategy dictators will pursue in managing their elites. In particular, two theories have emerged on elite dynamics in dictatorships.

A dictator's interest is to survive. How one does this depends on how relationships with the ruled and other rulers develop. As Milan Svolik notes, politics of authoritarian regimes involves two fundamental relationships—the relationship between the rulers and the ruled (or what he calls the "problem of authoritarian control") and the relationship between the dictator and the other members of the "winning coalition" (or

the "problem of authoritarian power-sharing").[5] Our focus in this paper is on the latter relationship. How has Kim Jong-un's relationship with other members of the "winning coalition" evolved since 2012?

There are three general contending perspectives often discussed in the extant literature as to what constitutes the "best" strategies that a dictator can adopt vis-a-vis other members of the winning coalition. First is the "elite shuffle," which involves the moving of subordinates in and out of office as a survival technique used by rulers. This strategy was exemplified by Mobutu of Zaire, whose ruling style was described as a "musical chairs system of government".[6] Such a strategy helps to ward off potential rivals, by creating uncertainty within the elite and preventing them from establishing bases within the administration from which they may reduce the dictator's influence, or even worse, attempt removal from power. By creating uncertainty the dictator can prevent the development of regime insiders who could otherwise threaten the autocrat's control of the state. Further, by periodically purging "key administrators or military commanders" this publicly signals "the dictator's independence from his administrators".[7] This strategy is summarized by Bueno De Mesquita and Smith when they provide the following "advice":

> Rotate them [the officials] around in different positions, pit them against each other, fire them and re-hire them in other roles. Place them in position where they are unqualified and won't be able to produce results…Anyone who becomes a threat must be removed…But this implies a lot of staff turnover. Who cares? People are cheap and abundant.[8]

A second perspective, which is a variation of the "elite shuffle" strategy and also designed to keep potential rivals off balance, is the "purge strategy" of physically removing potential adversaries. Machiavelli perceived the value of violence as an instrument of power building: physical elimination of political rivals and removal of others capable of ruling help secure the position of the Prince.[9]

In the modern era purges have been used to great effect by new dictators attempting to consolidate power. Purges, which involve the removal of other elites through violence, represent both a way to permanently remove potential elite challengers, but also helps create a fear to dissuade others from considering actions against the dictator.[10] Stalin, for example, used the Great Purges to cleanse the Soviet elites of any potential challengers to his authority in the 1930s and replaced the old revolutionary elite with a new generation of elites (which included Khrushchev and Brezhnev).[11] Further, Saddam Hussein executed most members of the revolutionary elite that had accompanied him to power in 1979, including some of his closest associates, who had staged the revolt of 1979 and replaced them with more dependent supporters.[12] However, as Bove and Rivera point out, elite repression can be generally counterproductive for the survival of autocrats if repression is seen by other elites as "unfair or even unpredictable, they are more likely to consider their safety at high risk and hence will be more prone to lead or support a plot against the dictator."[13] Thus the purge strategy carries with it a considerable amount of risk for a dictator.

Another very different strategy is "cooptation".[14] This perspective contends that autocrats create formal institutions – such as single parties – to credibly share power and

revenue with other members of the winning coalition and at times with opposition leaders.[15] This work focuses on the process of "power sharing" where the autocrat seeks to accommodate potential challengers by providing them with access to office and authority. A cooptation strategy thus often involves the use of government resources, which are offered up strategically to potential elite challengers as concessions, thus providing them with them a vested stake in the survival of the regime.[16] This also facilitates monitoring of potential opponents ("keeping your enemies close").[17] In this sense, then, cooptation is seen as an important strategy in building authoritarian stability.[18]

Although a "menu of choices" for dictators, these strategies should not be seen as mutually exclusive propositions. Leaders can use each of these strategies, often in combination, to effectively consolidate power and authority. Further these strategies may vary over time, given new circumstances facing the dictator.[19]

What affects the choice of strategy? As much of the literature on the behavior of chief executives generally suggests, the strategies used by leaders can be a function of the characteristics of the leader as an agent, or as a response to changes in the social, political, and economic environment. How leaders behave relative to other political actors are not only a function of the personality and traits of leaders, including their ethical and cultural characters but also the societal or organizational context in which the leader-follower interaction occurs.[20] Indeed, as Joseph Nye points out, to understand, explain and predict patterns of political leadership, scholars need to analyze the beliefs, values, characters, power relations, and ethical/unethical values, attitudes and actions of leaders and followers, as well as historical situations.[21] Thus, the nature and urgency of

the issues facing leaders also impacts the survival strategy chosen. For instance, in times of crisis, leaders often engage in the "elite shuffle" to find a "fall guy" for policy failures, and to signal that policy changes are being pursued to meet the crisis.

However, beyond idiosyncratic personality characteristics and structural conditions facing leaders, an additional important factor that may impact the choice of strategy is the extent to which leaders have already completed the process of power consolidation prior to ascending to power. As George Breslauer noted in his landmark study of Soviet leaders, leaders engage in two related processes upon coming to power: power consolidation and authority building.[22] Power consolidation involves building the leader's power base through the recruitment of loyal associates. Through this process the leader creates a loyal client network on which she can rely for support as leverage in political competition with other elites. Often partial power consolidation occurred prior to ascending to leadership, as leaders cultivated connections with other Soviet elites in order to ascend to power in the first place. For Breslauer, leaders that were more secure in their position were likely to use cooptation strategies once in office (such as Brezhnev), as compared to those that were less secure and perceived themselves to be surrounded by potentially existential threats (such as Khrushchev).

The leadership strategies identified above are all effectively part of the power consolidation process, where the leader seeks to make other elites dependent on them. However, the elite shuffle presumes that a leader has already developed a network of somewhat reliable and dependent associates (indeed the elite shuffle is a strategy that seeks to stave off the possibility of other elites becoming *independent*). Cooptation can be used to make independent elites dependent on the leader, but it presupposes that the

leader has the resources to reward potential followers (meaning that the leader has already built up a power base). Purges, on the other hand, are a tactic used by leaders that are insecure in the power consolidation process, and are challenged by other elites who may have independent power bases apart from the leader. Purges are thus the product of leaders who do not have a well-developed network of associates.

The above literature suggests three hypotheses regarding leadership strategies in North Korea with regard to on-the-spot-guidance attendance. The first is the "shuffling" strategy which involves the movement of elites from one job to another. This would suggest that the members of the elite remain the same, but they switch official positions. The second is the "purging" strategy, in which the number of attendees decreases over time and/or are replaced by others. The third strategy, "cooptation," suggests an increase in the number of attendees.

Although conceptually the strategy of shuffling and purging are certainly different actions, they are more similar to each other than they are to cooptation. First, as we noted above, we believe that shuffling and purging are due to the same root cause—leader insecurity. Shuffling keeps potential threatening opponents off balance, whereas purging removes the threat altogether. These are very different from the strategy of cooptation. Although cooptation may also be a product of insecurity, the leader feels secure enough in their position that providing some access to power (which is what coopation involves) to potential opponents is not an existential threat to the leader's position (and may enhance power).

Further, it should be noted that to empirically distinguish between shuffling and purging, we would need to know whether participants in guidance inspections actually

switch positions or disappear. This would require detailed career data for all participants in inspection tours; although some career data does exist (produced by the Korean Institute for National Unification) they are limited to a fraction of the elites listed in inspection tours.

However, one indicator that may distinguish between shuffling and purge strategies is to examine the size of the "winning coalition," which we define loosely as the size of the group who appears with Kim Jong-un. Given the leader-centric nature of the North Korean system, appearing with the "Brilliant Leader" is a clear indicator that that particular member of the elite is in favor. Departures would indicate that the individual is out of favor with the leader. Unlike shuffling, purges often result in the sudden departure of an elite member, who may be replaced later, but are at least initially removed. Thus, we would expect that in a purge strategy, entourage size should shrink quickly, whereas shuffling would be indicated by entourage size remaining the same and turnover within the entourage. In contrast, cooptation is indicated by both entourage size and composition increasing. Thus, examining the winning coalition as indicated by the size and composition of the entourage is a potential "second-best" proxy indicator to assess whether the "Brilliant Leader" employed a purge, shuffle, or cooptation strategy.

3. Comparing the Transitions of Kim Jong-il and Kim Jong-un

In many ways the leadership transitions from Kim Il-sung to Kim Jong-il in 1994 and from Kim Jong-il and Kim Jong-un in 2011 were quite different, both in terms of the domestic crises and international challenges facing the regime. In the case of the transition in 1994, Kim Il-sung's death shook the system to its core—a system that had

been entirely built around his cult of personality. His death in 1994 also occurred during a time of great crisis for the regime. Internationally, the collapse of the USSR had created great economic hardships for North Korea in the 1990s, as the regime had depended heavily on the Soviet Union for fuel subsidies and markets for its products. The demise of the Soviet Union deprived the North Korean state access to cheap fuel, leading to the rapid shrinkage of the economy, which some estimated at 5% annual decline in gross national product from 1990- 1997.[23] Ultimately, the economic downturn, coupled with a series of poor harvests, resulted in the great famine of the late 1990s in which thousands of North Koreans died of starvation and the collapse of the economy.[24]

Thus, the new leader Kim Jong-il was faced with an extreme systemic crisis upon his ascendency to power, where there was the real and imminent question of regime survival. However, Kim Jong-il had spent many years consolidating his hold on power prior to his father's death in 1994. As several scholars have noted, the process by which Kim Jong-un was groomed to succeed his father Kim Il-sung began as early as the 1970s.[25] Kim Jong-il spent many years from the 1970s on building a support base within the Korean Workers' Party and, later, in the military. Although he had been referred to as the "party center" in official publications, Kim Jong-il had his official "coming out" party at the Sixth Party Congress in October 1980, when he was named to senior posts in the Party's Presidium, the Central Military Commission, and Party Secretariat.[26] It was at this time Kim Jong-il assumed the titles of "Dear Leader" second only to his father the "Great Leader." After consolidating his control over the party, Kim Jong-il, with the encouragement of his father, established a power base in the military as well. The effort to extend Kim Jong-il's influence in the military (despite the fact he himself lacked

military service) was led by the then Defense Minister Oh Jing-wu, one of Kim Il- sung's most trusted subordinates.[27] This effort culminated in his being named Supreme Commander of the Korean Peoples on December 24, 1991, and then named to be in charge of all internal security affairs in 1992.

After his ascendency to power Kim Jong-il engaged in a strategy to further consolidate his power, via the 'honor-power' system.[28] This practice involved retaining senior officials from his father's regime in honorary positions, but real power was passed to their 'subordinates' in the various ministries and military commands. In this way Kim Jong-il engaged in more of a cooptation strategy to deal with the crisis facing the regime in the 1990s.

The transition from Kim Jong-il to Kim Jong-un was remarkably different. Although the new leader Kim Jong-un also faced economic and international challenges, these did not rise to the same systemic crises that had faced the leadership transition in the 1990s. In many ways the North Korean economy had stabilized, in part because of the benefits of the "Sunshine Policy" of South Korea under President Kim Dae Jung and his successor Roh Moo-hyun, which led to significant investment in the North. Further, some limited reforms were introduced in the early 2000's to liberalize aspects of the economy and to develop "gray markets" in the cities of the North. As a result, the Seoul-based Bank of Korea estimated that the North Korean economy experienced significant growth from 2000-2006.[29] However, growing tensions with the South in 2006, and the election of hardliner Lee Myung Bak as South Korean president, led to a curtailing of FDI and the suspension of aid shipments to the North. This in turn contributed to the contraction of the North Korean economy from 2006-2010, although the contraction did

not approximate the declines of the 1990s.[30]

Thus, in many ways, the challenges facing Kim Jong-un were different than those that faced his father in 1994. Unlike Kim Jong-il, who had been groomed by Kim Il-sung as a successor at least since the 1970s, Kim Jong-un was the little known third son. Kim Jong-il had not prepared any of his children for the mantle of leadership, although for a brief time it was expected that his eldest son, Kim Jong-nam would succeed him—at least until the Japanese Disneyland debacle in 2001, which led to his fall from favor.[31] Kim Jong-un was only mentioned in 2009 as a possible successor to Kim Jong-il—who had suffered a stroke in 2008—and had held no official positions until his ascendency to a mid-level position in the National Defense Commission in late 2009. After this he was quickly promoted and ascended to the position of Supreme Leader upon his father's death in December 2011.

Unlike his father, who had developed a network of allies and supporters in both the army and the party, Kim Jong-un had very little in the way of established ties with other North Korean elites. Since ascending the mantle of leadership, Kim Jong-un has faced numerous challenges, both within the regime and from without, including numerous foreign policy challenges facing the regime as the result of continued tensions with the South and the United States. Many observers suggest that Kim Jong-un has had great difficulty in consolidating power since his ascendance to power: there have even been numerous challenges to his authority (either perceived or real) which has led to his frequent purging of those who were senior officials in his father's regime, most notably the execution of his uncle Jong Song-thaek and the assassination of his half-brother Kim Jong-nam.[32]

So how does Kim Jong-un's strategy for building authority compare to that of his father, after his accession to power following the death of Kim Il-sung in 1994 and the subsequent economic and political crisis of the 1990s? As Ishiyama, and Haggard Herman and Ryu, suggest, one way to think about the extent to which relationships between the autocrat and the winning coalition change is reflected by two dimensions: the size of the winning coalition and the degree to which there is volatility in its composition.[33] If the coalition grows larger, then this might indicate the use of an accommodationist strategy. If the winning coalition grows smaller, this may suggest more removals and hence may indicate a purge strategy. However, more volatility in the winning coalition (with the size staying the same) may indicate a shuffle strategy.

4. Assessing elite dynamics in North Korea under Kim Jong-un

Both the size and the composition of the inner elite in North Korea are difficult to assess with conventional approaches used in studies of authoritarian power-sharing. Ethnographic work and field-based research is challenging given the harsh environment for scholars working within the state, leaving our understanding of North Korean politics to observation from the outside. Similarly, statistical analysis is impeded by the lack of data on even the most basic indicators so commonly available in other authoritarian contexts. Systematic information is deficient, for instance, on changes in cabinet composition, legislative and subnational elections or appointments, political imprisonments, and reliable socio-economic indicators such as GDP, unemployment, life expectancy, and literacy; indeed these are typically gathered from third party sources in the South rather than from reports from the North Korean government.[34]

4.1. Data

While we cannot solve the former problem, we can use novel techniques to assess the size and composition of Kim Jong-un's elite by parsing state-run newspaper reports about his political visits across North Korea. We then code these visits into a relational dataset that measures the frequency with which elites co-appear at these political events. By looking at how this network evolves over time, we can assess changes in the size and composition of the regime's winning coalition—and ultimately, whether Kim Jong-un's strategy in retaining power has been one of shuffle, purge, or cooptation.

4.1.1. Network data as repeated co-occurrences

There are a variety of methods to collect network data in political contexts. The primary variable of interest is the existence and/or intensity of social ties between individuals. In studying legislators, scholars often use text analysis to parse laws and legislative reports to assemble network data based on attributes such as voting patterns, co-membership in party lists, and sources of campaign donations.[35] Similar approaches are used to create networks beyond legislators, such as parsing promotion patterns and bureaucratic co-occurrences of Chinese Communist Party officials[36] and analyzing court case citations for judges in the European Court of Human Rights.[37] Scholars also use interview and archival methods to gather relational data on interactions between individuals. An example from the study of authoritarian politics is work by Choucair-Vizoso on elite coalitional stability using network data gathered based on interviews with former elites in Iraq and Syria.[38]

None of these approaches is applicable here given inherent challenges to identifying such behavioral information in North Korea. Instead we draw on the method of measuring social ties using co-appearances at public events. Here, ties are inferred based on the frequency with which people interact in public to assemble one manifestation of what is generally referred to as an "affiliation network".[39] We use one-mode affiliation networks in particular—where the unit of analysis is the individual, as opposed to both the individual and the event—given that our focus is the frequency with which pairs of individuals co-occur and not the events at which they occur.[40]

Affiliation networks have long been studied in sociology, starting with the Davis et al. network study on the social activities of women in the Southern U.S.[41] Here, the authors collected network data through the use of newspapers and interviews to record how often the subjects attended the same social events. Affiliation networks are less common in the context of political networks. Notable exceptions include Desmarais et al. who apply this approach to capture ties among U.S. senators occurring together at press events,[42] while Mahdavi uses public co-occurrences reported by newspapers to measure ties among and between the Nigerian oil elite and presidents Jonathan and Buhari. [43]

One-mode affiliation networks may also be particularly well suited to studying elite dynamics in authoritarian contexts. Being seen with the dictator in public is a signal of closeness with the regime, while changes in the frequency of public appearances in the regime entourage are symptomatic of changes in the relationships between the dictator and his elites. In opaque and isolated dictatorships, it may be difficult for outsiders to assess the information given by the official positions, titles, and functions of elites compared to their actual behavior and standing within the regime.

In North Korea in particular, scholars have ascertained the composition of elites and their access to the great leader by examining public appearances with him—whether it be Kim Il-sung, Kim Jong-il, or Kim Jong-un—in "inspection tours" or visits.[44] These visits began with Kim Il-sung's "on-the-spot guidance" tours of agricultural and industrial sites to impart practical wisdom on management and performance instead of relying on abstract Marxist slogans and directives. While anyone within the regime could perform these visits, the highest honor was in receiving guidance from the great leader himself, accompanied by high-ranking party officials and members of the inner circle.[45]

Both Kim Jong-il and Kim Jong-un continued this practice, although the spontaneity or "on-the-spot" nature of visits gave way to planned and calculated inspections which allowed the subject of these visits ample time to prepare before the arrival of party officials. Guidance visits were often targeted to sectors of high political importance (such as defense, education, health, and agriculture) and became the basis of policy priorities. These visits continue to be carefully choreographed, still considered a great honor, and are not seen as a "punishment" for poor performance but rather as a reward for "model" units.[46] As such, we draw on these visits to provide insights, albeit informally and indirectly, on the size and composition of the dictator's elite circle.

4.1.2. On the use of web-scraping tools to collect relational data

Following Lee et al, and Mahdavi, we use web-scraping tools to gather information on the co-occurrence of elites at these inspection visits by parsing through news reports published online.[47] We initially scrape all daily reports in English from the KCNA website from January 2012 to June 2015.[48] The endpoint is the latest available date that

the website could still be accessed without a South Korean "mirror."[49] We then identify any report that provides information on an inspection visit using keyword stems associated with these events.[50] We subsequently verify each report manually to ensure that each is indeed reporting on an inspection visit by Kim Jong-un; this step yields a total of 303 reports. Using a list of 88 elites within the regime at the end of 2011 based on Ishiyama and from NK News (at https://www.nknews.org/pro/nk-leadership-tracker/) we identify both the events each individual attended with the great leader and the frequency of co-occurrences with any other elites at each event.[51] The latter results in an 88-row by 88-column matrix (for each time period) where each cell provides the number of inspection visits at which individual *i* and individual *j* appeared together. We then convert these *socio-matrices* into dynamic network data to assess how the structure of the network evolved over time.

4.2. Analysis

To provide some comparative context to our analysis of the Kim Jong-un period, it is important to identify patterns that were exhibited in co-appearances under Kim Jong-il. Previous studies of the composition of entourages that accompanied Kim Jong-il on inspection tours indicated that from 1997 to 2009 (roughly the period of the "Great Famine" to his first suspected stroke) entourage sizes were quite large, averaging 6.78 members.[52] In addition, there was a greater inclusion of "pragmatists" as opposed to the hardliners (who had been predominant during the "Great Famine" period).[53] Expansion of the number included in entourages, coupled with inclusion of new elites, suggests that Kim Jong-il pursued a cooptation strategy from 1997-2009. However, from 2009-2011,

not only did the frequency of inspection visits decline, but the number accompanying the "Dear Leader" declined to 4.61 individuals (largely due to Kim Jong-il's declining health).

For the Kim Jong-un period, table 1 provides a breakdown of network summary statistics for each year in the sample, including the first half of 2015. Interestingly, Kim Jong-un increased the number of inspection visits compared to 2012. Over the same time frame, the number of co-occurrences declined slightly from 2012 to 2013 and then dramatically from 2013 to 2014. In other words, although the opportunity for increased interaction with Kim Jong-un rose from his first year in power onwards, the number of elites appearing with the leader shrank markedly over time from 41 in 2012 to 25 in 2014, a 39 percent reduction in the size of his winning coalition as measured by public co-appearances.

The composition of the winning coalition shrank over time as well. This would suggest that individuals were removed, but not replaced in entourages—suggesting evidence of purging rather shuffling. A simple metric to capture this change is the average number of co-occurrences between a given member of the elite and other elites (also captured by network density[54]). This average dropped from 12.0 in 2012 to 0.7 in 2015, with the clearest shift in composition happening from 2013 to 2014 (Appendix Figure 3 provides the full distribution). In aggregate, a lower median count reflects a sparser network, meaning that inspection visits are typically made up of a minimal group of elite traveling with Kim Jong-un. A higher count, in contrast, indicates that these visits are attended by most of the elite in a given year. While none of the networks exhibits high density—the maximum observed count across all networks is 40, or 45% of the

maximum possible count—it is clear that the composition of Kim Jong-un's visitations are becoming sparser and sparser over time. Indeed, the number of isolates (elites with no ties at all) rises from 47 in 2012 to 63 in 2014, such that 16 of the elites with ties in the 2012 network are no longer connected to any individuals by 2014.

Two alternate metrics for composition are the average number of elites attending each inspection visit and the average number of visits per elite. These metrics also show a tightening of the network, as fewer elites are traveling with Kim Jong-un over time—from roughly 6 elites in 2012 to 3 elites in 2014 and 2015—while the frequency of co-occurring with the leader increases over time. This was considerably lower than 5 elites on average who accompanied his father, Kim Jong-il. Since the number of overall visits fluctuates each year, we show that the percentage of total visits per year attended by the average elite increases from 13.9% in 2012 to 32.3% in the first half of 2015. One reason for this structural change is the drop-off in the average number of co-attendees at each inspection visit with which an individual will appear. In 2012, a given elite member co-appears with about 11 other elites at a typical (median) inspection visit, but by 2014 and 2015 this falls to 5 co-attendees and 3 co-attendees respectively (see Appendix Figure 9). Thus, the shrinking size and composition of entourages accompanying Kim Jong-un suggests further evidence of his use of the purge strategy.

4.2.1 Visualizing the elite network

To provide a comprehensive sense of the changing size and composition of the winning coalition based on inspection visit co-occurrences, we visualize the networks in Figure 1 for each year in the data (Appendix Figure 4 further disaggregates this by quarter). Each

individual elite is represented by a node with curved lines between nodes indicating a tie between two individuals; the darker and wider the curved line, the more frequently two individuals appear at inspection visits together. The layout algorithm places individuals with more ties closer together, although the distances between individuals does not have any specific meaning.[55]

What is striking about the figure is the dramatic change in network density and composition from 2012 to 2015 and the gradual withering of the network from 2012 to 2013. Not only does the network shrink in terms of the number of connected individuals, but also in the intensity of ties within the dense cluster surrounding Kim Jong-un – as visualized by the lack of darker, wider lines between nodes in 2014 and 2015 when compared to 2012 and 2013.

We graph only the 2012 and 2014 networks with labels in Figure 2, with isolates in each case dropped for ease of visualization (Appendix Figure 5 shows the labeled network for 2015). The shape of the network in 2012 is not uncommon from what we would expect in a single-party dictatorship.[56] Namely, we see a cluster of individuals surrounding the leader who are tied with each other, with only a few others tied either only to Kim Jong-un or to the leader and a handful of other influential insiders. We also see dense clustering not only around Kim Jong-un but also around top commanders in 2012, such as Choe Ryong-hae (who fell out of favor in 2014), Pak To-chun (former secretary of the Workers' Party), and Kim Jong-gak (former defense minister; fell out of favor in 2013). This kind of dense clustering indicates the presence of more than one key central actor in the network, reflecting inspection visits that encompass several of the same elites over the course of the year.[57] For instance, the top four actors in the network

in terms of centrality held 14% of all co-occurrences in the network—illustrative of a network not dominated by any one individual.

This pattern disappears in 2014, with clustering more symptomatic of a highly ego-centric network. Here, Kim Jong-un and (up until mid-2014) Choe Ryong-hae are starkly in the center of the network with all others appearing less frequently with other members of the elite throughout the year. Most ties (and the intensity of ties) are directed towards the center, with relatively fewer ties in the periphery and across the network. In 2014, the top four actors held 26% of all co-occurrences, almost double that of 2012. In this case, many of the inspection visits throughout 2014 were composed of different groups of elites—with few opportunities for the same group of elites to interact with one another over the course of the year. This kind of pattern would be expected in a highly personalist dictatorship.[58] Of course, greater clustering in 2014 to 2012 could simply arise due to the decline in network size over time. Looking instead at ties as a share of total ties in each period, we see the same pattern: in 2012, half of all ties in the network were held by the top 27% of elites while in 2014, half of all ties were held by only the top 13% of elites (see Appendix Figure 8).

The 2014 network also highlights the paucity of elites from Kim Jong-il's regime (based on his inspection visits during 2009-2011[59]) in Kim Jong-un's inner circle. Party members who appeared with Kim Jong-un in 2012 and who were also in his father's inner circle—such as Hyon Chol-hae, Kim Kyong-hui, Ri Myong-su, and Ri Yong-mu—are notably absent from the group of elites attending inspection visits just two years later. While some of these elites have simply been removed from power via replacement, others have been executed. It is believed, for example, that General Kim Kyong-hui, the

daughter of Kim Il-sung and the aunt of Kim Jong-un, has been either imprisoned, poisoned, or exiled after the execution of her husband Jang Sung-taek for charges of treason in 2013.[60]

There are still some remnants of his father's entourage in 2014. However, those who have remained, such as Pak To-chun, Kim Yang-gon, and Kim Yong-chun, are on the periphery of the network and rarely appeared alongside the great leader in his inspection visits. Kim Yong-chun, who was once Vice Marshall and Minister of the Armed Forces, attended only one visit with Kim Jong-un in 2014. Kim Yang-gon, once head of relations with South Korea and a key member of Kim Jong-il's party, appeared at only two inspection visits in 2014 after attending at 10 in 2012 and 8 in 2013. Indeed his absence at inspection visits foreshadowed his falling out with the great leader in 2015 and, possibly, his sudden death in December 2015.[61]

4.2.1 Modeling the dynamic network

While these summaries and visual comparisons offer important insights into the changes in the size and makeup of the network, we turn to a more systematic approach to uncover the dynamic patterns underlying the changing composition of the winning coalition. To do so, we employ a dynamic network model and treat the network as one structure over time instead of multiple independent networks. We draw on the separable temporal exponential-family random graph model (STERGM) as generalized by Krivitsky and Handcock.[62]

The STERGM approach views the network dynamically in terms of actors making decisions on whether to form, maintain, or dissolve ties with other actors in the

network. It models the formation and dissolution of ties separately but within a unified framework for the same set of actors over the entire time period.[63] The dichotomy within the model is based on the assumption that the social processes that result in actors forming ties are different from the social factors that result in these ties being dissolved. This model is a good fit for elite coalition dynamics: we intuitively expect that the reasons for an elite member's inclusion in the network, such as ties with the previous regime, social status, and wealth, will be different than the reasons for expulsion from the inner circle, such as a change in support for the leader or perceptions of challenging the leader for authority. By modeling these processes separately, we can observe and estimate structural patterns in how the network changes over time.

Table 2 shows the results from a STERGM analysis of the three full calendar years in our sample, with substantively similar results from a quarterly analysis from January 2012 to June 2015 presented in Appendix Table 3. Results are split into two columns. The first column provides estimates of network statistics on the formation model, which gives the probability that a tie will form between two individuals in the network. The second column provides estimates of the dissolution model, which gives the probability that individuals who are tied in the previous network (at time t - 1) will retain their ties in the current network (at time t). While the models are estimated simultaneously, they can contain different parameters. For our model, we try a basic specification where the probability of tie formation between two individuals at time t is given by the density of the network at t - 1 (captured by the *edges* term) and whether the two individuals are mutually connected to at least one other individual in the network (captured by the *triangle* term). The positive coefficient on the latter term indicates that

elites in the 2012 network, for example, are more likely to form ties in the 2013 network with other elites if they are tied to a mutual contact. The coefficients are given as conditional log-odds, so the 0.195 estimate implies that elites tied to a mutual contact are 21.3% more likely to be tied to one another in the future than elites who do not share a mutual contact.

For our dissolution model, we include both the *edges* and *triangle* terms and add a metric to capture the effect of popularity on the dissolution of ties. The difference in the *edges* coefficients across models is a reflection of what we observed in Table 1, that the average degree is declining over time. The *concurrent* term adds a network statistic to the model equal to the number of individuals in the model with more than two co-occurrences at inspection visits. The negative coefficient on this term implies that individuals who have attended more than two inspection visits in the past year are extremely unlikely (only 3% likely) to attend an inspection visit in the current year. We obtain similar results when using more conventional models, such as OLS and Poisson, on the relationship between current visits and past visits (Appendix Table 4).

The *triangle* coefficient is similar in magnitude when compared to the formation model, indicating that individuals who are tied not only to each other but also to a mutual contact are likely to retain that tie in future time periods. Note that since we are using an egocentric network, this interpretation is primarily meaningful for closed triangles. If two elites tied to Kim Jong-un are also tied to one another—i.e., they co-occur at the same events—then they are likely to continue co-occurring with one another in the future.

4.3. Discussion of results

While not as intuitive to interpret as conventional regression models, the STERGM framework does allow us to estimate the differences in how ties form and dissolve in a comprehensive context. What we can infer from these models is that Kim Jong-un is replacing members of his elite who were previously tight with the regime (measured as the number of co-occurrences in a prior year) with individuals who were largely peripheral (having attended two or fewer inspection visits in a prior year). Further, the models confirm what we observed using summaries and visualizations: both the size and the composition of the inner elite are shrinking over time. Kim Jong-un not only severed ties with elites entirely but also traveled with fewer elites in each inspection visit. These results point markedly towards a purge strategy, with almost no evidence of cooptation even with those individuals who remain within his inner circle, nor of shuffling given the decline in the size and density of the winning coalition. This pattern is discernible using conventional approaches as well: modeling the duration of inclusion in the winning coalition using a Kaplan-Meier survival framework on the elite network when Kim Jong-un first took power in December 2011 shows a dramatic drop in survival probability from 46.6% in 2012 to 5.7% in 2014 (Appendix Figure 7).

What might explain these patterns, particularly the fairly large changes in the elite networks from 2013-14? And what might explain the move towards the purge strategy employed by Kim Jong-un as opposed to the cooptation strategy that was used by his father? As to the first issue, changes in the composition of the network coincided with the major purges of senior officials in the regime, particularly marked by the removal and execution of Jang Song Thaek (and the subsequent purge of many of his followers) but also the reported removal or marginalization of a number of other key senior figures who

were part of the transitional leadership after the death of Kim Jong-il.[64] As long-time North Korea watcher Michael Madden observed:

> Those guys were an amount of window dressing for Kim Jong-un. They were there at the funeral so they could be seen to be regarding him as highly as they did his father. The group were around to make sure the elites respected the transition of power….It was like learning to ride a bike for Kim - now he's consolidated enough power he doesn't need that training.[65]

Thus a "thinning out" of the elite networks can be seen as part of the power consolidation strategy by Kim Jong-un.

Then what explains the difference in strategies used by Kim Jong-un versus his father? First, there is the possibility that, as mentioned above, a leader may engage in the elite shuffle (or in the case of Kim Jong-un, purges) in response to external pressures to create "fall guys" for policy failures. Clearly the period between 2013-2015 saw growing tensions with the West (and questionable progress on the development of nuclear weapons and numerous failed ballistic missile tests). To some extent these could be seen as policy failures, but this is unlikely given the trumpeting of success of the nuclear program in Pyongyang, despite these setbacks. Further, although economic growth was slow between 2012-2014 (with GDP growth in North Korea estimated at about 1.1% on average per year) it was not nearly the catastrophe that had faced Kim Jong-il in the 1990s.[66] Thus it is unlikely that "crisis" explains Kim Jong-un's use of the purge strategy.

The second explanation focuses more on the characteristic of the "leader as agent." For instance, in his book on Kim Jong-il's North Korea, Song Chull Kim argues

that there were several key features of Kim Jong-il's personality that structured his management style.[67] Using the classic framework developed by James David Barber, Kim argued that Kim Jong-il had an 'active-negative' personality—in other words, the 'Dear Leader' had a compulsion to be very active, and the need to have a structured and ordered hierarchy to exercise the maximum of control and the desire to manage even the smallest details. On the other hand, his level of activity was personally unsatisfying, and he had a generally negative attitude towards the world around him, seeing constant threats to his person and position. This resulted, according to Kim, in Kim Jong-il's preference for a mix of formalistic and competitive models. On the one hand, Kim controlled the institutions of the state separately and depended on hierarchical bureaucratic mechanisms, but he consistently promoted competition between individuals around him (partially as a way to 'divide-and-rule' and thereby neutralizing potential future threats).[68] However this meant that he preferred to coopt as many different points of view around him and to keeping his enemies or potential enemies close. Because he had developed stable connections with many North Korean elites during his time being groomed to succeed his father, Kim Jong-il was able to find success using this strategy.

Although we know very little about the personality or management style of Kim Jong-un, we do know that the characteristics of the transition that led to his ascendency to power were very different when compared to his father's experiences. Unlike his father, Kim Jong-un was not groomed to fill the mantle of leadership for nearly 20 years. He lacked the administrative and political experience of his father prior to becoming Supreme Leader. Presumably, he also failed to develop the extensive interpersonal networks that his father had, and initially had little choice but to depend on other, more

senior members of the elite for "guidance" (his uncle Jang Song-taek being a prime example). At first, Kim Jong-un's position as a newly established leader was quite tenuous and far less secure than his father's. Thus once he had firmly established the formal bases of power, by assuming all of the offices held by his father by the end of 2012, he followed the pattern of many other dictators who sought to purge key administrators or military commanders to publicly signal his independence and remove potential challengers to his power.[69] Unlike his father, who had developed an extensive network of reliable associates prior to ascending to power, Kim Jong-un did not have such a luxury. However, is this strategy permanent, or does it pave the way for more cooptation later? This is certainly a possibility—Kim Jong-il, once coopting the old elite, did engage in periodic purges and reassignments later (including the demotion and rehabilitation of his brother in law Jang Song-taek). However, the spate of recent executions of some key members of the elite throughout 2016-17 suggests that the purge strategy has become a fixture of the current regime. But, ultimately, to answer this question definitively, we must await the collection of new data on Kim Jong-un's behavior as he further hones and develops his strategy of rule in the years to come.

Of course this might change, now that Kim Jong-un's regime has been bolstered by his recent summit meeting with President Trump in Singapore. This has undoubtedly boosted his standing within the North Korean elite. He has been able to accomplish what his father's regime has sought for years—a face to face bilateral meeting with a very high-ranking US official. To be able to meet with the President of the United States is an enormous boost for the legitimacy of the DPRK, and to accomplish this without surrendering the nuclear weapons which ensures the survival of the regime is a major

coup for Kim Jong-un. How this affects his leadership strategy remains to be seen, but we believe that there will be a shift away from the purge strategy as Kim Jong-un becomes more secure in his position.

5. Conclusion

Our analytical results using web-scraped social network data are largely in line with anecdotal evidence and journalistic accounts about the dynamics of Kim Jong-un's inner elite. Since his first year in power, reports have indicated that he has effectively purged his council of many of his father's closest advisors and commanders. We have been able to extend this description to show that not only is Kim Jong-un expelling elites and shrinking his winning coalition, but that he is also weakening his ties to those who remain in his inner circle. The elite purge strategy that the great leader has pursued since taking power in December 2011 after the death of his father has led to an unstable and sparse network of core allies and inner elites.

These patterns are more illustrative of highly personalist dictatorships than of the single-party regimes common in other communist and post-communist countries. Indeed, our analysis highlights elite dynamics that we might expect to see in historical contexts such as Mobutu's Zaire and Qaddafi's Libya, or in the current dictatorships of Nursultan Nazarbayev in Kazakhstan, Emomali Rakhmon in Tajikstan, or Ilham Aliyev in Azerbaijan. As such, our findings suggest that North Korea can indeed be fruitfully examined as a case using theoretical literature developed from other authoritarian regimes, with one wrinkle: that the best comparisons may be with geographically distant

personalist dictatorships in the post-communist states rather than with the often-assumed analogous communist single-party regimes of Cambodia, China, Laos, and Vietnam.

The above also suggests several paths for future research on North Korean politics using network analysis. One example is to examine career paths of members of the elite and how those paths were affected by network connections. Do the patterns of ties between specific individuals (clustering) predict who gets purged or who succeeds, and will that change now that the North Korean regime has become more secure in the wake of the Singapore Summit? Still another is to examine whether the external "shock" of the Singapore Summit changes patterns of elite recruitment and dismissal in the DPRK. Recent events certainly have opened up new possibilities in the study of North Korean politics and opportunities to further bring studies of that country into the mainstream of comparative political analysis.

Notes

[1] Nicholas Eberstadt, 2000. "Economic Recovery in the DPRK: Status and Prospect." *International Journal of Korean Studies*, 4:1 (Fall/Winter 2000); Stephan Haggard and Marcus Noland. *Famine in North Korea*. (New York: Columbia University Press, 2007); Marcus Noland. "Famine and reform in North Korea." *Asian Economic Papers*. 3, 2(2004), 1-40; Marcus Noland and Stephan Haggard, *Witness to Transformation: Refugee Insights into North Korea*. (Washington, DC: Peterson Institute for International Economics, 2011).

[2] Arend Lijphart, "Comparative Politics and the Comparative Method" *American Political Science Review* 65,3 (1971) 682-693.

[3] The counter here would be that North Korea cannot be studied comparatively. This could result from network dynamics that exhibit a fully stochastic network evolution such that the probability of formation and dissolution of network ties is completely random; or, an ego-centric network with no alter-alter ties, consisting solely of ties to Kim Jong-un with no ties between actors. There are no existing comparable elite networks in other dictatorships with such structures.

[4] P.H. Lewis,. *Latin Fascist Elites: The Mussolini, Franco, and Salazar Regimes*. (Westport, CT: Praeger, 2002), 23

[5] Milan Svolik, *The Politics of Authoritarian Rule.* (New York: Cambridge University Press 2012), 2.

[6] B. Berkeley, *The Graves Are Not Yet Full*, (New York: Basic Books, 2002), 122.

[7] Svolik, 2012.

[8] Bruce Bueno de Mesquita and Alistair. Smith. *A Dictator's Handbook: Why Bad Behavior is Almost Always Good Politics*. (New York: Public Affairs, 2011). 49.

[9] Nicolo Machiavelli,. *The Prince*. London: Penguin Books, 1532 [2003]). Chapter 17 and 19.

[10] Zbigniew Brzezinski, "The Pattern of Political Purges." *The ANNALS of the American Academy of Political and Social Science* 317, 1 (1958), 79–87; E. Frantz, and N. Ezrow. *The Politics of Dictatorship: Institutions and Outcomes in Authoritarian Regimes*. (Boulder: Lynne Rienner, 2011).

[11] This is the predominant view of most historians of the explanation for the Stalinist purges in the 1930s and in the immediate post World War II period. Jerry Hough and Merle Fainsod, *How the Soviet Union is Governed,* (Cambridge: Harvard University

Press, 1979); Seweryn Bialer *Stalin's Successors: leadership, stability, and change in the Soviet Union.* (New York: Cambridge University Press, 1980. A slightly different revisionist view of Stalin as "coopter" is offered by Sheilah Fitzpatrick *On Stalin's Team: The Years of Living Dangerously in Soviet Politics*. (Princeton: Princeton University Press, 2015).

[12] Frantz and Ezrow, 2011.

[13] V. Bove and M. Rivera. "Elite Co-optation, Repression, and Coups in Autocracies." *International Interactions* 41, 3 (2015), 456.

[14] Daron Acemoglu, James A. Robinson and T. Verdier. "Kleptocracy and Divide-and-Rule: A Model of Personal Rule." *Journal of the European Economic Association* 2, 2(2004),162–192; G. Egorov, and K. Sonin. "Dictators and Their Viziers: Endogenizing the Loyalty-Competence Trade-Off." *Journal of the European Economic Association* 9, 5(2011), 903-930.

[15] Jennifer Gandhi and Adam Przeworski. "Authoritarian Institutions and the Survival of Autocrats." *Comparative Political Studies* 11 (2007), 1279–1301; Beatriz Magaloni. "Credible Power-Sharing and the Longevity of Authoritarian Rule." *Comparative Political Studies* 41, 4 (2008), 715–741; D. Slater. *Ordering Power: Contentious Politics and Authoritarian Leviathans in Southeast Asia.* (New York: Princeton University Press, 2010); Lisa A. Blaydes, *Elections and Distributive Politics in Mubarak's Egypt.* (New York: Cambridge University Press, 2011); Svolik, 2012.

[16] Jennifer Gandhi. *Political Institutions under Dictatorship*. (New York: Cambridge University Press, 2008); Gandhi and Przeworski, 2007; E. Frantz, and A. Kendall-

Taylor. 2014. “A dictator’s toolkit.” *Journal of Peace Research* 51, 3(2014), 332–346.

[17] see Svolik, 2012; Gandhi and Przeworski, 2007.

[18] J. Gerschewski. “The three pillars of stability: legitimation, repression, and co-optation in autocratic regimes.” *Democratization* 20, 1(2013), 13–38; R. Wintrobe. *The Political Economy of Dictatorship*. (New York: Cambridge University Press, 1998).

[19] Bruce Bueno de Mesquita and Alistair Smith. “Leader Survival, Revolutions, and the Nature of Government Finance.” *American Journal of Political Science* 54, (2010), 936–950; Wintrobe 1998.

[20] G. Peele. “Leadership and Politics: A Case for a Closer Relationship?” *Leadership* 1,2(2005),187-204; J. Masciulli, , M. A. Molchanov and W. Andy Knight. *The Ashgate Research Companion to Political Leadership* (London: Ashgate, 2009)

[21] Joseph S. Nye. *The Powers to Lead*. (Oxford: Oxford University Press, 2008).

[22] Georg Breslauer. *Khrushchev And Brezhnev As Leaders: Building Authority In Soviet Politics* (London: George Allen & Unwin, 1982).

[23] Oh and Hassig 1999; for other estimates see Nicholas Eberstadt, *The North Korean Economy: between Crisis and Catastrophe*. *(*New Brunswick: Transaction Publishers, 2007).

[24] Haggard and Noland, 2007.

[25] Sung Chull Kim *North Korea under Kim Jong-il: From Consolidation to Systemic Dissonance*, (Albany: State University of New York Press, 2006); Lim, Jae-Cheon, *Kim Jong-il's Leadership of North Korea* (New York: Routledge, 2009).

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[27] Kim, 2006.

[28] John Ishiyama,. "Elite Volatility and Change in North Korean Politics: 1997–2010." *Journal of Asian and African Studies* 49, 5(2014a), 570-583; J.G. Jeon. "North Korean leadership: Kim Jong-il's intergenerational balancing act". *Third World Quarterly* 21, 5(2000), 761–779.

[29] *GDP Estimates for North Korea in 2014.* Bank of Korea. June 17, 2015. Accessed July 2016 from http://www.nkeconwatch.com/nk-uploads/GDP_of_North_Korea_in_2014_ff.pdf

[30] Ibid.

[31] The incident involved Kim Jong-nam's apprehension when trying to enter Japan using a false Dominican passport to visit Tokyo Disneyland. It was an international embarrassment to the regime, thus drastically reducing Kim Jong-nam's stature.

[32] See for instance Choe Sang-Hun "In Hail of Bullets and Fire, North Korea Killed Official Who Wanted Reform" *New York Times* March 12, 2016 accessed March 27, 2016 from http://www.nytimes.com/2016/03/13/world/asia/north-korea-executions-jang-song-thaek.html; and Choe Sang-hun and Rick Gladstone "Kim Jong-un's Half Brother Is Reported Assassinated in Malaysia" February 14, 2017, accessed July 9, 2017 from https://www.nytimes.com/2017/02/14/world/asia/kim-jong-un-brother-killed-malaysia.html

[33] Ishiyama, 2014a; John Ishiyama,. "Assessing the leadership transition in North Korea: Using network analysis of field inspections, 1997 – 2012." *Communist and Post-*

Communist Studies 47(2014b), 137-146; Stephan Haggard, L. Herman and J. Ryu. "Political Change in North Korea" *Asian Survey* 54,4 (2014).

[34] See note 24.

[35] See James H. Fowler, "Connecting the Congress: A Study of Cosponsorship Networks." *Political Analysis* 14, 4(2006), 456–487.

[36] F. Keller. "Social Network Analysis and the Study of Chinese Elites: A New Approach for Conceptualizing and Measuring Informal Institutions." (2014); F. Keller, "Networks of Power: Using Social Network Analysis to understand who will rule and who is really in charge in the Chinese Communist Party." (2015)

[37] Lupu and Voeten 2012.

[38] J. Choucair-Vizoso,. "Elite Networks and Authoritarian Stability." Paper presented at the 2015 Annual Political Networks Workshop and Conference (2015).

[39] Wasserman and Faust 1975.

[40] The alternative is to use bipartite networks where the units of analysis are individuals and the events which they attend. The choice of one-mode over two-mode affiliation networks is suitable when "the occasions on which people interact (the events) are only important in that they link people" (Wasserman and Faust 1975, p. 307).

[41] Davis 1941.

[42] B.A. Desmarais,, V. G. Moscardelli, B. F. Schaffner, and M. S. Kowal. "Measuring legislative collaboration: The senate press events network." *Social Networks* 40 (2015), 43–54.

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[44] K. Gause, "The North Korean leadership: system dynamics and fault lines." In: Hassig, Kangdan Oh (Ed.), *North Korean Policy Elites*. (Alexandria, VA: Institute for Defense Analysis,2004) pp. II-s1—II-s44; J. Lim,. "The Power Hierarchy: North Korean foreign policy-making process." *East Asian Rev*iew 14, (2002), 89-106; Noland and Haggard 2011; K.D. Lee, S.H, Lim, J.A. Cho, and J.H. Song, *Study on the Power Elite of the Kim Jong-Un Regime* (Seoul: Korea Institute for National Unification, 2013).

[45] S.C. Kim,. *North Korea under Kim Jong-il*. (Albany, NY: State University of New York Press,2006).

[46] Ishiyama 2014b, 139.

[47] Lee et al. 2010; Mahdavi 2017.

[48] We choose calendar year to ensure a consistent comparison over time. Inspection visits do not necessarily follow a pattern and could be subject to seasonal and non-systematic events. For robustness, we use quarters and find the same substantive results; see Appendix Table 3 and Appendix Figure 4. Although we used primarily English Language KCNA reports we do not believe that there were differences between the Korean language and English language reports, especially in terms of the names listed as part of the entourage. A sample of 30 randomly selected reports shows no differences in the names reported in press releases.

[49] As of July 2018, the KCNA website remains directly inaccessible. An alternative is to rely on visitations reported by services such as *KCNAwatch*, *Rodong Sinmun*, or *Uriminzokkiri*. But it is not clear that these sources provide systematic reports on all guidance visits. More importantly for our purposes, these sites do not consistently provide names of individuals traveling with Kim Jong-un at each visit.

[50] Inspection visits are referred to as an "inspection", "on-the-spot guidance" visits, or "instructions" by the great leader. Thus, we use a variety of keyword stems: visit, instruct, inspect, guid.

[51] Ishiyama, 2014b; The 88 elites have been identified by NK news as the top party, state, and military officials in the country.

[52] Ishiyama, 2014b

[53] Ishiyama, 2014a

[54] While average ties and network density are often correlated, it is not necessarily the case that a decline in one corresponds to a decline in the other. A network may become sparser while valued-edge intensity may increase at the same time.

[55] Appendix Figure 5 shows networks with data for full calendar years (2012-14) only.

[56] See the Chinese politburo network in Keller 2014.

[57] This is a pattern also noted by Lee et al. (2013) for Kim Jong-un's first year in power.

[58] See, for example, Josef Woldense. "The Ruler's Game of Musical Chairs: Shuffling during the Reign of Ethiopia's last Emperor." *Social Networks* 52 (2018), 154—66.

[59] Ishiyama, 2014b.

[60] See Paula Hancocks "North Korean leader ordered aunt to be poisoned, defector says" May 12, 2015, accessed April 2, 2016 from http://www.cnn.com/2015/05/11/asia/north-korea-kim-aunt-poisoned/.

[61] K.J. Kwon and Tiffany Ap "Top aide to North Korean leader dies in car crash, state media say" December 31, 2015, accessed April 2, 2016 from http://edition.cnn.com/2015/12/29/world/north-korean-official-kim-yang-gon-dies/.

[62] Pavel N. Krivitsky and Mark S. Handcock. "A Separable Model for Dynamic Networks". *Journal of the Royal Statistical Society*, Series B, 76,1 (2014), 29–46.

[63] Note that we are not adding or removing actors from the network itself, but rather allowing all actors to remain in the network and focus on tie presence as an indicator of inclusion in the regime.

[64] Of the seven men who had stood alongside Kim Jong-un at his father's funeral in 2011, five were purged or disappeared from the public scene by 2015. See Tim McFarlan "Brutally executed, banished or 'disappeared'" *The Daily Mail* May 15 2015, accessed 12 August 2016 from http://www.dailymail.co.uk/news/article-3080427/Brutally-executed-banished-disappeared-grim-fate-North-Korean-officials-purged-Kim-Jong-four-years-acted-pallbearers-father-s-funeral.html#ixzz4GTkTQUZh.

[65] Quoted in Ibid.

[66] *GDP Estimates for North Korea in 2014.*

[67] Kim, 2006, 102-103.

[68] Ibid.

[69] Milan Svolik. "Power-Sharing and Leadership Dynamics in Authoritarian Regimes." *American Journal of Political Science* 53, 2 (2009), 477–494.

Table 1. Summary statistics of the elite network, 2012-2015

	2012	2013	2014	2015*	Change (%) 2012-2014
Number of inspection visits	56	117	108	22	92.9
Total number of elites in sample	88	88	88	88	-
Number of elites tied to Kim Jong-un	41	38	25	10	-39.0
Average number of elites per visit	5.7	3.8	3.4	3.2	-40.4
Average number of visits per elite	7.8	11.7	14.5	7.1	85.9
Average number of visits per elite (percent of total)	13.9	10.0	13.4	32.3	
Average number of co-occurrences per elite	12.0	10.4	3.8	0.7	-68.3
Network density	0.138	0.119	0.044	0.008	-68.1

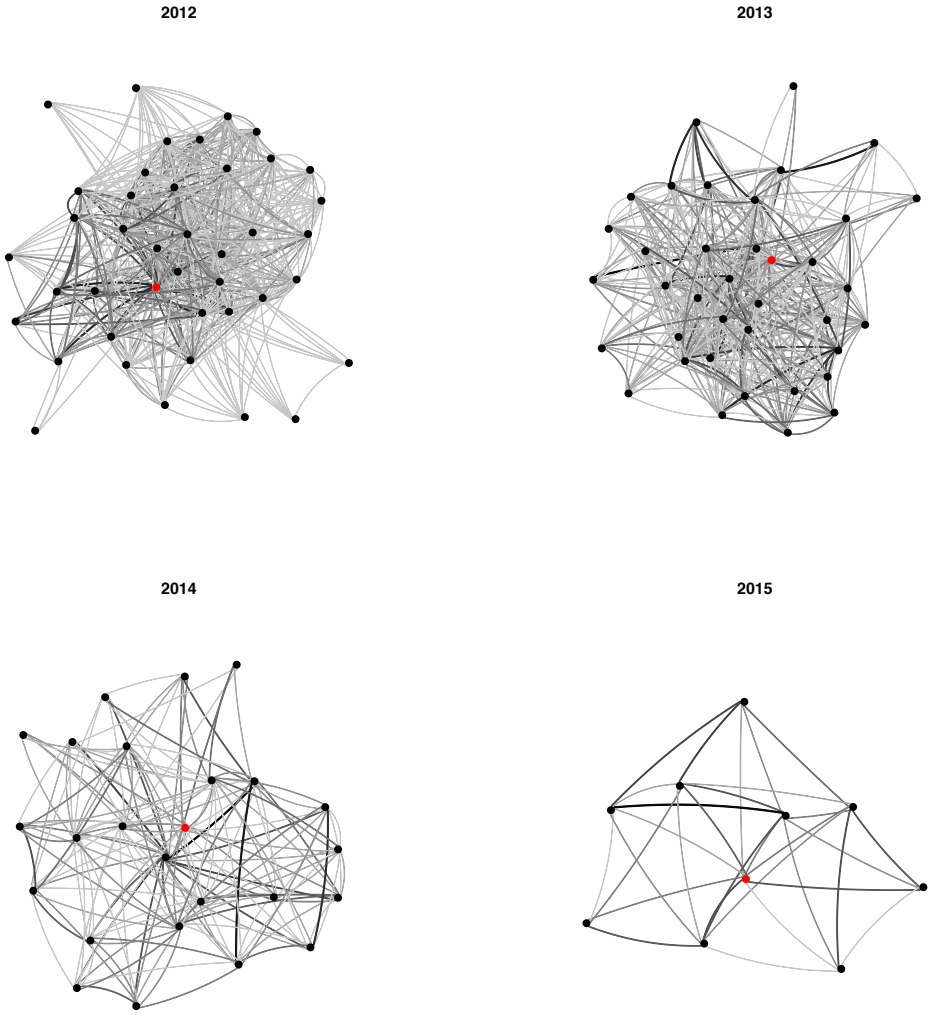
* Partial calendar year, January-June.

Table 2. MLE parameter estimates for STERGM of North Korean elite, 2012-2014

	Pr(Tie formation)		*Pr(Tie dissolution)*	
Parameter	Coef.	(SE)	Coef.	(SE)
Edges	-4.785	(0.130)***	-1.049	(0.119)***
Triangle	0.195	(0.008)***	0.170	(0.009)***
Concurrent			-3.339	(0.429)***

Significance levels: 0.05 , 0.01** , 0.001****

Figure 1: North Korean elite co-occurrence network, 2012-2015



Note: Figure produced with the statnet *package in* R *using the "Kamadakawai" vertex placement algorithm. Curved lines between points represent the existence of a tie (co-occurrence), with shading indicating intensity of ties (darker lines correspond to more frequent co-occurrences). Kim Jong-un is shown in red for each network.*

Figure 2: Labeled network comparison, 2012 vs 2014