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ANALYTICAL ESSAY

The Study of Leaders in Nuclear Proliferation and How to Reinvigorate It

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For both nuclear proliferation and nuclear weapons restraint, the individual characteristics of political leaders—their beliefs, experiences, and identities—frequently play an important role. And yet, theories of proliferation have so far paid insufficient attention to the influence of leaders, focusing instead on international and domestic structures that allegedly determine states' nuclear choices. This article makes two contributions. First, by showing that important cases of both nuclear weapons pursuit and nuclear reversal cannot be fully understood when neglecting the role of the involved leaders, the article makes a systematic case for an increased analytical emphasis on political leaders in theories of proliferation. Second, the article offers practical advice for scholars seeking to develop proliferation theories that take leader characteristics into account. Specifically, it shows how scholars can preempt endogeneity concerns. Moreover, the article details how changing the dependent variable—from state behavior to leader attitude—could help scholars overcome the aggregation problem in the study of proliferation dynamics.

Keywords: leaders, nuclear proliferation, political psychology

After the escalation of North Korea's nuclear and ballistic missile tests in recent years it has been all but forgotten that more than a few officials and pundits had once pinned their hopes for resolving the crisis over Pyongyang's nuclear weapons efforts on Kim Jong Un. In the wake of the passing of Kim Jong Il in 2011, the ascension of Kim Jong Un, as an unusually young leader who had partly grown up in Switzerland, seemed to bring a new spirit to the Hermit Kingdom. His different personal background, it was hoped, could help in making progress at the deadlocked talks on the country's nuclear program (Aoki 2012; Cha 2012). Underscoring their sense that North Korea's leadership transition was consequential for Pyongyang's nuclear policies, these observers were quick to urge reengaging the regime: "A New Kim. A New Chance" (Kristof 2011, A37).

The unforeseen triumph of Hassan Rouhani in the Iranian presidential election in 2013 gave rise to similar expectations of substantial changes in that country's nuclear behavior. A moderate in Iran's factional politics, Rouhani might well, or so it was hoped in 2013, be able to nudge the Iranian Supreme Leader, Ayatollah Ali Khamenei, toward a more accommodating approach to the diplomatic talks over Iran's nuclear program. Such Iranian flexibility may then create the room

for diplomatic compromise (Maloney 2013; Straw 2013). In this vein, a Middle East adviser to Secretary of State Hillary Clinton contended in 2013 that although Rouhani's victory did not amount to a regime change in Tehran, the fact that the confrontationally minded Ahmadinejad was succeeded by Rouhani would become a game-changer for the nuclear talks (Nasr 2013).

As of this writing, most experts and intelligence analysts believe that the early hopes in Kim Jong Un as a potential reformer who could let go of North Korea's nuclear arsenal were misplaced (Narang and Panda 2018; Tharoor 2018). Conversely, the optimism accompanying Rouhani's election seems to have been vindicated. To the best of our knowledge, his rise to the presidency played a crucial part in the process leading to the Iran Nuclear Deal in 2015 (Rozen 2014). What the above-mentioned attempts at predicting the trajectory of these two nuclear programs have in common, however, is that they paid serious attention to the independent causal impact of individual political leaders. By including leaders in their proliferation forecasts, the experts implicitly assumed that replacing just a few key politicians and senior officials might change the direction in which the Iranian and North Korean nuclear programs were headed. In short, their analyses presumed that even short of a complete regime change, it clearly matters for these countries' nuclear policies which people are holding the key positions of political power in Teheran and Pyongyang.

Interestingly, whereas predictions for "rogue" regimes such as Iran and North Korea devote much of their attention to leaders, forecasts focusing on Western states and their allies typically ignore any independent effect of leaders on a state's proliferation behavior. For example, studies estimating the probability that Japan or South Korea might build a nuclear arsenal typically do not pay any attention to individual leaders—neither as drivers nor as barriers to proliferation (e.g., Hughes 2007; Fitzpatrick 2016). Likewise, predictions of whether Saudi Arabia, Egypt, or Turkey will embark upon a nuclear weapons program rarely address the role of these countries' current or future political leadership (e.g., Ülgen 2012; Kahl, Dalton, and Irvine 2013; Einhorn and Nephew 2016). Rather, proliferation assessments of Western states and their allies typically privilege international structural forces, such as security threats, superpower coercion, alliance politics, and the nonproliferation regime. In addition, such analyses tend to stress the proliferation-driving or inhibiting effect of domestic structures, including public opinion, institutional checks and balances, and economic models that shape the ruling coalition's vulnerability to sanctions. Given their emphasis on the structural context, these forecasts presume that it is essentially irrelevant for Western states' nuclear trajectories which particular leaders are calling the shots.

Whatever the reasons for the divergent views of the causes of proliferation may be, this fundamentally different perspective—the nuclear ambitions of "rogue" regimes appear to be driven by their leaders, whereas the nuclear behavior of Western countries is seen as tied to their structural environment—is indefensible. There is no reason to assume *a priori* that the independent causal effect of leaders on foreign policies is limited to certain types of political regimes, such as autocracies (Byman and Pollack 2001, 141; Jervis 2013, 156–57). To be sure, the relative impact of leaders seems to be greatest in personalist dictatorships (such as North Korea). Recent research shows, however, that apart from such one-man states, the relationship between democratic institutions and leaders' (shrinking) room for maneuver is not as linear as often assumed. Domestic institutionalist scholarship suggests considerable variation across different *types of democracies*, with presidential systems—such as France or the United States—providing leaders with greater leeway in foreign affairs than coalition governments—such as in Germany or Italy (Auerwald and Saideman 2014). Similarly, recent research emphasizes the variation across different *types of autocratic regimes*, contending that many nondemocratic systems are characterized by

power-sharing arrangements that severely limit the head of government's freedom of action in the international sphere (Weeks 2012). According to these findings, democratic leaders do not necessarily enjoy less leeway than leaders in complex autocracies (such as today's Iran), in which political power is decentralized. This conclusion—that democratic leaders often have room for maneuver—fully applies to proliferation decision-making, a secretive field where even in democracies leaders have frequently made choices with little or no democratic oversight (Hymans 2011, 157–60).

This article makes two contributions to the proliferation literature. First, by showing that important cases of both nuclear weapons pursuit and nuclear reversal cannot be fully understood when neglecting the role of the involved leaders, the article makes a systematic case for an increased analytical emphasis on political leaders in theories of proliferation. Specifically, it holds that explanations of proliferation should, regardless of the type of regime they are dealing with, devote more attention to the personal characteristics of leaders—the so-called “first image” of international politics (Waltz 1959). Crucially, the article does not claim that variables focusing on leaders should be considered the *only* explanatory factors of nuclear policies. Rather, this article starts from the assumption that while international and domestic structures constrain nuclear decision-making considerably, they do not fully determine states' nuclear choices: More often than not, these situational pressures are sufficiently vague, and pointing in different directions, to allow policymakers room for maneuver for how to respond. As they can choose between different courses of action, it matters how different leaders assess the policy options before them. Therefore, to improve their theories, scholars of proliferation may want to adopt a more eclectic approach, enriching their structure-focused frameworks by including the personal characteristics that can account for the remaining variation in leader's proliferation decisions.¹

Such eclectic leader-centric theories can explain why a state's nuclear policies might shift while the structural context remains unchanged: because a new leader holding different characteristics came into office. No less important, however, such eclectic theories could also illuminate why the same leader might oversee different policies even if her underlying beliefs and dispositions stayed the same: because a profoundly changed environment curtailed, or greatly widened, the room for individual choice. As noted above, it is not that leaders *always* matter. In nuclear politics, however, they often do. Within this interactionist framework, the exact timing of nuclear weapons choices might be produced by the arrival of a new leader or by structural changes—such as heightened insecurity, improved access to technologies, or powerful nonproliferation sanctions. Importantly, with regard to new leaders, this article does not claim to know which personal characteristic is influential in shaping a specific nuclear choice. The article only suggests scholars should look at the individual level of analysis when they seek to account for unexplained within-case variation.

As its second contribution, the article offers practical suggestions for scholars seeking to develop proliferation theories that take leaders' characteristics into account. Specifically, it argues that such theory-building efforts need to overcome two difficulties: First, although a few scholars have developed first-image theories of both nuclear weapons pursuit and reversal, most of these leader-centric explanations have invited heavy criticism because they have not dealt adequately with endogeneity concerns. Second, leader-centric research on proliferation is often confronted with the so-called “aggregation problem”: scholars must determine whose preferences will prevail when the state's leadership consists of several decision-makers advocating different courses of action. This article will explain how the endogeneity concerns can be addressed by stressing the role of contingency in how

¹ On the promise of eclectic theorizing, see Sil and Katzenstein 2010.

leaders come to share particular characteristics. Furthermore, the article will show how a change of the dependent variable—from state behavior to leader attitude—could help scholars overcome the aggregation problem in the study of proliferation dynamics.

Over the last several years, nuclear scholars from various academic schools of thought have alluded to the urgent task of reinvigorating the study of leaders in nuclear proliferation. “[W]hen it comes to critical decisions such as whether to build nuclear weapons, I argue here that we must also bring the agent back into the analysis,” concluded Kelly O’Reilly (2009, 5) in his dissertation in political psychology. Subsequently, constructivist scholar Maria Rost Rublee (2012, 51) likewise stressed that “in nuclear politics, it may be time for a renaissance of the individual level of analysis.” Most recently, even Matthew Fuhrmann and Michael Horowitz (2015, 86), both adherents to realist lines of thinking, argued that their findings “underscore the importance of future research on the influence of leaders on proliferation.”

These calls to pay serious attention to the role of leaders in proliferation dynamics reflect growing interest among international relations (IR) scholars in the way that individual leaders matter.² Future works on how leaders’ characteristics influence their nation’s nuclear choices could make a valuable contribution to this burgeoning literature. To name but a few examples, recent research has suggested that leaders’ beliefs about the origins of threats shape how states conduct military interventions (Saunders 2011). Other work has pointed out that leaders systematically vary in their beliefs about the trustworthiness of others and that this variation shapes whether they embrace strong multilateral security institutions (Rathbun 2012). Similarly, recent scholarship has argued convincingly that the beliefs that leaders develop about the “national efficacy” of their states shape whether they pursue policies that challenge or accept the international environment (Kennedy 2011). According to yet another study, leaders have distinct diplomatic styles, and the interaction of these tactics exerts an independent effect on the outcome of international negotiations (Rathbun 2014). Finally, new scholarship suggests that national leaders’ military experiences prior to entering office, such as military service and combat experience, shape their later decisions about going to war (Horowitz, Stam, and Ellis 2015).

The article proceeds in five steps: First, drawing on historical accounts and primary sources, I show that structural theories cannot explain crucial cases of nuclear weapons pursuit and reversal, and I argue that the unexplained variation results from the influence of political leaders. Second, I discuss the extant literature on leaders and nuclear proliferation. Third, I explain in detail how first-image scholars can address endogeneity concerns effectively. Fourth, I elaborate on the aggregation problem in leader-centric research on proliferation and discuss several ways to deal with it through changes in research design. Fifth, I introduce to non-German-speaking readers a leader-centric theory of proliferation that takes both the endogeneity concerns and the aggregation problem into consideration.

Evidence for the Influence of Leaders on Nuclear Proliferation

The proliferation forecasts mentioned above—for North Korea under Kim Jong Un and Iran under Rouhani—nicely illustrate that as far as “rogue” states are concerned, the impact of leaders on proliferation is already considered common

²To be sure, the political psychology subfield of IR has paid attention to the influence of leaders since the 1960s, with scholars such as Alexander George (1969; 1980), Fred Greenstein (1969; 2000), and Margaret Hermann (1984; see also Hermann et al. 2001) making seminal contributions. For an overview of this literature, consult Preston (2017). Unlike these classic works, however, “much of the more recent work on leaders in IR is both more nomothetic and less explicitly psychological, focusing on how leaders matter in IR more generally” (Kertzer and Tingley 2018, 327). I refer here to this recent wave of research. For an overview, see Horowitz 2018.

sense.³ Reflecting this tendency, a comprehensive internal report by researchers at the US National Defense University on previous proliferators stressed the decisive role of leaders in Egypt, Indonesia, Yugoslavia, and Romania—all of which were non-Western autocracies at the time they sought the bomb. This study argued that without taking Nasser, Sukarno, Tito, and Ceausescu into account, it was impossible to understand these countries' pursuit of nuclear weapons. Moreover, these leaders' fall from power also seemed to be the main reason why their states eventually abandoned all nuclear weapon activity. Consequently, the authors concluded that, "for all four cases, the importance of personal leadership cannot be overstated" (Hersman and Peters 2011, 104, as quoted in Rublee 2012, 57). Given this strong emphasis, the study appears to imply that other leaders from within the same country held different attitudes toward the bomb and, if placed at the helm of their nation, may have pursued different nuclear policies.

This variation in leaders' attitudes toward an indigenous nuclear arsenal could also be witnessed within Western nations and their partners, however. Recent historical research has shown that *prior to the authoritative political decision to build nuclear weapons or give up the quest for the bomb*, leaders in numerous Western nations held very different views about the desirability of a nuclear arsenal.⁴ However, the binding decision for or against nuclear weapons then typically transformed the picture to a lasting extent. The decision to build a nuclear arsenal creates powerful bureaucracies and decision-making momentum—effects that make such a decision hard to reverse from a domestic politics perspective (Hymans 2006, 44–45; Müller and Schmidt 2010, 149–51; Lanoszka 2018, 19–21). Similar dynamics, and resulting political problems, afflict attempts to reconsider a nuclear reversal decision (Campbell and Einhorn 2004, 345; Walsh 2005, 42–47; Rublee 2009, 131–33, 202). Given these strong path dependencies, the room for maneuver for other leaders in such nations—including subsequent ones—to reopen the nuclear question decreases substantially. Hence, leaders will often (need to) continue the chosen nuclear policy even if they hold a different personality and thus would not have made the original nuclear weapons decision in the same way. Accordingly, leaders matter *relatively* less subsequent to the decision to pursue or reject the bomb.

Political science research has ignored or downplayed the diversity of opinions that characterized Western domestic debates on nuclear weapons prior to the respective decision for or against an arsenal. In part, this pattern may be a consequence of the "hindsight bias" that commonly influences how social scientists interpret historical events. This well-documented bias describes the tendency that people's knowledge about the outcome of a certain event strongly colors their judgment of how likely *this particular* outcome was compared to other plausible scenarios: in hindsight, people typically consider the outcome that occurred as much more likely than prior to the event.⁵ As a result, the retrospective explanations of historical events by political scientists tend to ignore the influence of all variables that could have brought about a different outcome (Fischhoff 1982, 341–43; Lebow 2010, 38–39; Nye 2013, 1–2). Thus, when they try to explain a certain nation's acquisition of nuclear weapons, political scientists neglect (among other things) all leaders within this country who had opposed a nuclear arsenal. In the same vein, if the historical event concerns a state's nuclear reversal, the interpretations of political scientists often ignore (among other things) policymakers within this country who had favored a nuclear deterrent.

³Way and Weeks (2014) illuminate why this focus makes sense in the North Korean but not in the Iranian case.

⁴For Britain, see Hennessey 2007, 44–47; for Japan, consult Hoey 2016, 167–72; for Sweden, see Jonter 2016; for Italy, consult Nuti 2017; for West Germany, see Lutsch forthcoming; for Pakistan, see Khan 2012, 59–63; and for India, consult Prahladan 2017. For France and Australia, see Hymans 2006, 85–140.

⁵The seminal text is Fischhoff and Beyth 1975. For a review of subsequent research, see Roese and Vohs 2012.

The following summaries of the historical cases of West Germany, South Korea, and Pakistan illustrate how accounts by political scientists have neglected the great diversity of leaders' attitudes toward a nuclear arsenal and, as a result, painted a far too deterministic picture. The three examples show that once we acknowledge the large within-case variation across leaders, domestic and international structures alone cannot sufficiently explain even the outcome of cases that should be easy to explain for structural theories. Leader-based factors, on the other hand, seem to hold promise for accounting for the unexplained variation.

West Germany

The Bonn Republic offers an apt example of the retrospective neglect of the diverse views that often characterized domestic discourses on nuclear weapons in Western countries. In hindsight, West Germany's 1974 accession to the Nuclear Nonproliferation Treaty (NPT), which marked the end to that nation's nuclear weapons activities, is usually portrayed as structurally overdetermined: as West German security was protected by NATO's nuclear guarantee, as the country's globalized economy was highly vulnerable to sanctions, as the young German democracy depended on US goodwill and support in many ways, and because the long shadow of the Nazi past put tremendous moral pressure on Bonn to renounce the bomb, West Germany's NPT accession must have been inevitable (e.g., [Küntzel 1995](#); [Paul 2000](#), 44–47; [Ruble 2009](#), 192–93). Thus, no leader in Bonn could have resisted these forces.

However, this deterministic “it had to happen this way” narrative is likely to be flawed. While the pressures suggesting West German approval of the NPT appear overwhelming in hindsight, at the time numerous leaders in Bonn refused to be impressed, rejecting the NPT consistently ([Taschler 2001](#); [Lutsch forthcoming](#)). Thus, when the treaty came up for ratification in the Bundestag in 1974, a fifth of the deputies voted against joining the NPT. At first glance, the fact that all of these NPT foes were members of the Christian-Democratic parties' (CDU/CSU) parliamentary group seems to suggest that party-level factors determined their negative vote, overpowering the influence of all the pro-NPT forces. Yet this conclusion is flawed, too, for two reasons: First, the CDU/CSU parliamentary group was itself divided over the NPT, comprising not only steadfast opponents of the treaty but also just as many (in fact, slightly more) deputies opting in favor of NPT ratification. Hence, the voting behavior of the Christian-Democrats as a whole clearly did not reflect a common CDU/CSU position on the treaty informed by a shared party ideology. Second, sensing the deep divisions over the NPT within their ranks, the leadership of the CDU/CSU parliamentary group allowed a free vote on the treaty's ratification ([Schneider 2016](#), 515). Thus, strict partisan politics cannot explain either why certain Christian-Democratic politicians opposed or grudgingly accepted the NPT. Accordingly, factors below the party level—that is, at the individual policy-maker level—seem to hold greater promise for explaining this variation within the German case.

To be clear, the explanations of West Germany's NPT accession offered by existing proliferation theories are not without merit. Many of these structural variables did exert *some* influence on calculations in Bonn, making it at least *more likely* that West Germany would join the treaty. Thus, [Gavin's \(2015\)](#) emphasis on the assurance effect of US security guarantees within NATO receives empirical support. For instance, when West Germany deposited the instruments of ratification, it stated that it was joining the NPT on the premise “that the security of the Federal Republic of Germany will continue to be guaranteed through NATO” ([West German Foreign Office 1975](#), 66–67). The prediction of [Lanoszka's \(2018\)](#) theory that Bonn would choose nuclear restraint because West Germany was dependent on US protection and therefore could not afford to alienate Washington over the NPT also gets part

of the story right. In fact, for many in Bonn, joining the treaty seemed inevitable because it was the United States, their country's superpower ally, who explicitly demanded West Germany's accession to the NPT (Lutsch forthcoming). Finally, as the ruling coalition that led Germany into the NPT banked its political survival on a strategy of export-led growth, Solingen (2007) can also claim that Bonn's nuclear forbearance is consistent with her argument.

Of the existent interpretations of the German case, only Gerzhoy's (2015) claim that the United States obtained Bonn's signature to the NPT through threats of military abandonment receives no support from the historical record. In contrast to Gerzhoy's assertions, US leaders did not threaten their German counterparts with abandonment over the NPT, Washington's overall strategy for obtaining Bonn's approval of the treaty did not involve coercive threats, and German leaders did not feel threatened at all by Washington toward consenting to the NPT (Schneider and Gerzhoy 2016, 182–84).

Yet even the three structural accounts of West Germany's accession to the NPT for which some empirical support can be mustered fail to fully account for the event. For despite all the international and domestic forces pushing Bonn away from the bomb, a sizable part of the West German political elite—including a fifth of the Bundestag deputies—categorically rejected the NPT. The existing structural theories cannot explain this large within-case variation. After all, both German policymakers who acquiesced into joining the NPT and those steadfastly rejecting this course of action enjoyed the protection of US security guarantees. Likewise, the two camps disagreed over the NPT even as they both represented a country that was heavily dependent on American military support and although both groups belonged to the same domestic coalition favoring export-led growth (Gray, forthcoming). Given these structural incentives, all German policymakers should have been equally amenable to US nonproliferation demands. Yet only one group in Bonn accepted the need to join the NPT. This variation suggests that the causes stressed by existing structural accounts were influential only because those West German policymakers who voted for the NPT shared some personal characteristic that made them receptive to these structural forces. Lacking this characteristic, the NPT foes in Bonn did not respond at all to the same incentives and constraints.

In hindsight, it is tempting to depict these irreconcilable NPT opponents as irrelevant—a group that stood outside the mainstream of West German politics and, thus, never could have blocked the country's accession to the treaty. However, this conclusion is likely to be flawed. The political clout of these Christian-Democratic NPT foes should not be trivialized. A closer look reveals that in the 1969 elections, after which Willy Brandt of the Social Democrats (SPD) became chancellor and swiftly signed the NPT, the CDU/CSU had come very close to winning an absolute majority of seats in the Bundestag. Accordingly, Brandt's victory was far from inevitable. Even more importantly, if the Christian-Democratic contender, Kurt Georg Kiesinger, had become chancellor in 1969 and had been backed by a majority in the Bundestag that comprised *only* the CDU/CSU, it is questionable if he would have been able to commit the Christian Democrats to signing the NPT.⁶ For only as chancellor of a coalition could Kiesinger have overcome the strong resistance against the NPT within some factions of his own party. Specifically, he could have accomplished this goal by employing the familiar tactic of pointing to the firm stance of a coalition partner—the SPD or the Free Democrats (FDP), both of which preferred joining the NPT—that had to be accommodated. As chancellor of a Christian-Democratic majority, in contrast, Kiesinger would have lacked this option (Bange 2005, 485–86). Thus, as the CDU/CSU came close to such a majority in 1969, West Germany's rejection of the NPT was a plausible scenario.

⁶ Note that Kiesinger himself had grudgingly accepted the NPT by January 1968. See Gassert 2004, 662–64.

Importantly, the familiar counterargument (Gerzhoy 2015) that, even in case of such German resistance, Washington could simply have obtained Bonn's consent to the NPT through brute threats of military abandonment is questionable. As the historical record shows, US presidents during these years were not prepared to employ such coercive measures to nudge the Germans toward joining the NPT. Only weeks after the first draft was presented, President Lyndon Johnson had made the strategic decision that the United States would seek to obtain Germany's consent to the NPT not through threats and strong-arming tactics but solely through "patience, explanation, and friendly persuasion."⁷ As Johnson saw it, a public US-German row over the NPT would only play into the hands of the Soviets (*West German Foreign Office 1967*, 617). For the same reason, Johnson's successor, President Richard Nixon had also moved quickly to make sure that Bonn would not be coerced into joining the NPT. The United States would accede to the treaty, but, according to an early Nixon ruling, "there should be no efforts by the U.S. Government to pressure other nations, in particular the Federal Republic of Germany, to follow suit" (*US Department of State 1969*, 1). Hence, with reservations in the White House against coercing Bonn running deep, it is conceivable that a determined West German refusal to join the NPT could have prevailed.

Given the plausibility of this counterfactual, any sufficient explanation of West Germany's nuclear reversal must answer the question of what distinguished the policymakers categorically rejecting the NPT from the leaders who grudgingly approved the treaty. As the dividing line between these groups ran right through the Christian-Democratic parliamentary group—with almost half of its members voting against ratification while the remaining CDU deputies joined Willy Brandt's Social Democrats to approve NPT membership—it cannot be explained by party ideology or party politics. Much, therefore, suggests that such a sufficient explanation of the German case should include factors at the individual level of analysis.

South Korea

The conventional wisdom among political scientists on South Korea's nuclear reversal also reveals how the discipline's hindsight bias produces an excessive emphasis on structural variables. To be sure, most accounts acknowledge that the weapons program was personally initiated and subsequently protected by President Park Chung Hee. Then, it was abandoned by Park's successor, Chun Doo Hwan, shortly after he took over the reins. However, the structural narratives treat the two leaders as completely interchangeable: After the steady erosion of the US-Korean alliance under Nixon and Jimmy Carter had forced Park to seek an indigenous deterrent, Chun's decision to give up the program was merely a response to the restoration of the alliance under Ronald Reagan and to Koreans' increased need for US goodwill and support during a period of domestic upheaval (e.g., Bleek and Lorber 2014, 444–47; Cho 2009, 342–58; Debs and Monteiro 2017b, 386–88). In this reading, which South Korean leader was ruling the nation did not seem to matter.

To some extent, these structure-focused explanations can be attributed to the fact that they draw on an erroneous chronology of South Korea's nuclear program. Specifically, as Korean sources unmistakably show, Chun Doo Hwan ordered a halt to all South Korean nuclear weapons activities not just in 1981 but as early as summer 1980 (Kim 2004, 199–201; Shim 2003, 232)—that is, several months before Reagan was even elected, let alone inaugurated, as US president. Consequently, the Reagan administration's swift efforts in 1981 to strengthen the US-Korean military alliance cannot have been the cause of Seoul's nuclear reversal decision. However, the small number of assurance-based explanations of the South Korean case that

⁷ The quotation is from a March 1967 letter to ACDA Director William Foster from Secretary of State Dean Rusk. Quoted in Lahiti 2008, 334.

are consistent with the correct chronology (Paul 2000, 123–24; Hersman and Peters 2006, 542) also fail to fully persuade. As Chun clearly mistrusted the Carter administration's pledges of protection just as much as Park had done before him (Wickham 1999, 120–1), the notion that Korean faith in the US security guarantee had increased toward the end of the Carter presidency receives no support from the historical record. Hence, it cannot explain Chun's nuclear course reversal.

Crucially, the second conventional explanation—that the weak legitimacy of Chun's regime was responsible for his acquiescence in the nuclear reversal (Cho 2009, 243–58)—is not entirely convincing either. For it neglects that Park Chung Hee's regime, too, had witnessed a drastic crisis of legitimacy since 1978, one that ushered in Park's assassination in October 1979 (Gleysteen 1999, 2–3, 51–52; Lee 1980, 64–70). Yet while Park had continued Seoul's nuclear weapons activities during the 1978–79 regime crisis and defiantly ignored all US nonproliferation requests, Chun—under the same conditions of fragile legitimacy—quickly seized the opportunity to fulfill the US demand for a nuclear reversal.

Another alternative explanation that received increasing attention in recent years proposes that South Korea's economic and security dependence on the United States made it receptive to coercive US nonproliferation efforts (Miller 2018, 137–39; Gerzhoy 2015, 127–28; Lanoszka 2018). Thus, when Washington credibly threatened to cut off its bilateral civilian nuclear assistance and to terminate the military alliance, Seoul allegedly abandoned its quest for nuclear weapons in 1976. However, although South Korea annulled its contract to purchase a reprocessing plant from France—which would have given it the capability to produce weapons-grade plutonium—and halted its effort to develop a nuclear warhead, the Park regime did not stop all its nuclear weapons activities in 1976. Specifically, Seoul continued to pursue reprocessing technology at least until 1978 (Harrison 2002, 248–49; Choi and Park 2008, 377), fully cognizant of the fact that for Washington “reprocessing equal[ed] nuclear weapons,” according to a US diplomat (quoted in Weinstein and Kamiya 1980, 139). Because US sanctions threats cannot explain why South Korea continued these nuclear weapons activities after 1976, they cannot account for that country's nuclear reversal in 1980.

What is more, in the Korean case, yet another plausible structural driver of nuclear weapons-related policies—the ruling coalition's attitude towards integration with the global economy (Solingen 2007)—did not vary either. Both Park and Chun championed the same domestic coalition of export-oriented industries. In this situation, Solingen's theory cannot explain why Park had not abandoned all of his country's nuclear weapons activities.

Clearly, a sufficient explanation of South Korea's nuclear reversal must account for why Park and Chun made divergent nuclear choices under very similar circumstances. In this regard, studying these leaders' individual characteristics seems to be a particularly promising avenue for future research.

Pakistan

The nuclear history of Pakistan provides additional evidence for the finding that domestic nuclear debates in Western and Western-allied nations often comprised a fairly diverse range of views that cannot be explained by structural variables alone. Unfortunately, however, the interpretations of Pakistan's nuclearization offered by political scientists have typically shunned this more nuanced picture. Instead, their accounts have embraced a thoroughly deterministic narrative that essentially claims that, in Pakistan, “it had to happen this way.” As Pakistan had lost two wars against India in 1965 and 1971, during both of which Islamabad's Western allies had left the country in the lurch, and since New Delhi had also exploded a nuclear device in 1974, Pakistan's leaders really had no other choice than to pursue an indigenous nuclear deterrent (e.g., Ahmed 1998, 182–85; Paul 2000, 133; Reiter 2014, 75).

However, this familiar interpretation overstates the impact of the international security environment on the nuclear choices of Pakistani leaders. A closer look reveals that prior to President Zulfikar Ali Bhutto's authoritative decision in 1972 to pursue nuclear weapons—a decision that forever transformed the country's domestic politics on this question in favor of a nuclear arsenal (Lavoy 2005, 10–12; Weissman and Krosney 1981, 45–48)—only very few politicians and officials in Pakistan, as well as a handful of younger nuclear scientists, had suggested that their nation seek a nuclear arsenal (Khan 2012, 59–63, 81–84). Furthermore, as the foremost advocate of this Pakistani bomb lobby, then–foreign minister Bhutto had been arguing forcefully for a nuclear weapons option at least since 1963 (Weissman and Krosney 1981, 49)—that is, since well before Pakistan was defeated militarily by India in 1965 and 1971. Yet while Bhutto, still before the 1965 war, declared that the Pakistani people would even “eat grass or leaves” to enable their nation to acquire the bomb, then-president Mohammad Ayub Khan kept opposing a nuclear weapons program well after his nation's military defeat in 1965. Thus, when Bhutto's entourage approached him in 1967 with yet another proposal for a weapons option, Ayub quickly sunk it with a disdainful remark that questioned the entire logic of a Pakistani bomb: “Why is the Foreign Office so jittery? What will India do with nuclear weapons?” (quoted in Khan 2012, 65). These episodes raise serious questions for interpretations of Islamabad's bomb decision that focus exclusively on the nation's security predicament: If the threat environment was so compelling after Pakistan had lost the war in 1965, then why did Ayub fail to respond to this powerful incentive to pursue a nuclear arsenal? And if the threat to Pakistan's national security was still manageable before the 1965 war, then why had Bhutto already been pushing for the bomb for years?

To be sure, the fact that Pakistan's leaders held different views on nuclear weapons does not mean that Pakistan's external insecurity did not influence these leaders' preferences regarding a nuclear arsenal. What their diverse views show, rather, is that—at least prior to Bhutto's transformative 1972 decision—even the combination of all these hostile environmental conditions was not sufficient to compel a consensus among Pakistan's leaders to pursue nuclear weapons: Ayub and Bhutto never saw eye to eye on whether Islamabad should seek a nuclear arsenal. Notably, the fact that both Pakistani leaders shared the strategic fixation on the Indian military threat did nothing to alleviate their disagreement on nuclear policy.

A recent structural explanation of Pakistan's bomb decision that is more nuanced than the conventional “severe threats / no allied support” interpretation contends that Bhutto could easily afford to initiate a nuclear weapons program after assuming the presidency in late 1971 because, at that time, Pakistan did not need to fear any painful Western pushback (Miller 2018, 194–98). As Pakistan's economic and military dependence on the United States was then low, the country was not vulnerable to potential nonproliferation sanctions if Washington were to find out about Islamabad's bomb project. This theory cannot explain, however, why Ayub did not seek nuclear weapons in 1965. Although Pakistan received significant economic and military aid from Washington at that time, potential threats to cut off this assistance would—according to the same theory—clearly have lacked credibility since the United States had then no established policy on nonproliferation sanctions. Consequently, with respect to US sanctions, Ayub faced the same permissive environment in 1965 that Bhutto inherited a few years later. In contrast to Bhutto, however, Ayub declined to jump through this window of opportunity for pursuing a nuclear arsenal.

Given the vast similarities between their structural situations, the causes of Ayub and Bhutto's contrasting views on whether Pakistan should go nuclear are likely to be found on the individual level of analysis (Lavoy 2005, 9–10). Hence, any sufficient explanation of why Pakistan pursued nuclear weapons should include not only the hostile external context and the permissive sanctions environment but also

the personal characteristics (shared by Bhutto) that combined with the structural conditions to produce Islamabad's decision to build the bomb.

This cursory analysis of nuclear decision-making in West Germany, South Korea, and Pakistan suggests two important insights: First, our conventional structural theories can often not fully explain states' nuclear policies. Although most of them get parts of the story right, significant within-case variation remains unexplained. Second, at least in nuclear politics, leaders are not interchangeable. As a result, paying attention to the influence of leaders on proliferation could go a long way in helping us to improve upon our existing theories. The next section will discuss how far the proliferation literature has gotten in this regard.

The Literature on Leaders and Nuclear Proliferation

A stronger focus on leaders is particularly warranted in nuclear proliferation studies because the nature of decisions about nuclear weapons makes them unlike most other foreign policy choices. First, nuclear weapons policy involves mostly one-time decisions for which no precedent exists. They are sometimes irreversible and, thus, especially risky. Second, partly due to the dual-use nature of nuclear technology, choices in the proliferation realm have unusually diverse effects and unintended consequences, generating additional uncertainty. Third, given that decisions about "the ultimate weapon" are consequential for a country's geopolitical position and threat environment, they represent issues of great political salience. Finally, and relatedly, many nuclear weapons questions require top-down decisions by the nation's highest leaders and cannot be settled by lower-level officials alone. Overall, then, nuclear choices are different from decisions in most other policy domains and, therefore, fall within the exclusive responsibility of leaders.

Studying the influence of individual political leaders—their beliefs, experiences, or identity conceptions—on states' nuclear policies is a relatively recent development in the political science literature on proliferation. The first attempts at careful theory building date back to Jacques Hymans's work in the early 2000s.⁸ A previous comparative study by Mitchell Reiss (1995, 329–31) had also stressed the importance of the "quality of political leadership." However, Reiss presumed that, under identical circumstances, all leaders would evaluate the merits of nuclear restraint for their state's security and welfare by the same standards. Given this strong rationalist assumption, Reiss essentially confined the role of leaders to whether or not they were "smart" in the sense that they were able to draw the "right" conclusions from an objective evaluation of the environment. Meanwhile, the variation of interest from a first-image viewpoint—why certain leaders had, and others lacked, the ability to reach the "right" conclusions in the nuclear realm—did not receive any attention.

More sophisticated explanations of leaders' independent impacts on proliferation only emerged when scholars started looking at nuclear decisions through a psychological lens (Hymans 2006; O'Reilly 2014). The fact that this novel perspective swiftly delivered results is hardly surprising. After all, the finding that people systematically vary in their responses to a given constellation of political incentives and disincentives is one typical starting point of research in political psychology (McDermott 2004, 14–15). So far, the literature on leaders and proliferation has comprised four distinct theoretical frameworks.⁹ Three of them—the familiar theories developed by Jacques Hymans (2006), Kelly O'Reilly (2014), and Fuhrmann

⁸The first major publications in this strand of the literature were Hymans 2000 and Hymans 2001.

⁹Additional leader-centric research on nuclear dynamics has tried to explain decisions on counterproliferation strikes (Whitlark 2017), the efficacy of nuclear coercion (Macdonald and Whitlark 2016), and bilateral nuclear cooperation (Berkemeier 2018). In contrast, Lavoy's (1993) work on the impact of nuclear beliefs ("myths") on proliferation is not a leader-focused theory. In his framework, the nuclear beliefs of political leaders are a function of the leaders' interaction with influential pro-bomb scientists ("mythmakers") and thus lack independent explanatory power.

and Horowitz (2015)—will be elaborated upon in this section. The recent theoretical framework proposed by Jonas Schneider (2016) builds on these three theories to the extent that it has solved the endogeneity and aggregation problems afflicting the preceding first-image works on nuclear proliferation. As it has so far only been published in German, however, Schneider's theory has not yet been able to influence the discourse among non-German-speaking scholars of the nuclear age. His theoretical framework will be introduced in the final section of the article.

Of all first-image theories of proliferation, Jacques Hymans's (2006) work on leaders' national identity conceptions has received the most attention.¹⁰ His theory starts from the premise that the authoritative political choice to build the bomb is afflicted with such tremendous uncertainty as to what the political, military, and economic consequences might be that it cannot possibly follow from a classic assessment of the costs and benefits of the decision. With a rational calculation thus rendered unfeasible, Hymans contends that the choice to pursue a nuclear arsenal more closely resembles a gut feeling and that this intuitive decision is shaped by leaders' identity-driven views of their own country—their "national identity conception" (NIC). Notably, a leader's NIC constitutes her *individual* perception of her own country. As a result, different leaders from within the same state may hold divergent NICs. In Hymans's framework, NICs comprise ideas about one's own country's relationship to a particular external "key comparison other," and these ideas provide intuitive answers to crucial questions of national identity: First, is the relationship with our key comparison other antagonistic, or do we both belong to a larger group that is more important than anything that divides us? Second, does our nation occupy an equal (if not higher) rank in the international pecking order, or is it accorded a lower status than the key comparison other? According to Hymans, only leaders holding an "oppositional-nationalist" NIC—who combine an antagonistic outlook with a sense of an equal (or superior) national status—pursue the bomb: As their oppositional-nationalist NIC instills them with strong fear and pride, these political leaders are most likely to make the risky decision to build a nuclear arsenal.

Another scholar who has studied the role of leaders in proliferation is Kelly O'Reilly (2014). He has proposed a second theory on why only some leaders pursue the bomb. Just like Hymans, O'Reilly argues that the decision to build nuclear weapons resists typical cost-benefit analyses, since the uncertainty about what might follow a push for the bomb is so cognitively overwhelming. Working from that assumption, he claims that a leader's choice for a nuclear arsenal is determined by their "operational code," a set of fundamental beliefs about how international politics works.¹¹ Specifically, operational codes address two very basic questions: First, is international politics dominated by conflict, or is it primarily cooperative? And, second, is my country able to shape and control its environment, or are its policies driven by external forces? According to O'Reilly, leaders who view the world as inherently conflictual, yet believe they can control this environment, are particularly prone to pursue nuclear weapons. This conflict-control type of leader seems quite similar to the oppositional-nationalists in Hymans's framework. Unlike Hymans, however, O'Reilly develops a dyadic explanation of nuclear proliferation. Thus, he does not claim that only those leaders who view their world as conflict-driven and also believe they can control events push their nations toward the bomb. In his theory, leaders holding other operational codes also seek a nuclear arsenal once their country is involved in a confrontation with a state whose leader has internalized the conflict-control type of operational code.

¹⁰ Hymans's book received a prominent place in important literature reviews, including in Potter and Mukhatzhanova 2008 and Sagan 2012.

¹¹ The concept was originally introduced by Leites (1951). However, the operational code construct was later reconceptualized by George (1969), who stripped it of its psychoanalytical elements and isolated the cognitive aspects.

A third leader-centric theory of proliferation shifts the analytical focus to the experiences that national leaders made before entering office. In this theory, Fuhrmann and Horowitz (2015) contend that such earlier experiences have various effects on political leaders, shaping, among other things, how they see the likely success and failure of different grand strategies or how they perceive the costs and benefits of certain courses of action. Specifically, Fuhrmann and Horowitz argue that leaders with a particular experience—participation in a rebellion against the state—are more likely to pursue a nuclear arsenal once in office than leaders lacking a rebel background. To explain the influence of rebel experience on proliferation, their theory claims that former rebels excessively value national independence and sovereignty, place little trust in military alliances to provide for their country's security, and generally tend to be more risk acceptant than other types of leaders. Through these mechanisms, Fuhrmann and Horowitz contend, rebel experience makes leaders more likely to value the potential benefits of possessing a nuclear arsenal and to downplay the costs and risks of pursuing the bomb.

Although these theories differ in which particular leader-centric factor they deem the most important for explaining proliferation, all of them have enhanced our understanding of nuclear dynamics. In particular, by drawing attention to the impact of leaders, these theories have allowed us to make sense of important “ups and downs” that have typically afflicted states' nuclear weapons activities after leadership transitions. For example, according to recent research, seventeen of the twenty-seven states that have abandoned their existing nuclear weapons activities had changed their leadership less than twelve months before concluding negotiations that permanently stopped their nuclear weapons efforts (Mehta 2015, 18). Such abrupt nuclear policy changes can often not be sufficiently explained by structural conditions alone. Moreover, equipped with first-image theories like these three, scholars could account for the above-mentioned large *within-case* variation in leaders' attitudes toward a nuclear arsenal. And yet, the conclusion that leaders are not interchangeable is not just contested but has also been challenged on a more fundamental level, as the next section will discuss.

How to Preempt Endogeneity Concerns

Scholars have offered a theoretical critique that essentially questions whether leaders exert *any* independent effect on their nations' nuclear policies. In particular, these skeptics have contended that first-image accounts of proliferation dynamics have focused on leaders' beliefs and identity conceptions “without consideration of how the security environment of the state shapes” such individual-level variables (Debs and Monteiro 2017a, 334; see also Lieber 2007, 255). This critique appears to imply that the characteristics of national leaders—their beliefs, experiences, and identities—can be systematically traced back to external factors, such as the international threat environment.¹² Accordingly, the political leaders of states facing a hostile security situation will hold beliefs and identity conceptions that strongly push them toward the pursuit of nuclear weapons. In contrast, if a country enjoys a benign security environment, its leaders will share beliefs and identities making them disinclined to acquire an arsenal. If this were true, the relationship hypothesized by first-image theories between leaders and their nuclear attitudes would be spurious: the characteristics of leaders would be endogenous to preceding external conditions and, consequently, exert little or no causal effect on their states' nuclear

¹²Beyond nuclear decision-making, scholars have also challenged first-image scholarship on other grounds than endogeneity concerns. These general critiques have claimed, for example, that human nature could not explain international relations because the former is a constant whereas the latter varies (Waltz 1959), or that leaders could not be studied analytically since their personalities were too idiosyncratic to be compared systematically (Rosenau 1966). However, to the best of this author's knowledge, no scholar has ever directed these specific objections at leader-centric theories of nuclear proliferation.

behavior. Hence, these critics consider individual-level factors less as independent variables causing proliferation but as mere intervening variables lacking significant explanatory power.¹³

This objection—that leaders exert no independent causal effect on nuclear weapons decision-making—represents a severe challenge to the validity of first-image accounts of proliferation. To refute this claim, proponents of leader-centric theories need to make the case that the pattern of causal sufficiency that the critics claim to have identified between *some* aspects of the structural environment and the proliferation-relevant characteristics of leaders does not exist. In other words, they need to establish a distinct logic of first-image theories of nuclear dynamics.

Fortunately, there is a proven way for how scholars can approach this important task. In general terms, any first-image account needs to argue convincingly that possession of the causally relevant characteristic is, on average, the result of contingency: an individual-level variable—such as a belief, identity conception, or experience—can claim to exert an independent effect on subsequent behavior only if the selection through which people came to share *one specific* belief, identity, or experience was fundamentally contingent and thus “literally inexplicable.”¹⁴ Thus, if a theory can make a plausible case that this selection occurred with some range of autonomy from preceding material conditions, its argument that a subsequent behavior is *caused by* this individual-level characteristic is logically sound. (Of course, one would still have to show that the causal argument is supported by the empirical evidence.) If, on the other hand, a theory fails to argue credibly that the process shaping which specific characteristic a person came to share was contingent, the claim that a later behavior is *caused by* that characteristic is logically flawed. For, in this case, the selection outcome appears as a mere function of the structural environment.

Against this general backdrop, it certainly seems possible for first-image theories of proliferation to rebut the endogeneity critique and establish a distinct causal logic. To achieve these goals, leader-centric explanations of proliferation must argue persuasively that the selection of the particular individual-level characteristic they deem proliferation-relevant cannot be reduced to preceding structural conditions.¹⁵ Only then will their claim that leaders’ characteristics have an independent effect on proliferation—and are not just the derivative of external circumstances—be logically sound.

Unfortunately, the three first-image theories of proliferation discussed above have not made the case for their distinct logic. Hymans (2010, 33) even admits that his theory “takes state leaders’ identities as given and therefore does not tackle the important further questions of how people become oppositional nationalists in the first place and why oppositional nationalists may rise to power at certain moments in history.” To his credit, however, Hymans seems to accept implicitly that leaders’ selection of a particular NIC is contingent: he contends that the origins of different leaders’ NICs “are quite evidently highly complex,” likely combining collective memories with personal experiences or affinities (Hymans 2006, 208). Still, it would have helped his case if Hymans had argued that even *specific* conjunctions of collective and personal factors—say, a culture of national revenge and the experience of military service—do not systematically produce oppositional nationalists. These conditions are still sufficiently ambiguous to allow for a range of different NIC-type interpretations.

Unlike Hymans, O’Reilly (2009, 7) makes clear at the outset of his study that “for the leaders examined, their rise to power was far from being preordained, resulting

¹³ For example, Bleek (2010, 195–96) suggests that Bhutto’s rise to the presidency—which proved crucial for Pakistan’s pursuit of nuclear weapons—was largely a derivative of structural conditions. Consequently, Bhutto’s individual characteristics did not seem to matter.

¹⁴ Here I draw on Parsons 2007, 13–14. The quote is from Parsons 2007, 13.

¹⁵ For practical advice on how to establish the exogeneity of leaders’ beliefs or identities, see Jacobs 2015.

more from circumstances and political compromise than historic certainty.” In particular, O’Reilly (2009, 7) highlights that three prime ministers who were decisive for South Africa, Australia, and India’s evolving nuclear programs “came to power following the sudden and unexpected death of their predecessors by way of assassination, heart attack, and a swimming accident.” Drawing on these and other examples, O’Reilly (2009, 253–54) unmistakably dismisses any notion that pro-bomb leaders’ rise to power can be reduced to broader structural forces, such as a state’s security environment. Moreover, O’Reilly (2009, 21–22, 34) reveals that he regards leaders’ operational codes as exogenous, thereby presuming that they operate independently from the environment surrounding a certain proliferation decision. His framework does not address, however, the issue of where national leaders’ operational codes originate. Consequently, O’Reilly’s theory is vulnerable to criticism on the grounds that (future) leaders whose states are facing a hostile security environment will naturally come to hold the types of operational codes that predispose them, once in office, towards the pursuit of nuclear weapons. A clarification by O’Reilly that he views leaders’ selection of a specific operational code as contingent could have preempted this structuralist challenge effectively.

Finally, Fuhrmann and Horowitz (2015) likewise fail to dispel all doubts that the proliferation-relevant characteristics of leaders can be traced back to preceding conditions. To be fair, they go to considerable lengths to show that the rise to power of former rebels occurred autonomously from environmental factors—such as a foreign occupation—that might also make states more likely to seek nuclear weapons (Fuhrmann and Horowitz 2015, 76–77). By doing so, Fuhrmann and Horowitz successfully undercut concerns that states that are especially likely to pursue nuclear weapons for structural reasons are also the ones most likely to produce, or select, leaders with rebel experience. However, they do not address the other potential objection, namely that rebel experience may be systematically caused by a specific set of preceding conditions. This is a serious omission given that participation in a rebellion seems to reflect a conscious decision to resist and fight back; a person can hardly become a rebel fighter without choosing to do so. In other words, leaders *select themselves* into a rebel experience. And one could argue that this fateful choice is made only by people facing very specific circumstances. In this case, rebel experience would be a good predictor of whether state leaders seek nuclear weapons, but it would not exert an independent effect on the decision to proliferate. To be sure, the decision to join a rebellion might as well reflect contingency. Yet if Fuhrmann and Horowitz believe so, then they should have revealed, and explained, this assumption to defend their argument against the critique that rebel experience is a spurious cause.

As this review of extant theories has shown, proponents of first-image accounts of proliferation ought to make a better case that leaders’ characteristics arise with some autonomy from the surrounding environment. Otherwise, their claims that political leaders have an independent effect on proliferation dynamics are vulnerable on logical grounds and will thus fail to be fully persuasive.

How to Overcome the Aggregation Problem

Earlier sections of this article have shown that political leaders within a single nation can—and frequently do—strongly disagree on decisions involving their country’s proliferation behavior. This within-case variation in leaders’ attitudes raises an important question for the task of theory testing. Specifically, scholars testing theories of proliferation against evidence from cases involving such disagreement among the leadership face the problem that they will find evidence confirming but also evidence infirming these theories’ hypotheses: Within a single country, some members of the ruling elite will have made statements or choices that support a certain proposition, while other leaders will have produced evidence calling that

proposition into question. The ideal solution to this problem would be to have a rule that specifies a priori whose leader's statements or actions carry more inferential weight and why they do so. Yet unfortunately, such a priori guidelines are not commonly used by IR scholars. Nonetheless, a posteriori approaches—which treat a certain leader's actions or statements as decisive evidence for no other reason than the fact that her views prevailed—are not acceptable because they entail strong, and usually unwarranted, assumptions about that person's ability to determine her nation's policies.

This challenge for theory testing reflects the broader “aggregation problem,” which, in an IR context, is usually concerned with the question of how the different attitudes of leaders from one country are aggregated up into the international behavior of their state. In nuclear politics, answering this question is no easy task; we may know which variables shape leaders' individual attitudes toward proliferation. Yet this information does not tell us much about which of these different attitudes will prevail in the decision-making process and eventually influence the state's nuclear-weapons policies.

Importantly, the aggregation problem has fostered the tendency among scholars of proliferation to theorize not the *entire* process of states' nuclearization but only *one part* of that process. As I suggested above, the causal relationship that proliferation theories seek to explain—the connection between certain “determinants” and “states' proliferation behavior”—is more fittingly conceived of as a *two-step* causal chain: the “determinants” first shape the “attitudes of a country's political leaders,” which then aggregate up into the “nuclear behavior of their state.”¹⁶ Given this two-step causal model, every national process of nuclear proliferation in reality involves two processes that are linked in a sequence. The first step in that sequence encompasses the process of *attitude formation* on the part of each political leader within a particular country. For example: “Influenced by Iranian hostility and driven by his confrontationally minded operational code, the Saudi defense minister has concluded that his nation should pursue a latent nuclear weapons capability.” The subsequent second step involves the actual *decision-making* processes within the executive or legislative branches of government. In that process, a particular leader might prevail. The state's nuclear behavior would reflect her individual attitude. But she could as well be on the losing side of the argument. For example: “The Saudi defense minister argued forcefully for a latent nuclear weapons capability when the Royal Council debated the kingdom's strategic options; yet cooler heads prevailed.”

Distinguishing between these two processes of individual attitude formation and group decision-making appears to be straightforward. This more complex reality seems to be problematic, however, for the goal of theory building. In this regard, the challenge is that domestic nuclear decision-making processes vary considerably—for example, in terms of how many veto players are involved—across countries but even across different nuclear decisions within the same country (Walsh 2001; Hymans 2011, 129–31). For instance, it makes a huge difference whether a partic-

¹⁶ What exactly is meant by “attitude” here? Drawing on the foreign policy analysis (FPA) literature, I define a political leader's attitude as her personal stance (of approval or disapproval) toward a policy issue *under specific circumstances* (Hudson 2007, 51). Thus, the answer of the foreign minister of Saudi Arabia to the following question would be a good example of an attitude: “Given that critical parts of the Iran Nuclear Deal have a sunset clause, should Saudi Arabia start now to develop a latent nuclear weapons capability?” Notably, according to this definition, a leader's general *beliefs* (“Are nuclear weapons useful tools of coercion?”) or *preferences*, which are never tailored to specific situations (“Should Germany have nuclear weapons?”), do not qualify as attitudes. As the two-step causal chain mentioned above makes clear, a leader's attitude precedes the behavior of the state on the question at hand. Yet it also precedes the pressures for consensus within her own party, caucus, or governing coalition, each of which might lead the leader to modify her position. Attitudes are thus not driven by constraints from intraparty, legislative, and governmental politics. Rather, a leader's attitudes could be influenced by any of the following: (1) the international environment; (2) those domestic constraints that—like public opinion—do not directly result from decision-making processes within parliament, government, or her own party; and (3) the leader's individual characteristics. Simply put, a political leader's attitude on an issue is her answer to the question: “How would I decide if I did not have to take my party, caucus, or cabinet's views into consideration?”

ular country's nuclear reversal decision requires just a few senior cabinet members to stop calling for an indigenous nuclear deterrent or whether the choice for a nuclear reversal involves the ratification of an international nonproliferation treaty. In the former case, the domestic decision-making process will likely be informal and include only very few veto players. In the latter case, in contrast, all members of parliament will participate in a highly formalized, and frequently multilayered, decision-making process with numerous veto points. This institutional variation is important from a theory-building perspective since it obstructs scholars' ability to generalize about the effects of domestic decision-making processes on proliferation outcomes—a generalization that is necessary for theory building.

Interestingly, the first-image theories developed by Hymans and O'Reilly have managed to circumvent this tricky problem. This was only possible, however, because Hymans (2006, 36, 226–27) and O'Reilly (2009, 31–32, 48) have chosen to theorize only one highly specific decision—the ultimate binding order to build a nuclear arsenal—and explicitly assume that a nation's top leader will *always* prevail in the decision-making process on this question. As a result of this assumption—that the decision-making process has no independent effect on the outcome—the top leader's attitude toward the final decision to build the bomb, on the one hand, and the eventual behavior of the state on this issue, on the other, are identical in the two theories.¹⁷ Hymans and O'Reilly's assumption on the dominant role of the top leader may or may not be justified as far as the high-stakes decision to build an arsenal is concerned.¹⁸ However, in the case of many other important nuclear policy choices—for example, ratifying the NPT—this particular assumption seems questionable (Hymans 2010, 32–33).

Except for Hymans and O'Reilly, existing theories of proliferation have “solved” the aggregation problem by ignoring all effects of decision-making processes on outcomes. Not surprisingly, by neglecting one of the two halves of the proliferation process, this approach has introduced “omitted variable bias” into the existing theoretical models, thereby—statistically speaking—increasing the error term and distorting the results of any empirical test.¹⁹ The omitted variable bias that has resulted from ignoring the nuclear decision-making process is arguably one of the reasons for the astonishing lack of theoretical progress on the causes of nuclear proliferation (Bell 2016).²⁰

I propose three pathways towards avoiding this particular omitted variable bias. First, scholars could limit their theories to certain *types of states* in which the independent causal effect of the domestic decision-making process on proliferation outcomes is negligible. For example, they might want to develop a middle-range theory that seeks to explain only the proliferation behavior of personalized dictatorships. For if only one leader truly matters for the course of a nation's nuclear policy, then—by definition—there are no veto players and, consequently, the nuclear decision-making process does not matter for the outcome.

Second, scholars could also study just one specific *nuclear choice* for which the domestic decision-making process is (kind of) similar in all cases. Such projects might focus, for example, on the conditions under which states have acceded to the NPT, conducted their first test of a nuclear device, dismantled their nuclear arsenal, or pursued the full nuclear fuel cycle. Ideally, the narrow focus on just one choice would eliminate (most of) the cross-case variation in the decision-making process. In this case, scholars would find it much easier to theorize the effects of

¹⁷ Likewise, earlier research in FPA dealing with leaders typically focused on decisions where the assumption of such “predominant leaders” seemed to hold. For the concept, see Hermann et al. 2001, 84–86.

¹⁸ Significantly, Hymans's (2006, 124–33) case study of Australia shows that even a strongly pro-bomb prime minister (John Gorton) could not impose his views upon a reluctant cabinet.

¹⁹ On omitted variable bias, consult King, Keohane, and Verba 1994, 168–82.

²⁰ For further reasons for the limited theoretical progress on proliferation, see Montgomery and Sagan 2009 and Chernoff 2014, 115–22.

the decision-making process on the resulting policy choice explicitly. As I noted previously, Hymans and O'Reilly have chosen this option.

Third, scholars could choose to *exclude the decision-making process* from their theories—which is not the same as ignoring that process. In the former case, the domestic process of nuclear decision-making would no longer be a part of what these scholars aspire to explain. In other words, the dependent variable of their studies would change from the “nuclear behavior of the state” to the “attitudes of the political leaders” toward their nation’s nuclear behavior. Thus, scholars would no longer try to identify the circumstances under which *states* pursue nuclear weapons or abandon all nuclear weapons activities. Instead, they would now attempt to ascertain the conditions under which *political leaders* argue and vote in favor of their nation’s pursuit of a nuclear arsenal or why these leaders agree to give up their country’s nuclear weapons program.

Of these three options to avoid the outlined omitted variable bias, the third approach appears to be the most promising. Significantly, it represents the only option that allows scholars to aim for *general* theories of nuclear proliferation—instead of focusing on ever-smaller subsets of proliferation dynamics that are limited to certain types of states or very specific nuclear choices. Moreover, by explicitly concentrating scholars’ energies on explaining the process of *attitude formation* (while excluding the *decision-making* process from what is to be explained), this approach only gives priority to what has already been the central goal of the demand-side literature on proliferation: improving our understanding of why some states *seek* nuclear weapons, *do not want* them, or *are willing to* give up all nuclear weapons activity²¹—all questions that are concerned with attitude formation. Given this implicit bias in the proliferation research program, it is not just all the easier to understand scholars’ ignorance toward domestic decision-making processes. Further, the case made here to prioritize the goal of more fully understanding nuclear attitude formation does not signal a radical departure. Rather, it amounts to little more than concentrating all our theoretical efforts on what is widely considered the core of the proliferation puzzle.

Most importantly, future theories of nuclear attitude formation will yield explanations and predictions that promise to be more precise than those offered by conventional theories of proliferation.²² For these new explanations are not plagued by the same omitted variable bias: such theories seek to explain “only” nuclear attitude formation, and they explicitly theorize that process. In contrast, most extant theories of proliferation aspire to explain both nuclear attitude formation and domestic nuclear decision-making yet theorize only the former and ignore the latter. And as the decision-making process does exert an independent effect on states’ nuclear behavior, neglecting that process introduces omitted variable bias into the explanations and predictions of the conventional proliferation theories. Theories of nuclear attitude formation do not face this problem.

Skeptics may worry, however, that developing theories of nuclear attitude formation is not worth the effort. Specifically, they may argue that a better understanding of when leaders hold certain nuclear attitudes would not make a significant contribution to the extant literature on proliferation and would also lack policy relevance. After all, both scholars and nonproliferation practitioners are primarily concerned with the nuclear *behavior of states*.²³ These worries are unfounded. Insights about nuclear attitude formation can contribute to the extant literature and be policy-relevant because they still enable scholars to draw conclusions about states’ nuclear behavior. These conclusions about state behavior are of a more conditional nature

²¹ On this focus of the literature, see Sagan 1996, 55–56 and Hymans 2010, 13–14.

²² For the general argument that first-image theories offer more empirically realistic models of individual attitude formation, consult Hafner-Burton et al. 2017, S4.

²³ For a general critique of first-image theories along these lines, see Powell 2017.

because they include the impact of the decision-making process as a caveat. For example: “States will pursue nuclear weapons if they are engaged in an enduring rivalry with a competitor that has a latent nuclear weapons capability *and their nuclear policy-making process is dominated by leaders holding a confrontationally minded operational code.*” Crucially, the exact meaning of “dominating” the domestic decision-making process depends on the specific case at hand—that is, on the country’s political system and the particular nuclear decision. Hence, in some cases, such dominance might require a two-thirds majority in a parliamentary vote. In other cases, it may be necessary to achieve unanimous agreement among cabinet members to dominate the decision-making process on a particular nuclear choice. In yet another case, it may suffice to have the top leader’s consent. This caveat on decision-making notwithstanding, the added understanding of proliferation that first-image theories of attitude formation promise—for example, that only leaders holding one particular operational code may be receptive to proliferation pressures—makes developing such theories worthwhile from both a scholarly and a practitioner’s perspective.

The last section of this paper will present the first-image theory of proliferation developed by Jonas Schneider. In this framework, Schneider has taken both the endogeneity concerns and the aggregation problem into consideration.

Why Do Leaders of US Allies Agree to a Nuclear Reversal?

Decisions of states to reverse course and abandon their nuclear weapons activities have recently received increasing scholarly attention. This literature on nuclear reversals has also come to include research focusing on the individual level of analysis: to explain why some leaders of US allies agree to, and others steadfastly reject, their nation’s nuclear reversal, Jonas [Schneider \(2016\)](#) proposed a leader-centric framework named “Intra-Alliance Status Theory.”

Just like Hymans and O’Reilly’s accounts of the final decision to *build* the bomb, Schneider’s theory starts from the premise that the choice for a nuclear *reversal* also entails huge uncertainties. Thus, such a choice cannot follow from a classic cost-benefit calculation. Given these cognitive constraints, his framework ties allied leaders’ attitudes toward a nuclear reversal to their basic beliefs about the status hierarchy within their alliance with the United States. To illuminate allies’ movement toward a nuclear reversal, Schneider’s theory draws on a crucial psychological force at work in US alliances: the social pressure that is inherent in all demands that the United States, as an ally with a superior international status, makes on its partners. Crucially, this social pressure does not entail any threats of sanctions. Nonetheless, US social pressure has historically been highly relevant because Washington has been very reluctant to employ coercive tools against its allies for nonproliferation purposes. However, Schneider claims that not all political leaders of US allies are susceptible to this social pressure; leaders who conceive of their nation’s status as inferior to the United States are highly receptive to US social pressure and therefore obey the demand for their country’s nuclear reversal. In contrast, allied leaders ranking their nation on par with the United States are insusceptible to social pressure from Washington and, consequently, disobey the US request for their country to undertake a nuclear reversal.²⁴

²⁴ Importantly, Schneider’s theory differs from Hymans’s framework in important respects. For example, in Hymans’s theory, the reference point to which leaders compare their nation in terms of status is its key comparison other. In the case of militarily threatened states, like US allies, the major rival of a state will typically occupy that role. In contrast, Schneider’s theory is only concerned with how allied leaders conceive of their nation’s status vis-à-vis the United States. Crucially, the two status beliefs do not correlate. Although some allied leaders holding an oppositional-nationalist NIC might also rank their nation on par with the United States, this is not a general pattern. For example, most “China hawks” in Japan hold an oppositional-nationalist NIC (vis-à-vis China, their key comparison other) but consider their country’s status as inferior to the United States. See [Curtis 2013](#) and [Michishita and Samuels 2012](#).

Drawing on recent historical scholarship and research in sixteen archives, Schneider's book shows in great detail that German and Korean leaders sharing an inferior-status view opted for nuclear reversal. Meanwhile, German, Korean, British, and Pakistani leaders ranking their respective nation on par with the United States all steadfastly rejected such a course reversal.

Notably, Schneider explicitly makes the case that the individual-level explanatory variable of his theory—allied leaders' beliefs about their nation's status vis-à-vis the United States—cannot be reduced to structural factors. He concedes that these status beliefs of leaders have always been influenced by collectively shared ideas and ideational currents—such as postimperial notions of supremacy (in Britain); the view (of Northern Germans) that their country's surrender in 1945 also implied a defeat of German culture and intellectual traditions; the Asian version of anti-colonial nationalism (in Pakistan and Korea); or the conservative, and distinctly Catholic, contempt in postwar Europe (Southern Germany, France, and Italy) for the allegedly materialist and “cultureless” America. Nevertheless, Schneider argues that such collectively shared ideas and frames alone did not determine leaders' views of how high their nation ranks vis-à-vis the United States. As he shows, such ideational structures combined with highly idiosyncratic facets of personal biographies to produce a leader's status belief vis-à-vis the United States: for example, in the case of some leaders, early encounters with the Anglo-American “world” were influential in shaping an inferior status belief. For another leader, however, this early contact with US culture entailed negative personal experiences with racism and, as a consequence, triggered the opposite status belief. Armed with further good examples, Schneider ably makes the case that allied leaders' selection of one status belief vis-à-vis the United States is influenced by contingency.

Finally, to avoid the omitted variable bias that results from ignoring the effects of domestic decision-making, Schneider deliberately opted for a theory of nuclear attitude formation. Accordingly, he uses *allied leaders' attitudes toward their nation's nuclear reversal* as the dependent variable of his theory. Notably, his framework still provides a general theory, since it applies to all kinds of nuclear reversal decisions and to all types of US allies. Furthermore, the four detailed case studies offer strong support for his theory of nuclear attitude formation. In contrast, structural explanations of nuclear reversal did not fare nearly as well in the empirical tests. The superior explanatory power of Schneider's theory might well be the result of his decision to exclude decision-making processes from what is to be explained. Or Schneider's framework might simply capture more of the causal forces at work in nuclear reversal choices than alternative explanations. In any case, his theory allows scholars to draw an important—though conditional—conclusion about the *behavior of states*: US-allied states will not give up their nuclear weapons activities if leaders ranking their nation on par with the United States enjoy veto power over the nuclear reversal decision. As I explained in the previous section, the exact meaning of the caveat “holding veto power” depends on the case at hand, especially on a state's political system and on what kind of nuclear weapons activity would have to be stopped to accomplish a nuclear reversal. Even so, the added understanding of nuclear dynamics that Schneider's theory offers—that leaders who rank their nation on par with the United States are the ones most likely to frustrate and derail US nonproliferation efforts toward allies—makes an interesting contribution to the literature and seems valuable for policymakers.

Concluding Thoughts

Scholars of nuclear proliferation should devote more attention to the role of leaders. Certainly, the international environment and domestic political constraints have had a major influence on the spread of nuclear weapons. Still, as nuclear history has shown time and again, even strong situational pressures do not determine

nuclear choices as leaders retain significant room for maneuver and look at their environment through very different lenses. Accordingly, when they faced similar structural conditions, different leaders—from the same nation and sometimes even from the same political party—have frequently favored markedly different nuclear policies.

Developing theories of nuclear *attitude formation* could be a promising path to pursue for scholars interested in the influence of leaders. Instead of explaining states' proliferation behavior—a very ambitious undertaking that has so far proven elusive—theories of attitude formation limit their scope to understanding why leaders approve or reject particular nuclear policy choices. By concentrating on what has always been considered the proliferation puzzle's core, theories of nuclear attitude formation enable scholars to improve upon existing theoretical explanations and enhance our knowledge of proliferation dynamics. Significantly, it is this more precise understanding of causal relationships that is arguably one of the keys for making sure that theoretical knowledge is policy-relevant (George 1993, 6–11, 120–25; Mearsheimer and Walt 2013, 439–40, 448). No less important, scholars of proliferation should not regard the shift in their analytical focus from state behavior to leader attitudes as an admission of their subfield's failure. Decisions of states to pursue, acquire, renounce, or abandon nuclear weapons are just extremely complex. Thus, a step toward more modest theoretical aspirations is probably only realistic. After all, it is worth remembering ourselves that “God gave physics the easy problems” (Bernstein et al. 2000, 43).

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