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Propaganda with purpose: uncovering patterns in North Korean Nuclear Coverage, 1997–2012

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Abstract

What explains patterns in North Korea's own coverage of nuclear issues? The conventional wisdom assumes that North Korea focuses its attention on the United States and that changes in the administrations in the United States and South Korea influence such rhetoric, yet this remains largely untested. Content analysis using daily English news reports from the Korean Central News Agency from 1997 through 2012 provides an explicit base for how the regime attempts to frame nuclear issues for a foreign audience. References to the United States positively correlate with nuclear reference while findings regarding US and South Korean administrations conflict with the conventional wisdom. References to the Kims also negatively correlate with nuclear references with variation after Kim Jong Il's death. More broadly this analysis suggests the possible leverage of analyzing North Korea's own materials.

1 Introduction

North Korea is frequently presented as a black box, indecipherable to outsiders. However, such imagery detracts from the increasing sophistication of scholarly analysis on North Korea. The question remains how to best explain the country's behavior and rhetoric (Cumings, 1982/83; Kim, 1998; Koh, 2004; Kim, 2011; Kim and Choy, 2012). While existing research debates the rationality of North Korean behavior (e.g. Cha, 1998; Park, 2002; Cha and Kang, 2003; Bleiker, 2003; Hymans, 2008; Pollack, 2011), systematic analysis of North Korean rhetoric, despite increased empirical analyses, remains underdeveloped.

A paradox emerges: our knowledge of North Korea remains limited despite increasing mounds of material available on the country. A sizable literature gives us glimpses into various aspects of North Korea (e.g. Noland, 2000; Park, 2002; Portal, 2005; Lankov, 2007; Haggard and Noland, 2009; Hassig and Oh, 2009), yet little of this translates to how North Korean policy is formed (e.g. McEachern, 2009b; Park, 2010). The lack of direct access for in-country research has not prevented the growth in the academic literature, dominated by what several scholars see as Cold War framed security analyses (e.g. Smith, 2000; Armstrong, 2011) and thus perpetuates the assumption that the United States dominates North Korea's foreign policy decision making. The literature on Pyongyang's nuclear ambitions and related conflict (e.g. Hassig and Oh, 2000; Wit, 2001; Maull and Harnisch, 2002; Cha and Kang, 2003; Scobell, 2005) remain limited by what Hymans (2008, p. 259) summarizes as our 'cloud of ignorance', despite, according to Russian and Hungarian archives, interest in nuclear weapons since the early 1960s (Szalontai and Radchenko, 2006). Considering the role that Pyongyang's nuclear program plays in their own sense of identity and security, as well as relations with its neighbors, using available materials to understand North Korean intentions warrants greater attention.

This article argues for rigorous analysis of North Korea's own English language materials as a means to challenge the conventional wisdom in several ways. First, unlike claims of North Korean materials simply being boilerplate propaganda, this article suggests intentional variation and builds off a growing consensus that announcements of appointments and institutions potentially provide insight into the inner workings of the North Korean state. Second, claims about the saliency of American and

South Korean presidential administrations on North Korean rhetoric if not behavior can be directly tested by identifying whether shifts in nuclear references occur. Similarly, while the assumption is North Korea's framework focuses primarily on the United States, this remains to be empirically verified. As Cumings (1999, pp. 148–149) argues, since American media are often stocked with misinformation that one would be better off analyzing North Korean news directly for any insight on the nature and tone of US–DPRK relations, even if the news consistently exaggerates, omits, or misleads (also see Chong 1997).

This article proposes using North Korea's own words as the basis for analysis, responding to earlier calls to use such materials (e.g. Kim, 1980; Snyder, 1999; Song, 2011; Kim, 2012) and contributing to the growth in empirical analyses on the country (e.g. Jin 2003; Bae, 2004). Admittedly, such materials must be considered with a grain of salt, especially considering North Korea's penchant for glorifying the ruling regime. Yet analysis of these materials can potentially uncover patterns previously undetected. Choi and Lecy (2012, pp. 589–590), for example, show statements in North Korean documents implying economic policy changes. Using evidence largely from the *Rodong Sinmun* translated by the CIA's Open Source Center, McEachern (2009a; 2009b) suggests divergent interests evident among in the government cabinet, the party, and the army, building off earlier claims of policy conflicts within the government (e.g. Ahn, 1996; Mansourov, 1997; Harrison, 2002). Most of the evidence suggesting meaningful variation in preferences within North Korean sources, or what McEachern (2008) refers to as 'institutional pluralism', focuse on the economic realm (also see Carlin and Wit 2006). In contrast, one may assume greater internal consistency regarding the country's nuclear ambitions. As the conventional wisdom presumes North Korean foreign policy is implemented in a top-down fashion (Ahn, 1996, p. 96; Hassig and Oh, 2000; Moon, 2004, p. 330), North Korean media, especially with respect to nuclear coverage, should replicate the interests and desires of Pyongyang's political elite.

Although often dismissed as propaganda by outside media and researchers alike,[1] an analysis of North Korea's English language Korean Central News Agency (KCNA) news reports provides several benefits.

1 A recent interview with a representative from South Korea's Ministry of Unification reflected similar neglect of Pyongyang's English materials.

Created in 1946, the KCNA is the official mouthpiece of the Korean Worker's Party (KWP), with English news via the web since 1997. The KCNA, as with North Korean media more generally, in part intends to advance loyalty to the leadership and promote broader socialist goals (e.g. Jeffres, 1986, p. 20; Youm, 1991, p. 75). Framing has long been known to influence perceptions of news coverage and how this translates to public understanding and discourse (Tuchman, 1978; Scheufele, 2000) but without direct data from North Korea it is difficult to separate the government's intended framing for a foreign audience and its interpretation in foreign outlets. As a broader body of text than North Korean New Year's editorials, the KCNA should include intentional and unintentional rhetoric patterns and avoid potential selection biases. In addition, a text created for a foreign audience should contain fewer messages that only serve as domestic propaganda.

Admittedly, the tone and message of KCNA reports likely differ from that intended for a domestic audience. Wit *et al.* (2005) claim that English translations by North Korea during nuclear program negotiations directly contradicted statements made in Korean. Similarly, Hecker (2010) argues that North Korea's international propaganda portrays the country as vulnerable, a far cry from domestic propaganda that emphasizes the strength of the military. However, even leadership in democracies commonly employ different languages for domestic and international audiences as leaders navigate a two-level game (Putnam, 1988). Analysis solely of the English version, rather than the Korean or less analyzed Spanish versions, admittedly fails to capture the extent in which North Korea tailors its message for different audiences. However, few content analysis software programs support Korean, and a multilingual analysis would also require knowledge of grammatical syntax in each language. Focusing on the English version largely ignored by Korean scholars but of interest to American counterparts, nevertheless should provide additional insight.

This article makes several contributions. In terms of theoretical and substantive contributions, it evaluates the conventional wisdom on both Pyongyang's focus on the United States and the role of presidential administrations in the United States and South Korea. This analysis also captures evidence of shifts in nuclear references related to major events, from nuclear tests to the death of Kim Jong Il. More broadly, this analysis challenges the notion of North Korean materials as simply replicating domestic propaganda and thus lacking analytical value.

Methodologically, this article advances content analysis on North Korea. Scholars interested in uncovering patterns in large bodies of text face challenges in maintaining consistency over time and across coders (Berelson, 1952; Holsti, 1969; Weber, 1990; Neuendorf, 2002; Krippendorff, 2004). In contrast, computer-assisted automated content analysis overcomes many of these barriers, leading to increased use in social science research (e.g. Evans *et al.*, 2007; Konig and Luig, 2009; Gabbay and Thirkill-Mackelprang, 2011; Pettitt, 2012). While many analysts use North Korea's own words in either Korean or English (Haynes, 2001; Kwon, 2005; Kim and Yi, 2005; Malici and Malici, 2005; Hymans, 2008; Kim and Choy, 2011; Rich, 2012; Joo and Lee, 2013; Joo, 2013), most use a restricted timeframe, aggregate to monthly references, or in other ways only use a fraction of the available materials. For example, Choi and Lecy (2012) analyze the title of articles in North Korea's top economic journal *Kyŏngje Yŏn'gu* (*Journal of Economic Research*) after translated into English while McEachern (2009a, b) focuses on New Year's editorials. While all steps in the right direction, these studies may fail to capture long-term patterns in text.

Daily news reports from the KCNA from 1997 to 2012 provide means to analyze Pyongyang's nuclear rhetoric, using their own English translation instead of relying on South Korean experts with their own ideological filters.[2] This analysis provides descriptive and regression analysis as a means to address competing claims on what motivates North Korea's nuclear talk. In addition, the use of computer-assisted content analysis on a publicly available data source aids not only in explicit measures, but transparency and replication.

This analysis will first provide a brief introduction of the history of North Korea's nuclear ambitions. Expectations regarding North Korea's nuclear references follow. Next, the basic research design is presented, followed by descriptive and regression analysis. Empirical analysis identifies great fluctuation in nuclear references and finds that mentions of the United States consistently correlate with nuclear references. In contrast to the conventional wisdom, changes in US and South Korean administrations show little consistency with assumptions of a distinction between engagement and hardline approaches to Pyongyang. Patterns in references to the Kim family, including after Kim Jong Il's death, also suggest an

2 With over 50 years of separation, differences emerge between the Korean language in both countries, further complicating interpretation.

intentional framing. A general decline in nuclear references is also seen with each nuclear test, consistent with a cooling off period. Ultimately, this research argues for closer examination of the existing materials from North Korea, in that the naked eye may miss broad patterns or worse, view North Korean news as static propaganda.

2 North Korea's nuclear history

States do not develop nuclear weapons by accident (Betts 2000, p. 57), and the rationales for states to develop nuclear weapons often are tied to security concerns (e.g. Jo and Gartze, 2007) and the willingness to expend resources for manufacturing (e.g. Silverson and Starr 1990, p. 48; Kincade 1995). With the end of the Cold War, North Korea lost much of its military and economic assistance from the former Soviet Union, leaving its outdated though numerically superior conventional military to fall behind that of the US-backed South Korean forces. Considering the economic disparities between the Koreas as well as Pyongyang's limited ability to match conventional forces, acquiring a nuclear deterrent and signaling the continued viability of the North Korean state can be viewed as rational.[3] Along realist lines, the acquiring of nuclear weapons could be seen as consistent with previous attempts to use limited force to meet policy goals (Michishita, 2008). Thus, Kim Jong Il's efforts to develop such weapons (including tests in 2006 and 2009) and later Kim Jong Un's test in 2013 should not be surprising.

The country's nuclear ambitions have a much longer history. Kim Il Sung failed to convince both the Soviet Union and China to provide such weapons despite repeated requests. Finally, an atomic energy research center was established in Yongbyon and staffed by Soviet-trained specialists in the 1960s. Nuclear energy remained a primary focus for at least two decades. After evidence of a secret nuclear program in the late 1970s and under international pressure, North Korea reluctantly signed the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1985. However, a crucial component to acceding to the NPT, allowing inspections by the International Atomic Energy Agency (IAEA), was denied until 1992. Again in 1993, North Korea refused inspectors access to previously

3 For research on nuclear deterrence, see Quester (2005). For research on nuclear weapons and signaling viability, see Quester (1973) and Betts (1977).

unreported facilities and announced later in the year its intent to withdraw from the NPT, the only country to date to do so.

Concurrent with UN demands to allow inspectors, the United States convened bilateral talks with North Korea that year, culminating with the 1994 Agreed Framework. However, enduring mistrust on both sides (the US skeptical of North Korea's clandestine nuclear program and North Korea's impatience over the lack of promised energy assistance) as well as Kim Il Sung's death undermined progress. Ambiguous statements from North Korean officials regarding the right to nuclear weapons were later interpreted by the United States as confirmation of Pyongyang's continued program if not their possession of a weapon. Similarly, multilateral efforts, such as the Six Party Talks, failed to meet perhaps unrealistic expectations,[4] with no meetings since 2009. While a 2007 agreement led to North Korea freezing its Yongbyon 5 MW reactor, heightened tensions with the United States led North Korea to briefly block inspectors of the reactor in 2008. By 2009, North Korea announced a resumption of plutonium reprocessing with a uranium enrichment plant operating in 2010. With little direct pressure from the outside world, North Korea announced in May 2010 the completion of a nuclear fusion reaction. In 2012, again North Korea announced a suspension of activities at Yongbyon only to reverse course in 2013.

The secrecy of Pyongyang's program creates several concerns for the broader international community. Besides traditionally obstructing international inspectors, underground facilities hamper determining whether the regime is compliant with any agreement. Perhaps more of a concern is the regime selling nuclear technology. Evidence suggested that North Korea supplied Libya with limited material before the latter voluntary ceased its program in order to end international sanctions. With the regime selling conventional weapons to raise hard currency, including recently to Syria, one may wonder if the regime has similar economic plans for its nuclear program. North Korea's own ties to Syria's nuclear facility, bombed by the Israeli air force in 2007, further fuels such speculation. More broadly, the presence of nuclear weapons in North Korea, while an insurance policy against foreign invasion, upsets the already delicate security balance in Northeast Asia, leading to questions of whether

4 China' *Xinhua* reported that the first three rounds of talks 'made little progress' (Xinhua 2006).

South Korea and Japan may consider larger commitments to their own military programs. Despite repeated international efforts, it remains unclear whether any offers would lead North Korea to abandon its nuclear program (e.g. Bechtol, 2007; Funabashi 2007).

3 Expectations in North Korean nuclear coverage

Consistent with the broader literature on media framing (e.g. Nossek, 2004; Brewer, 2006; Novais, 2007), the assumption is that national interests shape the rhetoric within KCNA reports. Because North Korea's nuclear program weighs so heavily in terms of national security and foreign policy, it is assumed that the KCNA reflects the perceptions of a unified leadership, rather than divergent views within political institutions. For example, if Pyongyang interpreted the Axis of Evil speech as an unprovoked heightening of tensions as evidence suggests (e.g. Solingen, 2007, p. 119), the expectation would be for increased references to its nuclear program and security more generally. Similarly, one expects North Korea to emphasize its right to a nuclear program and display resolve not only by continuing its nuclear program but also carrying out threats to test said devices. However, after successfully displaying its commitment to a nuclear program, maintaining such coverage may not serve the same purpose post-test and a cooling off period may be apparent. Similarly, once proving the ability to test a nuclear weapon, North Korea may feel it requires less effort to get a response from concerned parties and thus repetition of nuclear references may be less prevalent.

Terry (2012) notes that critics commonly criticize either American or South Korean presidents for the failure of nuclear negotiations. Davies (2007) finds North Korea to be more cooperative in general as US presidential approval declines, but that this has no effect on behavior toward South Korea. Conventional wisdom expects a more hardline tone during conservative administrations in both South Korea and the United States as Presidents Lee Myung-Bak and George W. Bush generally opposed engagement in favor of embargoes to persuade Pyongyang to abandon its nuclear program. After all, North Korea considered Bush's publicly stated preference for regime change accompanying rhetoric a declaration of war (Long, 2005, p. 12; also see Kim and Choy, 2011, p. 482). Furthermore, Funabashi (2007) claims that many within the Bush administration questioned whether North Korea would ever fulfill any agreement (also see Chinoy, 2008). In contrast, the 'Sunshine

Policy' initiated under Kim Dae-Jung and continued by his predecessor Roh Moo Hyun encouraged direct dialogue with North Korea.[5] The Clinton administration implicitly supported a similar policy of engagement, sending Secretary of State Madeline Albright on a diplomatic mission to North Korea and suggesting eventual diplomatic recognition. In contrast, the Obama administration's policy has not appeared to deviate much from that of his immediate predecessor, suggesting such a liberal-conservative policy divide may be overstated. Kim and Choy (2011) analyze the shift in North Korean foreign policy between Clinton and Bush, relying on analysis of the *Rodong Sinmun*, yet a longer time horizon has not been adequately explored. Nor does this distinguish whether a shift is evident after Bush's Axis of Evil speech. It also remains unclear to what extent North Korea tests each South Korean or US administration and whether this would be evident in their news.

Admittedly the security environment may differ from one presidential administration to another (e.g. see Cho 2010). However, determining whether North Korean news is influenced by South Korean or American leadership is complicated in part by overlapping terms. As an alternative, analyzing presidential dyads of the individual combinations of Korean and American presidential administrations should provide insight. Extending the existing literature suggests two possible patterns. Joint conservative dyads may encourage greater hostility from Pyongyang with the opposite true for liberal dyads, or hostile rhetoric may be highest when the United States and South Korean presidents diverge ideologically, in essence providing an opportunity for Pyongyang to drive a wedge between allies. If no distinction is seen between dyad types or across dyads over time, this suggests either a static message consistent with claims that North Korean materials are ignorable noise or that North Korea is not reframing its news coverage based on partisan politics beyond its borders.

What countries North Korea frames within its nuclear rhetoric also require closer analysis. Negative tones toward the United States, Japan, and South Korea are a staple in North Korean materials regardless of language. Conventional wisdom suggests that the United States is the primary focus of North Korea's nuclear propaganda, however without a broader comparative framework that includes these other parties, one cannot properly evaluate this claim. Conversely, China and Russia

5 Recent declassified documents suggest Roh's acceptance of a nuclear North Korea (see Kim 2013).

traditionally were viewed in a more positive light, in part because of both countries' reluctance to criticize North Korean leadership. Evidence of an often contentious Sino-North Korean relationship undermines the common characterization of North Korea as China's puppet (e.g. Pollack, 2011), yet China's concern regarding the potential for North Korea's collapse in part explains a hesitancy to pressure their neighbor regarding its nuclear program. Russia too has been reluctant to apply unilateral pressure and instead focuses on general regional collective security, one not led by American interests (Blank, 2011). Other countries are frequently mentioned in KCNA reports, yet most references are with respect to claims of foreign praise for the Kims or the establishment of Juche study groups abroad and as such can be treated as noise. Meanwhile references to the countries of the Six Party Talks dominate total country references. As references to the United States comprise a greater percentage of references to the other parties of the Six Party Talks, this should indicate intentionality.

Content analysis should also provide additional insight into how the Kims are portrayed. North Korean news routinely showers praise on Kim Jong Il and his father Kim Il Sung, nearly two decades after the latter's death. North Korean materials from *The Great Mangyongdae Family* to daily news reinforce an idealized image of the Kim family both uniquely suited for leadership and unbounded by institutional constraints (Cumings, 1997, pp. 409–4011; Hunter, 1999, p. 212; Armstrong, 2003, pp. 23–23). In contrast to Kim Il Sung and Kim Jong Il, little was known about Kim Jong Un prior to succession, with intermitted references in domestic propaganda, and no references in the KCNA before 27 September 2010. Prior to his father's death, North Korean officials denied that Kim Jong Un was the heir apparent, much like Kim Il Sung vehemently denied any intention of extending his personality cult to his son (Martin, 2004).

Despite Western media linking North Korean leadership to their nuclear program, such a pattern may not be evident in North Korea's own text. Part of this could be attributed to the ubiquitous barrage of praise for the leaders each day, from military affairs to everyday life, or an intention to place the Kims as above the fray. To put into context, Kim Il Sung is directly referenced by name 35,664 times (90.1% of days) in this analysis, with Kim Jong Il referenced 57,756 times (96.2% of days). Kim Jong Un by contrast appears 6,897 times (8.8% of days), with no references before mid-2010. Nuclear rhetoric may focus more on critiques of foreign hostility to the program rather than just credit claiming. However, a possible

distinction may exist after the death of Kim Jong Il as references to the leadership could be a means to indicate stability. Similarly questions over succession may encourage greater framing of Kim Jong Un and his lineage with the country's nuclear program. Content analysis thus provides a means to better contextualize how North Korean leadership is framed *vis-à-vis* discussions of nuclear programs.

Based on the literature and the above assumptions, this article will test the following hypotheses:

Hypothesis 1: As references to the United States increase as a share of references to relevant countries, nuclear references should also increase.

Hypothesis 2a: Nuclear references should be higher under conservative presidential dyads and lower under liberal presidential dyads.
Hypothesis 2b: Nuclear references should be higher under ideologically inconsistent presidential dyads.
Hypothesis 3: If North Korea intentionally separates the image of the Kims from policy proscriptions, references to the Kims should negatively correlate with nuclear references.
Hypothesis 4: If nuclear references are used to signal stability and resolve under Kim Jong Un, a positive correlation between each Kim and nuclear references should be evident after the death of Kim Jong Il.

4 Research design

This paper uses WordStat software from Provalis.[6] WordStat was used to take daily English KCNA news reports, pulled from the KCNA website[7] using a web crawler and convert them into a format for pulling out descriptive statistics (e.g. number of references) as well as relational data (e. g. distance between terms, Jaccard coefficients[8]). This allows for the production of count data – the number of references to coded topics each

6 See http://www.provalisresearch.com/wordstat/WordstatFeatures.html.

7 See http://www.kcna.co.jp/index-e.htm. This website, rather than http://www.kcna.kp, is used for two reasons. First is that the former covers a much longer time period, with easily accessible archives back to 1997. Relatedly, the format of the news pages were more conducive for web crawling programs to extract the materials. While the content of the two sources may differ, a cursory view shows no fundamental difference in coverage.

8 The Jaccard coefficient (J) is a measure of the intersection of two terms divided by the union of these two terms or $J = C/(A + B - C)$, where A is the frequency of term A, B the frequency of term B, and C the occurrence of both A and B.

day. Following the literature on automated content analysis and historical knowledge of North Korea, words and phrases are coded in a content dictionary to identify *a priori* important concepts and events. Because this process often muddles transparency, this analysis restrains itself to explicit references to only a limited number of factors within the KCNA news. Although this requirement admittedly misses indirect references within the text, this approach allows for consistent measures within the text and aids in replication by other scholars. For nuclear references, this included all variations of the word nuclear (e.g. nuclearize, nuclearization) and nukes. Refinement of categorization ensured that the coded terms were consistent with the intended code. For example, refinement of codes ensured that by including the words 'America' and 'American' in the category of United States only included references to United States and not Central and Latin America.

Daily news sources were collected from the KCNA website in English and analyzed with descriptive statistics and regression analysis.[9] Each day is collected as one unit, although texts are analyzed across dates and within each day, from the day as a whole down to individual words, allowing for a multilevel analysis and thus a greater sense of the variation within the data. The decision to collect at the day level is based on several factors. Because the KCNA is presumably created in a centralized office, general trends should be apparent throughout a day. This holistic approach attempts to capture general rhetorical patterns, including the standard heaps of praise to the leadership, rather than make arbitrary decisions on what articles to include. An analysis at the day level also simplified extraction with a web crawler, generating 5,440 days of complete coverage rather than over 60,000 individual news articles, which due to website formatting may not have been spliced consistently by the crawler. Because this software goes beyond individual word counts and can identify the repetition of phrases and the proximity of words within a document, descriptive and inferential statistics should provide empirically accurate means to evaluate rhetoric. Furthermore, the inclusion of additional controls for historical events and the presidential dyads allows for a more structured analysis.

9 WordStat, like most advanced content analysis software, unfortunately does not support East Asian languages, while the few existing software options that due largely are not equipped for such a large number of original texts.

5 Analysis

To properly gauge the extent of nuclear references, Fig. 1 shows daily frequencies from 1997 through 2012. Of particular interest, nuclear issues only appeared in a 58.4% of days with an average of 3.9 references to nuclear issues each day, maxing at 84 one day in 2003. Figure 1 suggests at minimally that nuclear coverage is not static over time. Summary statistics surrounding key events and presidential dyads show variation in nuclear references as well (Table 1). References declined after the first nuclear test (9 October 2006) before almost doubling after the second (25 May 2009). Average references also jumped after the Axis of Evil reference in President Bush's state of the union speech (29 January 2002) and Kim Jong Il's death (17 December 2011). Moving to administration dyads, surprisingly increases in nuclear references are seen until the Lee Myung-Bak–George W. Bush dyad, again increasing when Obama took office, conflicting with expectations.

Table 2 presents the frequencies of references to the other five countries of the appropriately named Six Party Talks. Unsurprisingly, South Korea is mentioned nearly every day in the set. In terms of raw frequency, Japan is referenced more than any of the five other countries at 65,951times, more than double of that of China, four times that of Russia, and six times that of the United States. In contrast, the United States is mentioned in more days (62.6%) than either China or Russia. The difference between China and Russia in frequency may be a product of growing PRC–DPRK

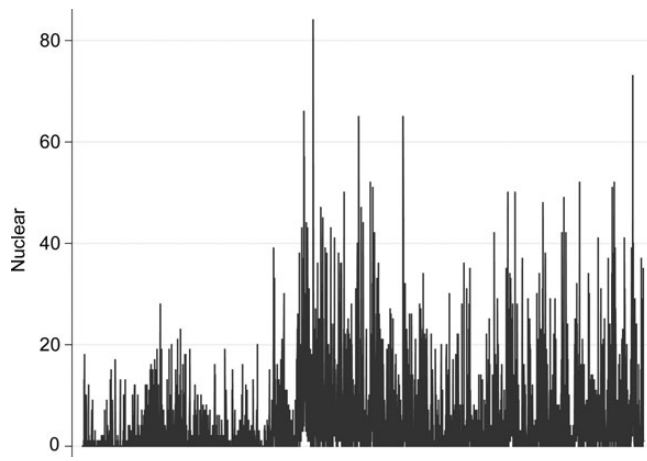

Figure 1 Daily references to nuclear issues (1997–2012).

Table 1 Average nuclear references by events and presidential dyads

Events		Presidential dyads	
Before Nuclear Tests	3.65	Kim YS–Clinton	0.63
After First Test	2.96	Kim DJ–Clinton	1.65
After Second	5.29	Kim DJ–Bush	3.48
Before Axis of Evil	1.29	Roh MH–Bush	5.58
After Axis of Evil	5.25	Lee MB–Bush	3.04
Before Kim Jong Il's death	3.75	Lee MB–Obama	5.15
After Kim Jong Il's death	6.52		

Table 2 Frequencies of country references

Country references	Frequency	Number of days	Percentage of days
China	24,353	3,137	57.70
Japan	65,951	4,736	87.10
Russia	15,977	2,820	51.80
South Korea	60,516	5,133	94.40
US	9,955	3,407	62.60

relations, in stark contrast to Haynes (2001) who found nearly equal attention to both countries in his study. As a whole, the references to the United States comprise a paltry 5.63% of references to the five main countries of interest, contrasting with conventional wisdom. Furthermore, the Jaccard coefficient (a measurement of the proximity of terms within text) finds that references to the United States, South Korea, and Japan co-occur with nuclear references at a higher rate than China or Russia at the news day, paragraph, and sentence level.[10]

Regression analysis should allow for additional insight, allowing us to uncover the comparative importance of factors otherwise clouded by multidimensionality. I first employ two negative binomial models using references to nuclear issues as the dependent variable. To evaluate the

10 Because of the length of the daily news, coefficients at the sentence and paragraph are expected to be small. Nevertheless, the Jaccard coefficient provides a means for comparison in the co-occurrence of words.

focus on the United States within the daily news, references to the United States as a percentage of the references to the five major countries in North Korean relations (United States, China, Japan, Russia, and South Korea) are included. Next, The author include raw frequencies of references to each in the Kim Dynasty (Kim Il Sung, Kim Jong Il, and Kim Jong Un). Two different measures of presidential dyads are used. In Model 1, I use dummy variables for the Kim Dae-Jung/Bill Clinton and the Lee Myung-Bak/George W. Bush dyad as these are the only united liberal and united conservative dyads in the time period. In Model 2, I use a six-point variable for all six dyads in chronological order, with Kim Young-Sam/Bill Clinton coded as 1 and Lee Myung-Bak/Barack Obama coded as 6. In addition, I include variables to capture three categories of events: the first a trichotomous variable based on the timing of the nuclear tests (1/1/1997–10/08/2006; 10/8/2006–6/26/2009; 6/27/2009–), along with dummy variables for the period after Axis of Evil speech and after the death of Kim Jong Il. Lastly, I include both the text length of the daily news in words (logged) with the assumption that greater intentionality is present on longer news days as well as a lagged dependent variable ($t-1$) under the assumption that references to nuclear issues on one day correlate with the previous day's coverage.

Table 3 presents the results. Model 1 finds that references to the United States positively correlate with nuclear coverage at the 0.001 level, with this variable also having the largest positive coefficient in the model, findings consistent with Hypothesis 1. References to both Kim Il Sung and Kim Jong Il negatively correlate with nuclear references as well, consistent with Hypothesis 3, while the positive sign on the Kim Jong Un variable contrasts with expectations. In terms of presidential dyads, the results in Model 1 clearly contrast with our expectations. Instead of nuclear coverage being less common in liberal dyads and more common under conservative ones, the opposite is found here, with both variables not only statistically significant at 0.001, but having nearly polar opposite coefficients (0.395 for Kim Dae-Jung/Bill Clinton versus −0.397 for Lee Myung-Bak/George W. Bush). This contrasts with Hypothesis 2a, but produces partially consistent with Hypothesis 2b. The nuclear test scale also negatively correlates with nuclear references, suggestive perhaps of a toning down of such propaganda or at least less repetition after successful tests. As expected, the period after the Bush's Axis of Evil correlates with an additional nuclear reference per day. Of particular note, the control for the period

Table 3 Base models of correlations with nuclear references in KCNA News (1997–2012)

	Model 1		Model 2	
	Coefficient	SE	Coefficient	SE
References in KCNA				
United States (percentage)	2.412***	0.263	2.498***	0.266
Kim Il Sung	−0.027***	0.003	−0.027***	0.003
Kim Jong Il	−0.014***	0.002	−0.015***	0.002
Kim Jong Un	0.018**	0.007	0.018**	0.007
Presidential dyads				
KDJ–Clinton	0.395***	0.086		
LMB–Bush	−0.397***	0.095		
Continuous dyads			0.161***	0.045
Events				
Nuclear Tests Scale	−0.148***	0.032	−0.334***	0.059
Axis of Evil speech	1.363***	0.083	0.798***	0.094
Kim Jong Il's death	−0.014	0.134	0.000	0.135
Controls				
Text length (logged)	1.241***	0.064	1.268***	0.064
Nuclear ($t-1$)	0.028***	0.003	0.030***	0.003
Constant	−9.693***	0.481	−9.979***	0.483
N	5,424		5,424	
Pseudo R^2	0.055		0.054	

***$P < 0.001$, **$P < 0.01$, *$P < 0.05$.

after Kim Jong Il's death fails to reach significance. Unsurprisingly, the lagged nuclear count variable suggests that references of the previous day correlate with later references.

Model 2 finds nearly identical results, with similar levels of significance and coefficients on the above named variables. Switching from two dummy variables for presidential dyads to a continuous dyadic measure shows a general increase in nuclear coverage over time, significant at 0.001 and contrasting with Hypothesis 2b. Evidence overall conflicts with the conventional wisdom regarding partisan influence in the United States or South Korea and suggests a general ratcheting up with each new combination.

Next, interaction effects were tested to identify whether references to the United States or the Kims shift after Kim Jong Il's death (Table 4). The findings in Models 3 and 4 were largely consistent with the original models. In particular, references to the United States again positively correlate with an increase of a little over two nuclear references a day, the largest positive coefficient among the independent variables. Similarly, the

Table 4 Extended models of correlations with nuclear references in KCNA News (1997–2012)

	Model 3		Model 4	
	Coefficient	SE	Coefficient	SE
References in KCNA				
United States (percentages)	2.368***	0.265	2.440***	0.268
Kim Il Sung	−0.024***	0.004	−0.024***	0.004
Kim Jong Il	−0.029***	0.003	−0.029***	0.003
Kim Jong Un	−0.155	0.099	−0.141	0.099
Presidential dyads				
KDJ–Clinton	0.361***	0.086		
LMB–Bush	−0.409***	0.095		
Continuous dyads			0.147***	0.045
Events				
Nuclear Tests Scale	−0.126***	0.033	−0.298***	0.060
Axis of Evil speech	1.311***	0.083	0.792***	0.094
Kim Jong Il's death	−0.274	0.164	−0.255	0.164
Interactions				
United States/Kim Jong Il's death	−0.418	1.649	−0.430	1.655
Kim Il Sung/Kim Jong Il's death	0.003	0.007	0.003	0.007
Kim Jong Il/Kim Jong Il's death	0.022***	0.004	0.022***	0.004
Kim Jong Un/Kim Jong Il's death	0.156	0.099	0.142	0.099
Controls				
Text length (logged)	1.348***	0.066	1.373***	0.066
Nuclear ($t-1$)	0.027***	0.003	0.029***	0.003
Constant	−10.389***	0.495	−10.653***	0.496
N	5,424		5,424	
Pseudo R^2	0.056		0.055	

***$P < 0.001$, **$P < 0.01$, *$P < 0.05$.

presidential dyads follow a similar pattern, with the patterns associated with Kim Dae-Jung/Bill Clinton and Lee Myung-Bak/George W. Bush contrasting with expectations and having near opposite coefficients. One noticeable change in both extended models is that references to Kim Jong Un, while not reaching significance, now negatively correlate with nuclear references like references to his father and grandfather. Second, all three of the interactions of the Kims and the post-Kim Jong Il era positively correlate with nuclear coverage; however, only the Kim Jong Il interaction is statistically significant at 0.001. Thus, the findings here are only partially consistent with Hypothesis 4. Framing nuclear coverage with references to Kim Jong Il could be interpreted as a means to display filial piety and a continuation of policies from father to son. Meanwhile the post-Kim Jong Il period sees a negative relationship between references to the United States and nuclear coverage, although the coefficient is a fraction of the United States variable (−0.418) and fails to reach statistical significance.

Several additional specifications were tested as robustness checks and for additional leverage. First, out of concern of the potential heterogeneity in the category of nuclear references and that the context may differ over time, models were retested with more restrictive nuclear reference categories. Five separate categories were generated for explicit references to nuclear weapons, nuclear war, nuclear tests, nuclear reactors and plants, as well as the phrase 'nuclear issue'.[11] However, rerunning the original models with each of these more restrictive dependent variables produced results largely consistent with the original findings in terms of statistical significance and coefficient size. Of particular note, the pseudo R^2 of several models exceeded the originals, the highest on the 'nuclear issue' (0.14 or greater). Only the model on nuclear tests found noteworthy divergent results. Here references to the United States positively correlated with nuclear test references, but significant only at 0.10, while unsurprisingly references increased with each nuclear test (significant at 0.001).

Second, to identify whether the counter-intuitive findings on administration dyads hinged on the inclusion of the Axis of Evil variable, models were ran excluding this variable. In the two models using dyadic dummies, the Kim Dae-Jung/Bill Clinton dummy variable switched signs, negatively correlating with nuclear references and significant at 0.001. Meanwhile, the patterns previously seen on the Lee Myung-Bak/George W. Bush

11 Each category also included synonyms and plural versions of the category names.

variable and elsewhere remained largely the same. These findings provide mixed support at best for Hypothesis 2a and indirectly seem supportive of Hypothesis 2b. In contrast, using the dyadic scale saw no major difference with the exclusion of the Axis of Evil variable.

Third, to identify whether references to the other countries within the Six Party talks show similar patterns with nuclear coverage, I tested the original models with the percentage of references to South Korea, Japan, and China as well.[12] In the basic models, the South Korea and Japan variables positively correlate with nuclear coverage at 0.05 or stronger. However, the coefficient is less than a quarter the size of that of the United States.

Fourth, based on the existing literature, I reran the original models but converting the raw frequency counts to their percentage of the day's total words, and in doing so employed a standard ordinary least squares regression. These models were largely consistent with the original models, especially in terms of the relationship between references to the United States, Kim Il Sung, and Kim Jong Il in relation to nuclear references. The main difference was in terms of presidential dyads, only the Lee Myung-Bak–George W. Bush dyad reached statistical significance. These models also resulted in an adjusted R^2 of more than double the original models.

Overall, these findings challenge the conventional wisdom in several ways. First, the partisan leadership dyads do not indicate a pattern of greater hostility toward a united conservative front than liberal leadership, with the empirical analysis suggesting the exact opposite. This could be interpreted as Pyongyang attempting to take advantage of liberal dyads and acting cautious based on the hardline approach of conservatives; however, additional evidence undermines these claims. The general trend of more nuclear references with each dyad suggests a ratcheting up of the importance of nuclear claims rather than a means to exploit particular divisions within US–South Korean leadership, implying that partisan claims in both the United States and South Korea regarding North Korea policy have little influence on Pyongyang's rhetoric. Second, references to Kim Il Sung and Kim Jong Il do not seem closely tied to nuclear coverage, perhaps due to the symbolic role the program plays in projecting the regime's strength. Evidence of a correlation between Kim Jong Un and

12 Russia could not also be included as it drops out of models due to collinearity.

nuclear references is consistent with patterns of autocratic consolidation. The ubiquitous references to the Kim family in general may partially explain the patterns for Kim Il Sung and Kim Jong Il, but does this alone does not explain the shift after Kim Jong Il's death, with references to the recently deceased positively correlating with nuclear references. Third, a general decline is seen with each nuclear test, consistent with a cooling off period after demonstrating an ability to defy international condemnation of their program. Furthermore, rather than leading to an increased focus on nuclear coverage after Kim Jong Il's death as a means to signal resolve or strength, models consistently find this period negatively correlating with such messages.

Other findings suggest the limits of conventional claims. While the United States is not mentioned as frequently as others in the Six Party Talks, references appear consistently connected to nuclear talk. Such findings are consistent with Pyongyang's preference for bilateral negotiations over that of the Six Party Talks framework and claims suggesting the North Korean leadership feels that it is not accorded its rightful status by the United States (see Hayes, 2006). Similarly, ratcheting up nuclear rhetoric, and even nuclear tests, may be in part North Korea's diplomatic maneuver to push the United States toward future negotiations (Michishita, 2009). As such, equating North Korea's materials as blanket propaganda appears unwarranted.

6 Conclusion

A full understanding of North Korea is unlikely until well after the collapse of the regime, much like the flood of information that emerged with the fall of the Soviet Union and East Germany. Similarly, the insights based on English translations of KCNA reports are subject to poor translations and intentional omissions (see Pinkston and Saunders, 2003, pp. 83–84; McEachern, 2009a, p. 35). Nonetheless, this article highlights how methodological innovation allows us to test several aspects of the conventional wisdom regarding North Korean rhetoric if not intentions.

This analysis provides an imperfect measure of North Korean news coverage over time, but an improvement over conjecture and piecemeal efforts. This method tests claims regarding the focus on the United States and the influence of presidential dyads and sheds light on how the North

Korean government frames nuclear issues independent of a foreign lens. The empirical results confirm assumptions that Pyongyang links nuclear coverage to references to the United States, while also suggesting a downshift in references after each nuclear test. The expected role of US and South Korean administrations is not confirmed by the patterns in nuclear references, suggesting that partisan changes in either country do not alter North Korea's nuclear narrative. Meanwhile, general references to Kim Il Sung and Kim Jong Il do not appear closely related to nuclear ambitions, despite the latter being intrinsically tied to nuclear proliferation in western media.

Additional work is certainly necessary, especially to understand the mindset of North Korean leadership (Kang, 2003) and to move toward what White (1984, p. 160) refers to as 'realistic empathy' (also see Malici and Buckner, 2008). This analysis suggests that the KCNA reflects the decisions of the leadership, but may miss inconsistent or competing perceptions within North Korean political institutions. Controlling for other factors within North Korean news, such as including other officials and key events, may shed greater light. Separating reports attributed to the military versus the party may not only lead credence to McEachern's (2009a; b) claim that divergent preferences between the two institutions have emerged, but provides a means to measure this divergence. Similarly, additional coding may identify conflict within North Korean bureaucracies (e.g. Mansourov, 1997) or competition to show loyalty (Ahn 1996, p. 6). Sentiment analysis, identifying positive or negative tones within text, potentially provides additional leverage. Combining content analysis with our existing knowledge of major events in North Korea, including event data analysis,[13] and insights from refugee offers hope for a more well-rounded understanding of North Korean politics. Regardless, empirical analyses of existing materials provide a means to gain additional leverage on the regime.

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13 Kim and Yi (2005, p. 85) in particular argue the complementary nature of combining content analysis with event data analysis.

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