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Why Do Less Capable States Go Nuclear?

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Introduction

The first nuclear weapons program, the Manhattan project by the United States, was not cheap. It cost approximately $2.2 billion to detonate the first nuclear weapon, a figure of about $30 billion dollars today[1]. To create a nuclear weapon is a vastly complicated, time consuming, resource intensive, and expensive process. This can lead to the assumption that all states that develop nuclear weapons capabilities would be states with larger pools of resources, who would thus be able to muster more assets to such a program. We would expect only the most powerful of nations in the system to achieve nuclearization first, with less and less powerful and wealthy countries struggling to achieve them at all, if ever. A status quo of nuclear states almost perfectly aligning with great powers seemed reasonable. Initially, the assumption proved true, as the US, USSR, UK, France, China, and India obtained their weapons. Each of these nations were either one of the victorious Allies on the UN Security Council, or nations with vast populations and human resources.

However, after them, the second generation nuclear proliferators were comparatively minor powers, skipping several rungs on the expected proliferation ladder. Of Pakistan, South Africa, Israel, and North Korea, each achieved nuclear weapons with far smaller economies, weaker institutions, and less robust scientific and industrial capabilities. They achieved nuclearization of their militaries before several actors which would conventionally be considered larger powers, such as Japan, Germany, Italy, South Korea, or Saudi Arabia did. Why did these nations, with limited capabilities compared to the first nuclear states, pursue nuclear weapons?

[1] Alex Wellerstein, "Manhattan Project," Encyclopedia of the History of Science, October 10, 2019, https://lps.library.cmu.edu/ETHOS/article/id/35/.

While there has been significant work done in the field of nuclear weapons proliferation, there are significant holes in modern literature. Notable here is the homogeneity with which much of the existing scholarship surrounding nuclear weapons treats potential proliferators. While it is understandable that some generalization is necessary, this leaves the current picture of nuclear proliferation logic lacking in nuance as to the capabilities of potential nuclear acquirers. By treating all states the same, modern proliferation theory ignores the very salient fact that states with different capability levels may have different logics than those that have been assumed to apply to great powers. This may be partially explained by the fact that the theories surrounding nuclear proliferation first germinated in the period when only great powers did have nuclear weapons. As such worrying about the possibility of less capable nuclear acquirers was unnecessary, or at least, not an immediately pressing issue. However, as we have seen the second generation of nuclear acquirers, the most recent proliferators have been states with less capabilities than the first. This warrants re-examination of the logics initially applied to great powers to see if they do indeed hold true for the less capable acquirers.

This reexamination is more important, however, than simply checking under the hood of an academic theory. While largely successful, the modern nonproliferation regime has been built on the assumptions of a theory of nonproliferation that may not be accurate for all cases. This alone would warrant a review, but the issue is compounded by the simple face that the majority of the nearly 200 states in the world are not great powers. As such, a nuclear proliferation theory that began with assumptions built with great powers in mind, disregarding less capable states, may not adequately cover the majority of potential proliferators. As the second generation of nuclear acquirers shows, these less capable states can and have nuclearized. If the

nonproliferation regime is to maintain its thus far broadly positive track record, then it must be certain that its theories cover all states.

In order to see why less capable states obtain nuclear weapons, I will first examine the standing theories and literature, showing where the common understanding of proliferation is, and what potential holes may lie therein. Next, using the proliferation theories currently put forward by scholars, I will apply them to a test case of a less capable nuclear acquirer, determining whether or not they hold true in that specific context. Finally, using the results of that case, I will explore what the results imply about less capable nuclear acquirers, the implications for the nonproliferation regime, and potential avenues of future research.

Literature Review

Given the incredible importance of the issue of nuclear proliferation, it is unsurprising that a great deal of ink has been spilled writing on the logics of how and why it occurs. One of the most important pieces on the subject is Scott Sagan's "Why Do States Build Nuclear Weapons?: Three Models in Search of a Bomb[2]". In it, Sagan discusses three different models which could, in theory, each independently explain why states pursue, and ultimately obtain, nuclear weapons.

The first model, the security model, follows the classical realist logic surrounding nuclear weapons[3]. In this framework, nuclear weapons are the ultimate security guarantor for states that possess them, and the ultimate security threat for those that do not. Therefore, the history of

[2] Sagan, Scott D. "Why Do States Build Nuclear Weapons?: Three Models in Search of a Bomb." International Security 21, no. 3 (1996): 54–86. https://doi.org/10.2307/2539273.
[3] Sagan, "Three Models", 57

nuclear proliferation can be most readily seen as a chain reaction, with one nuclear bomb begetting the next. The US's nuclear arsenal threatened the Soviets, who in turn created their own, in due time causing the dominos to fall as the rest of the nuclear nations built their own arsenal in response to a prior threat. Nuclear weapons, then, should be taken at face value as a means to military and security ends.

This view is articulated by William Epstein in his 1977 piece "Why States Do – And Don't – Go Nuclear." In it, he states that the first nuclear acquirers, save the US as the progenitor of the bomb, each spurred the next to build their own "invulnerable strategic nuclear weapons" to deter an attack by a nuclear superpower[4]. He laments the "awful arithmetic" used by the first six nuclear acquirers to justify their own proliferation may be used by the sixth, seventh, and eight, with no "firebreak" to stop the spread to every corner of the world[5]. The age of this piece should be noted, both because of how it demonstrates that this way of thinking about nuclear proliferation is in no way new, and because it correctly predicted that proliferation would continue.

The second is the prestige model[6]. Nuclear weapons are, as mentioned previously, the most powerful and complex in the world, with (generally) those nations that possess them being perceived as the most advanced and powerful. As such, to possess nuclear weapons can become and end unto itself, conferring prestige and legitimacy upon the possessor. In this way, nuclear weapons become akin to an Olympics team or a national airline: not necessarily a financially sound investment on paper, but worth it in terms of the status benefits provided.

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[4] William Epstein, "Why States Go—and Don't Go—Nuclear," The ANNALS of the American Academy of Political and Social Science 430, no. 1 (1977): 16–28, https://doi.org/10.1177/000271627743000104.
[5] Epstein, "Why States Go – And Don't Go – Nuclear," 19
[6] Sagan, "Three Models," 73

The third and final model, the domestic politics model, focuses on internal actors within the state as drivers of nuclearization[7]. Rather than the pressure to proliferate coming from without, it comes from within. Internal actors, be they scientists looking for funding and prestige or military planners eager to increase their own influence, are the ultimate deciding factor that pushes a state to nuclearize. The interest of the state becomes subordinate to the interest of actors within it, and in states that nuclearize, the actors that stand to gain from nuclearization ultimately win out. In short, positions on nuclear weapons end up following Miles' Law: where you stand depends on where you sit.

Ultimately, Sagan finds no fault with the security-centric approach that had previously defined nuclear proliferation theory. Rather, he simply suggests a multicausal system, with the domestic politics and prestige model serving as secondary explanations to the overarching security model. Sagan uses the example of several nuclear programs, including India, France, and South Africa, as objects of study in order to demonstrate the different lenses with which one can view nuclear proliferation. In doing so, he succeeds in proving the plausibility of the individual models as presented. However, this method of analysis makes it somewhat more difficult to understand the multicausality of the different theories of nuclearization. By applying different nations to the different theories, he proves them each exists within that nation, but does not prove that they all apply to each. It may lead to the erroneous impression that for any given state, one theory or the other may apply, rather than all at once as he implies with his multicausal hypothesis. In order to prove that hypothesis correct, one would need to show all three of the stated reasons for proliferation active in a single case.

[7] Sagan, "Three Models," 63

While Sagan's three models provide a solid foundation for analysis, they are not without issue. Most importantly for this work, Sagan pays little attention to the varying capacity for nuclear development among states. He touches briefly on examples for the different theories, and in utilizing France, India, and South Africa, both more and less capable powers, he shows his intention to treat the different states as interchangeable as far as capabilities are concerned. Furthermore, he does not assign specific models to specific categories of states, meaning that the use of these examples is done without the intention of saying something about the nuclear motivations vis-à-vis their capacities.

Sagan is not alone in this lack of focus on the capabilities of states. Most nuclear literature that currently exists does not differentiate between the capabilities of different states when examining their potential motivations for nuclear weapons. This is not meant as a criticism of the work of Sagan or any other author, but rather meant to show that there is a potential gap in the literature. Without focusing on the ways that state capability may alter the nuclearization decision, the implied "one size fits all" approach could lead to a misunderstanding of less capable states.

Theory and Hypotheses

The intent of this analysis is to determine why less capable states pursue nuclear weapons. This question assumes that states that are comparatively lacking in capabilities will nuclearize under different circumstances and for different reasons than are assumed to apply to their relatively more capable counterparts. I believe that this is a reasonable assumption to make, as, for a nation with fewer capabilities, a nuclear weapons program will be a comparatively more expensive and difficult proposition. As such, the same combination of pressures to nuclearize in a more and less capable state will not necessarily produce the same outcome. Given that some

less capable states have nuclearized, it stands to reason that the pressures that drove those states to acquire nuclear weapons were different.

In order for the analysis to make sense, we first need to distinguish what is meant by a "less capable" state. While there is no agreed upon definition of how to judge the comparative strengths of states (and likely never will be), it is necessary to provide a more detailed point of comparison than "you know it when you see it." I have chosen to use the National Materials Capabilities index of the Correlates of War project[8], given it includes both military and economic factors to make its determination of national military capabilities. In this data, we can see a clear distinction between the first generation of nuclear proliferators, the "more capable" states, and the second generation, the "less capable" proliferators. Of the six first generation proliferators (USA, USSR, UK, France, China, India), none ever drop below the top 16 in terms of capabilities in the time since they became nuclear powers. Save India, in fact, none ever drop below the top 10. By contrast, none of the second generation proliferators (Pakistan, South Africa, Israel, North Korea) ever achieve a place in the top 15 throughout their history. Therefore, we can conclude there is a stark divide between capabilities of the groups of nations that have achieved nuclearization.

Further explanation is also required on the nature of the ability of a state to acquire the bomb, even if the focus of this study is on the decision to create a nuclear weapon, not the ability to create one. I will call the latter "physical proliferation." While nuclear weapons are expensive and difficult to develop, the difficulty should not be overstated. Numerous studies have concluded that it would be possible for even non-state actors, such as terrorist groups, to acquire

[8] J. David Singer, "Reconstructing the Correlates of War Dataset on Material Capabilities of States, 1816–1985," International Interactions 14, no. 2 (1988): 115–32, https://doi.org/10.1080/03050628808434695.

a crude nuclear weapon[9]. This presumes a group without formal access to nuclear technology, like a civilian nuclear power plant, could still achieve nuclearization if provided with the correct materials. Therefore, it stands to reason that any state with formal control of a nuclear power industry would be in an even better position to develop a nuclear bomb. Indeed, there has long been consternation over the potential for a nuclear power industry to beget physical proliferation, as seen most recently in Iran[10]. 32 countries currently operate civilian nuclear power plants[11], with 65 countries also operating research reactors[12]. This also says nothing about the potential for discrete nuclear transfers between states, another avenue of physical proliferation[13].

This study does not intend to focus on the complex and separate issue of physical proliferation. However, for the purposes of this study, it will be assumed that any reasonably organized and motivated state would have the capacity to physically acquire a nuclear weapon. This is a reasonable assumption, not only as very poor and isolated states, notably Pakistan and North Korea, were able to develop nuclear weapons through a variety of means, but also as a large proportion of states have the infrastructure necessary for at least a limited bomb project. This is important for the purposes of this study, as acknowledging nuclear weapons as obtainable for a larger number of states reinforces the centrality of the decision-making process as the primary determinant of nuclearization, rather than physical ability to create a bomb.

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[9] Matthew Bunn and Anthony Wier, "Terrorist Nuclear Weapon Construction: How Difficult?," *The ANNALS of the American Academy of Political and Social Science* 607, no. 1 (2006): 133–49, https://doi.org/10.1177/0002716206290260.

[10] Ian Jackson, "Nuclear Energy and Proliferation Risks: Myths and Realities in the Persian Gulf," International Affairs 85, no. 6 (2009): 1157–72, https://doi.org/10.1111/j.1468-2346.2009.00855.x.

[11] 1. "Nuclear Share of Electricity Generation in 2022," PRIS, 2022, https://pris.iaea.org/pris/worldstatistics/nuclearshareofelectricitygeneration.aspx.

[12] IAEA, "Research Reactor Database," 2022. https://nucleus.iaea.org/rrdb/#/home

[13] Matthew Kroenig, "Importing the Bomb," Journal of Conflict Resolution 53, no. 2 (2009): 161–80, https://doi.org/10.1177/0022002708330287.

In order to determine whether or not the standing wisdom surrounding nuclear proliferation remains accurate for less capable states, I will use three hypotheses based on those presented by Sagan.

H1: *Less capable states pursue nuclear weapons in order to balance against the superior conventional forces of a potential adversary.*

Under Sagan's original hypothesis less capable states, like their more capable counterparts, primarily pursue nuclear weapons as a means of ensuring security against nuclear armed rivals. Though the initial dominos of proliferation were major powers, the causality chain eventually led to less capable states facing nuclear threats, and as such creating their own arsenals in response. Under this conception, the Indian bomb begat the Pakistani one, North Korea built its arsenal to counter a perceived threat from the US, and both Israel and South Africa pursued nuclear weapons as a hedge against the Soviet bomb.

However, this model is, in my view, limited when specifically applied to states explicitly less capable than their rivals. Such a state will, by their very nature, be less able to produce a large nuclear arsenal, and thereby be outmatched bomb for bomb by their rivals. Furthermore, the production of a nuclear arsenal in the face of a nuclear rival would potentially decrease security rather than increase it, as the action may invite a strike from its more capable rival to head off the threat, as shown by Numo Montero and Alexandre Debs[14]. Such a possibility is far from purely theoretical, as the Israeli attack on the Iraqi Osirak reactor demonstrates[15]. As such,

[14] Nuno P. Monteiro and Alexandre Debs, "The Strategic Logic of Nuclear Proliferation," International Security 39, no. 2 (2014): 7–51, https://doi.org/10.1162/isec_a_00177.
[15] Or Rabinowitz and Giordana Pulcini, "The Israeli Raid against the Iraqi Reactor - 40 Years Later: New Insights from the Archives," Wilson Center, June 3, 2021, https://www.wilsoncenter.org/blog-post/israeli-raid-against-iraqi-reactor-40-years-later-new-insights-archives.

simply ascribing nuclear proliferation as a response to the arsenal of a rival is, in my view, insufficient. Therefore, I offer a second hypothesis.

A more logical explanation for why a less capable state may pursue a nuclear arsenal is in response to a rival with a more powerful *conventional* military. By virtue of being less capable, a state will be unable to match their adversary gun for gun and tank for tank, at least, not sustainably. A conventional arms race will end with it on the losing side. However, by pursuing a policy of nuclearization, a less capable state could wipe away the conventional advantage enjoyed by its more powerful rival. This levels the playing field, restoring the balance of power and ensuring its own continued survival. This is a far more satisfactory explanation, as it leads to an overall increase in the security enjoyed by the less capable state.

In order for this logic of proliferation to be shown as present, it will be necessary to uncover whether or not those in power making a nuclearization decision were more spurred on by the prospect of an unfriendly nuclear or conventional arsenal. Statements and other communications by those in power can shed light on this issue, as they will allow for an understanding of which threat was being more heavily considered. Furthermore, the timing of actions can also be illustrative here; if nuclear weapons program interest grew following a conventional military defeat as opposed to following an adversary's nuclear weapons acquisition, with documentation connecting the two, it would show the theory as viable. Of course, unless the literal transcripts of specific meetings are available, any documentation available could potentially be skewed by the goals and perspectives of the author. If, however, multiple sources can corroborate the same understanding of intent, then it will show the theory as viable.

H2: *Less capable states pursue nuclear weapons for the prestige they provide to the nation and its leaders.*

Under this hypothesis, the motivating factor for less capable states to pursue nuclear weapons is the status benefits they provide. Being a nuclear power is a privilege few states enjoy and joining that exclusive club can be a powerful symbol of modernity. Furthermore, especially for a less capable state, a nuclear weapon can be a symbol of national strength and authority. All four of the second generation less capable nuclear acquirers became independent in the aftermath of the Second World War, with each needing to shore up a national identity where none had existed before. Furthermore, the leaders of these states needed a way to demonstrate their legitimacy. A nuclear weapon could be an ideal way to do just that. While the prestige of being a nuclear power would apply to any nation, large or small, for a less capable state, these benefits ought to be more pronounced. The large nuclear powers, like the US, Russia, China, UK, France, or India, have significant sources of national pride and legitimacy beyond nuclear weapons, including large populations and economies and strong conventional militaries. Furthermore, each of these states had long national histories and traditions, something the second generation acquirers lacked. For a less capable state with fewer comparable points of national prestige, a nuclear weapon should be an even more attractive symbol.

For this logic of proliferation to be shown as viable, it is necessary to show that there was more than rote security or bureaucratic interest in a nuclear weapon. Showing that leaders of less capable nuclear acquirers conceived of nuclear weapons as having greater value than as mere military tools would show the plausibility of this hypothesis. Statements, speeches, and memoirs may provide insight on this front. Importantly, it should be noted that the statements made by leaders to be consumed by a wider audience may not reflect true intentions, especially if made while said leader was still involved in politics. As this theory deals with national pride, a common subject of political discussion and campaigning, there is the chance that the importance

of such may be over-exaggerated. Again, corroboration by different sources, including those outside the political establishment, will be important in establishing viability.

H3: *Less capable states pursue nuclear weapons due to the successful lobbying of interested parties within the state.*

Be they scientists looking for job security or generals looking for the personal influence of holding a nuclear arsenal, this theory proposes that the driving force behind nuclear proliferation among less capable states are the people within them. This hypothesis opens the black box of the state, examining who stands to gain and who stands to lose if a bomb project is initiated and ultimately proves successful. This, in my opinion, will be even more important for a less capable state. Given the comparatively higher cost such a project will demand for a state with fewer resources, there will necessarily need to be a coalition within pushing for the acquisition of a bomb.

This hypothesis also considers the shifting balance of power of players within the system. If proponents for a nuclear weapon are able to, independent of their opinions on a bomb project, increase their influence within government, then the bomb project has a better chance of being implemented overall. This hypothesis is perhaps the most banal of all three; it suggests that, if the people with the power want a bomb, they'll acquire one if they can.

In order to show this theory of proliferation as valid, it will be necessary to show that those with a history of advocating for a nuclear weapons program ended up in power, and that their gaining authority led directly to the creation (or acceleration) of a bomb project. Furthermore, it will be necessary to show that their advocacy for nuclearization was a direct

contributing factor to their ascension to power. While nuclearization is far from the only issue in any country at any point in time, showing a focus on whether or not to pursue a nuclear weapon in the political sphere, with the eventual success of the pro-nuclear camp, will show the plausibility of this hypothesis.

These three hypotheses provide a broad range of reasons why less capable states may pursue a policy of nuclearization. I do not intend to prove one hypothesis to the detriment of the others; rather, I intend to examine each in turn to determine to what extent each plays a role in the nuclearization decision. This will allow me to see which effects are more and less visible. In this way, all hypotheses may be true, or indeed none of them may be. Indeed, the multicausal system as proposed by Sagan may continue to hold. The goal of this analysis is not to determine which hypothesis of these three stands above the others, but to see whether these three, representative of modern proliferation logics, are visible in the nuclearization decision for less capable states. This would then affirm their accuracy even for this specific context for which they were not originally conceived.

Methods

In order to understand which of the three proliferation models drive less capable states towards nuclearization, we need to examine why a specific state began, and ultimately completed, their nuclear bomb program. Sagan used different states as examples for each of his different models of proliferation, but doing so in this context would be inappropriate. In order to show that the three presented hypotheses are applicable (or not) to less capable states, picking and choosing cases based on how they line up with the models would only be a study of the idiosyncrasies of each nuclear proliferation decision. Therefore, if we are to determine which are

and are not applicable, it is better to pick a single case and, placing it under the lens of each different hypothesis, see if each is visible.

This study will be conducted in the form of a plausibility probe, in which the three hypotheses will be examined in the context of a single less capable nuclear weapons acquirer. By tracing the history of that country's nuclear weapons program three times, once each focusing on the three standing hypotheses, we will be able to see whether or not each hypothesis is at work. Undertaking a study in this form has many advantages. Only ten states in history have successfully completed a nuclear weapons program. This is an exceptionally limited number, further whittled down by our explicit focus on less capable states to only four. Given the extremely limited number of cases overall, a large, data-driven study would be next to impossible. Furthermore, given the diverse contexts of the nuclear acquirers, comparative case studies looking for similar factors potentially driving development could easily turn into an expansive wild goose chase. As such, beginning with hypotheses derived from previous research and adjusted for the context of less capable states, and then probing to see if they are plausible, is the best way forward.

Focusing on a single state's nuclear program is advantageous as it allows the analysis to explicitly look for multicausality. One of the primary shortcomings of the earlier work of authors like Sagan is that, by analyzing different hypotheses in the context of different states, it becomes impossible to say whether or not multiple reasons for nuclear proliferation exists in each case. By focusing on a single state's proliferation decision, we can ensure that all hypotheses presented are given the chance to be observed, thus proving or disproving their contribution to a multicausal system.

In theory, a "perfect" study of the motivations of less capable nuclear acquirers would be broader in scope. A deep dive into the history of each of our four less capable nuclear acquirers, along with a great power acquirer acting as a point of reference, would give a more extensive view of why less capable states choose to nuclearize, especially in comparison to their more capable counterparts. However, this analysis is not nearly large enough to do justice to the histories of five nuclear programs, at least not in any meaningful way. As such, focusing on one single state and exploring its development in detail is ideal for the limitations of this study.

In order to complete this analysis, first we must choose which of our four "second generation" acquirers we should study. For reasons of unsuitability for study, Israel, South Africa, and North Korea can be eliminated. The Israeli nuclear program is unrecognized by the rest of the world, with the country's capacity being officially secret, if an open one. As the Israeli program is undeclared, it becomes a far more difficult object of study. Furthermore, while even the governments of friendly nations admit that Israel almost certainly has nuclear weapons[16], without official confirmation from the Israelis themselves, to study the logics of a decision which was never officially made would be problematic. As for North Korea, a similar problem as Israel arises in that, given the nation's intense isolation, any analysis of the program will by necessity be by the outside. This will make the research of the decision making behind their program next to impossible. Finally, for South Africa, their nuclear weapons program comparatively limited, resulting in only six weapons, which could indicate lesser prioritization of them as defensive weapons. This is further fueled by speculation that the South African nuclear program may have begun without a defense focus at all, but rather as a means of nuclear economic development[17],

[16] 1. House of Commons Library and Claire Mills, Nuclear weapons at a glance: Israel § (2022).
[17] Sagan, "Three Models," 68

similar to the US' Operation Plowshare. The swift dissolution of the program also clearly shows a lack of sustained interest, making a study of them less valuable. Furthermore, there has been speculation that the South African program had links to the Israeli one[18]. Without better understanding of the nature of these linkages, it becomes more difficult to ascertain how linked the South African nuclearization decision was to the Israeli one. Given all of these uncertainties, studying the South African program becomes unnecessarily problematic.

As such, for these reasons, Pakistan remains the most logical choice for study. Not only will there be better access to source material, but their nuclear program is far more robust than the others considered here, indicating a greater interest by the Pakistani government.

Pakistan as a case study also provides ample opportunity to put the proposed hypotheses to the test. The hypothesis can be readily examined in the context of Pakistan's relationship with India. Since its independence, Pakistan has had a fraught relationship with its neighbor, including the fighting of several wars. India throughout the period maintained a stronger conventional force and, later, developed its own nuclear arsenal. This provides an ideal scenario in which to test the security focused hypothesis. By tracing statements made by leaders as to their own perspective on why they want to pursue a nuclear weapon, it can be inferred whether they were more concerned with India's conventional advantage or their nuclear arsenal. Dating the key moments of the Pakistani program as before or after Indian nuclearization will also help to put the events in context. Of course, the decision to acquire nuclear weapons is not as simple as pushing a button. It is a process of many years, with studies, shifting opinions, and the ramping up and slowing down of efforts. There is no straight line from the first thought of nuclear

[18] "Israel Nuclear Overview," The Nuclear Threat Initiative, May 14, 2014, https://www.nti.org/analysis/articles/israel-nuclear/.

armament to a big bang. But by determining when Pakistan made its most concerted efforts towards the bomb, we can determine which security hypothesis was more present in the minds of Pakistani leaders.

The second and third hypotheses can also be easily tested in the context of the Pakistani nuclear weapons program. Pakistan's history during the 20th century was marred by corruption and political upheaval, including three military coups. This battleground of personal interests and needs for legitimacy provide fertile ground for a study of whether or not these factors played a significant role in the Pakistani decision to acquire a nuclear weapon. Not only can the actions and interests of key players be traced, but their statements as to the need for shoring up the legitimacy of their own rule and the Pakistani state's existence as a whole vis-à-vis India will provide ample insight as to these inner workings. By opening the black box of the state, it will be possible to determine with greater precision how much these theories ended up actually affecting the course of the program.

Each of the hypotheses will be examined in turn within the context of the Pakistani nuclear program. This step will include the examination of historical documents and statements by key figures, as well as outside analysis, to determine whether each of the three listed hypotheses is plausible. Once this analysis is complete, for the hypotheses that are shown as valid, it will be examined how applicable they are to other cases of less capable states acquiring nuclear weapons, as well as potential future cases. For hypotheses which are invalid, potential reasons for the invalidity will be explored, as well as possible alternative explanations. Finally, these results will be used to draw conclusions and implications for the broader context of nuclear non-proliferation efforts.

This is, of course, hardly the first analysis to be done on the Pakistani nuclear program. Several other studies have looked at the history of the program, including looking at reasons for why the decision to nuclearize was made. These include analysis from the 1979 done by Richard Betts, closely after the initiation of the Pakistani program in force, claiming that security concerns, complimented by desires for prestige, would be the potential drivers of a theoretical program he did not know was already underway[19]. These sentiments are echoed in a 1999 piece by Samin Ahmed[20], written shortly after the first Pakistani nuclear test. However, while both give convincing accounts of logics behind the Pakistani nuclearization decision, neither do so specifically identifying Pakistan's status as a less capable state except in its relationship with India, and neither go into depth exploring the potential multicausality of the decision. I plan to address both of these topics in my analysis.

Analysis

Hypothesis One

In order to understand the security rationale behind Pakistan's decision to acquire a nuclear weapon, it is important to understand the geopolitical context in which Pakistan found itself, specifically its relationship with India. Pakistan was formed out of the partition of the British Raj in 1947, and immediately came into conflict with its larger neighbor. The partition of the former colony had been made along religious lines that were far from clean, leaving both questions of unresolved territory and religious minorities caught on the wrong side of the

[19] Richard K. Betts, "Incentives for Nuclear Weapons: India, Pakistan, Iran," *Asian Survey* 19, no. 11 (November 1, 1979): 1053–72, https://doi.org/10.2307/2643954.
[20] Samina Ahmed, "Pakistan's Nuclear Weapons Program: Turning Points and Nuclear Choices," International Security 23, no. 4 (Spring 1999): 178–204, https://doi.org/10.1162/isec.23.4.178.

partition. This led to the 1947 Kashmir war shortly after independence, which solidified the rivalry between the two nations.

For Pakistan, the security situation was dire. From the beginning, Pakistan was a distinct disadvantage compared to India. According to national census figures from both countries in 1951[2122], India maintained a nearly five to one population advantage, along with a significant advantage in land area. Economic output also was an area of concern for Pakistan, with Indian GDP outstripping Pakistan's by nearly tenfold by 1960[23]. Finally, Pakistan was consistently outmatched by India in terms of military power, with the Correlates of War index showing India ahead in all years since each state gained independence, and indeed greater than twice as powerful in all years after 1955[24]. Finally, to add to Pakistan's woes, its territory was physically bisected by India, with East Pakistan, now Bangladesh, more than a thousand miles from the Pakistan mainland.

As such, it is easy to conclude that Pakistan's security concerns, at least externally, stemmed primarily from India. It is this security concern that would, eventually, lead to the Pakistani bomb project. However, there would be several intervening steps between the initiation of the rivalry with India and the decision to build the bomb. The first came in 1965, when Pakistani leader Ayub Khan invaded Indian-occupied Kasimir. Falsely believing that the war could be limited to a "lightning strike" offensive to take what Pakistan claimed as theirs, and that retaliation by India would be limited by the US, Ayub invaded India in 1965, only to find

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[21] R A Gopalaswami, "Census of India 1951, Appendices to the Census Report, 1951, Volume I, Part !-B, India - Census 1951," Office of the Registrar General and Census Commisioner, May 28, 2021, https://censusindia.gov.in/nada/index.php/catalog/28409.
[22] "AREA & POPULATION OF ADMINISTRATIVE UNITS BY RURAL/URBAN: 1951-1998 CENSUSES," Pakistan Bureau of Statistics, 2019, https://www.pbs.gov.pk/sites/default/files/population/census_reports/pcr_kp.pdf.
[23] "GDP (Current US$) - Pakistan, India," World Bank Open Data, 2022, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=PK-IN.
[24] Singer, "Correlates of War Dataset"

battlefield defeat and a lack of support internationally[25]. It was only diplomatic cover by China that ultimately prevented disaster from becoming cataclysm[26].

The second came in 1971, when Pakistan faced its most daunting test to its sovereignty to date. Following a contested election and subsequent political gridlock, the West Pakistan territories rose in revolt against the government in East Pakistan. Following a brutal crackdown, rebels in West Pakistan were able to seize control of parts of the territory. Finally, in December 1971, India, spurred by both humanitarian and security motives[27], invaded West Pakistan on behalf of the rebels. War with the East Pakistan territories soon followed which became a crushing defeat for Pakistan. West Pakistan became the independent Bangladesh, and again, despite some meager diplomatic support from the US and China[28], Pakistan was left to largely fend for itself.

As such, twice in just six years, Pakistan had found itself decisively losing a military conflict to India, with increasingly disastrous results. Notably, both of these defeats had come before India had tested their first nuclear weapon in 1974. Therefore, even without an Indian bomb, Pakistan was already seeing the full effects of their military inadequacy in comparison to their neighbor. Furthermore, foreign allies like the US, whom Pakistan's leadership had hoped to be a guarantor of security[29], ended up offering little in the way of real assistance, even embargoing Pakistan along with India in 1965 in response to their conflict[30]. Even without

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[25] Rudra Chaudhuri, "'Just Another Border Incident': The Rann of Kutch and the 1965 India–Pakistan War," Journal of Strategic Studies 42, no. 5 (2019): 654–76, https://doi.org/10.1080/01402390.2019.1571996.
[26] Chaudhuri, "Just Another Border Incident"
[27] Sonia Cordera, "India's Response to the 1971 East Pakistan Crisis: Hidden and Open Reasons for Intervention," Journal of Genocide Research 17, no. 1 (2014): 45–62, https://doi.org/10.1080/14623528.2015.991207.
[28] Mehrunnisia Ali, "China's Diplomacy During the Indo-Pakistan War, 1971," Pakistan Horizon, 1st Quarter, 25, no. 1 (1972): 53–62, https://www.jstor.org/stable/41393113.
[29] Shubhangi Pandey, "U.S. Sanctions on Pakistan and Their Failure as Strategic Deterrent," ORF Online, August 2018, https://www.orfonline.org/content-type/issue-brief/.
[30] Feroz Hassan Khan, *Eating Grass: The Making of the Pakistani Bomb* (New Delhi: Foundation Books, 2013).

considering the Indian nuclear program, the Pakistani situation was already looking dire. Conventionally, Pakistan was proven to be unable to stand against its neighbor, and there was no longer any reason to hope for significant foreign intervention on their behalf.

It was in this context that the Pakistani military began to consider the implementation of nuclear weapons. The military's interest in nuclear weapons can be traced to a 1967 presentation to the Pakistani Army Headquarters by Ishrat Usmani, the director of Pakistan Atomic Energy Commission (PAEC). Several officers at the time recount how the presentation shifted the opinion of the Pakistani military leadership, who had up until then been largely disinterested in nuclear weapons. The Pakistani Army had not even been monitoring the Indian nuclear program, showing both a lack of interests in the weapons themselves and a lack of faith that India could build such a bomb. However, after the presentation, nuclear weapons began to factor more heavily in Indian military thought, being perceived as a method by which Indian conventional dominance could be overcome[31].

This view is echoed by Pervaez Cheema, who notes that, as Pakistan seemed to have little hope of matching India in a conventional sense, a nuclear weapon could be used to even the playing field. Rather than simple provide Pakistan with a comparable military advantage, however, Cheema also proposes that the acquisition of a bomb was seen as a way of "raising the cost of aggression to an unacceptable level.[32]" With Pakistan's conventional military disadvantage now on full display after successive failures to deter India, most damagingly in 1971, fears persisted that India might attempt to further dissect the Pakistani state. By developing

[31] Khan, *Eating Grass*, 80
[32] Pervaiz Cheema, "Anatomizing Pakistan's Motivations for Nuclear Weapons," Pakistan Horizon 64, no. 2 (April 2011): 5–19.

a nuclear weapon, however, the cost of such an enterprise would become astronomical for India no matter their conventional advantage, hopefully forestalling any future Indian adventurism.

Despite the slowness of the military to come around to believing in the necessity of a nuclear weapon, however, the political sphere of the Pakistani elite was far more aggressive in their want of a nuclear weapon. For this group, the security issue that spurred the desire for nuclearization was not, however, Pakistani conventional insecurity. Rather, it was the prospect of an Indian bomb that pushed politicians like Zulfikar Bhutto to famously declare that Pakistan would "eat grass" to obtain a nuclear weapon if their neighbor achieved one[33]. The centrality of the potential of a nuclear-armed India in the thoughts of the political class is further emphasized in Bhutto's 1969 book *The Myth of Independence*, written to advance a political campaign. In it, he declares that India, "whose progress in nuclear technology is sufficient to make her a nuclear Power in the near future," could "blackmail Pakistan with her nuclear advantage[34]" if Pakistan's own program were not directed towards the production of a bomb.

The focus on an Indian weapon, while slow to emerge in military circles, was more prevalent among the political class from an earlier stage. Interestingly, this line of thought emerged from neither Pakistan nor India's activities, but events in China. On October 16th, 1964, China detonated its first nuclear weapon, being the first Asian nation to do so. India, whose relationship with China had deteriorated throughout the 1950's due to events at the Tibetan border[35], was immediately concerned with the development. Outside observers, including the US

[33] Khushwant Singh, "Pakistan, India and The Bomb," The New York Times, July 1, 1971, https://www.nytimes.com/1979/07/01/archives/foreign-affairs-pakistan-india-and-the-bomb.html.
[34] Zulfikar Ali Bhutto, *The Myth of Independence* p.g. 130 (Karachi: Oxford University Press, 1976).
[35] Lorenz Lüthi, "Sino-Indian Relations, 1954-1962," Eurasia Border Review 4, no. 3 (2012): 93–119.

State Department[36], speculated that the Chinese detonation may spur India to move decisively in the direction of their own nuclear weapon.

What, then, can explain this discrepancy in the views of why Pakistan needed a nuclear weapon, and which of the presented views was more impactful on the ultimate decision for Pakistan to pursue a weapon? The civilian-military divide on their perspectives of the issue may shed some light. As the frontline force against India in three wars, the Pakistani military knew firsthand that, no matter their preparations, they were likely to be outmatched by India in any armed conflict. As such, the balance of Pakistani military might would be their primary concern. Telling is their lack of focus on the Indian bomb even after the Chinese nuclear detonation, not showing interest in the nuclear program at the highest levels until directly confronted with its potential utility as hedge against Indian conventional strength. Until India actually detonated their first nuclear weapon in 1974, the prospect of an Indian weapon was, to the minds of the military leaders, more distant.

Conversely, the political leadership was far more focused on the issue of a potential Indian bomb. Much of this can be explained by the use of an Indian bomb as a fearmongering tactic for winning elections. Recall that Zulfiqar Bhutto's book in which he advocated for the advancing of the Pakistani nuclear program towards a bomb was written in the midst of the 1969 campaign in which he was a candidate.

Which of these two views, then, was the most impactful on the Pakistani decision to finally construct a nuclear weapon? Members of the political leadership were the first to speak

[36] "U.S. Department of State Policy Planning Council, 'Policy Planning Statement on a Chinese Communist Nuclear Detonation and Nuclear Capability,' October 15, 1963, Secret," National Security Archive, October 15, 1963, https://nsarchive.gwu.edu/document/20335-national-security-archive-doc-12-u-s-department.

openly about the need to develop a nuclear bomb, as a possible hedge against a potential Indian detonation. However, as this rhetoric began long before India actually detonated any weapon, it is difficult to discern how much was spurred on by a genuine belief in policy and a desire for electoral and political advantage. Military support for the bomb followed later, with greater concern over Pakistan's conventional inferiority to India. As Pakistan was military led from 1958 to 1969, it would be easy to assume that the military way of thinking took priority. However, as the military government ultimately imploded following the loss of East Pakistan in 1971, the impact of military personnel on the decision to nuclearize may not have been as impactful as might be assumed. Finally, it should be recalled that, following the collapse of the military regime in 1971, it was Zulfiqar Bhutto who took power as the leader of the country. He has already made his thoughts on the Pakistani nuclear program quite clear, insisting that Pakistan would need a weapon if India achieved one. It would be under his watch that Pakistan would begin to purposefully pursue a nuclear weapon, with a meeting of scientists in Multan in 1972, overseen by Bhutto, seen as the "starting gun" for the Pakistani nuclear weapons program[37]. As such, while the conventional balance of power with India was no doubt a contributing factor in the Pakistani decision to nuclearize, it seems that worries over a potential Indian nuclear weapon was the more prevalent force behind the Pakistani decision to pursue a nuclear weapon.

Hypothesis 2

When Pakistan was founded, it was created with even greater challenges than face most post-colonial nations. Mohammed Ali Jinnah, Pakistan's founder, famously stated that the nation

[37] Khan, *Eating Grass*, 86

had come into existence "mutilated, truncated, and moth-eaten.[38]" Physically bisected by its larger and antagonistic neighbor, tens of millions of Indian Muslims were forced to migrate to the new state, with more than three million not surviving the journey[39]. Furthermore, the same year of its independence, a war was fought over India and Pakistan's disputed border, not only permanently marring relationships between the two nations but putting the very notion of Pakistani statehood into question. This question was only further exacerbated by the 1965 failed attempt to recapture parts of Kashmir, and made critical by the 1971 loss of East Pakistan to rebels with India's assistance.

The pursuit of the prestige associated with nuclear weapons is hardly surprising. In the 1960's, when Pakistan began to first conceive of a bomb project, only a handful of nations had achieved nuclearization. These included the US and USSR, the two global superpowers, as well as Britain, Pakistan's old colonial master. Joining them was China, who, after its break with the USSR, had become a third pole in international politics and the most powerful of nations not allied with either major Cold War camp. In this time period, nuclear weapons were few and far between, with the nations holding them being the most powerful in their regions, if not the world. For Pakistan, the symbolism surrounding nuclear weapons as the weapons of the rich and powerful nations was a powerful driving force. Furthermore, creating a nuclear weapon might have even been a better symbol of national strength than the more "real" factors of societal development and economic growth[40]. A nuclear bomb project not only had a definite success condition, as opposed to nebulous goals associated with societal progress, but it was also far

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[38] Muhammad Jinnah, "Moves to Partition Punjab and Bengal" (speech, May 4, 1947).
[39] Prashant Bharadwaj, Asim Ijaz Khwaja, and Atif R. Mian, "The Big March: Migratory Flows after the Partition of India," SSRN Electronic Journal, 2008, https://doi.org/10.2139/ssrn.1124093.
[40] Barry O'Neil, "Nuclear Weapons and National Prestige ," COWLES FOUNDATION FOR RESEARCH IN ECONOMICS , February 2006, https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=2847&context=cowles-discussion-paper-series.

more salient for the Pakistani public at large. That their newborn, at times fragile nation could compete with the global superpowers would have been a powerful way of shoring up Pakistani nationalism.

The prospect of an Indian nuclear bomb was also a critical factor in increasing the prestige associated with a Pakistani bomb. It has already discussed at length how much of the Pakistani decision to nuclearize occurred as a direct result of its relationship with India. Throughout its early history, Pakistan not only had to deal with the real strategic threat posed by India, but also its perceived status as rump state in comparison to its neighbor. On the partition of the British Raj, Pakistan received a substantially smaller amount of the military assets of the British Indian Army than did India[41], and charged that some of the promised transfers were never made[42]. Monetary assets were similarly unevenly divided with disputes over rightful Pakistani claims continuing even into the present[43]. These factors, while limiting the resources available to Pakistan, would have had the side effect of increasing the perceived prestige associated with achieving a nuclear weapon. If India, who had been given what was perceived to be a disproportionate share of the Raj's assets, built a bomb, and then Pakistan was able to match it despite its limitations, it would have been a triumphal moment in assuring Pakistan's legitimacy and power in relation to its neighbor.

Of course, there was always another choice for Pakistan. Many states come to view nuclear weapons as abhorrent, and indeed place significant national emphasis on the rejection of

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[41] R Komer, "Data on Division of Indian Armed Forces in Partition," Eisenhower Presidential Archives, accessed June 3, 2023, https://www.eisenhowerlibrary.gov/sites/default/files/research/online-documents/declassified/fy-2012/1959-09-24.pdf.
[42] Khan, *Eating Grass*, 18.
[43] Kazim Alam, "Post-Partition: India Still Owes Pakistan a Little over Rs5.6b, Says State Bank," The Express Tribune, July 16, 2014, https://tribune.com.pk/story/736390/post-partition-india-still-owes-pakistan-a-little-over-rs5-6b-says-state-bank.

them. Perhaps the most telling example of such a movement is Bangladesh, formerly a part of Pakistan itself.[44]. This taboo is not present among all states. Karsten Frey argues that, if a set of factors are present, a state is more likely to develop a norm of viewing nuclear weapons as symbols of national power and prestige, rather than as abhorrent weapons that ought not be pursued[45]. These factors include a sense of fear, an independent foreign policy, estrangement from its main adversary, and a nuclear-armed adversary whom it perceives as deriving benefits from its ownership of nuclear weapons. Given the situation that Pakistan found itself from the 1960's and 1970's, all of the factors would seem to be at work. This can begin to explain why Pakistan came to view nuclear weapons as something to be desired rather than shunned, when other nations in similar positions chose the opposite. Today, the specter of nuclear proliferation is ever-present in international relations, with any attempt to nuclearize heavily penalized, as evidenced by North Korea or Iran[46]. However, in the period in which Pakistan was considering nuclearization, these norms had not yet crystallized. The Nuclear Nonproliferation Treaty was only signed in 1968, and only entered into force in 1970 with 46 parties[47], less than half of states in the world at the time. This environment, with nonproliferation norms that had not yet become as ironclad as they are today, allowed for Pakistan to avoid the reputational damage that would come with proliferation in the modern world.

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[44] Iftekhar Chowdhury, "Statement by H. E. Dr. Iftekhar Ahmed Chowdhury, Ambassador and Permanent Representative of Bangladesh to the United Nations, at the General Debate of the 2005 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons," 2005 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (speech, May 5, 2005).

[45]Karsten J. Frey, "Nuclear Weapons as Symbols: The Role of Norms in Nuclear Policy Making," SSRN Electronic Journal, 2006, https://doi.org/10.2139/ssrn.960762.

[46] Robert Gallucci, "North Korea, Iran, and the Proliferation of Nuclear Weapons: The Threat, U.S. Policy, and the Prescription . . . and the India Deal," The Tobin Project, 2006, https://www.tobinproject.org/books-papers/how-to-make-america-safe.

[47] Kena Alexander, "Treaty on the Non-Proliferation of Nuclear Weapons," UNODA Treaties, accessed June 6, 2023, https://treaties.unoda.org/t/npt.

However, Pakistan had more reasons than simple fear or an adversarial relationship with India or a more permissive proliferation environment to see nuclear weapons as a potential status symbol. Pakistan is notable in that it is the first, and thus far only, Muslim nation to achieve a nuclear weapon. This is important, given the intense centrality of Islam as a part of Pakistani national identity. It was religious affiliation that first led to the All India Muslim League to form and demand separate electorates for Muslims in British-administered India[48], a development which would eventually snowball into the partition of the country on religious grounds. Indeed, religious identity was the single most important force that justified Pakistan's continued existence as an independent nation vis-à-vis India.

As a Muslim nation, Pakistan's leaders sought to be the first of their kin to produce a working nuclear weapon. In his book *If I Am Assassinated*, written by Zulfiqar Bhutto from prison before his execution, he commented that "had he not been overthrown he would have put the Islamic civilization at par with the Hindu, Christian and Jewish civilizations by giving it "full nuclear capability.[49]"

The quarrel with Hindu civilization, as represented by India, is already apparent throughout Pakistan's history. The reference to a quarrel with Christian civilization, though, is more surprising. This, however, may also be explained by looking at Pakistan's history. While Pakistan was a member of several arms agreements and alliance with the west, such as SEATO and CENTO, these alliances ended up providing Pakistan with little in the way of military benefits[50]. In fact, it was the same western nations that would ultimately impose sanctions on

[48] Nadeem Malik, "Formation of the All India Muslim League and Its Response to Some Foreign Issues – 1906 – 1911 ," Journal of Political Studies 19, no. 2 (2012).
[49] Bhutto, *If I Am Assassinated,* 25
[50] Musuraat Jabeen and Muhammad Mazhar, "SECURITY GAME: SEATO and CENTO as Instrument of Economic and Military Assistance to Encircle Pakistan," Pakistan Economic and Social Review 49, no. 1 (2011): 109–32.

Pakistan, limiting its conventional military capabilities and leaving it more vulnerable to India. The refusal of the US and the international community writ large to extend the nuclear umbrella to Pakistan no doubt also created a sense of resent in Pakistan towards its erstwhile allies. Finally, there is a belief in Pakistan that, because of its Muslim population, it has been unfairly singled out by the international community for condemnation in relation to its nuclear program, while India is allowed to "get away with it.[51]" While this criticism may or may not be valid, it points to a belief in Pakistan that its nuclear program is a way of standing against a western order that does it no favors. In this way, Pakistan was able to use both its status as a purportedly disadvantaged religious minority in global affairs as well as the failure of western nations to protect it as a way of making a nuclear weapons program an object of nationalism. By thumbing its nose at the western superpowers while simultaneously achieving what only a few other nations had, the Pakistani national project could be reinvigorated.

As such, it can be confidently asserted that, for Pakistan, the prestige benefits surrounding the acquisition of a nuclear weapon played a significant part in its ultimate decision to pursue one. Its adversarial relationship with India and perception of abandonment by the west made a nuclear weapon a powerful symbol of Pakistani independence and legitimacy as a state, driving it away from rejecting nuclear weapons outright as other nations did. A more permissive proliferation environment meant that the backlash received by Pakistan for developing a weapon would be relatively less in comparison to the prestige it would gain by doing so. Furthermore, by becoming the first Muslim nation to achieve a nuclear weapon, Pakistan's religious nationalist origins further increased the perceived value of such a bomb. Furthermore, by becoming a part of the domestic political debate in Pakistan and being used by political candidates as a part of their

[51] Khan, *Eating Grass*, 6

platform, these theoretical factors surrounding prestige and the perceived nationalistic value of a nuclear weapons program were transformed into salient and clear contributors to the nuclearization decision.

Hypothesis 3

While security concerns no doubt played a starring role in the acquisition of the Pakistani nuclear bomb, the role of individual actors cannot be understated. The push to create a Pakistani bomb was the result of years of political maneuvering by interested parties, both in the Pakistani political and scientific establishments.

The nuclear bomb debate in Pakistan kicked of seriously following the 1965 defeat of Pakistan by India, but the foundations for such a debate had been laid far earlier. The Pakistan Council for Scientific and Industrial Research (PCSIR) and its later successor, the Pakistani Atomic Energy Commission, or PAEC, had been created at the urging of the immigrant scientists who had been trained in western laboratories and who were, at the time, being underutilized[52]. During this period, Pakistani nuclear science was sustained by a concerted group of scientists who wanted to see the Pakistani scientific and nuclear space expanded. However, even early Pakistani scientists were highly ambitious, desiring to see the nation transition to nuclear power. Usmani, PAEC's head, quipped that "there are fossils in Pakistani who want to keep using fossil fuels[53]," showing how, even in its early stages, the Pakistani nuclear establishment had become a lobbying force for policy.

[52] Khan, *Eating Grass*, 25
[53] National Centre for Physics, "CONTRIBUTIONS OF PROFESSOR ABDUS SALAM AS MEMBER OF PAEC," The Nucleus 42 (October 13, 2005): 31–34.

However, as the debate around Pakistani nuclear activity became more explicitly around the debate whether or not to create a weapon, the most important single voice became, undoubtedly, Zulfikar Ali Bhutto. A hawkish Pakistani politician, he served as foreign minister for Ayub during his administration, until being forced to resign in 1966. From the start, Bhutto led the coalition of policymakers who wanted Pakistan to pursue a nuclear weapon, largely concentrated in the Foreign Affairs ministry, with allies in the PAEC[54]. While this "bomb lobby" would eventually carry the day and establish the Pakistani nuclear program, they began as lower-level bureaucrats within their respective agencies.

In opposition to the bomb lobby were several of the ministerial and military advisors to Ayub Khan's regime in the 1960's, notably the members of the finance and economic ministries. These actors were primarily concerned over whether the pursuit of a weapons program would lead to backlash from western powers, potentially cutting off crucial lifelines from the World Bank and IMF[55]. This was not an idle concern, as during the 1960's, Pakistan was enormously reliant on foreign economic aid, with it accounting for approximately 8% of gross national income on average during that decade[56]. Combined with these concerns were questions in the military as to whether such a project would siphon away crucial resources from the conventional military, and whether or not India could develop a bomb at all.

However, in December of 1971, it would be Bhutto that took control of the country in the aftermath of the disastrous war with India and the loss of control of East Pakistan. By ousting the disgraced martial law regime in place at the time, Bhutto was able to sideline parts of the military

[54] Khan, *Eating Grass*, 60
[55] Khan, *Eating Grass,* 63
[56] Mohey-ud-din Ghulam, "Impact of Foreign Aid on Economic Development in Pakistan [1960-2002]," Munich Personal RePEc Archive, 1211, 2006.

establishment, especially those that disagreed with him. Furthermore, by running on an explicitly hawkish and populist platform, Bhutto, was able to downplay concerns that pursuing a weapons program may induce economic harm in the country, and convince his supporters that a nuclear weapon was a necessity for Pakistan's continued security and dignity as a nation, helping to secure his popularity.

In order for a nuclear bomb project to be successful, however, it would also require support from the scientists physically creating a weapon. Within PAEC, prior to and in the early days of the Bhutto administration, senior leadership found itself at odds with the rank and file. Usmani, PAEC's head, urged caution and nonproliferation, while several younger scientists pushed for an active weapons program. This included several protests and acts of civil disobedience by junior scientists within PAEC beginning in 1970, illegal at the time under martial law[57]. Bhutto, not yet national leader though politically powerful already, encouraged such protesters, including Mahmood Sultan Bashir-Ud-Din, who would go on to give nuclear secrets to Al Qaeda[58]. These continued until, at Bhutto's ascent to power, Usmani was relieved of command of PAEC in January 1972, less than a month into Bhutto's administration. He was replaced with Munir Ahmad Khan, a supporter of the bomb project who would oversee PAEC from the inception of the weapons program all the way to Pakistan's first nuclear detonation[59].

Therefore, by 1972, both government and scientific organizations had been taken over by proponents of Pakistan's acquisition of a nuclear weapon. With little in the way of opposition, it is then unsurprising that the project was given the go-ahead. Without the maneuvering of pro-

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[57] Khan, *Eating Grass*, 83
[58] "Mahmood Sultan Bashir-Ud-Din," United Nations, 2015, https://www.un.org/securitycouncil/sanctions/1267/aq_sanctions_list/summaries/individual/mahmood-sultan-bashir-ud-din.
[59] "OBITUARY : Munir Khan Dies; Developed Pakistan Bomb Project," The New York Times, 1999.

nuclearization authorities into positions of power, it appears unlikely that Pakistan would have so forcefully pursued a weapons program.

Discussion

As shown by tracing the history of the Pakistani nuclear program, the security-driven aspect of the decision to acquire nuclear weapons for a less capable state is not necessarily driven by concerns over the conventional superiority of an adversary. In fact, in the Pakistani case, it seems that fears over the nuclear capabilities of its main rival, India, were indeed the more decisive factor in the ultimate decision to push for a weapons program. While concerns over India's conventional military advantage were voiced as a justification for Pakistan's pursuit of a nuclear weapon, concerns over India's potential, and eventually successful, acquisition of nuclear weapons is what ultimately drove the Pakistanis to build their bomb. As such, for a less capable state, the same logics that apply to more capable states still seem to apply. This is a surprising result, as it seems to imply that, despite their inherently more limited capabilities, a less capable state will still try to compete with its larger neighbors in the nuclear domain. Given that, as previously stated, they cannot hope to match the size of a larger rival's nuclear arsenal, why might this be?

One answer may be found in an alternative logic of nuclear deterrence. Nuclear weapons remain the most devastating weapons in the world, by a significant margin. As such, even a single nuclear weapon is enough to cause considerable damage; consider that the United States, using only two weapons of low yield by modern standards, were able to force a Japanese surrender during the Second World War and avoid a costly invasion. While a less capable state

might not be able to create as large a nuclear arsenal as its neighbor, it may not be necessary to do so in order to provide a sufficient deterrent. Consider the Pakistan-India rivalry under this framework. Given the sizes of their respective economies and militaries, India ought to be able to field a more powerful nuclear weapons arsenal than Pakistan. In the event of a full-scale nuclear conflict, India could inflict more damage onto Pakistan than vice versa. However, even in such a "defeat" scenario, Pakistan would still be able to significantly damage Indian cities, military capacities, and economic infrastructure. As such, while Pakistan would fare far worse in such a conflict, India itself would suffer significantly, meaning that such a war would ultimately still be not in India's favor to initiate. Therefore, even with an inferior arsenal, Pakistan has successfully deterred India.

However, the assumption that a less capable state will produce a less capable nuclear arsenal may also be flawed. As of 2020, India possessed approximately 150 nuclear warheads, whereas Pakistan possessed about 160[60]. This figure is in line with 2022 data collected by Hans M. Kristensen and Matt Korda, indicating 165 Pakistani warheads[61] and 160 Indian warheads[62]. These numbers would indicate that Pakistan has a nuclear capability that is on par with India, if not exceeding it. This is somewhat surprising, as not only is the Pakistani economy far smaller than the Indian one, and thus should be able to support less, but Pakistani military spending overall is approximately one seventh that of India[63]. The answer to the apparent quandary lies in the fact that India spends approximately three percent of its military budget on nuclear weapons,

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[60] "SIPRI Yearbook 2020," SIPRI, June 15, 2020, https://www.sipri.org/media/press-release/2020/nuclear-weapon-modernization-continues-outlook-arms-control-bleak-new-sipri-yearbook-out-now.
[61] Hans M. Kristensen and Matt Korda, "Pakistani Nuclear Weapons, 2021," Bulletin of the Atomic Scientists 77, no. 5 (September 7, 2021): 265–78, https://doi.org/10.1080/00963402.2021.1964258.
[62] Hans M. Kristensen and Matt Korda, "Indian Nuclear Weapons, 2022," Bulletin of the Atomic Scientists 78, no. 4 (July 11, 2022): 224–36, https://doi.org/10.1080/00963402.2022.2087385.
[63] "SIPRI Military Expenditure Database," SIPRI MILEX, accessed June 11, 2023, https://milex.sipri.org/sipri.

while Pakistan spends nearly ten percent[64]. This would appear to imply that, perhaps contrary to expectations, a less capable nation will spend comparatively more on nuclear weapons than a more capable nation. However, this may also make strategic sense. As previously discussed, for a less capable nation, a nuclear stockpile may be perceived as the only way to guarantee safety against a more capable nuclear armed adversary. Therefore, given the criticality of such a stockpile for defense vis-à-vis their larger rival, greater emphasis would be placed on it, meaning a higher proportion of military spending going towards the nuclear effort. A less capable nation, even with a far smaller military budget, can then confidently proceed with a nuclear program, knowing that, by dedicating a higher percentage of its budget to its nuclear forces, it can achieve parity. This is something a less capable state should be willing to do as, given its inability to match its rival in a conventional sense, taking money from conventional arms and putting it towards nuclear ones does not diminish its actual security.

Therefore, it cannot be concluded that balancing against superior conventional forces is the primary reason less capable states pursue nuclear weapons. While it may provide an ancillary reason for doing so, deterrence against nuclear armed states appears to be the more significant reason. This is supported by the evidence from Pakistan, and subsequent analysis shows that a realistic theory of deterrence can still be constructed even if a state is less capable overall than its rival. This is not to say that it is impossible for a less capable state to have a conventional-focused rationale for nuclear weapons development. However, it cannot be asserted that such is a requirement.

[64] ICAN, rep., WASTED: 2022 GLOBAL NUCLEAR WEAPONS SPENDING (Geneva: ICAN, 2022).

The status power of nuclear weapons, however, does appear to be a significant factor in the decision of a less capable state to pursue nuclear weapons. As the history of the Pakistani nuclear experience shows, nuclear weapons became objects of prestige for the nation's leaders, and an easy vision to sell to the Pakistani public. Given Pakistan's tumultuous early history, nuclear weapons served as a salient symbol of not only national progress and power, but of the legitimacy of the Pakistani statehood project overall. This vision was latched onto by political leaders such as Zulfikar Bhutto, and used to not only propel themselves into power, but to shore up Pakistani nationalism.

Furthermore, the Pakistani relationship with the outside world is important. Pakistan perceived itself to have been abandoned by its western allies, leaving it alone to face India. As for India, much of Pakistan's national identity was constructed in direct opposition to India. The acquisition of an Indian bomb, as well as the burgeoning nonproliferation effort beginning in the west, made nuclear weapons appear as an ideal way to show Pakistan's strength, self-reliance, and independence.

This pattern can be seen in other second generation nuclear acquirers as well. North Korea's nuclear weapons program is widely shunned by the western powers who already oppose the Kim regime. It is well known that North Korea singles out the United States as its primary perceived adversary, so creating the weapons of its enemy, even while enduring sanctions and international backlash, reinforces the legitimacy of the regime's ruling family. A similar pattern shows itself in the nuclear program of Iran, though that nation has not yet actually produced a bomb. Iran has been on dismal terms with the west, and the United States specifically, since the 1979 revolution. Furthermore, it has also had an adversarial relationship with Israel, with the supreme leader Ayatollah Khomeini in 2015 stating that "God willing, there will be nothing as

Zionist [sic] regime by next [sic] 25 years.[65]" That both Israel and the United States are nuclear powers contributes to the value of a nuclear weapon for Iran, as it demonstrates the regime's ability to match its rivals.

Just as important as the positive prestige associated with a nuclear weapon, avoiding the negative status associated with being a nuclear proliferator is just as important. It should not be forgotten that, while Pakistan conducted its first nuclear test less than a decade before North Korea, the decision to proliferate and the creation of their nuclear arsenal occurred far earlier. Although efforts by global powers towards nonproliferation had already begun, the total ban on nuclear weapons proliferation, as exemplified by the Nuclear NPT, had yet to be established. Therefore, the norm which held nuclear proliferation as the immoral action of a rogue state, not yet in place, did not yet tarnish in the eyes of Pakistani leaders and citizens the positive status associated with nuclear weapons. However, in the intervening decades, the norm against nuclear proliferation strengthened dramatically. This change in environment is important for understanding the importance of norms as they relate to the Pakistani nuclearization decision, as well as the nuclearization decision of other would-be potential proliferators. Today, with a strong nonproliferation norm, the creation of new bomb projects is limited to nations well outside the mainstream international community. As North Korea and Iran demonstrate, a nation already considered rogue or disfavored by the international community will suffer less reputational damage by pursuing nuclear weapons, if only because their reputation is already so tarnished. This can also be seen in the South African nuclear case. South Africa was under an intense sanctions regime relating to its apartheid-era social policies when it created its nuclear arsenal.

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[65] Siobhán O'Grady, "Khamenei to Israel: You Will Not Exist in 25 Years," Foreign Policy, September 9, 2015, https://foreignpolicy.com/2015/09/09/khamenei-to-israel-you-will-not-exist-in-25-years/.

As the South African regime was already facing international isolation, the pursuit of nuclear weapons, even in secret, became far less hazardous, as the regime's reputation was already dismal.

Therefore, it can be confidently concluded that the prestige benefits surrounding nuclear weapons are an important determinant of whether or not a less capable regime will pursue them. Given either a more permissive proliferation environment, such as existed in the 1960's and 70's, or given an already-tarnished international reputation, a state is far more likely to find the status benefits of a nuclear weapon outweigh the potential negative consequences to their prestige. This points to serious implications for the modern nonproliferation regime, which will be discussed later.

Finally, it is undeniable that the decision for Pakistan to pursue a nuclear weapon was greatly influenced by the ascension of pro-weapon figures like Bhutto to national prominence. While rhetoric surrounding nuclear weapons no doubt assisted in helping them to achieve political power, it is difficult to say the extent to which that is the case, and how much of their ascension was due to totally unrelated factors. It is a bit banal to say that once the people in the bomb lobby got the keys to the kingdom, a nuclear weapons program became more likely, but at the same time to totally dismiss this factor would be hasty.

However, as the previous two hypotheses show, there are better explanations as to why the nuclear weapons program in Pakistan went forward. While the personal opinions of those in positions of authority matter, to call them a central pillar of the Pakistani nuclearization decision may be overzealous. That being said, there are ways that this model of nuclear acquisition may be especially important for a less capable state. It is an unfortunate fact that many of the less capable states in the world are politically volatile; of the four second-generation nuclear

acquirers, two, Pakistan and South Africa have undergone total changes in government since their acquisition of weapons, and one, North Korea, is perhaps the world's most infamous and repressive dictatorship. With this political uncertainty comes a greater chance of the imposition of a strength-based regime, which in turn means a greater chance of a regime wherein political power rests with the few, rather than the many. If those few, like in Pakistan and other second-generation acquires, decide a bomb is in their best interest, there is little in the way to stop them.

To conclude, while the conventional military imbalance proved to not be the decisive factor in Pakistan's decision to nuclearize, security fears, most notably the expectation and eventual development of an Indian bomb, did. This not only increased Pakistani concerns about their physical security, but heightened questions surrounding the legitimacy and strength of the Pakistani state project, further increasing the value of a nuclear weapon. These concerns, both prestige and security based, were translated into opinions and action by politicians such as Bhutto, who, upon gaining power, shepherded Pakistan towards their eventual nuclearization. As such, both the security and prestige focused explanations seem to play significant roles in the nuclearization decision for less capable states, with domestic actors using those motivations to advance their own agendas.

Implications for Future Nonproliferation

Nuclear nonproliferation efforts might be thought of in the same way as a criminal investigation; an actor needs means, motive, and opportunity to be a reasonable suspect for nuclear proliferation. Within the context of this analogy, means would be the physical capability of producing or acquiring a nuclear weapon, motive would be the pressures pushing a country towards a nuclear weapon, and opportunity would be the specific confluence of events that leads to that final big bang.

As discussed earlier, a wide variety of actors have the means to produce a nuclear weapon, wider than many initially believe. Furthermore, it would be impossible to predict the exact circumstances and future events that could create the opportunity for a nation to acquire a weapon. This analysis, however, has focused on the motive part of the equation, dissecting why a less capable state might want to get their hands on a nuclear weapon. Therefore, using the information gathered, it may be helpful to create a "criminal profile" of those countries who may pursue a nuclear weapon. I do not, however, intend on naming names, and thus making a specific prediction about future proliferators.

The first thing we can state with confidence about less capable nuclear proliferators is that they are more likely than not facing a nuclear threat themselves. While the world's current number of nuclear armed nations remains small, nuclear weapons exist in several major zones of contestation. As demonstrated by the Pakistani case, even the reasonable suspicion that a rival might achieve nuclearization may be enough to spur a nation towards nuclear armament. While a large conventional threat may also be a potential catalyst for nuclearization, the specter of a nuclear threat seems to be more potent in this regard.

Notable here is the nature of the nuclear threat faced as well. A state with a longstanding history of conflict with an adversary is more likely to nuclearize as a result of their rival's nuclearization. This speaks to the idea of a less capable state viewing themselves as "besieged" by their more capable rival, who presents an existential threat to their sovereignty. It would, however, be faulty to assume that this must be a neighboring state, such as Pakistan's relationship with India. This could include states that are far away, but still have a credible capacity to strike the less capable state and have enough of an adversarial relationship to make

such a strike conceivable. The poster child for this sort of threat may be the North Korean relationship with the United States.

This leads us to another attribute of likely less capable nuclear proliferators: a sense of isolation and abandonment by the international community. In Pakistan's case, critical to its decision to develop a nuclear weapon was the perceived failure of the west, and the international community writ large, to protect it from India. As such, this self-perception as being apart from the broader international community may be a warning sign for a potential future proliferator. When Pakistan was pursuing its nuclear weapons program, this meant not having credible backing by either of the major superpowers. Today, in a world that is far more unipolar, it may mean a state that perceives itself as opposed to the US-led international order without credible backing by a more powerful ally, like China or Russia. This may also manifest in limited recognition by the international community, leaving a state (or quasi-state) as feeling that its right to sovereignty is not fully recognized or endorsed by the rest of the world. Much of the modern nuclear nonproliferation regime relies on the ability to implement sanctions and other coercive measures to deter nuclear activity. For states that are immune to such pressures, perhaps for reasons of already being isolated by sanctions regimes, nonproliferation efforts will be less effective.

Such isolation may also be important as the current nuclear nonproliferation norm, exemplified by the NPT, is very strong, and to break it would invite intense condemnation on a state. As such, states who have already achieved the dubious moniker of "rogue state" will face fewer disincentives for a nuclear program, given their reputation is already tarnished. For this reason, it is imperative that the zero-tolerance nuclear nonproliferation norm remain in place and

undamaged. Even "safe" proliferation by seemingly responsible actors[66] will only serve to broaden the scope of nations potentially feeling a direct nuclear threat and reduce the reputational costs associated with proliferation today. The reason that the modern nonproliferation regime has been largely successful in preventing the spread of nuclear weapons is that the international community has so strongly condemned it, leaving only a handful of rogue states as proliferation candidates. Should this norm begin to crack, even slightly, by allowing new programs to succeed, then we will then find ourselves in the environment of the 1960's and 70's where a nuclear program was not so unthinkable for many states. Needless to say, this would be a dire development.

Another potential warning sign for a less capable nuclear proliferation is their view of themselves. More specifically, the way a state relates to its people may indicate the likelihood of obtaining a nuclear weapon. States where significant legitimacy is built on the strength of the ruling establishment may be more likely to pursue a nuclear program, whereas states where this is deemphasized may be less likely. In the Pakistan case, it was the perceived weakness of the previous regime that allowed for vocal pro-nuclear leaders to eventually gain power. Such incentivizes the current rules of a country to project strength to their citizens as a way of shoring up the stability of the state. Nuclear weapons, viewed as the end all be all of military technology, can be a powerful tool for accomplishing this goal.

Finally, it should be recalled that theoretical factors do not decide policy; people do. If the leaders of a state decide a weapons program is in their best interest, and have the strength to make it happen, it has a good chance of moving forward. Therefore, the close monitoring of the

[66] Jean Mackenzie, "Nuclear Weapons: Why South Koreans Want the Bomb," BBC News, April 21, 2023, https://www.bbc.com/news/world-asia-65333139.

statements made by political actors within states should not be dismissed as grandstanding. Put simply; if important figures within a state start talking about nuclearization, it is worthwhile to pay serious attention.

None of these factors provide a mathematical equation for determining nuclear proliferation among less capable states; there is no way to predict all future circumstances, happenstances, and critical decisions. However, with these "motives" spelled out, those seeking to prevent nuclear proliferation will have a better chance of identifying suspects who may, one day, go down that path.

Avenues of Future Study

While this study has taken a look at the factors leading less capable states to seek out nuclear weapons, there is still significant work to be done. While it was shown that less capable proliferators will be more concerned with an adversary's nuclear potential than their conventional advantage, more work is needed to precisely demonstrate why. A model for such has been explored here, but requires more work to fully flesh out and confirm.

Although a more full explanation is needed for some of the study's results, said results are still valuable, and can be useful for predicting future proliferation. By taking the factors that make a state more likely to proliferate, we can begin to examine which states specifically pose the greatest risk of becoming future proliferators. This would be a large effort, as it would require the examination of the security environments of just about every functional state, as well as their domestic politics and relationship with the international community. Thankfully, as the number of nuclear weapons states remains small, the number of states directly threatened by them may also be somewhat limited. Such a task would still be a considerable undertaking, but by seeing

which states are the most at risk, nonproliferation efforts can be better targeted. Further still, this framework could be used to examine theoretical scenarios where a state not currently a nuclear power, such as Iran, obtained a weapon. This is far from a remote possibility, and these findings allow us to predict which states, if perceiving an nuclear threat from Iran or any other state, would be most likely to proliferate.

However, in conducting this study, another question has arisen that may require serious consideration. The purpose of this study was to determine what motivates less capable states to obtain nuclear weapons, under the assumption that these may differ from those assumed to be present for great powers. However, therein lies an assumption: that the theories as presented adequately explain the motivations of great powers to acquire nuclear weapons. Our understanding of this very important issue may not be as solid as initially assumed. Though this issue is perhaps of less immediate importance – most great powers have already acquired nuclear weapons – in order to understand if there is a difference between their motivations and the motivations of less capable states, a review directly comparing their motivations to the ones discovered here for less capable states may be necessary.

Conclusion

While nuclear weapons remain the ultimate prestige weapons, their creation has not been limited to the most powerful and capable states. States further down the capability ladder have shown themselves to be more than capable of producing nuclear arsenals and may present the most important arena for ensuring the spread of nuclear weapons does not continue. By examining the history of one such weapons program, Pakistan, we have managed to determine some factors, including a salient nuclear threat from an adversary, abandonment by and isolation

from the international community, and a strong need to shore up the image of the state's strength, that push these states toward nuclearization.

The last state to acquire a nuclear weapon was North Korea, in 2006. While there has been seventeen years of success in deterring the further spread of these weapons, indefinite success is not guaranteed. Iran moves closer to a weapon seemingly by the day, and an increasingly unstable world may lead more countries to look to the ultimate weapon for ultimate protection. However, by identifying which states will be most tempted to pursue nuclear weapons, it may yet be possible to forestall further proliferation and reduce the risk of catastrophe.

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