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Why Do Leaders Matter?:
Exploring Leaders' Risk Propensities and Nuclear Proliferation

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Political Science

by

So Yeon (Ellen) Park

Committee in charge:

Professor Neil Narang, Chair

Professor Julia C. Morse

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June 2021

The dissertation of So Yeon (Ellen) Park is approved.

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Why Do Leaders Matter?:

Exploring Leaders' Risks Propensities and Nuclear Proliferation

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by

So Yeon (Ellen) Park

ACKNOWLEDGEMENTS

Although I am an ordinary grown-up, I have a little child inside who likes adventures just as *The Little Prince* does. When I was 11 years old, I wanted to become an explorer and a writer. However, I was promptly discouraged by other grown-ups, who advised me to choose another career that was more realistic: a lawyer, a doctor, or a professor. So, I became a commissioned officer in the army. In that role, I met a lot of serious people who never had a mind to look up at the sky or at the stars at night. Those people got easily bored when I told them about beautiful rosemary flowers and planets other than our own. Thus, I kept my curiosity and romanticism to myself and went without anyone to talk to. But I was neither lonely nor sad. I had many friends, including the silent mountain, the smiling clouds, and the singing birds. During that time, I wrote a fairy tale, "A Baby Star in Its Mother's Arms," which I would like to present here.

There once was a baby star who wished to be held in her mother's arms. But her mother told her again and again to come to her on foot and would not cuddle her. Through dark nights, the baby star walked on and on for the chance to throw herself into her mother's arms. Although she kept falling down and got purple bruises on her snow-white knees, the baby star never stopped walking to be in her mother's arms. Little by little, while she learned how to walk better, the baby star grew into a beautiful young lady star. Nevertheless, her mother still would not cuddle the little star and repeatedly told her to come to her on foot. Beginning to resent her mother, the young star, who had been walking for nearly one hundred years, felt hopeless and utterly exhausted and nearly fell to the ground. At that very moment, her mother said something to her.

Before I finish the tale, it is time for me to be honest. Upon being discharged from military service, I made the decision to attend graduate school. Starting doctoral study six years ago was another crash-landing for me, just as those I had experienced during my numerous adventures. However, it has become one of the most joyful times of my life. I greatly appreciate having been able to take such a journey and having met so many inspirational people along the way.

First, my deepest appreciation goes to Professor Neil Narang, whose profound knowledge, skills, and mentorship have deeply inspired me. Professor Narang has taught me nearly everything about how to be a scholar and mentor. Most remarkable of all, he has always made himself available to his students and demonstrated exceptional commitment. During an early meeting, Professor Narang quickly discerned what I needed and moved efficiently to provide key information, recommendations, and direction for my dissertation. He always scheduled follow-up appointments to discuss the results of my work and to determine whether additional steps were necessary. This dissertation would have been impossible without his valuable guidance and active support.

I also want to thank Professor Julia C. Morse, who has consistently and enthusiastically supported my project and provided insightful comments. Her empathetic nature guides her to delve deeply into the heart of every student whom she teaches, including me. I am indebted to her outstanding mentorship, her untiring dedication, and her emotional support, all of which have fostered my professional skills and intellectual growth. She certainly serves as my role model for professionalism. I additionally wish to thank Professor Paasha Mahdavi for his valuable guidance and helpful comments. His keen eye and thoughtful suggestions, especially for Chapter IV, have enriched my statistical analysis and helped me

to greatly improve my dissertation. I have also benefited tremendously from his boundless energy, enthusiasm, and mentoring support.

Beyond my dissertation committee, I would like to give special thanks to Professors P. E. Digeser and Pei-te Lien for their honest concern and guidance since day one of my life as a graduate student at UC Santa Barbara. I also owe thanks to Professors Yong-sup Han, Myongsob Kim, and Soo-jung Lee for their ceaseless support and steadfast belief from the other side of the planet. I am also grateful for all of the friends and colleagues who have become good companions during my academic journey.

With the wisdom I have gained from all of the wonderful people whom I have met throughout my life and with my doctorate in hand, I am ready to embark on a new journey. I may face numerous challenges, but I am not afraid. Instead, I wonder how the road beyond goes and eagerly await my future. Ironically, though I once gave up my dream of becoming an explorer and a writer, I have truly become both. As I have explored political science and written articles as well as this dissertation, I have been living out my childhood dream.

Now, to return to the tale: The baby star, all grown up finally grew old and tired, as she had walked for a hundred years to be in her mother's arms. At the moment when she was about to fall over from weariness, her mother said, "Now you are leaving my breast. You were in my arms all along, my darling little star." At last, the baby star realized the truth. The night sky through which she had walked was indeed her mother's breast all along. Her mom had always been cradling her baby star at her breast so that she would not fall down.

As the baby star's life in the story, my entire life would have been impossible without my mother's perseverance and sacrifice. She is the strongest and wisest woman whom I have ever met, and she is a true inspiration.

Last, I wholeheartedly thank my family for their love and undying faith in me.

Any errors and omissions are my own.

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ABSTRACT

Why Do Leaders Matter?:

Exploring Leaders' Risk Propensities and Nuclear Proliferation

by

So Yeon (Ellen) Park

The purpose of this dissertation is to identify what motivates leaders to seek to possess nuclear weapons. I argue that individual leaders' risk propensities are associated with their behaviors in regard to nuclear proliferation. To test my theory, I aim to create a new dataset of leaders' risk propensities on approximately 1,700 leaders from 1945 to 2000. My risk propensity index draws on insights from psychology and business management, which suggest that leaders' age, socioeconomic backgrounds, college major, military experience, and international experience contribute to his or her risk tolerance. I build on data from the Leader Experience and Attribute Descriptions (LEAD) dataset. I supplement this data with my own in-depth coding of the demographic backgrounds of leaders, including childhood wealth, college major, and international experience. I find that certain demographic characteristics of leaders that are used as proxies for examining their risk propensity significantly influence their risk-taking behaviors with respect to nuclear weapons pursuit. I

conclude that leaders possessing relatively higher levels of risk propensity are more likely to pursue nuclear weapons than leaders with lower levels of risk propensity. These statistical results are further confirmed by more in-depth case studies on South Korea and India.

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CHAPTER 1

Introduction

1.1 Why Do Leaders Matter?

Nuclear weapons are perhaps the deadliest military arsenals ever created. Thus, since the advent of nuclear weapons in 1945, concerns about their spread have continued to receive attention from international relations and security studies experts. Halting their spread is a critical priority in the international pursuit for world peace. The first step in the prevention of nuclear weapons proliferation is to identify who wants to possess a bomb. Much of the literature attempting to explain the causes of nuclear weapons proliferation has focused exclusively on system- and domestic-level analyses. In other words, considerable attention is given to security motivations and domestic political and economic interests.

However, in contrast to the academic literature, journalistic accounts of recent nuclear proliferators like India, Iraq, and North Korea often place the leaders at the center of the explanation. And indeed, it would be difficult to imagine any complete explanation of these countries' nuclear programs without understanding the decision-making calculations of Indira Gandhi, Saddam Hussein, and Kim Il-sung. In particular, former U.S. President Bill Clinton expressed that Iraq would be better served if it had a leader other than Hussein, who

was believed to be the driving force behind Iraq's purported proliferation of nuclear weapons.[1]

The existing accounts emphasizing leaders provide two important implications. First, beliefs about the likelihood that a state was seeking nuclear weapons based on leaders is the aggregate cross-national statistic, not simply a few isolated and idiosyncratic cases. Second, existing leader-based accounts highlight the importance of top-down political decision-making when it comes to nuclear weapons. Not only do states require a leader's decision to develop nuclear weapons; states often cannot use a nuclear weapon without a leader authorizing it. In other words, without a leader's final decision, states can neither develop nor use nuclear weapons in the full sense.

Therefore, a more specific question should be asked: What causes leaders to explore, pursue, and acquire nuclear weapons? Despite the importance of this puzzle to the spread of nuclear weapons, little attention has been devoted to examining the role of individual leaders. Most international relations scholars have focused on security and domestic factors (Sagan 1996; 2011). Some scholars, for example, argue that states build nuclear weapons to increase their national security against external threats (Mearsheimer 1990; Paul 2000). According to this group of thinkers, national leaders make similar choices under the same structural situations in the international system. Other scholars focus their attention primarily on domestic politics (Perkovich 1999; Sheikh 1994; Soligen 1998).

While generally instructive, these theories cannot fully explain cases like India, where Prime Minister Indira Gandhi decided to pursue a nuclear arsenal. While many scholars

[1] Former U.S. President Bill Clinton expressed his thoughts about the Iraq War in a joint news conference with U.K. Prime Minister Tony Blair on February 6, 1998. Clinton said, "Do I think the country would be better served if it had a different leader? Of course, I do" (Clinton 1998, 193).

argue that India decided to develop its nuclear weapons program partly in response to China's nuclear tests in 1964, India did not initiate the development of nuclear weapons until roughly a decade later, in the early 1970s. Theories premised on the domestic politics of India often argue that the decision to pursue nuclear weapons is the outcome of bureaucratic battles. Yet, it is important to recognize that India took a leap forward in developing nuclear weapons with successful nuclear detonation, especially in 1974 and 1998, during a time when the nation was governed by relatively powerful leaders.

Indeed, there is broad empirical variation among leaders that cannot be explained by the existing models. For example, scholars argue that South Korean President Park Chung-hee, who served from 1963 to 1979, pursued nuclear weapons in the 1970s in response to U.S. President Nixon's plan for withdrawing military forces from South Korea. It has also been argued that Park believed that Kim Il-sung would never give up on becoming the leader of a nuclear-weapons state and a unified Korea. Yet, interestingly, Rhee Syngman, South Korean President from 1948 to 1960, took a quite different path with respect to nuclear policy in similar circumstances. Despite U.S. President Dwight Eisenhower's decision to withdraw or reduce American troops in South Korea as part of the New Look policy and Kim's continuous provocations with nuclear ambitions, Rhee did not seek to develop nuclear weapons. Why did the two leaders, Park and Rhee, who shared similar characteristics as authoritarian dictators and who both ruled the country under especially similar circumstances, including when it had a low GDP, adopt such divergent policies with respect to the pursuit of nuclear weapons?

More generally, why do some leaders seek nuclear weapons while others in similar situations in different countries do not? Why do different leaders within the same country take such different paths with regard to developing nuclear weapons? Such questions may be

impossible to answer completely without considering the role of individual national leaders and important sources of variation across them. History suggests that at key moments in time, individual leaders can disproportionately influence the course of international politics; yet the literature on the causes of nuclear weapons proliferation largely ignores the centrality of national leaders, who make the most consequential policy choices in developing nuclear weapons. To date, we lack a theory of nuclear weapons proliferation that takes individual leaders seriously by identifying those who might make the proliferation of nuclear weapons more or less likely.

These are important questions for both scholars and policymakers. Focusing on leaders challenges existing narratives of nuclear weapons in international relations, where scholars are most likely to focus on structural, domestic, and dyadic factors. If the evidence suggests that certain characteristics of leaders systematically influence their decision to pursue nuclear weapons, then analysts should examine individual leaders more thoroughly to predict where these weapons will spread next. Assuming that such characteristics of individual leaders pose numerous international consequences for the pursuit of nuclear weapons, some with severe and far-reaching effects, existing oversight could precipitate inadequate international strategies and nuclear-related policies.

1.2 The Need for a Risk Propensity Index

While historical evidence shows that national leaders play critical roles in driving their states' courses of action, it is difficult to analyze in a systematic way how individual leaders behave. Many international relations scholars thus far have delegated an individual-level analysis to psychologists, historians, and scholars in business management. In this

dissertation, therefore, I bring the influence of individual leaders back into the study of international politics by building on theories in psychology and business.

A cost-benefit analysis is a commonly used process for understanding individual decision-making. The model suggests that people identify the benefits of a certain action as well as the possible associated costs, and they subtract the costs from the benefits to make a decision. Interestingly, the degree to which each individual perceives costs and benefits differs: some people overestimate benefits while underestimating costs. Scholars in psychology have long been interested in this issue and have found that individuals who either underestimate costs or overestimate benefits are more likely to engage in risky decision making, and this depends on the individual's risk propensity (Brockhaus 1980; Kogan and Wallach 1964; MacCrimmon and Wehrung 1986, 1990; Nagin 1998; Nagin and Paternoster 1994; Sitkin and Weingart 1995).

What factors affect an individual's risk propensity? Many psychologists have come to agree that individual predispositions, such as cognitive processes, neuroticism, extroversion, openness to experience, and conscientiousness, appear to be important factors in explaining risk propensity. Accordingly, scholars have developed many psychological questionnaires and tools to measure individuals' risk propensities in order to understand their general tendency to take risks.[2]

[2] There are a number of psychological tools that measure risk propensity: (1) the Risk Propensity Questionnaire (RPQ) includes five items using a 10-point Likert-scale to measure individuals' risk propensity (Rohrmann 2002); (2) the Risk Propensity Scale (RPS) measures individuals' general tendency to take risks. This questionnaire includes seven items using a nine-point scale (Meertens and Lion 2008); (3) the General Risk Propensity Scale (GRiPs) is a self-report measure of general risk propensity that includes eight items using a five-point Likert scale (Zhang, Highhouse, and Nye 2018); and (4) the Risk-Taking Propensity Scale (R-TPS) is a self-report questionnaire designed to measure the so-called "sensation-seeking" behaviors underlying risk-taking propensity. It was developed for individuals older than 18 years (Townsend 2019).

However, these psychological instruments are mostly self-reported measures in which participants must spend a certain amount of time answering survey questions. Therefore, business scholars, who are interested in the strategic decisions of chief executive officers (CEOs), often face struggles in examining relationships between individual leaders and their risk propensities. Interviewing or surveying hard-to-reach CEOs is not an easy task for researchers. To overcome the limitations of these psychological methods, Hambrick and Mason (1984), professors in business management, formalized the upper echelons theory, which has been widely cited across disciplines.

The upper echelons theory states that the demographic characteristics of top executive leaders predict organizational outcomes. The premise of the theory is that CEOs can influence organizational outcomes, and their background characteristics are useful proxies with which to measure their cognitive frames. As such, the upper echelons theory has been widely applied to predict future strategic decisions of CEOs. For example, many scholars use this theory to demonstrate the relationship between leaders' risk-propensities, according to their demographic backgrounds, and their risk-taking behaviors such as innovative performance (Bantel and Jackson 1989; Liu, Li, Hesterly, and Cannella 2012; Sitkin and Pablo 1992; Wang, Kruger, and Wilke 2009; Wu, Levitas, and Priem 2005).

This dissertation applies this theoretical framework to political science in order to understand the decision-making of national leaders. To complete this mission, I create a risk propensity index that can easily proxy individual leaders' risk propensities. The risk propensity index draws on insights from psychology and business management, which suggest that a leader's age, socioeconomic background, college major, military experience, and international experience contribute to the leader's risk tolerance. I build on data from the Leader Experience and Attribute Descriptions (LEAD) dataset, which includes the

background experiences of approximately 24,000 leaders from 1875 to 2004 (Horowitz et al. 2015). I supplement this data with my own in-depth coding of the demographic backgrounds of leaders, including childhood wealth, college majors, and international experience. With this newly developed index, political scientists are now able to analyze how national leaders' risk-taking behaviors affects numerous types of political decisions. The risk propensity index can be used not only to identify potential leaders who pursue nuclear weapons, which is the main focus of this dissertation, but also to predict national leaders' other political decisions involving risk.

1.3 Objective and Outline of the Chapters

To the best of my knowledge, there has been no systematic statistical analysis of how leaders' characteristics influence their decisions to pursue nuclear weapons. In this research, I intend to address this issue. I create a leaders' risk propensity index that measures age, socioeconomic backgrounds, military experience, and international experience. To test my argument, I use a combination of quantitative and qualitative methods. I employ a statistical analysis focusing on approximately 8,000 leaders in the international system from 1945 to 2000. A factor analysis is applied to create a leaders' risk propensity index. I then use logistic regression to analyze the relationship between leaders' risk propensities and their decisions to pursue nuclear weapons. As designed, the statistical analysis can suggest correlations and highlight average effects; however, it does not shed light on causal mechanisms. For this reason, I supplement my analysis with small-n comparative case studies on South Korea and India.

The overall results demonstrate that leaders with higher levels of risk propensity are more likely to pursue nuclear weapons than are leaders with lower levels of risk propensity. Case studies on two South Korean Presidents (Rhee Syngman and Park Chung-hee) and two Indian Prime Ministers (Indira Gandhi and Morarji Desai) further support the relationship between leaders' risk propensities and their decisions to pursue nuclear weapons.

The remainder of this dissertation proceeds as follows. Chapter 2 reviews the historical background of nuclear weapons proliferation and surveys the literature on the causes of nuclear proliferation. The chapter then presents the limitations of existing scholarship and suggests a new research agenda.

Chapter 3 elaborates on why and how particular demographic characteristics of individual leaders shape the nuclear proliferation environment. In order to build a bridge between leaders' risk propensities and their decisions to pursue nuclear weapons, I examine scholarship from various disciplines including political science, psychology, and business management. In the end, this chapter proposes testable hypotheses. Some of the hypotheses suggest that leaders who are older, majored in non-economic or business in college, and have a lower educational level are more likely to pursue nuclear weapons.

Chapter 4 lays out the research design for a large-n statistical analysis. In this chapter, I present a newly developed leadership risk propensity index comprising five variables: age, non-economic major, socioeconomic background, international experience, and military experience. Applying this index, I statistically test my proposition and hypotheses and report the empirical results of quantitative analyses. The results show that older leaders are more likely to pursue nuclear weapons than younger leaders. Leaders who majored in economics or business in college, and leaders with lower-level socioeconomic backgrounds,

international and military experience are more likely to pursue nuclear weapons than leaders who do not have these characteristics.

In Chapter 5, I conduct a deep qualitative case work study of South Korea, with particular attention paid to Rhee Syngman and Park Chung-hee. These leaders shared similar characteristics as authoritarian leaders and ruled the nation under remarkably similar circumstances, but they adopted different policies with respect to the pursuit of nuclear weapons. My findings demonstrate that President Park, who pursued nuclear weapons during the 1970s, had a relatively higher level of risk propensity than Rhee, who did not pursue the bomb under circumstances similar to those in Park's rule.

Chapter 6 presents another case study to demonstrate the relationship between leaders' risk propensities and their decisions to pursue nuclear weapons. This chapter examines two Indian Prime Ministers, Indira Gandhi and Morarji Desai. Focusing on these two Indian leaders is important because Indira Gandhi pursued nuclear weapons during her first prime ministership from 1966 to 1977 and during her second term from 1980 to 1984, while Morarji Desai, who served between the two Gandhi terms from 1977 to 1979, did not pursue the bomb. Along with the South Korean case, this chapter offers qualitative evidence for my proposition and hypotheses. The result supports my theory that Gandhi had a relatively higher level of risk propensity than Desai, and this characteristic led Gandhi to pursue nuclear weapons under very similar security and domestic situations as in Desai's case.

Finally, Chapter 7 summarizes the findings and discusses major contributions to the field and possible policy implications. In closing the chapter, I suggest a future research direction. I propose to further examine how and to what extent leaders' risk propensities will be constrained by international or domestic systems and to expand more cases in addition to

leaders in South Korea and India to generate and enhance a multi-faceted understanding of nuclear proliferation.

CHAPTER 2

Nuclear Weapons Proliferation

2.1 Introduction

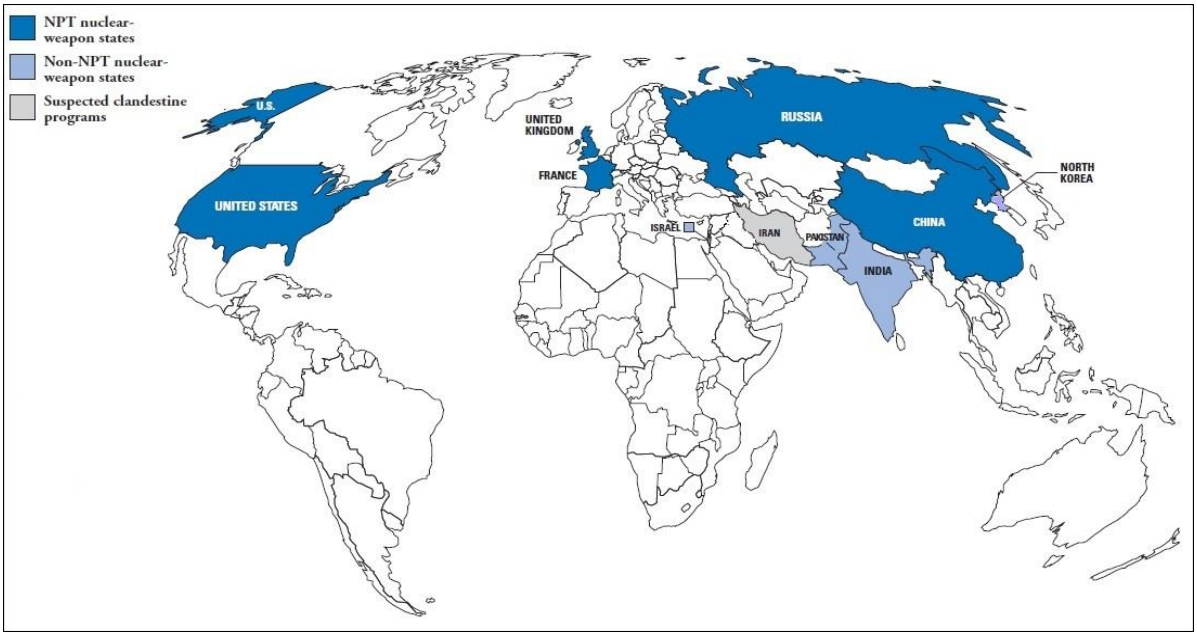
According to Scott Sagan's (2011) review article on nuclear weapons, a new nuclear weapons state has emerged about every five years. What causes states to develop nuclear weapons? To begin, we need to know the historical background of nuclear weapons proliferation and to clarify its definition. To that purpose, this chapter describes trends in nuclear weapons proliferation. Chapter 2 is organized as follows: Section 2.1.1 introduces the historical background of nuclear weapons proliferation. Next, Sections 2.1.2 discusses the causes of nuclear proliferation. Finally, Section 2.2 concludes the chapter and proposes a research agenda for this dissertation.

2.1.1 Historical Background of Nuclear Weapons Proliferation

A nuclear weapon is a device designed to release energy as a result of nuclear fission, nuclear fusion, or combined fission and fusion reactions for the purpose of wide-scale destruction. Nuclear fission was first discovered by German chemists in 1938, after which the theoretical possibility of developing nuclear weapons was proven. During World War II, the US and the UK collaborated a scientific research that is called the Manhattan Project to produce a nuclear weapon. As a result, they produced the first nuclear weapons in history.

Thus far, nuclear weapons have been used twice, both by the US against Japan. The U.S. military dropped a bomb called “Little Boy” on Hiroshima on August 6, 1945, and three days later detonated another bomb called “Fat Man” on Nagasaki, Japan. Those two explosions reinvigorated the Soviet Union to develop its own nuclear weapons, and not long after, the US and the Soviet Union became the world’s two most powerful countries as they competed to produce new, modernized nuclear weapons.

Figure 2.1 Nuclear Weapons Countries 2020



In the decades since 1945, many countries have developed nuclear weapons, and, consequently, more than two thousand nuclear tests with various purposes have been conducted all over the world. As shown in Figure 2.1, as of today, nine countries possess a combined total of approximately 14,000 nuclear warheads. Chronologically and

accompanied by the number of warheads, they are Russia (6,490), the US (6,185), France (300), China (290), the UK (200), Pakistan (160), India (140), Israel (90), and North Korea (20–30) (Arms Control Association 2019). Among those countries, only Russia, the US, France, China, and the UK are acknowledged as nuclear weapons states under the Treaty on the Non-Proliferation of Nuclear Weapons, or, for short, the Non-Proliferation Treaty (NPT).

Excessive secrecy, especially among countries not recognized by the NPT, makes it difficult to ascertain the exact number of nuclear weapons in the world. For example, the U.S. Defense Intelligence Agency (DIA) estimates that Israel, although never having acknowledged its possession of nuclear weapons or publicly having conducted a nuclear test, has approximately 90 warheads. India and Pakistan have also not released official information about the size and composition of their nuclear weapons. However, since India conducted its first nuclear test in 1974 under Indira Gandhi, which spurred Pakistan to produce its own nuclear weapons, it is believed that India has produced enough fissile material for as many as 140 warheads and that Pakistan has assembled approximately 160 warheads. Beyond that, although the range of North Korea's nuclear weapons power remains a mystery, the state has been determined to possess approximately 20 to 30 warheads. Some experts further estimate that it could acquire up to 100 nuclear warheads by the end of 2020 based on the rate of its stockpile growth (Arms Control Association 2019).

Signed on July 1, 1968, and enacted on March 5, 1970, the NPT defines nuclear weapons states such that the category includes only the five countries that possessed nuclear devices before January 1, 1967. To date, 191 states have joined the NPT. Although North Korea had acceded to the NPT, it did not complete a safeguards agreement with the International Atomic Energy Agency (IAEA). Moreover, the state announced its withdrawal

from the treaty on January 10, 2003. By contrast, India, Israel, and Pakistan, all of which possess nuclear weapons, have never accepted the NPT (Arms Control Association 2019).

Importantly, the NPT attempts to prevent the spread of nuclear weapons while at once allowing the peaceful use of nuclear technology and nuclear energy among its member states. Although the IAEA, established on July 29, 1957, prohibits any military use of nuclear energy, it also seeks condones peaceful applications of nuclear technology. Those objectives of the IAEA are clearly written in Article II of the IAEA Statute: "[The goals of the IAEA are] to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world…[And to] ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose" (IAEA Statute 2020).

Along with the IAEA and the NPT, additional treaties, including the Strategic Arms Reduction Treaty (START I),[3] the Intermediate-Range Nuclear Forces Treaty (INF),[4] and New START,[5] were signed between the US and the Soviet Union and later between the US and Russia to limit and reduce the number of nuclear weapons. Due to the effort of those treaties and organizations, the nuclear arms race between the superpowers has decelerated; however, as noted earlier, the world has clearly experienced a gradual increase of nuclear

[3] START I was a bilateral treaty between the US and the Soviet Union to reduce and limit strategic offensive arms. The treaty was signed on July 31, 1991, and expired on December 5, 2009.

[4] The INF was signed between the US and the Soviet Union on December 8, 1987. Under that treaty, the two countries banned all land-based, short and intermediate-range ballistic missiles, cruise missiles, and missile launchers. On October 20, 2018, U.S. President Donald Trump announced the withdrawal of the US from the treaty due to Russian non-compliance and the US formally withdrew from the INF on August 2, 2019.

[5] New START is a nuclear arms reduction treaty signed between the US and Russia on April 8, 2010 and expected to last until 2021.

weapons states. In addition, increasingly more countries have sought to promote civilian uses of nuclear energy.

Considering all of the above, to understand nuclear weapons proliferation, it is necessary to focus not only on which states eventually acquired nuclear weapons but also which ones have taken preliminary steps toward developing nuclear weapons before acquiring them. Peaceful-use nuclear energy can be repurposed for military use at any time. Thus, many scholars have agreed to divide nuclear weapons proliferation into four phases: exploration, pursuit, acquisition, and most recently latency (Bleek and Lorber 2014; Debs and Monteiro 2017; Fuhrmann and Tkach 2015; Sagan 2011; Singh and Way 2004).

The phase of nuclear exploration is defined as the "authorization by national leaders to conduct cost [and] benefit assessments of potential proliferation or engage in low-level proliferation activities, such as bolstering nuclear infrastructure with the intention of building nuclear weapons" (Bleek and Lorber 2014, 433). For example, Algeria (1983–1991), Indonesia (1964–1967), Sweden (1945–1970), and Switzerland (1945–1969) are some of the countries that explored nuclear weapons but not pursued the atomic bomb.

The second phase, nuclear pursuit, involves active steps beyond mere exploration, including the "authorization by national leaders to launch programs to acquire nuclear weapons" (Bleek and Lorber 2014, 433) and "movement toward weaponization or development of single-use, dedicated technology" (Singh and Way 2004, 866). Brazil (1975–1990), Iraq (1976–1991), Libya (190–2003), and South Korea (1970–1981) are some of the countries that have explored and pursued nuclear weaponization but have yet to acquire nuclear weapons.

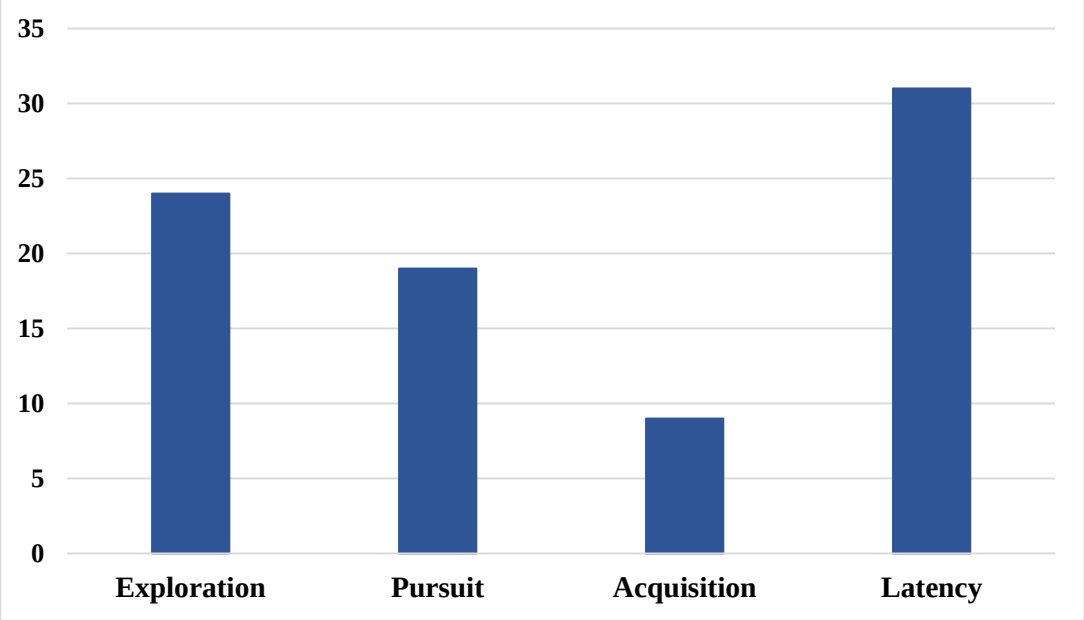
The third phase, nuclear acquisition, refers to the stage of fully coming into possession of nuclear weapons. In addition to the nine countries possessing nuclear weapons mentioned

earlier, South Africa acquired the bomb but discarded it in 1991. Among those nine countries, most acquired nuclear weapons in the year of their first test, except India, which conducted its first nuclear test on May 18, 1974, without having acquired any nuclear weapons. Conversely, South Africa, Israel, and Pakistan acquired nuclear weapons before testing any (Bleek and Lorber 2014).

Lastly, an increasing number of literatures have recently focused on the capacity to build nuclear weapons, known as nuclear latency (Fuhrmann and Tkach 2015; Sagan 2010). Fuhrmann and Tkach (2015) have proposed measuring nuclear latency based on states' uranium-enrichment plutonium-reprocessing capabilities, which can reveal whether or not a state has actual bomb-making capabilities. According to this data, Belgium, Canada, Czech Republic, and the Netherlands, among others, are considered to have nuclear latency even if they have neither explored nor pursued nuclear weapons.

Figure 2.2 shows that the number of countries that proliferated nuclear weapons between 1945 and 2000 can be broken down into various phases: exploration (24), pursuit (19), acquisition (9), and latency (31). Among those four stages, nuclear pursuit has been regarded by scholars, including myself, as the most important for several reasons: (1) It gives a clear signal of an actor's demand for nuclear weapons for the purpose of military use; (2) It entails an in-depth commitment to obtaining nuclear weapons other than exploration and latency; (3) Compared to acquisition, pursuit is unlikely to be mediated by internal and external constraints (Bleek and Lorber 2014; Fuhrmann and Horowitz 2015; Jo and Gartzke 2007). For this dissertation, therefore, I focus chiefly on nuclear weapons pursuit to examine the relationship between leaders and their decision to proliferate nuclear weapons.

Figure 2.2 Countries that proliferated nuclear weapons between 1945 and 2000



2.1.2 Causes of Nuclear Weapons Proliferation

A large number of studies on nuclear weapons proliferation have examined the causes of actors' decisions to develop nuclear weapons (Bell 2016; Braut-Hegghammer 2016; Debs and Monteiro 2017; Fuhrmann 2009; Hymans 2006; Jang 2016; Jo and Gartzke 2007; Kroenig 2009; Miller and Narang 2018; Monteiro and Debs 2014; Narang 2012; Narang, Gartzke, and Kroenig 2016; Sagan 1996; Saunders 2019; Solingen 2007; Way and Weeks 2014).[6] Having a clear and accurate answer is important for both international relations

[6] Many scholars have devoted their efforts to understand the consequences of nuclear weapons. Nuclear optimists argue that nuclear proliferation promotes stability and brings about nuclear peace. This type of scholars believe that nuclear weapons make war difficult to initiate regardless of the size or number of nuclear weapons that states have (Mearsheimer 1984; Van Evera 1990; Waltz 2013). On the other hand, nuclear pessimists claim that the spread of nuclear weapons increases the risk of war (Barnaby 1993; Dunn and Kahn 1976; Jervis 1984, 1988, 1989; Sagan 1994, 1996). In addition, some argue that nuclear

scholars and policy makers to prevent the spread of nuclear devices. The scholarly studies viewing nuclear proliferation as a dependent variable can be categorized into two groups: demand-side analyses and supply-side analyses. Demand-side analyses focus on states' motivations and or political intentions to develop nuclear weapons. Supply-side analyses, on the other hand, focus on states' technical capabilities to build nuclear weapons.

First, on the supply-side of the proliferation equation, scholars tend to focus on a techno-centric standpoint, meaning that the more technological capabilities states possess, the more likely these states are to go nuclear. In other words, they examine whether states have opportunities to develop nuclear weapons (Brown and Kaplow 2014; Choi and Hwang 2015; Fuhrmann 2009; Fuhrmann and Tkach 2015; Gheorghe 2016; Gilinsky 2014; Gilinsky, Miller, and Hubbard 2004; Horowitz and Narang 2014; Hymans 2014; Jo and Gartzke 2007; Kroenig 2009; Mark, Hippel, and Lyman 2009; Perkovich 2002; Sokolski 2015; Zentner, Coles, and Talbert 2005).

Jo and Gartzke (2007) argue that opportunities for nuclear weapons production include technologies or knowledge, materials, and economic capacity to manufacture a bomb. They modify[7] the Stoll and Meyer data[8] by dropping three indicators—construction work force,

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proliferation neither reduces military disputes nor increases the likelihood of war (Huth and Russett 1984, 1990; Lebow and Stein 1989, 1990; Snyder and Diesing 1977).

[7] The modified indicators of Jo and Gartzke's are as follow: chemical engineers (production of nitric acid or sulfuric acid), electricity production capacity (installed capacity of 200 MWe or produces equivalent of 50,000 metric tons of oil), metallurgists (production of crude steel or aluminum), uranium deposits (known uranium deposits or produced uranium already), nitric acid production capacity (nitric acid production or sulfuric acid production and nonorganic nitrogenous fertilizer production), nuclear engineers, physicists, chemists (three research-reactor years), and specialists in electronics and explosives (manufacture or assembly of motor vehicles and manufacture of radios or televisions)

[8] The full indicators of Stoll and Meyer's data are as follow: chemical engineers (production of nitric acid or sulfuric acid), construction workforce (production of steel and cement), electricity production capacity (installed electrical capacity of 200 MWe), metallurgists (production of crude steel), mining activity (some fraction of labor force in mining activity), nitric acid production capacity (nitric acid production or sulfuric acid

steel production, and previous national mining activity. Recently, Fuhrmann and Tkach (2015) introduced a new, more accurate dataset[9] on nuclear capability for so-called nuclear latency from 1939 to 2012. They argue that 31 states[10] are known to have the capacity to develop nuclear weapons if they want to do so.

Among scholars who have examined why states provide nuclear technologies to non-nuclear-weapon states, Kroenig (2009) introduces a strategic theory of nuclear weapons that addresses issues related to sensitive nuclear assistance. The author derives three hypotheses, all ultimately supported by empirical tests. First, the more powerful a state is than potential recipient of nuclear weapons, the less likely it is to provide sensitive nuclear weapons to such states that do not already possess them. Second, a state is more likely to provide sensitive nuclear assistance to another state with a shared enemy. Third, a state less vulnerable to pressure from a superpower is more likely to provide sensitive nuclear assistance to states without nuclear weapons.

Similarly, Fuhrmann (2009) explains why states assist one another in developing civil nuclear programs. Although Kroenig and Fuhrmann agree with the idea of sensitive

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production and nonorganic nitrogenous fertilizer production), nuclear engineers, physicists, chemists (three research-reactor years), specialists in electronics and explosives (manufacture of motor vehicles, or assembly of motor vehicles and manufacture of radios or televisions), steel (production of crude steel), and uranium deposits (Meyer considers known uranium deposits as a proxy, while Stoll uses assumed market access),

[9] Fuhrmann and Tkach (2015) examines countries' enrichment and reprocessing (ENR) facilities and detailed facility-specific information and sources: (1) ENR type (e.g., diffusion, centrifuge, EMIS, chemical and ion exchange, aerodynamic isotope separation, and reprocessing); (2) facility size; (3) whether the facility is under construction or in operation; (4) whether the facility was developed covertly; (5) whether the facility was placed under IAEA safeguards; (6) whether the facility was placed under regional safeguards; (7) whether the facility has a military purpose; (8) whether the facility is multinational; and (9) whether the facility was built with foreign assistance.

[10] 31 nuclear latency countries are as follow: Algeria, Argentina, Australia, Belgium, Brazil, Canada, China, Czech Republic, Egypt, France, Germany, India, Iran, Iraq, Israel, Italy, Japan, Libya, Netherlands, North Korea, Norway, Pakistan, Romania, Russia, South Korea, Sweden, Taiwan, UK, US, and Yugoslavia.

assistance contributes to nuclear proliferation, Fuhrmann emphasizes that the relationship between peaceful nuclear aid and the spread of nuclear weapons is broader. He argues that states provide civil nuclear assistance for three strategic reasons: (1) to strengthen their allies and alliances; (2) to strengthen their relationship with enemies of enemies; (3) to strengthen existing democracies and bilateral relationships with these states, only if the supplier is also a democracy.

Compared to the supply-side literature, a larger number of studies have focused on the demand-side of proliferation. This refers to the willingness to develop nuclear weapons that captures motivations for the proliferation decision. Sagan (1996) suggests three theoretical frameworks: an international security model, a domestic-politics model, and a norms model. Although some scholars later attempted to update his typologies by adding a status-driven model[11] (Jo and Gartzke 2007) and an externally influenced domestic politics model[12] (Hymans 2014), Sagan's initial foray seems to be an appropriate place to begin.

The first model of nuclear weapons proliferation focuses on the international structure based on neorealist theory in political science. According to this perspective, states develop nuclear weapons to increase their national security against external threats. For example, a precarious situation of World War II spurred the US to develop nuclear weapons. After the US dropped two nuclear bombs on Hiroshima and Nagasaki, the Soviet Union feared that

[11] Jo and Gartzke (2007) argue that states' regional or global status may affect their decisions about nuclear weapons proliferation. For example, regional powers, such as Argentina, Brazil, India, and South Africa, are slightly more likely to develop nuclear weapons.

[12] Hymans (2014) suggest a hybrid model combining international structure and domestic politics. In other words, he attempts to examine the impact of external states on a given state's domestic politics.

the balance of power[13] had been destroyed. In response to the U.S. nuclear attacks on Japan, the Soviet Union reinvigorated its nuclear program to provide the bomb. In turn, the development of the Soviet Union's nuclear program and its growing military threats provoked many European states, such as the UK and France, to develop their own nuclear weapons. In a similar vein, China, one of the five states recognized as a nuclear state by the NPT, developed its nuclear weapons due to the fear of U.S. attacks that China experienced during the Korean War (1950–1953).

Like a domino effect, India conducted its first nuclear test called, "Smiling Buddha," on May 18, 1974, in response to China's nuclear weapons.[14] Clearly, strategic thinkers believe the so-called China factor is the most convincing reason for India's nuclear build-up. Then, given the Indo-Pakistan relation that had experienced a number of wars,[15] India's 1974 "peaceful nuclear explosion" (PNE) provided Pakistan a legitimate reason to build its own nuclear weapons.

Moreover, the security model explains why Argentina, Belarus, Brazil, Kazakhstan, South Africa, South Korea, Taiwan, and Ukraine abandoned their nuclear weapons programs. For example, South Africa developed its nuclear weapons in the 1970s because of rising tensions and the fear of a growing Soviet expansion. For South Africa, a nuclear weapon is a deterrent tool against the Soviet Union. However, when the risk of the Soviet

[13] The theory posits that states build up their own military capabilities (i.e., internal balancing) or aggregate their capabilities by forming strategic alliances with other states (external balancing).

[14] The Sino-Indian war, also known as the Indo-Chinese war, occurred in 1962; two years later, China successfully conducted its first nuclear test.

[15] As of today, India and Pakistan have been involved in many wars and incidents: First Kashmir war (1947-1948), Second Kashmir war (1965), Indo-Pakistani war (1971), Siachen conflict (1984-2003), Kargil conflict (1999), India-Pakistan standoff (2001-2002, 2008, and 2019), and India-Pakistan border skirmishes (2013 and 2016-2018).

Union's attack was dramatically reduced in 1989, South Africa finally discarded all of its small nuclear arsenal in 1991 (Sagan 1996).

South Korea launched a nuclear weapons program after U.S. President Richard Nixon announced the Guam Doctrine[16] on July 25, 1969 (Jang 2016). However, using realist logic, South Korea gave up its nuclear program when President Ford stated that the US would not scale down its troop levels on the Korean peninsula and promised an enhanced security guarantee (Bleek and Lorber 2014; Siler 1998). Many scholars in international relations support this security model (Jang 2016; Mearsheimer 1990; Miller and Narang 2018; Paul 2000; Hecker 2010).

The second model focuses on domestic actors, such as bureaucratic interests. This is a bottom-up model, meaning that domestic actors can "create the conditions that favor weapons acquisition" (Sagan 1996, 64). In this perspective, there is no single domestic consideration that explains why states develop bomb programs (Braut-Hegghammer 2016; Chellaney 1994; Dunn and Khan 1976; Lavoy 1993; Saunders 2019; Sheikh 1994; Snyder 2000; Solingen 1998). For example, some focus on societal pressure (Lavoy 1993), while others differentiate between externally oriented and economically liberal political actors and internally oriented actors (Solingen 1998).

Indeed, given the importance of the role of domestic actors, some scholars further illuminate the interaction of those domestic actors. For example, Frey (2006) focuses on strategic thinkers and opinion leaders referred to as the so-called "strategic elite." He argues that not only the relationship between leaders and the public is important, but also the

[16] The Guam Doctrine was announced by U.S. President Nixon on July 25, 1969. Nixon stated that "the United States would assist in the defense and developments of allies and friends, but would not undertake all the defense of the free nations of the world" (Office of the Historian 1970). The doctrine implies that Asian countries, such as South Korea and Taiwan, should be responsible for their own defenses.

mediating role of the strategic elite between those relationships. According to the author, "[the strategic elites] indirectly dominate opinion leadership through their extensive media presence and newspaper publishing" (Frey 2006, 4).

This domestic politics perspective suggests explanations that differ from the security model regarding Indian nuclear proliferation and South Africa's dismantlement of nuclear weapons. In contrast to the realist's point of view mentioned earlier, this model illustrates that India's nuclear weapons proliferation is not the outcome of security considerations and underscores the necessity to take a closer look at the history of the Indian case. First, India did not immediately initiate a nuclear weapons program in response to the Chinese nuclear test in 1964. If security concerns had been a stimulus to the development of India's nuclear weapons program, then India would have started and conducted its first nuclear test much earlier than 1974. Second, during the 1960s, there was a controversy over nuclear weapons production among political and military officials (Sagan 1996). Third, prior to the Chinese nuclear test in 1964, China sent strong messages and signals that the strategic purpose of developing its nuclear weapons was only limited to the Taiwan and the South China Sea issues. Indeed, China expressed its interest in preserving the status quo regarding the south western border to India (Frey 2006). Fourth, the nuclear detonation test was a political strategy by the Gandhi government in reaction to public opinion polls, which had plummeted due to a severe domestic recession in 1973 and early 1974 (Sagan 1996).

The domestic model also lends a different explanation in regard to South Africa's reversals of nuclear weapons proliferation. Contrary to the security model, supporters of this model highlight internal political changes South Africa experienced during the 1980s and early 1990s. Some argue that when President de Klerk was elected in 1989, he immediately asked about discarding the existing nuclear weapons in order to blame failed policies of the

previous administration. Importantly, de Klerk's request came before "the Cold War was unambiguously over" (Sagan 1996, 70). Therefore, South Africa's decision to abandon its nuclear weapons is not directly associated with diminished external threats from the Soviet Union but rather is related to internal political changes.

The third model emphasizes the role of norms. Scholars who support the nuclear norms model criticize the Waltzian argument[17] in that it cannot sufficiently explain the non-use of nuclear weapons in the asymmetric power dyad (Katzenstein 1996; Tannenwald 2007; Rublee 2009). For example, norm theorists ask why other European countries[18] that faced security threats similar to those faced by France did not choose to acquire nuclear weapons. Put differently, they question why only France decided to develop nuclear weapons among many European countries under very similar circumstances. This provides a puzzle for the security model, which argues that France's aspiration for nuclear weapons is derived from the 1956 Suez Crisis.[19] More specifically, according to the realist's perspective, the French decision to develop nuclear weapons is due to the Soviet Union's nuclear threats. However, historical evidence tells that France decided to start a clandestine nuclear weapons research

[17] Kenneth Waltz, a preeminent scholar on international relations, enumerated seven reasons why states pursue nuclear weapons: "(1) Great powers always counter the weapons of other greater powers, usually by imitating those who have introduced new weapons; (2) A state may want nuclear weapons for fear that its great-power ally will not retaliate if the other great power attacks; (3) A country without nuclear allies will want nuclear weapons all the more if some of its adversaries have them; (4) A country may want nuclear weapons because it lives in fear of its adversaries' present or future conventional strength; (5) Some countries may find nuclear weapons a cheaper and safer alternative to running economically ruinous and militarily dangerous conventional arms races; (6) Countries may want nuclear weapons for offensive purposes; and (7) By building nuclear weapons a country may hope to enhance its international standing" (Waltz 1981, 7-8)

[18] The European countries that were threatened by the Soviet Union and had capacities to build nuclear weapons at that time were as follows: Belgium, Italy, the Netherlands, Norway, Sweden, Switzerland, and West Germany.

[19] The Suez Crisis was initiated when Israel invaded Egypt in 1956. France was also involved in the military intervention on the Suez Canal, but withdrew its troops after facing a nuclear threat from the Soviet Union.

program in 1954, which predated the Suez Crisis (Sagan 1996; Scheinman 1965). Furthermore, as noted, other European countries faced similar nuclear threats from the Soviet Union as France.

In short, according to the logic of this third model, France decided to develop nuclear weapons because of "French leaders' perceptions of the bomb's symbolic significance" (Sagan 1996, 78). This argument is supported by the first French Five-Year Plan that sought the return of France's great power status (Sagan 1996). Clearly, people in Paris believed that having a nuclear capability represented potent symbols and the great power status of France.

The norms model also gives an alternative explanation to understand India's decision to develop nuclear weapons. While identifying the role of the strategic elite and highlighting its moderating role on the relationship between leaders and the public, Frey (2006) further argues that, in addition to the security reason, the concepts of status and prestige also were important driving forces behind India's aspiration for having nuclear weapons. For India, "both Pakistan and China are not only exclusively perceived as threats to its security but also as factors in international status ranking" (Frey 2006, 22).

According to this model, Ukraine's decision regarding the destruction of existing nuclear weapons in the 1990s should be reexamined. Ukraine became a so-called born nuclear state when the Soviet Union collapsed in 1991. At that time, Ukraine had inherited 175 long-range missiles, more than 4,000 nuclear weapons, and more than 1,800 warheads. However, following the talks between the US, Russia, and Ukraine in Brussels on January 10, 1994, Ukraine finally agreed to remove all of its nuclear weapons from its territory.

Ukraine's decision to eliminate the world's third-largest nuclear-weapons stockpile is puzzling from the realist perspective. Although realists insist that the decision was possibly made due to the reduced level of Russian expansionist behavior, the history clearly shows

that there were continuing tensions between Russia and Ukraine over Crimea.[20] Furthermore, public opinion polls during this time showed growing support for maintaining nuclear weapons, suggesting that the domestic politics model cannot sufficiently explain the Ukraine case (Potter 1955; Sagan 1996).

Therefore, some scholars argue that the NPT, which inhibits the spread of nuclear weapons through an international norm embedded in the enforcement of an institution, is the most appropriate way to understand the removal of Ukraine's nuclear weapons. In other words, it is a "nuclear taboo" or norms that constrain the use of nuclear weapons rather than security or domestic reasons (Tannenwald 2007). Indeed, Ukraine attempted to use NPT membership to enhance its national sovereignty (Potter 1955; Sagan 1996).

2.2 The Importance of Leadership

There has been positive progress on understanding the causes of nuclear proliferation in the past decade. Despite this development, however, a serious gap in our knowledge remains because much nuclear proliferation literature disregards the role of individual leaders.

I begin with the problems of Sagan's three alternative theoretical frameworks, which provide a useful foray for understanding how neglecting the role of leaders leads to incomplete analysis. The security model's underlying assumption is that a state is a rational unitary actor and a national security threat is the first and foremost reason for a state to decide to build nuclear weapons. Although the security model is parsimonious and can

[20] The Crimean Peninsula is located on the north side of the Black Sea in Europe. Although Russia annexed Crimea in 2014, the majority of countries continue to recognize Crimea as part of Ukraine.

explain some important nuclear events in history, it cannot account for nuclear proliferation linked to domestic factors. For example, according to the security model, North Korea decided to develop nuclear weapons in response to the U.S. deployment of tactical nuclear weapons in South Korea in 1958. However, North Korea continued proliferating such weapons even after the US removed its weapons in 1991 as part of shifting its nuclear weapons-related posturing once the Cold War had ended. If North Korea's security had been threatened, then its nuclear weapons program would have been dismantled immediately after the US removed its nuclear arsenal from South Korea.

The domestic and norms models provide a more nuanced approach, yet still neglect how specific leaders may impact a state's nuclear policy. Sagan (1996) consistently recognizes the role of Indira Gandhi for Indian nuclear explosives, but excludes leaders from his list of domestic actors (state-run laboratories, the professional military, and politicians) in the domestic politics model. He describes, for example, that the "public support for Mrs. Gandhi increased by one-third in the month after the nuclear test according to the Indian Institute of Public Opinion, leading the Institute to conclude that both Gandhi and the Congress Party have been restored to the nation's confidence" (Sagan 1996, 68). Furthermore, Sagan highlights South African leader John Voster for his decision to develop a small number of nuclear deices and construct a secret testing location. As for the abandonment of nuclear weapons in South Africa, he also acknowledges the role of de Klerk by saying: "In September 1989, de Klerk was elected president and immediately requested a high-level report on the possibility of dismantling the existing six nuclear devices" (Sagan 1996, 70). Within the explanation of the norms model, Sagan continuously emphasizes the pivotal role of French leader Charles de Gaulle, who was described as an "obsessed [leader] with nuclear weapons (78). In addition to Sagan, while describing Egypt's interest in developing nuclear

weapons in terms of all security, domestic, and norm models, Levite (2003) still highlights the role of leaders.

Given the importance of the role of leaders in domestic politics, we therefore need to include a leader's personality and characteristics as a fourth category of causal variables from which we might explain variation in decision to pursue nuclear weapons. Unfortunately, very few scholars have devoted their attention to individual leaders. Among the few, for example, O'Reilly (2012) highlights the influence of individual leaders' attitudes toward the utility of nuclear weapons in the international arena. Utilizing operational code analysis,[21] he argues that leaders' views indeed influence their decision making about nuclear weapons proliferation. Hymans (2006) also focuses on the so-called oppositional nationalist identity[22] of some leaders by applying a psychological theory. These scholars do not, however, provide a systematic typology for understanding how leadership might influence proliferation across countries and time periods.

In summary, the lack of attention to the role of individual leaders is a large omission from scholarship on nuclear weapons proliferation. For example, Muammar Gaddafi of Libya had ambitions to acquire nuclear devices. Although Libya had insufficient capabilities to develop nuclear weapons, Gaddafi used illicit networks, such as A.Q. Khan, and various black-market sources to start developing nuclear weapons. So did Kim Il-sung of North Korea. It should be noted that the emergence of illicit networks and the Nuclear Suppliers Groups (NSG) complicates any future prediction of nuclear weapons proliferation. Put

[21] O'Reilly (2012) follows ten questions about operational code beliefs that are devised by Alexander George (1969). The operational code is a psycho-cultural factor demonstrating how philosophical or ideological beliefs shape actors' political outcomes.

[22] According to Hymans (2006), oppositional nationalist leaders view their nation "as both naturally at odds with an external enemy, and as naturally its equal if not its superior" (2). In order to measure the oppositional nationalist variable, Hymans analyzed political leaders' major public speeches.

differently, whether states overcome these deficiencies through the illicit networks or the NSG, or foreign countries largely depends on “leaders’ willingness” to do so.

CHAPTER 3

Bringing the Leader Back In

3.1 Introduction

The existing literature in international relations focuses most on state-level and system-level factors that influence states' decisions related to nuclear weapons, with particular attention to international security threats, domestic politics, and norms. Much of this literature neglects the role of national leaders in contributing to nuclear proliferation. Compared to psychology or business management, political science continues to lag in examining individual leaders due to its strong tendency toward structural analysis. In order to build a bridge between individual leaders and nuclear proliferation and, in turn, elaborate my theory, this chapter reviews how psychology and leadership study in business management examine individual leaders.

Chapter 3 is organized as follows: Section 3.1 explores why and how individual leaders matter. In particular, to understand their risk-taking behaviors, I examine scholarship from various disciplines, including psychology and business management, in addition to political science. Thereafter, Section 3.2 breaks new ground by bridging international relations literature on nuclear weapons proliferation with work from psychology and business management on leaders' risk propensities. The chapter also proposes hypotheses for further investigation.

3.1.1 Leaders' Risk Propensities

Cost-benefit analyses, which are commonly used in making decisions about policy, commercial transactions, and business investments, represent a straightforward process for explaining individuals' decision making. The traditional model of cost-benefit analysis suggests that decision makers rationally forecast the benefits of certain actions in light of the possible costs that such actions will incur. A model of simple decision making can be defined as below.

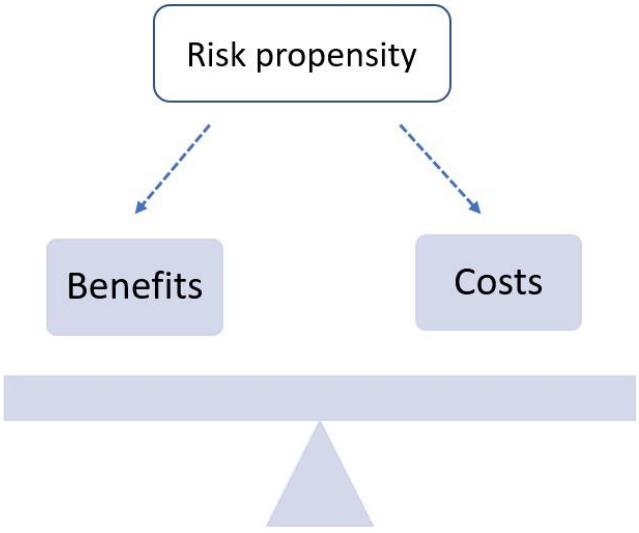
$$pr(\text{outcome}) = pr(\text{benefits}) - pr(\text{costs})$$

However, we know from psychology that how people make decisions is not simple. Importantly, the degree to which individuals perceive expected costs and benefits tends to differ, as individuals are not risk-neutral. That is, individuals are known to behave very differently when exposed to the same uniform distribution of risk. For example, several articles in psychology that focus on gambling describe how those who make risky decisions are more likely to perceive their chances of winning the lottery (i.e., benefits) or being a successful gambler as high because of their personal attributes (Roger 1998; Vong 2007). In addition, variation exists with regard to the likelihood of the costs to be incurred. Interestingly, scholars in psychology have observed that individuals evaluate the probability of being apprehended for committing a crime differently; consequently, if people perceive a greater certainty of being punished (i.e., costs), then they pursue outrageous behavior to lesser extents (Nagin 1998; Nagin and Paternoster 1994).

Variation among individuals concerning the probability of benefits and costs raises an important question: Why do individuals view the probability of being caught or acquiring

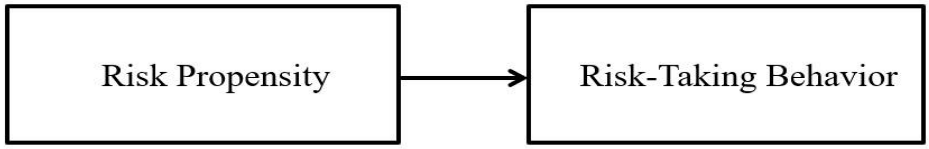
benefits differently? As briefly noted, individuals who perceive either the cost to be low or the benefit to be high are more likely to engage in making risky decisions, and these results stem from characteristics of the individual's risk propensity. In theory, individuals vary in their risk propensities, and many scholars in psychology and business have argued that the concept of risk propensity directly affects whether individuals will indeed make riskier decisions (Brockhaus 1980; Kogan and Wallach 1964; MacCrimmon and Wehrung 1986, 1990). In that sense, risk propensity, defined as an individual's willingness to take or avoid risks and "conceptualized as an individual trait that can change over time" and thus "an emergent property of the decision maker" (Sitkin and Weingart 1995, 1575), is causally related to making riskier decisions. Therefore, it is more accurate to include risk propensity in the traditional cost-benefit model. Figure 3.1 presents a cost-benefit model including the intervening variable of an individual's risk propensity.

Figure 3.1 Cost-benefit Model Including Risk propensity



Accordingly, risk propensity is not synonymous with risk-taking behavior or risky decisions. Risk-taking behavior is defined as "the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized. To the extent that a decision involves high uncertainty or extreme outcomes, either in terms of the choice among alternatives or for individual alternatives in aggregate, the decision is characterized as risky" (Sitkin and Weingart 1995, 1575). Figure 3.2 illustrates this causal relationship.

Figure 3.2 Determinant of Risk-Taking Behavior



What then affects an individual's risk propensity? Scholars in psychology have long acknowledged that individuals' risk propensities are often influenced by their predispositions, including their beliefs, values, cognitive processes, and personalities (Bromiley and Curly 1992; Eaves, Eysenck, and Martin 1989; Johnson 1990; Kowert and Hermann 1997; Loehlin 1992; Mount and Barrick 1995). In particular, Vertzberger (1995) has found that individual leaders' dispositions are important factors of their risk propensities regardless of the situations in which risks could be taken. Among those psychological factors, five characteristics in the five-factor model—neuroticism, extroversion, openness to experience, conscientiousness, and agreeableness—seem to be strong contenders for explaining risk propensity.

Business scholars widely recognize that leaders' psychological characteristics and experiences influence their risk propensities (Levitt and March 1988; Osborn and Jackson 1988), but often struggle to examine the relationship between individual leaders and risk propensities given the distinct difficulty of measuring the psychological factors of leaders. In short, the cognitive bases of individual leaders cannot be conveniently or even directly measured. To overcome that methodological problem, Hambrick and Mason (1984), from the discipline of business, have formalized their highly influential "upper echelons theory."

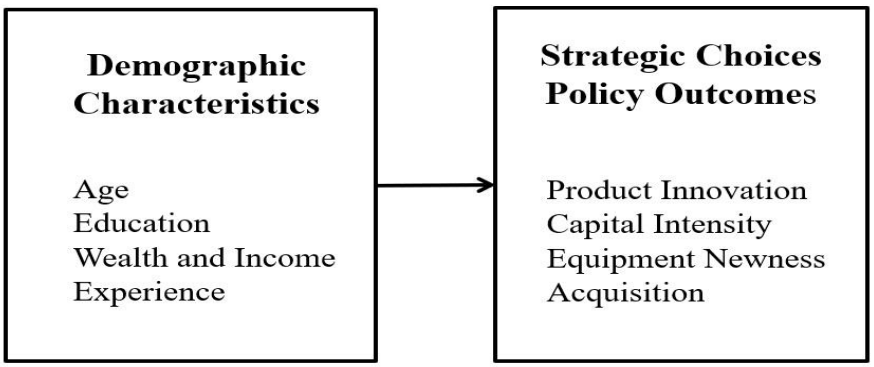
The upper echelons theory is built on the premise of bounded rationality: individuals behave based on their personalized interpretations of situations they face (Cyert and March 1963; Hambrick 2007; March and Simon 1958). The theory states that a leader's background characteristics influence their interpretation of situation and, in turn, their strategic choices and performance. It does not focus only on CEOs or other top executive leaders but also on the top management team (TMT) as a group. The premise of the theory is that the demographic characteristics of top executives useful and valid proxies of their cognitive frames (Hambrick 2007; Hambrick and Mason 1984).

Although leaders provide many demographic variables and strategic choices, Hambrick and Mason (1984) present several propositions. As shown in Figure 3.3, leaders' risk-taking behaviors, such as production, innovation, capital intensity, plant and equipment newness, and acquisition, are associated with their strategic choices or organizational outcomes and posited to follow from observable descriptive characteristics such as their age, education, wealth and income, experience, and more. Sitkin and Pablo (1992) also acknowledge that risk-taking behavior is affected by individual and/or organizational characteristics. Many scholars apply the upper echelons theory to demonstrate the relationship between leaders' risk-taking behavior, such as innovative performance, and their demographic characteristics,

such as age and education. Scholars study leaders' risk propensities according to their observable demographic variables (Bantel and Jackson 1989; García-Granero, Llopis, Fernández-Mesa, and Alegre 2015; Liu, Li, Hesterly, and Cannella 2012; Wang, Kruger, and Wilke 2009; Wu, Levitas, and Priem 2005). For instance, Wang, Kruger, and Wilke demonstrate the relationship between life history traits (e.g., age, parental status, and number of siblings) and risk propensity.

Drawing from these existing studies, I hypothesize that individuals' demographic variables are valid proxies for their risk propensities. Below, I identify and provide the logic for demographic factors of national leaders that may plausibly affect risk propensity with respect to the decision to pursue a costly and risky military innovation like nuclear weapons.

Figure 3.3 Upper Echelons Model



3.2 Nuclear Proliferation and Leaders

Based on 2.1 and 3.1, Section 3.2 elaborates my theory and hypotheses that undergird a new way of understanding nuclear proliferation and leaders.

3.2.1 Nuclear Proliferation and Leaders' Risk Propensities

The concept of risk is most often used in psychology to refer to the probability of a specific adverse event occurring (Breakwell 2007). Psychologists tend to think that the characteristic of risk is associated with aggression and impulsivity. In many studies of nuclear weapons in international relations, scholars place the concept of risk at the center of the model (Fuhrmann and Sechser 2014; Jervis 1972; Kreps and Fuhrmann 2010, 2011; Mehta and Whitlark 2017; Morrow 1985, 1987; Schelling 1960, 1966). Nuclear crises, for example, are conceived as involving brinkmanship or the manipulation of the shared risk of war by exploiting the threat that somebody may inadvertently cross the brink of no return (Schelling 1966). In addition, numerous scholarly works on game theory use the prisoner's dilemma to explain nuclear arms races between the two superpowers during the Cold War. As a risk-based decision-making game, the prisoner's dilemma illustrates why two rational individuals acting in their best interests do not cooperate. According to that model, both the US and the Soviet Union always benefited by arming themselves regardless of how the other side acted; however, if both countries armed themselves, then the outcome was less optimal than had both countries reduced their nuclear weapons.

Likewise, nearly all theories regarding the proliferation of nuclear weapons also place risk at the center of their models, which typically imagine horizontal and vertical proliferation. For example, Fuhrmann and Sechser (2014), who focused on a horizontal model of nuclear proliferation, questioned why countries deploy nuclear weapons abroad. While acknowledging that costly signaling has been the important topic in international relations, they argued that "alliance commitments from nuclear states reduce the risk of being targeted in a militarized dispute" (932). By placing risk at the center of their model,

they found that protecting allies and projecting military power are two important factors in driving the proliferation of nuclear weapons in foreign states. Mehta and Whitlark (2017), on the other hand, illuminated a vertical model of nuclear proliferation by focusing on the consequences of acquiring latent nuclear capabilities. More importantly, they discussed the benefits and costs of such latency. For example, some researchers have suggested that nuclear latency might serve as a deterrent as well as a bargaining chip in negotiations, whereas others have argued that the pursuit of latent nuclear capabilities invites risks that coincide with the probability of some outcomes, including international sanctions and preventive attacks.

Cost-benefit analysis has long been used to understand actors' decisions in international relations. Nonetheless, scholars in this field acknowledge the importance of risk. Much of the literature neglects the role of risk and, more specifically, how actors perceive risk differently. In fact, countries that sought to pursue nuclear weapons mostly faced a certain degree of risk, such as security threats. However, careful historical research on nuclear proliferation has detailed that not all states pursued nuclear weapons when facing similar security or domestic threats. Therefore, this dissertation suggests that state leaders are not always tempted by the prospect of pursuing nuclear weapons when they face risk; rather, their levels of risk propensity matter in their decision-making on nuclear weapons pursuit. This is not to claim that much of the proliferation literature focusing its attention primarily on systemic- and state-level analyses is incorrect. Rather, I argue that when leaders face security threats or domestic challenges, their risk propensities will affect whether they decide to pursue nuclear weapons.

Risk propensity can be integrated into the traditional cost-benefit framework. Applying this logic to nuclear proliferation and leaders, I propose the following model of leaders'

decisions on nuclear proliferation: The probability that an individual leader decides to proliferate nuclear weapons equals the benefits of possessing nuclear weapons minus the probability that the leader will pay some costs if caught engaging in such proliferation. How the leader evaluates these costs and benefits will be a function of individual risk propensity.

$$pr(\text{leaders' decision on nuclear proliferation}) = pr(\text{benefits of having nuclear weapons}) - pr(\text{costs of having nuclear weapons})$$

I begin by defining leaders' decisions on nuclear proliferation as risk-taking behavior. Risk-taking behavior, as previously discussed, is associated with potential outcomes that invite some extreme consequences, uncertain expected outcomes, and difficulties with achieving goals (Sitkin and Pablo 1992). In line with a common approach and other analyses of risk-taking behavior in the field, I define nuclear weapons proliferation as a risk-taking behavior in that (a) nuclear weapons are difficult to acquire due to technological issues, economic costs, and possible external sanctions; (b) the achievement of, or even before acquiring nuclear weapons, may invite some extreme consequences such as militarized disputes (Fuhrmann and Horowitz 2015; Sitkin and Pablo 1992).

Next, as explained in the literature review, most scholars examining nuclear weapons proliferation have posited that possessing nuclear weapons can afford several benefits for leaders and their states. In particular, many scholars have emphasized the deterrent effect of nuclear weapons. In other words, leaders can use nuclear weapons not only as a deterrent against adversaries but also as a bargaining chip in negotiations with allies as well as enemies (Hecker 2010; Mearsheimer 1990; Paul 2000; Thayer 1995). Some scholars have

additionally focused on the symbolic significance of nuclear weapons, which convey prestige, power, and respect to leaders and their countries (Kohl 1971; Rublee 2009; Tannenwald 2007), while others believe that nuclear arsenals are reliable technology that can be remotely positioned in a variety of locations. Thus, leaders can avoid conflicts on conventional battlefields that might jeopardize their personnel, infrastructure, and territories. At the same time, technologies that paid the development of nuclear weapons may foster the innovation of other technologies that can benefit a civil society in diverse ways and, in turn, strengthen leaders' popularity.

However, as mentioned in section 3.1, the extent to which individual leaders perceive these political or economic benefits differs. Therefore, it is reasonable to argue that individual leaders who seek to proliferate nuclear weapons are more likely to exaggerate the potential benefits of having the bomb relative to the costs.

The costs of developing nuclear weapons also merit attention. In most studies in international relations, scholars have argued that nuclear weapons proliferation can invite sanctions and risk coercive pressure or actual attacks from other states. Fuhrmann and Kreps (2010), for example, contend that pursuing nuclear weapons constitutes risky behavior because nuclear states are likely to attack or consider attacking nuclear infrastructure in states not in possession of nuclear weapons. Moreover, both Mehta's (2014) dissertation and Mehta and Whitlark's (2017) article discuss all sources of so-called "carrots" (i.e., political or military rewards) and "sticks" (i.e., the imposition of sanctions or use of military force) to persuade states without nuclear weapons not to proliferate them. Altogether, the consensus among most scholars and policymakers holds that the costs of developing nuclear weapons, if caught doing so, are high.

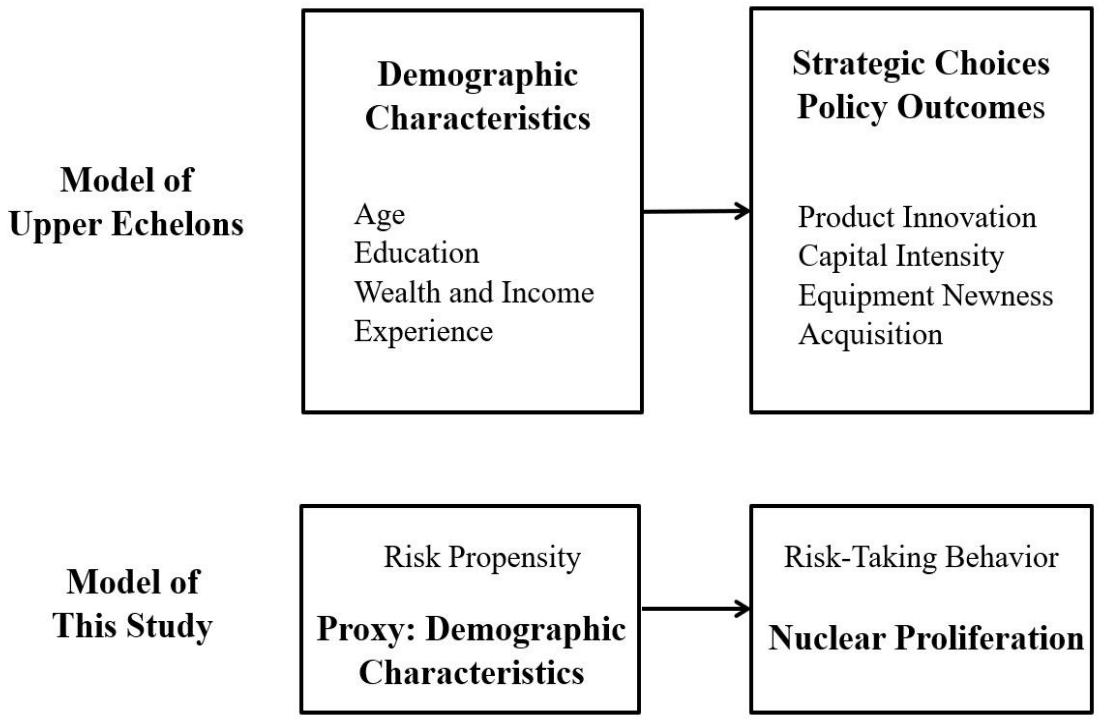
Importantly, those costs, as well as the benefits, take the form of expected costs. It means that variations exist in the certainty about those costs being imposed. In section 3.1.1, I showed that potential offenders evaluate the certainty of being caught differently. This implies that individual leaders evaluate the probability of being caught for developing nuclear weapons differently. By extension, the actual probability of being caught proliferating nuclear weapons varies as well. For example, Tehran's nuclear program has proceeded in clandestine fashion such that it has been more advanced than Western intelligence agencies and the IAEA have thought (Hirsh 2018). In addition to Iran, Pakistan secretly began construction of a uranium enrichment facility via the A.Q. Kahn network, which also illegally and clandestinely facilitated other states without nuclear weapons to commence developing them. In summary, leaders with a high level of certainty of being caught and punished for proliferating nuclear weapons are less likely to develop nuclear arsenals.

Variation among individual leaders regarding the probability of benefits and costs raises an important question in the context of nuclear weapons: What explains how individual leaders view the probability of being caught or acquiring the benefits of developing nuclear weapons? As discussed in section 3.1.1, a key source of variation is an individual leader's risk propensity. Therefore, it is reasonable to suppose that leaders' risk propensities influence their risk-taking behavior of nuclear weapons proliferation. The theoretical framework of my model thus explains the relationship between individual leaders and their decisions to pursue nuclear weapons.

3.2.2 Conceptualization of Leaders' Risk Propensities

In section 3.1.1, I reviewed some of the empirical studies and theories from psychology and business management. Building upon that scholarship, I apply that logical frame to political science in order to examine the relationship between leaders' decisions on nuclear proliferation and their risk propensities. Figure 3.4 illustrates the application of upper echelons theory to this study.

Figure 3.4 Upper Echelons Theory and Its Application to This Study



Proposition 1: Leaders' demographic characteristics will systematically influence risk-taking behavior with respect to nuclear weapons pursuit.

Given that individuals' demographic characteristics are valid proxies for examining their risk propensities, it is necessary to discuss how this study conceptualizes leaders' risk propensities. The upper echelons theory and its related literature suggest a number of demographic characteristics that could measure leaders' risk propensities, such as age, socioeconomic status, educational attainment, international experiences, and military experiences. While some of these demographic characteristics, such as age, are quite clear, others are more difficult or ambiguous to measure. Socioeconomic status, for example, is an important component of risk propensity, yet.

Many scholars distinguish the level of education from that of wealth to examine the socioeconomic status more accurately (Achenbck, Verhulst, Edelbrock, Baron, and Akkerhuis 1987; Adams, Hillman, and Gayos 1994; Butler, Starfield, and Stenmark 1984; Bradley, Whiteside, Mundfrom, Casey, Kelleher, and Pope 1994; Clifford 1991; Crooks 1995; Goodhand, Hulme, and Lewer 2000; Pierre 2005; Ponticell 2003).

In addition, with regard to military experiences, Horowitz et al. (2015) and Fuhrmann and Horowitz (2015) separately examine leaders' rebel experiences and military experiences. Although it is believed that most rebellions take some form of military action and include previous military experiences, not all individual leaders with military experiences engage in rebellious actions.

Given that it is difficult to identify how these specific variables interact, it is useful to begin with these individual characteristics of risk propensity independently rather than aggregating them from the first. Thereafter, this study will decide whether to combine them in a particular fashion, such as conducting statistical tests.

3.2.3 Individual Risk Propensity Characteristics

Hambrick and Mason's (1984) first proposition of leaders' demographic characteristics deals with the age of leaders. It is commonly believed that older leaders are less aggressive and often make risk-aversive decisions, because as men age their physical, mental stamina, and testosterone drop in accordance (Child 1974; Chown 1960; Hambrick and Mason 1984). The hormone testosterone has long been known to affect human behavior. In particular, it has been suggested that testosterone may increase aggressive, negative, and antisocial behaviors and that this effect varies with age. Therefore, testosterone is often considered "the aggression hormone" (Neave and O'Connor 2009).

In human males and females, testosterone levels normally peak in the mid-twenties and then begin to decline by 3% to 10% each decade over the remainder of the life span. Generally, men's testosterone levels exceed those of women. More specifically, normal testosterone levels in men younger than 20 years old are 300–1,200 ng/dl (20–75 ng/dl for women), and those of men over 20 years are 240–950 ng/dl (8–60 ng/dl for women).

The established scientific data has drawn considerable research attention from numerous psychology scholars, who have examined the relationship between testosterone levels various ages and aggressive behaviors or moods (Archer 1991; O'Connor, Archer, and Wu 2004; Pagonis, Angelopoulos, Koukoulis, and Hadjichristodoulou.2006). The majority of studies in this field have found a correlation between age and risk propensity (Bayar and Sayil 2005; Crone, Bullens, van der Plas, Kjjkuit, and Zelazo 2008). For example, one study of 280 men and women that examined the relationship between age and risk propensity demonstrated that people over 20 years old have higher risk propensities resulting in more risk-taking behaviors such as gambling, driving above regulated speed limits, and participating in high-risk sports (Bayar and Sayil 2005).

However, there is a contrasting argument. In psychology and economics theories, people perceive the outcome to be less valuable if pleasure has been delayed; this notion results in their pursuing benefits in the short term even if the options are less preferable than those related to long-term benefits (Loewenstein and Prelec 1992; Post and Robins 1993; Prelec and Loewenstein 1991). Therefore, older people, who have relatively shorter time horizons than younger people, are more likely to make immediate and risky decisions because they are concerned about building a strong reputation and their legacy since they are uncertain about how long they will remain in office because of health conditions related to the aging process.

In addition to the time-horizon reason, theories in business management argue that more-experienced leaders are likely to make bold decisions than less-experienced leaders (Hambrick and Mason 1984). Building upon these theories, many scholars in international relations argue that older leaders are more prone to risk-taking behaviors because they have shorter time horizons and more experience in building relationships with their electorate than younger leaders do (Downs and Rocke 1994; Goemans 2000; Horowitz et al. 2005).

Importantly, historical evidence proves that older national leaders are often more likely to associate with risky decisions. One example is the Iranian leader Ruhollah Khomeini, who took office at the age of 77 and became the first supreme leader of Iran after a popular revolt which overthrew the Persian monarchy, which had lasted for nearly 2,500 years. By the time Khomeini assumed power, he already had abundant experience as a politician and cleric that gave him confidence in his decision-makings skills (Lim 2015). In particular, he incited Islamic revolutions across the Muslim countries immediately after taking office. Not surprisingly, he ranked first among the most conflict-prone leaders from 1875 to 2001 (Horowitz et al. 2015).

Another example is the 41st U.S. president, George H. W. Bush, in comparison to the 42nd president, Bill Clinton. Before taking office, Bush served as the director of the Central Intelligence Agency (CIA), a U.S. Ambassador to the UN, and the 43rd vice president from 1981 to 1989. His abundant experience in foreign policy gave him confidence for dealing with multinational security issues. In contrast, Clinton was 47 years old when he took office without much political experience compared to Bush. As a relatively youthful leader, he "faced a relatively narrow set of foreign policy options during his first administration, constrained further by the almost immediate debacle in Somalia" (Horowitz et al. 2005, 668). In line with the historical evidence and empirical studies in international relations, this study arrives at the following hypothesis:

> H1: Older leaders will be more likely to pursue nuclear weapons than younger leaders.

Second, educational attainment, particularly in the form of a business or economic major, is an important factor that influences individual risk propensities. Among people who have majored in economics or business, there is broad consensus that the purpose of learning these subjects is to enhance deductive reasoning and problem-solving in combination with simplified models, such as cost-benefit and supply-demand analyses. "It involves identifying tradeoffs in the context of constraints, distinguishing positive from normative analysis, tracing the behavioral implications of some change while abstracting from other aspects of reality, and exploring the consequences of aggregation" (Siegfried, Bartlett, Hansen, Kelley, McCloskey, and Tietenberg 1991, 199). Put differently, graduates in these fields are expected to understand the following principles: (1) the examination of trade-offs by

comparing alternatives; (2) the calculation of opportunity costs; and (3) the formulation of constrained optimization.

A number of studies have examined the relationship between people who majored in economics or business and their behaviors (Schlee, Curren, Harich, and Kiesler 2007; Toncar, Reid, and Anderson 2005; Graham and Harvey 2001). In particular, Toncar et al. (2005) compared undergraduates majoring in business and those with non-business majors to show the differences in students' motivations. Their result indicates that business students are more pragmatic and more concerned about finances. Specifically, business students are more likely to calculate the opportunity cost of their decisions than non-business students are. Graham and Harvey (2001) also demonstrated that leaders with training in business school use more innovative techniques for estimating cost of capital. Consequently, their sophisticated calculations are associated with a lower level of risk propensity. Therefore, I suggest the following hypothesis:

> H2: Leaders who majored in economics or business in college are less likely to pursue nuclear weapons than leaders who majored in other fields in college.

Third, research on leadership by psychologists and business scholars suggests that socioeconomic status plays a major role in influencing leaders' risk propensities. McCrimmon and Wehrung (1990) argue that education and wealth, for example, are important factors in describing socioeconomic status because individuals with higher education and household income are more likely to have better occupations and achieve financial security.

It is widely known that education affects human behavior. The main purpose of education in schools is to teach knowledge through experience and experimentation. In

education and psychology literature, it is believed that education helps people to harmoniously integrate into society by managing their behaviors (Pierre 2005). Moreover, higher education is likely to encourage group discussions and require students to participate in some form of internship and experimentation. All of these activities foster individuals' socialization and, ultimately, serve to decrease aggressive behaviors that might isolate them from society (Spitzer 1975).

Notably, education is generally viewed as a means to increase individuals' social prosperity and economic wealth. People with a higher level of education have more opportunities to find jobs and succeed in life (Idirs, Hassan, Ya'acob, Gill, and Awal 2012). Therefore, as risk-taking involves the possibility of losing something as well as uncertainty, well-educated people, whose social status is often high and who tend to have stable jobs or professions and economic stability and well-being, are less likely to engage in risk-taking behaviors (Clifford 1991; Pierre 2005; Ponticell 2003).

Many scholars have demonstrated the link between educational background and qualities associated with risk propensity. For example, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) published a paper showing that primary education is a critical factor for stable emotional behaviors in later life (Kaga, Bennett, and Moss 2010). Some studies in political science also find significant support for arguments that individuals with higher levels of education are less likely to support political violence and a moderated set of policies. In particular, one study found that higher levels of education make people less likely to support using military forces against enemies (Collier, Hoeffler, and Söderbom 2004; Goodhand, Hulme, and Lewer 2000; Hermann and Keller 2004). Similarly, Horowitz et al. (2015) argued that more-highly educated individuals are less likely to engage in war, although the result of that relationship is not strong.

History offers a number of examples that support the link between individuals' educational levels and risk propensity. Kim Il-sung, the first president of North Korea, attended the Yuwen Middle School at the age of 15 in 1927. However, he became deeply interested in Marxist ideology and left school without earning a diploma. After dropping out of formal education, he joined several communist underground organizations, presumably resulting in his developing a narrow and biased perspective. Notably, Kim initiated the Korean War, which resulted in nearly five million deaths. He was ranked in the top 2 percent of leaders who had been most likely to initiate military conflicts between 1875 and 2001 (Horowitz et al. 2015).

In contrast, Woodrow Wilson of the US and Rhee Syngman of South Korea were considered a few of the most well-educated leaders in history. They both received PhDs in political science, Wilson from Johns Hopkins University and Rhee from Princeton University. Their academic backgrounds affected their decision-making while in office in that both leaders applied their profound scholarly knowledge of international affairs to make strategic decisions (Turner 1957; Lew 2014). Hence, I propose the following hypothesis.

> H3: Leaders with lower levels of education are more likely to pursue nuclear weapons than leaders with higher levels of education.

Fourth, in addition to level of education, wealth is another important factor in measuring socioeconomic status. As mentioned earlier, McCrimmon and Wehrung (1990) argue that wealth and higher income have a significant relationship with risk propensity. However, individuals' current wealth should be differentiated from their childhood wealth.

Researchers in behavioral science consistently report that childhood poverty has detrimental effects on school achievement, cognitive and physical functions, and

socioemotional development. First, children who grow up in poverty are less likely to perform well in school (e.g., test scores, course failures, failure to graduate from high school, and higher dropout rates) than middle-class and other non-poor children (Conger, Conger, Elder 1997; Entwisle and Alexander 1990; Haveman and Wolfe 1995; Paterson, Kupersmidt and Vaden 1990).

Second, childhood poverty has consistently between found to have critical effects on physical and cognitive functioning. The effect of premature birth (e.g., low birth weight) are often present in poor children because of inadequate prenatal nutrition, which may also increase the occurrence of seizure disorders and developmental delays (Bradley et al. 1994; Crooks 1995). Moreover, a number of studies have found that children raised in low-income families are more likely to receive low scores on the Peabody Picture Vocabulary Test (PPVT) and various IQ tests than children from middle- and high-income families (Duncan, Brooks-Gunn, and Klebanov 1994; Zill, Moore, Smith, Stief, and Coiro 1995).

Third, numerous scholars have identified a correlation between childhood poverty and emotional problems. Children from low-income families are more likely to have emotional problems that are manifested as disobedience, impulsivity, anxiety, fighting, sadness, and depression (Achenback et al. 1987; Adams et al. 1994; Butler et al. 1984). In sum, research in psychology has demonstrated that low socioeconomic status during early childhood promotes aggressive behavior later in life, and deprivation during that time can cause antisocial behavior. Consequently, growing up in poverty can cause trauma with a lifetime of negative consequences in terms of an individual's cognitive beliefs (Dupuy and Peters 2010; Horowitz et al. 2015; McLoyd 1998).

Herbert Hoover, for example, had both lost his parents by the time he turned 10 years old. As an orphaned young child, he grew up in deprivation, which affected his behavior as a

leader: “Hoover carried not only his cognitive memories of his youth but also visceral and emotional memories that are observable in his later decision-making behavior as the leaders” (Horowitz et al. 2015, 154).

Another historical example is that of the third president of South Korea, Park Chung-hee, who also grew up in poverty. Park’s parents were so poor that when Park’s mother was pregnant with him, she attempted to end her pregnancy. As Park was growing up, he knew about this, and this traumatic story negatively affected him emotionally. In fact, he often experienced a fear of abandonment in social relationships (Kim 2017; Lee 2012). Hence, I hypothesize as follows:

> H4: Leaders raised in lower-income households are more likely to pursue nuclear weapons than leaders raised in higher income households.

Fifth, some studies have demonstrated that students with higher risk propensities are more likely to participate in international experiences such as studying abroad (Hackney, Boggs, and Borozan 2012; Luethge 2004; Relyea, Cocchiara, and Studdard 2008).

As discussed previously in this chapter, decision-making often involves risk. Research on decision-making has consistently reported that the risk propensity of individuals directly affects their decision-making. When individuals are fearful or anxious about the outcome of a decision, they are more likely to avoid making a decision that might be associated with risk. By contrast, individuals with positive affectivity are more likely to be optimistic about the outcome of a decision (Maner and Gerend 2007; MacCrimmon and Wehrung 1986; Wiliams, Zainuba, and Jackson 2003).

Given the research described above, it would seem likely that the decision to study abroad is characterized by risk for a number of students: it has the potential to involve

financial risk, performance and social risk, physical risk, and psychological risk (Luethge 2004; Stone and Gronhaug 1993). Specifically, studying abroad means that most students are expected to adjust to a new culture and environment, which may cause anxiety, tension, and a sense of discomfort for many students. Table 3.1 presents Luethge's (2004) categorization of risks and their components regarding the decision to study abroad.

Table 3.1 Risks Associated with Study Abroad

Types of Risk	Description
Financial Risk	
Trip Cancellation	Insurance fees
Loss of Cash/Credit	Access to funds
Loss of Valuables	Insurance/Replacement
Hidden Charges	Communication fees
Performance and Social Risk	
Corporate Content Risk	Corporate contacts in preliminary visit Content of site visits
Cultural Communication Risk	Cross-cultural information Cultural courtesies
Content Information Risk	Preliminary visits or assignments
Physical Risk	
Physical Risk of Travel	Jet lag/travel warnings
Physical Risk from Crime	Crime target (muggings, kidnapping)
Health Risk	Health insurance/Immunization Prescriptions/physician
Psychological Risk	
Coordination/Control Risk	Lost students Legal problems Scheduling University communication

Travel Stress	Stress of international travel/visa issues Stress of local travel Stress of logistics/documents/packing Trouble communicating home Cultural sensitivity Stereotypes
Safety (Petty Crime)	Petty theft Local travel safety

Sources: The above Table 1 comes from Luethge's categorization on page 27 of his article "Perceived Risk and Risk Reduction Strategies in Study Abroad Programs" (2004).

Relyea et al. (2008), applying expectancy theory, conducted research surveying 471 students in order to examine the relationship between the risk propensity of individuals and their decisions to study abroad. The empirical results are highly supportive of their hypothesis and, therefore, they conclude that "Risk propensity will have a direct relationship with the likelihood to engage in an international experience" (350). In line with other similar studies focusing on international experiences and risk propensity, this dissertation confines its scope of international experience specifically to study abroad and college internships. Because international experiences that occur during childhood or adulthood more likely result from other factors, such as parents' or family choices or job conditions, rather than an individual's own decisions with regard to risk propensity.

Historically, the fourth president of Pakistan, Zulfikar Ali Bhutto, can be used as an example to support the theoretical link between risk propensity and study abroad. In his youth, Bhutto was active and courageous, leading him to participate in the Pakistan Movement in 1943 and to attend the University of Southern California in the US to study political science in 1947. He later transferred to the University of California, Berkeley, where he earned a BA in 1950. While studying in the US, he became more interested in socialism and traveled to the UK to continue his studies in political science and law. While

in office, Bhutto made a number of decisions that demonstrated his continued willingness to take risks, including the establishment of an atomic bomb program and the pursuit of nuclear weapons. Therefore, I suggest the following hypothesis.

> H5: Leaders with international experiences in college are more likely to pursue nuclear weapons than leaders do not have such experiences.

Finally, previous military experiences are also an important demographic factor that influences leaders' risk propensities. Kennedy (2011) showed that prior experiences in war shape the extent to which individual leaders are more likely to accept risks once they assume power. This is not only because those with high–risk–propensity personalities join the military but also because military experiences that occur during late adolescence or early adulthood can be particularly acute (Horowitz et al. 2015).

There is a certain amount of risk involved in joining a country's military force. It may mean that those who enlist are required to go to war and to make personal sacrifices. Griffith (2008) identifies several factors (e.g., risk, fidelity, dignity, challenge, and adventure) that motivate individuals to join a military force, and an individual's risk propensity is considered one of the most important motivations. Among these factors, it is noteworthy that people who like challenges and adventure tend to have higher levels of risk propensity (Meertens and Lion 2008; Nicholson, Fenton-O'Creevy, Soane, and Willman 2001). Therefore, it is believed that individuals willing to accept high levels of risk are more likely to join the military.

In addition, work experiences can change individuals' personality traits (Aldwin and Levenson 1994; Roberts, Caspi, and Moffitt 2003; Robins, Fraley, Roberts, and Trzeniewski 2001). All military personnel, whether serving voluntary or compulsory duty, are required to

fulfill military training in order to accomplish their respective roles. As military operations often take place in extreme environments, military training programs use harsh methods to train individuals to cope with severe physical pain and to increase their mental toughness. For example, to become a member of the US Navy's Sea, Air, and Land teams (SEAL), military personnel must endure approximately 72 hours of sleep deprivation during training (Barzilay 2015). Such military experiences often change individuals' personal traits, making them more fearless, courageous, and aggressive.

For example, Nikita Khrushchev, who governed the Soviet Union from 1953 to 1964, had significant military experience. While in office, he was in favor of aggressive actions and used military force 29 times (Taubman 2003). In particular, Khrushchev harshly suppressed the Hungarian Revolution in 1956, which appeared 7 military attacks, 14 territorial seizures, and 7 border violations. In the aftermath of the crisis, Khrushchev used the hostile phrase "we will bury you" to directly express his grievances when meeting with Western ambassadors at a reception in Moscow. Moreover, during his term, he did not hesitate to use power to eliminate his political opponents. It is clear that his military experiences influenced his conflict-prone behaviors, putting him in the top 1 of the most conflict-prone leaders (Horowitz et al. 2015).

Interestingly, Fuhrmann and Horowitz (2015) demonstrated that individual leaders' rebellious experiences, separately, affect their decision-making in regard to nuclear weapons proliferation. Participating in rebellious activities signals that individuals have a higher risk propensity than normal and are more likely to challenge the status quo (Horowitz et al. 2015). In addition, if rebellious movements succeed, these experiences are likely to reinforce and increase individuals' levels of risk propensity.

For example, having been involved in a rebel experience, Mao Zedong, the founder of the People's Republic of China (PRC) who ruled the country from 1943 to 1976, believed in his ability to use military force to achieve national ends. Unsurprisingly, Mao was involved in many risk-taking decisions while in office including the following: (1) a decision to engage in the Korean War to support North Korea; (2) the pursuit of nuclear weapons; and (3) the initiation of an extreme sociopolitical movement, the so-called Cultural Revolution (1966–1976). Hence, I hypothesize as follows:

> H6: Leaders with rebel experiences are more likely than leaders with non-rebel experiences to pursue nuclear weapons.
>
> H7: Leaders with former military experiences are more likely than leaders without military experiences to pursue nuclear weapons.

3.3 Conclusion

Why do some countries pursue nuclear weapons while others in similar situations do not? Why does variation exist within the same country in regard to nuclear policies? Having reviewed history, causes, and consequences of nuclear weapons, I find that nothing from systemic- or institutional-level arguments can give us clear-cut affirmative answers. This dissertation, therefore, claims that it is time to re-illuminate individuals from the oblivion to which political scientists have long consigned them. Since the individual-level of analysis has been largely ignored by international relations scholars, I borrow insights from psychology and business management in order to generate my theory and hypotheses. In the next chapter, I statistically test my propositions and hypotheses that are introduced in Chapter 3.

CHAPTER 4

Risk Propensity Increases Nuclear Proliferation

4.1 Research Design

To test my theory and hypotheses, I rely on a mixed-methods approach. In this chapter, employ a large-N statistical analysis focusing on approximately 8,000 leaders from 1945 to 2000.[23]

4.1.1 Data and Method

For this dissertation, I use leaders' demographic variables, which include age, college major, childhood wealth, education, international experience, rebel experience, and military experience as proxies for each one's risk propensity. I assembled data from the Leader Experience and Attribute Descriptions (LEAD) dataset, which includes the background experiences of approximately 2,400 leaders from 1875 to 2004 (Horowitz et al. 2015). Since the LEAD data are built on the Archigos dataset (Goemans, Gleditsch, and Chiozza 2009), I

[23] Large-N study probes my hypotheses across numerous contexts and therefore increases the external validity of my theory. However, it lacks depth of knowledge about each case, and that makes it difficult for us to uncover a causal inference because of various confounding factors and unobserved variables. More specifically, the large-N analysis cannot explain empirical variations among leaders under highly similar circumstances in my research. Quantitative analysis can suggest correlations and highlight average effects; however, it does not necessarily shed light on causal mechanisms. Thus, case studies on a selection of individual leaders will complement the limitation of large-N studies by providing details about the causal mechanisms of my theory. Case studies will be discussed

also review the Archigos data for reference. The LEAD dataset provides details in leader-year format about each leader's age, education, personal and family life, military experiences, and occupations before taking office. Despite the richness of the LEAD dataset, it does not include information about whether leaders majored in business or economics in college, were raised in lower-income households, and have previous international experience. I therefore create a novel dataset measuring these leader characteristics.[24]

A logit analysis, with the standard errors clustered by leader, is used for this research because my dependent variable, the pursuit of nuclear weapons, is a dichotomous outcome. The unit of analysis is the leader-year rather than the country-year, which is the focus of most previous research examining the domestic effects of states. However, the country-year observation is not suitable for analyzing leaders' effects, because states often have more than one leader in a year. For example, the LEAD codes both Richard Nixon and Gerald Ford in the year 1974 because Ford was inaugurated on August 9, 1974, following Nixon's resignation. The country-year observation, therefore, may result in inaccuracies since each leader can make a decision about pursuing nuclear weapons in a given year (Fuhrmann and Horowitz 2015). Having considered the leader-year as the unit of analysis for this research, I statistically weight each observation based on the leaders' duration in office in a given year and cluster the standard errors by leader.[25]

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in Chapters 5 and 6, while Chapter 4 focuses mainly on a large N analysis and reports the results.

[24] I provide more information about the coding in Appendix I.

[25] For a robustness check, I tried not to weight each observation. The results were not sensitive to this weighting.

4.1.2 Dependent Variable

Nuclear Weapons Pursuit. The dependent variable of this dissertation is the pursuit of nuclear weapons. I use a time-series and cross-sectional data set compiled by Bleek (2010). Bleek's data set was built on earlier works by Jo and Gartzke (2007) and Singh and Way (2004), who coded nuclear behaviors by the country-year. However, these data are now in need of updating based on new information available since their papers were published. For example, Jo and Gartzke's data do not code Libya as a proliferator, although, based on new information about the Libyan case, Muammar Qaddafi clearly pursued nuclear weapons from 1970 to 2000 (Bahgat 2008; Corera 2009; Way and Weeks 2014). As for the Egyptian case, Singh and Way code the country as having pursued nuclear weapons from 1965 to 1974, while Jo and Gartzke (2007) and Bleek (2010) do not code that country as a pursuing behavior but rather as exploratory attempt. Moreover, Taiwan is coded as pursuing nuclear weapons by Jo and Gartzke's and Singh and Ways' data from 1950 to 1974 and from 1950 to 1975, respectively, but it is excluded by Bleek, who codes Taiwan only as an exploring country due to insufficient evidence.

Most significantly, Bleek now codes South Korea as having pursued nuclear weapons from 1970 to 1981 based on new information. It is important to note that recently declassified documents released by the US Central Intelligence Agency (CIA) have provided new information on South Korea's nuclear efforts. These documents reveal that South Korea under President Park Chung-hee pursued nuclear weapons even after 1976 when previous experts and scholars thought this pursuit had ended (Hayes 2011).

Therefore, using the most recent data set compiled by Bleek is more accurate. Bleek and Lorber (2014) and Fuhrmann and Horowitz (2015) also used Bleek's updated data set for their analyses. I adapt Bleek's data to make it suitable for a leader-year analysis. Nuclear

weapons pursuit is a dummy variable that is coded 1 if a leader pursed nuclear weapons in a given year and 0 if not. Importantly, states are dropped from the sample once they acquire nuclear weapons.

4.1.3 Independent Variables

Age. I use the LEAD dataset to measure leaders' ages. The LEAD codes each leader's birth year and the year and date of his or her entry into office. Taken together, these pieces of information allow us to derive each leader's age at the time he or she assumed power and to trace their aging while in the office. Building upon the LEAD, I create a continuous variable of leaders' ages.

Economic/business Major. I construct a measure of leaders' majors in postsecondary school to test hypotheses H2a, H2b, and H5. A dummy variable is coded 1 for leaders who majored in business or economics and 0 for those who did not. In addition to the LEAD, Archigos, and other genealogical data sets, I utilize academic books and journal articles, state archives, and newspaper articles.

Low Education. I construct a measure of leaders' low level of education based on the LEAD. It is noteworthy that the LEAD differentiates between university level and graduate level rather than treating these as postsecondary because many modern leaders are highly educated; for example, the data code for education at the secondary, university, and graduate levels (1 = Secondary, 2 = University, 3 = Graduate). However, in order to test H3, which examines whether or not leaders have low level of education, I recreate a dichotomous variable that is coded 1 for leaders who have less than a college education and 0 otherwise.

Childhood Wealth & Childhood Poverty. Horowitz et al. (2015), who developed the LEAD data set, have acknowledged the link between childhood economic status and future

leaders' development of a particular personality, such as risk propensity. However, these researchers coded data only for parental status, orphan, and whether a leader was illegitimate to uncover the potential effects of difficulties in childhood. Therefore, to test H4, I construct a measure of leaders' childhood wealth. I utilize various scholarly books and journals as well as leaders' memoirs to examine their economic status in early childhood. I code 3 if the sources report that a leader was raised in a wealthy family, 2 for a middle-income family, and 1 for a low-income or impoverished family. However, for the purpose of this dissertation, I also construct and use a dichotomous variable that is coded 1 for leaders raised in a poor family and 0 otherwise.

International Experience. I construct a measure of leaders' international experiences before they assumed power. As previously discussed in Chapter 3, I count international experiences only if a leader studied or served an internship in another country while attending college. The reason for this is twofold: not only do leaders with a high on risk propensity decide to study abroad but, in addition, international experiences that occur during late adolescence or early adulthood can have a strong impact and result from an individual's own decision. A dummy variable indicating whether a leader experienced studying at an international college takes on a value of 1 if he or she has international experience and 0 if not. To construct a measure of international experiences, I rely on various sources, such as academic books and articles, memoirs, biographies, and state archives.

Rebel Experience. The LEAD data code leaders with rebel experience separately from those with general military experience. Rebel experience is defined as a leader having engaged in a rebel movement that seeks to overthrow the government of the state (Ellis et al. 2015). The rebel experience variable is coded as a binary variable. For example, Mao

Zedong, who held office from 1949 to 1976 in the People's Republic of China, had engaged in a rebel movement in the Chinese Civil War. Thus, the LEAD codes him as 1 for rebel experience.

Moreover, the LEAD data code a coup as a rebellion because they are similar in that coups are also "carried out by actors who were willing to use violence to overthrow the leadership of the state" (Ellis et al. 2015, 729). According to Horowitz and Stam (2014), the willingness to use violence, as well as the actual use of force, is a critical indicator that predicts the future risk-taking behavior of leaders.

Military Service. The military service variable of the LEAD data contains information on leaders' participation in national military service (National Military Service).

The National Military Experience variable includes the starting and ending dates of leaders' military service. It is important to note that the LEAD data separated formal national military experiences from rebellion experiences. If a leader served in a formal military organization but participated in a rebellion, these experiences are coded separately; I code 1 if a leader served in military service and 0 if not.

4.1.4 Control Variables

In order to address posttreatment and omitted variable bias while avoiding selection bias, this study begins by revisiting prior research and the theoretical arguments that discuss the causes of nuclear proliferation: security environment, domestic politics, and norms. Failing to control for these variables could generate a distort estimate of causal inferences. Therefore, I chose these variables by replicating all the confounding factors for which Fuhrman and Horowitz (2015) controlled because their study is the most recent leader-focused research on nuclear proliferation that is similar to this study.

Another potential concern is that countries that are most likely to have high-risk-propensity leaders are also more likely to pursue nuclear weapons. Leaders in authoritarian countries and those who have entered office through irregular means, including coups, appear to have a high level of risk propensity. Therefore, this study also controls for these potential variables that may generate an endogenous selection process. Specifically, I control for whether a leader assumed power through irregular means as well as the country's regime type. This allows for isolating the relative effect of authoritarian countries.

However, in a statistical analysis, there is a need to be cautious about including too many variables. Doing so often has a harmful effect in contrast to including one good variable. In addition, having too many variables results in an inability to accurately assess the effects of the independent variables (Achen 1986; Breiman 1992). As this study seeks to uncover the causal effect of a leader's risk propensity on his or her decision to pursue nuclear weapons, it begins with a simple model that evaluates only the effect of the independent variables. This enables the researcher to draw a first cut of the inferences about the relationship between a leader's risk propensity and his or her pursuit of nuclear weapons that is consistent with recent methodological recommendations of so-called garbage-can approaches (Achen 2005; Ray 2003).

Time, Time Squared, and Time Cubed. Most leaders serve their countries for more than one year, meaning that the same leaders are coded multiple times in my data. Therefore, leader observations over time clearly are not independent, and that may result in underestimates of standard errors, in turn lead to misleading inferences (Beck, Katz, and Tucker 1998). In order to avoid temporal dependence, I examine the amount of time a leader has been in power and has not pursued nuclear weapons, and include this in my model as

time, time squared, and time cubed (Carter and Signorino 2010; Fuhrmann and Horowitz 2015; Way and Weeks 2014).

Irregular Entry. Many have argued that how a leader assumed power affects his or her political decisions, such as foreign policies, military actions, and nuclear weapons pursuits. This is a dummy variable that is coded 1 if a leader assumed power through irregular means and 0 if not. In addition, some may argue that a leader's irregular entry into power could be a consequence of his or her rebellion experience. To address this potential issue, I include the results of cross-tabulation of leaders' rebel experiences and irregular entries in Section 4.2.1 in this chapter.

Polity. Although many recent studies have found that regime type has little or no influence on a state's desire to pursue nuclear weapons (Jo and Gartzke 2007; Montgomery 2013; Sagan 2011; Sasikumar and Way 2009), conventional approaches continuously claim the benefits of democracy for international peace and security. I thus use the polity score in the Polity IV data to control for a country's regime type (Marshall, Gurr, and Jaggers 2009). The score is calculated by subtracting the autocracy score from the democracy score in the same data; the resulting score ranges from -10 (strongly autocratic) to +10 (strongly democratic).

Superpower Alliance. Extending the nuclear umbrella by nuclear-armed states that is known as security guarantees make their recipients to reduce all levels of nuclear proliferation activity (Bleek and Lorber 2014). I control for this by including a dichotomous variable coded 1 if a state has a defense pact with a superpower country that possesses nuclear weapons and 0 if not (Narang and Mehta 2017).

Civilian Nuclear Cooperation. Several studies have demonstrated that states provide civil nuclear assistance for a strategic reason. For example, Kroenig (2009) argue that states

are more likely to export civil nuclear technology to states with which they share a common enemy. Similarly, Fuhrmann (2009) emphasizes three strategic reasons to explain patterns of civil nuclear assistance: (1) to strengthen their allies and alliances; (2) to strengthen their relationships with the enemies of their enemies and; (3) to strengthen existing democracies and bilateral relationships with these states only if the supplier is also a democracy. Apparently, both authors agree with the idea that civil nuclear assistance contributes to nuclear proliferation. Therefore, I include a variable examining the number of bilateral civilian nuclear cooperation agreements a state has signed from 1945 to a given year.

Gross Domestic Product Per Capita. Many argue that wealthy countries face lower technological obstacles to develop nuclear weapons. In other words, their greater capability of developing a bomb is greater, and this, in turn, makes them more likely to engage in the proliferation of nuclear weapons. Consistent with other scholars, I also use gross domestic product (GDP) per capita as a proxy for states' wealth (Fuhrmann and Horowitz 2015; Jo and Gartzke 2007; Singh and Way 2004; Way and Weeks 2014).

Nuclear Nonproliferation Treaty. Scholars who support constructivism or institutionalism argue that the participating in the Nuclear Nonproliferation Treaty (NPT) may make states less likely to develop nuclear weapons. Because of the international norm or commitments that the NPT projects, membership in the NPT may constrain leaders' proliferation of nuclear weapons. I control for this by including a dummy variable that is coded 1 for states that ratified the NPT in a given year and 0 for those that did not.

Economic Openness. Economic openness or economic liberalization refers to the openness to global markets in order to maximize a state's gains from international economic exchange. Some studies in political economy have argued that states whose leaders favor integration into the global economy are negatively associated with the pursuit of nuclear

weapons because of the fear of losing trade (Solingen 1994; 2007). Consistent with other previous studies that measure this variable, I use the trade ratio of exports plus imports as a share of GDP to measure a state's economic openness (Fuhrmann and Horowitz 2015; Singh and Way 2004).

Interstate Disputes. Many realist scholars argue that states are more likely to develop nuclear weapons when they face external threats. I thus control for the security environment, which may affect leaders' decisions to proliferate nuclear weapons. Following numerous other earlier works, I use militarized interstate disputes as an indicator of the external security environment. I control this variable by measuring whether or not leaders are engaged in militarized interstate disputes in a given year.

Enduring Rivalry. In addition to interstate militarized disputes, Singh and Way (2004) included the existence of enduring rivalry, which is considered another important component for measuring external threats. This is a dichotomous variable coded 1 if a state has enduring rivalries in a given year and 0 if not.

Civil War. Along with external threats, the conventional wisdom among policy makers supports the argument that internal threats, such as civil wars, may also affect leaders' decision-making in regard to the pursuit of nuclear weapons. The variable is coded 1 if a state has experienced a civil war within the previous 5 years and 0 if it has not. Table 4.1 shows all the control variables that were assorted into sub-categories, such as systematic and domestic factors.

Table 4.1 Control Variables

Systemic Factor	Domestic Factor
Polity Superpower Alliance Civilian Nuclear Cooperation Nuclear Nonproliferation Treaty Economic Openness Interstate Disputes Enduring Rivalry	Time, Time Squared, and Time Cubed Irregular Entry Gross Domestic Product Per Capita Civil War

4.2 Risk Propensity Index

As discussed in Section 3.2.2, this study begins with seven variables that are associated with risk propensity. Given that one cannot verify the causal relations among these variables at first glance, it is necessary to conduct statistical tests, such as cross-tabulation, multicollinearity, and factor analyses, in order to decide whether to combine some of these independent variables. Section 4.2 describes the processes of how the risk propensity index has been created.

4.2.1 Cross-tabulation Analysis

As a first step to examine underlying patterns in the relationship among my independent variables, I conduct several cross-tabulation analyses. First, Table 4.2 displays the results from a cross-tabulation analysis of childhood poverty and low education. The table shows that about 40% of leaders who had grown up in poor families have low education. Interestingly, about 60% of leaders who had not experienced childhood poverty are

associated with low education. The results reaffirm the VIF scores in that there is no multicollinearity problem between poor childhood and low education.

Table 4.2 Cross-Tabulation Analysis of Poor Childhood and Low Education

	No Low Education	Low Education
No Childhood Poverty	6,156 (89.85%)	1,010 (59.83%)
Childhood Poverty	696 (10.15%)	678 (40.17%)
Total	6,860 (100.00%)	1,688 (100.00%)

$\chi^2 = 904.98$ ($p < 0.0001$)

Table 4.3 provides the results of the relationship between rebel experience and military service. It is important to note that not all rebellion leaders have regular military experience. The table shows that leaders who have rebel experience are more likely to have regular military experience, but 27% of leaders have prior rebel experience that is not equivalent to national military service.

Table 4.3 Cross-Tabulation Analysis of Rebel Experience and Military Service

	No Military Service	Military Service
No Rebel Experience	4,196 (72.57%)	876 (29.30%)
Rebel Experience	1,586 (27.43%)	2,114 (70.70%)
Total	5,782 (100.00%)	2,990 (100.00%)

$\chi^2 = 1.5e+03$ ($p < 0.0001$)

One might also wonder about the relationship between rebel experience and how leaders enter into office, because the former could be a consequence of the latter (Fuhrmann and Horowitz 2015). I therefore present an additional cross-tabulation analysis of rebel experience and irregular entry into office to show some patterns in the data. Table 4.4 displays the results. Approximately 52% of leaders who have rebel experience assumed power through irregular means, but about 48% of those leaders entered into office regularly. The results nullify a possible counter-argument which holds that most leaders who have prior rebel experience assumed power through irregular means.

Table 4.4 Cross-Tabulation Analysis of Rebel Experience and Entry into Office

	No Rebel Experience	Rebel Experience
Regular Entry	4,422 (95.96%)	1,922 (51.96%)
Irregular Entry	186 (4.04%)	1,777 (48.04%)
Total	4,608 (100.00%)	3,699 (100.00%)

χ^2 = 2.3e+03 (p <0.0001)

Similarly, Table 4.5 shows the results of a cross-tabulation analysis of military experience and irregular entry into office. The analysis reveals that about 47% of leaders who have prior military experience entered into office irregularly, but approximately 53% of these leaders assumed power through regular means. The results imply that there are variations in how military experienced leaders entered into office.

Table 4.5 Cross-Tabulation Analysis of Military Service and Entry into Office

	No Military Experience	Military Experience
Regular Entry	4,757 (89.35%)	1,554 (52.77%)
Irregular Entry	567 (10.65%)	1,391 (47.23%)
Total	5,324 (100.00%)	3,699 (100.00%)

$\chi^2 = 1.4e+03$ ($p < 0.0001$)

4.2.2 Multicollinearity

In addition to the cross-tabulation analysis, it is useful to check for multicollinearity among my independent variables as a preliminary step to further conduct a factor analysis. Multicollinearity occurs when two or more independent variables in the model are highly correlated with one another. The most popular way to detect multicollinearity in a linear regression model is by calculating correlation coefficients. On the other hand, the variance inflation factor (VIF), which assesses how much the variance of an estimated regression coefficient is increased due to multicollinearity, is an alternative test for a logistic regression model. The VIF score can be estimated by calculating a linear regression model using the same dependent and independent variables in a logistic regression model, because "the concern is with the relationship among the independent variables, the functional form of the model for the dependent variable is irrelevant to the estimation of collinearity" (Menard 2002, 76).

In my logistic model, some may argue that leaders' childhood poverty is highly correlated with their low education or international experience. Therefore, it is necessary to

check multicollinearity among risk propensity independent variables in my model. Table 4.6 presents the VIF scores of seven independent variables.

Table 4.6 Multicollinearity (VIF)

Variable	VIF	SQRT VIF
Age	1.01	1.01
Business major	1.08	1.04
Low education	1.25	1.12
Childhood poverty	1.16	1.08
Int experience	1.13	1.06
Rebel experience	1.30	1.14
Military service	1.23	1.11
Mean VIF	1.15	

The smallest possible value of VIF is 1, indicating there is no presence of multicollinearity among independent variables in the model. A common rule of thumb is that if each VIF value exceeds 10, it means that there is a serious multicollinearity problem between predictor variables (Curto and Pinto 2011; Gómez, Pérez, Martín and García 2016; Pratheepan 2014). As Table 4.6 shows, none of the VIFs, which are from a model with these seven characteristics, are higher than ten. I thus conclude that multicollinearity is not a serious problem in my model.

A multicollinearity test does not tell why the VIF scores are low. To understand the results, I conduct additional research on leaders who coded 1 for childhood poverty but 0 for low education. For example, Joseph Jacques Jean Chrétien, who served as the 20th Prime Minister of Canada, was born to a poor family. According to his biography, the working-

class Chrétien family was so impoverished that Chrétien had to wear his siblings' hand-me-downs. However, his parents wanted their nine children to attend college in order to escape a working-class life. Chrétien's older brother received a scholarship to attend medical school, and later with the profits from his medical practice, Chrétien was able to attend college to study law (Martin 1995).

The case of Léon Dumarsais Estimé, who served as the President of Haïti, also shows the uncorrelated relationship between childhood poverty and low education. Historical research on Estimé states that he grew up in a poor family in the small city of Verrettes, Haïti, but his uncle later financed his education to study law in college (Nicholls 1996). As demonstrated in these examples, there are various ways to gain a higher education regardless of the level of childhood wealth.[26]

Along similar lines, some might expect to see a significant relationship between rebel experience and military service. Therefore, a detailed look at the data is necessary to understand the low VIF scores between these two independent variables. For example, among many others, Ruhollah Khomeini, Mao Zedong, Muammar Qaddafi, and Park Chung-hee are a few former leaders of rebellions who later assumed power. Specifically, President Park of South Korea coded 1 for rebel experience and military service, because he attended a military academy and served the country before overthrowing the government in power. In contrast, Khomeini had no prior military experience before engaging in

[26] On the other hand, the case of Joseph Estrada, the 13th President of the Philippines, shows the uncorrelated relationship between educational level and childhood wealth, but in the opposite way. Estrada was born into a wealthy family but had a low educational level. Specifically, he attended the Ateneo High School, but was expelled during his second year due to his disciplinary conduct. Instead of pursuing an academic degree, Estrada started his career as a drama actor (Doronila 2001).

revolution; he rather studied Greek philosophy at an Islamic seminary and was interested in literature and poetry (Brumberg 2001).

4.2.3 Factor Analysis

In the previous section, I found that there is no issue of multicollinearity among seven independent variables: age, economic/business major, low education, childhood poverty, international experience, rebel experience, and military service. In addition, a more detailed look at the data and cross-tabulation analyses support the statistical results of low VIFs that show there is no multicollinearity problem in my model.

Having these seven variables uncorrelated, I further conduct a factor analysis. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test are measures of sampling adequacy used to examine the appropriateness of factor analysis. A KMO value of 0.6 or higher and statistical significance of Bartlett's test indicate the data is adequate to conduct factor analysis. The results of my sampling provide the KMO statistic of 0.61 and the p-value of .000 from Bartlett's test. I therefore conclude that factor analysis is an appropriate statistical technique to further analyze my data.

The purpose of factor analysis, which is a statistical technique for data reduction, is to reduce a large set of variables to a smaller set. More specifically, by extracting maximum common variance from variables and sorting them into a common score, this statistical method creates an index with variables that measure similar things. I therefore extract factors with principal component analysis, which is the most commonly used method. After running factor analysis, it is necessary to rotate the factor loads to get more reliable and clear output. Among many rotation methods, I use varimax rotation which is the default rotation

method in STATA that produces orthogonal factors, meaning that the factors are not correlated to each other.

The initial output of factor analysis provides a number of factors to help with selection. The results are displayed in Table 4.7. The findings reveal that two factors are extracted by combining the relevant variables. The proportion percentage, specifically, presents the relative weight of each factor. For example, Factor 1 accounts for 23% and Factor 2 accounts for 22% in the total variance, meaning that each factor is sufficient to explain my model. While the proportion results give the percent of total variance accounted for by each factor, the cumulative percentages indicate the degree of variance explained by total factors. As Table 4.7 shows, Factor 1 and Factor 2 explain 45% of the total variance observed.

Table 4.7 Factor Analysis

Factor	Variance	Difference	Proportion	Cumulative
Factor 1	1.58339	0.04155	0.2262	0.2262
Factor 2	1.54184	.	0.2203	0.4465

$\chi^2 = 4737.93$ ($p < 0.0001$)

Figure 4.1 shows the results of Table 7 in a graphical way. Kaiser criterion suggests generating factors with eigenvalues equal to or higher than 1; it is worth noting that the first factor always accounts for the most variance and therefore presents the highest eigenvalue. The second factor accounts for the remainder of the variance and the same procedure continues until the last factor is reached. The scree plot of Figure 4.1, which provides the

eigenvalues on the y-axis and the number of factors on the x-axis, presents the same results as Table 4.7 in that it suggests two factors should be generated by the analysis.

Figure 4.1 Graphical Figure of Factor Analysis

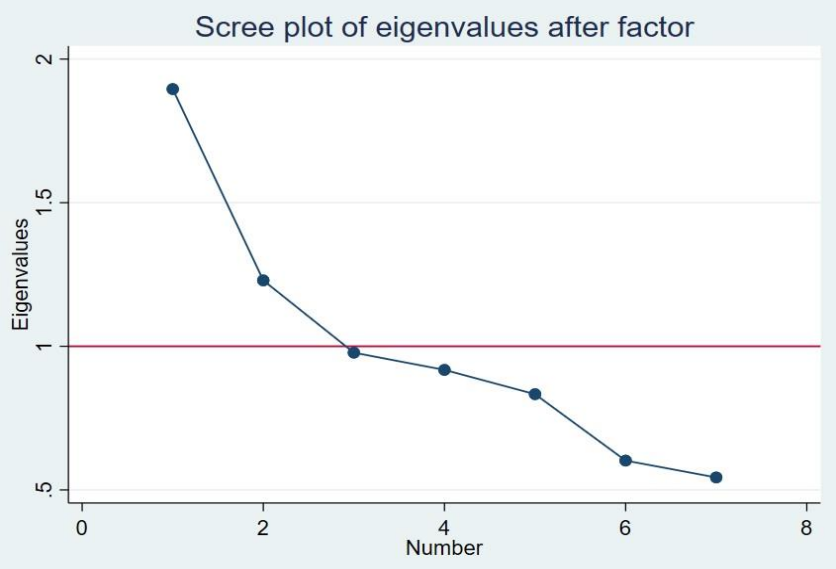


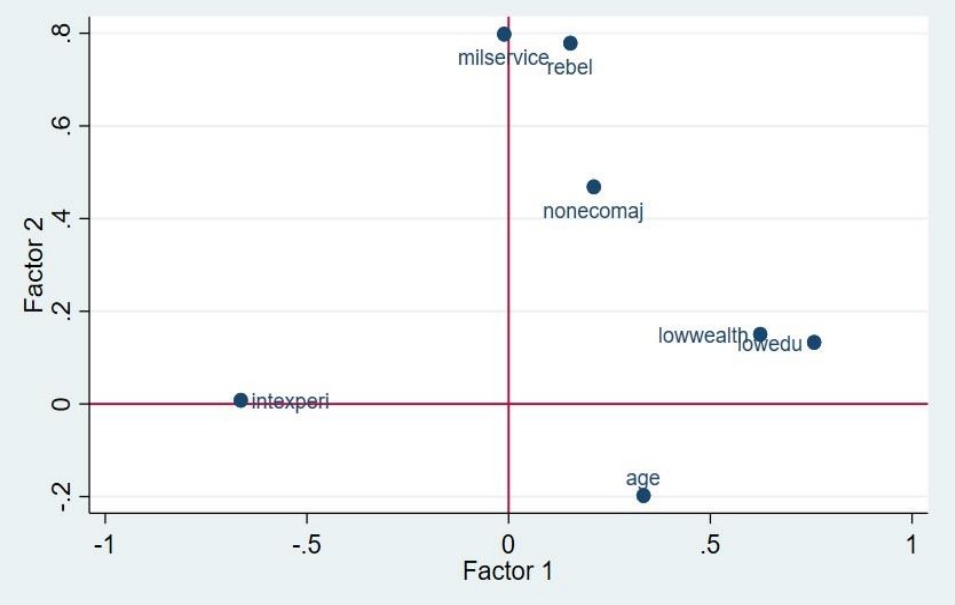
Table 4.8 records the results of the rotated factor loadings, which offer a clear pattern of the relevance of each variable in the factor. The factor columns represent the rotated factors that have been extracted after data reduction, and the matrix under each factor column presents the correlation of the variables. The higher loads are the more relevant variables in defining factors' dimensionality. Values of each variable more than 0.6 in the factor are normally considered high, which means that the variable is well explained by the factor. A negative value indicates that the variable has an inverse impact on the factor (Hamilton 2013; Kim and Mueller 1978; Mulaik 2010; Vincent 1972). The results show that Factor 1 is mostly defined by low education and childhood poverty, and international experience is the

most irrelevant to Factor 1. As shown, rebel experience and military service define Factor 2. These variables in each factor are highlighted with different colors in Table 4.8. Yet, it is always helpful to visualize the data graphically. Figure 4.2 illustrates the loading plot of seven independent variables in rotated space.

Table 4.8 Pattern of Variables

Variable	Factor 1	Factor 2
Age	0.3345	-0.1977
Business major	0.2111	0.4685
Low education	0.7574	0.1329
Childhood poverty	0.6237	0.1502
Int. experience	-0.6638	0.0078
Rebel experience	0.1532	0.7786
Military service	-0.0110	0.7980

Figure 4.2 Graphical Figure of Table 4.8



As Table 4.9 shows, given that low education and poor childhood define one factor, I aggregated these two variables to create a new variable with which to measure the socioeconomic factor. Along similar lines, I created a new variable called military experience by aggregating rebel experience and military service. In STATA, one can create the new variables using the user-written command (i.e., predict) after conducting a factor analysis. Another way to create the new variables is to generate indexes out of each cluster of variables. One can simply aggregate low education and childhood poverty to create an index to measure socioeconomic factors (Baldwin 2019; Torres-Reyna 2020). I tried both methods and found that these generate similar results.

Table 4.9 Name of the New Variables

Factor	Variables Included	**New Variables**
1	Low Education Childhood Poverty	**Socioeconomic**
2	Rebel Experience Military Service	**Military Experience**

In summary, Section 4.2 in Chapter 4 explains how the risk propensity index of this dissertation has been created. As a preliminary step in evaluating the appropriateness of factor analysis, I demonstrate that there is no issue of multicollinearity, and I acquired the KMO value of 0.61 and statistical significance of Bartlett's test. The findings of factor analysis suggest that, among seven variables in my model, low education and poor childhood define Factor 1 and rebel experience and military service define Factor 2. Based

on the results, I create the risk propensity index that is displayed in Table 4.10. In the next section of this Chapter, I conduct a logit analysis using these risk propensity variables.

Table 4.10 Risk Propensity Index

Risk Propensity Independent Variables
Age
Business/econ major
Socioeconomic
International experience
Military experience

4.3 Results

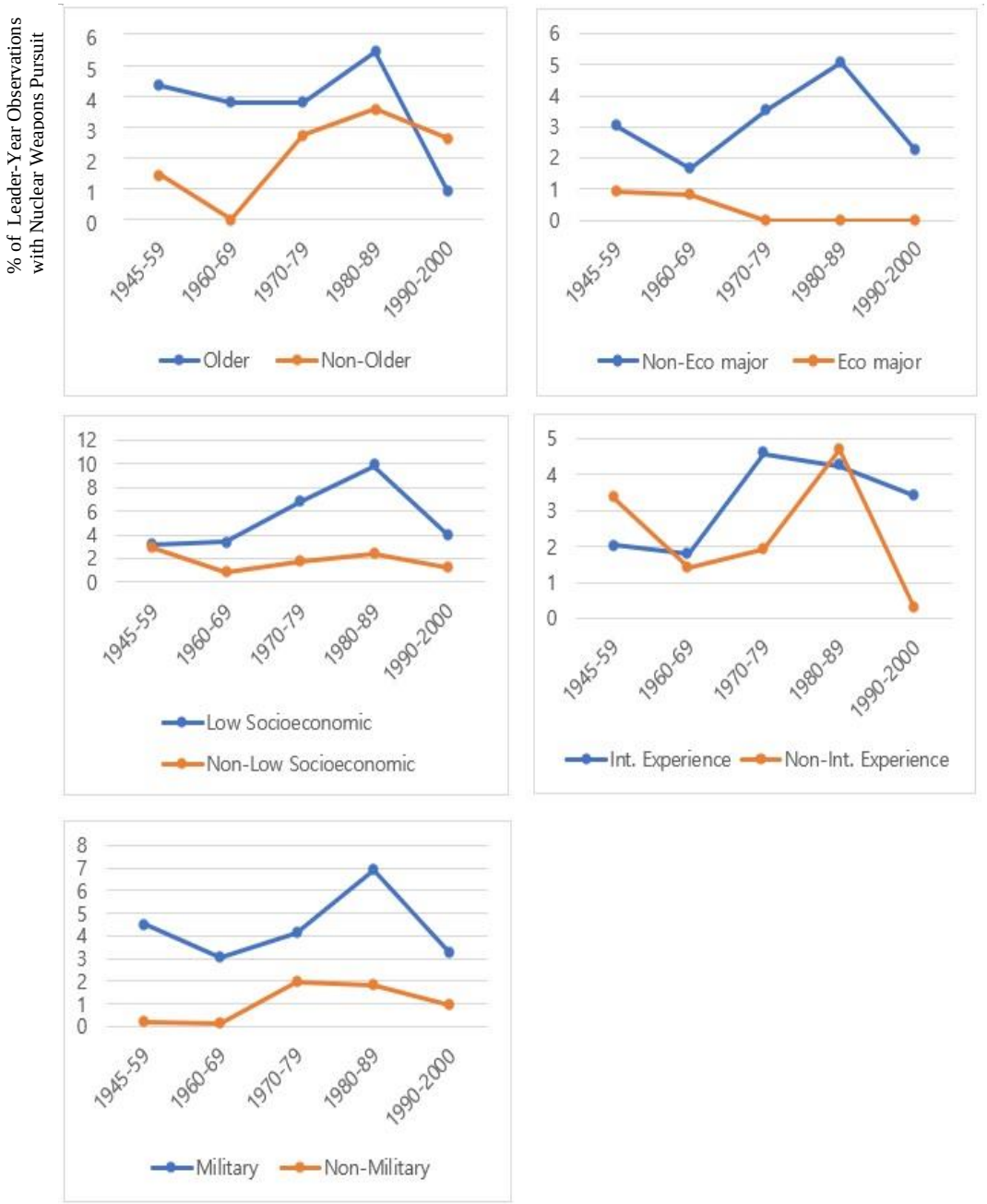
4.3.1 Preliminary Analyses

As a preliminary step to evaluating the hypotheses presented in Chapter 3, this study starts by comparing the rate of nuclear weapons pursuit among all five risk propensity indicators and the opposite of each indicator: older leader vs. non-older leader[27], non-economic major vs. economic major, low socioeconomic vs. mid-to-high socioeconomic, international experience vs. no-international experience, military experience vs. no-military experience. Figure 4.3 shows the percentage of leader-year observations for each risk propensity variable with nuclear weapons pursuit. As shown, on average, leaders who are

[27] For this preliminary analysis purpose only, I created a dummy variable coded 1 for leaders older than 56, the average age of leaders in my data, and 0 for those younger than 56.

older, who did not major in economics, whose background is low socioeconomic, and who have international experience and military experience are more likely to pursue nuclear weapons than leaders without these characteristics.

Figure 4.3 Independent Variables and the Pursuit of Nuclear Weapons



This preliminary analysis does not accurately examine the relationship between leaders' risk propensities and their decisions to pursue nuclear weapons because this does not consider other factors that could influence this pursuit. However, this enables us to see a first cut of that relationship and provides initial support for this study's hypotheses.

4.3.2 Risk Propensity Variables

To investigate the correlation of leaders' risk propensities and their nuclear weapons pursuits, I estimate a logistic regression model with the standard errors clustered by leader. Table 4.11 shows the descriptive statistics of the data and Table 4.12 reports the results.

Table 4.11 Descriptive Statistics for the Variables

	Obs	Mean	Std. Dev.	Min	Max
Pursuit	8,474	.027	.1635	0	1
Age	8,832	56.11	11.536	15	93
Bus/econ major	8,699	.883	.3213	0	1
Socioeconomic	8,548	.179	.3117	0	1
Int. experience	8,738	.447	.4972	0	1
Military experience	8,772	.381	.4071	0	1

I start with a basic model that includes only the cubic polynomial variables to account for temporal dependence and the risk propensity variables (Model 1). In the next column, I present Model 2, which is a modification of the basic model by controlling for the potential

confounders described in section 4.1.4. Across all these specifications, the coefficients on the risk propensity variables remain positively and statistically significant at conventional levels. The consistency of the results in both models, presented in Table 4.12, supports my first proposition: A leader's demographic characteristics systematically correlate with his or her risk-taking behavior with respect to nuclear weapons pursuit.

To evaluate the impact of a leader's risk propensity on his or her nuclear weapons pursuit, I further examine the predicted probabilities of nuclear weapons pursuit by these risk propensity variables. The relevant findings are displayed in Figure 4.4.

Table 4.12 Logit Analysis of Nuclear Weapons Pursuit

	Model 1 Basic Model	Model 2 Full Model
Age	0.0509***	0.0419*
	(3.82)	(2.41)
Business/econ major	2.908**	2.783**
	(2.85)	(2.66)
Socioeconomic	2.261***	2.405***
	(4.09)	(4.64)
Int. experience	1.140*	1.169**
	(2.66)	(2.97)
Military experience	1.719**	1.847**
	(3.43)	(3.15)
Time	-2.134***	-2.122***
	(-7.10)	(-6.69)
Time squared	0.140***	0.139***
	(5.08)	(4.83)
Time cubed	-0.00251**	-0.00246**
	(-3.18)	(-3.06)
Irregular entry		-0.188
		(-0.41)
Polity		-0.0473
		(-1.35)
Super alliance		-1.941***
		(-4.58)
NCA		0.345***
		(6.39)
GDP per cap (ln)		0.265
		(1.34)
NPT		-0.829*
		(-2.26)
Eco openness		-0.00506
		(-0.66)
Civil war		-0.188
		(-0.39)
Interstate disputes		0.392***
		(4.10)
Rivalry		1.240***
		(3.38)
Constant	-9.168***	-11.16***
	(-7.18)	(-4.69)
N	7999	6608

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Standard errors clustered by leader

The first figure, while holding other factors constant, shows how the likelihood of nuclear weapons pursuit changes depending on the leader's age. This indicates that older leaders, for example, at the age of 80 have about a 5% probability of pursuing nuclear weapons. In contrast, younger leaders, such as those 30 years of age, have about a 2% predicted probability of nuclear weapons pursuit under the same circumstance. Therefore, the results support Hypothesis 1.

> Finding 1: Older leaders will be more likely to pursue nuclear weapons than younger leaders.

In contrast to the conventional wisdom that younger people tend to be bold while older people are more likely to be cautious, these findings support Horowitz et al.'s (2005) study. Illuminating the history that many wars are the results of older leaders' decisions, the authors empirically demonstrated the argument: "As the age of leaders increases, they become more likely to both initiate and escalate militarized disputes" (Horowitz et al. 2005, 661). Therefore, the results of this dissertation shed light on the relationship between leaders' ages and their risk-taking behaviors in that not only does increasing age increase military disputes in general; it also increases leaders' decisions to pursue nuclear weapons.

The second figure, which is in the row immediately below the predicted probability of age, illustrates that leaders who studies a non-economic or non-business major are more likely to pursue nuclear weapons (3.7% as opposed to 1%). The marginal effect shows that, on average, leaders who were non-economic majors are 2.7 percentage points more likely than those who majored in economics to pursue nuclear weapons. The results therefore support Hypothesis 2.

Finding 2: Leaders who did not majored in economics or business in colleges are more likely to pursue nuclear weapons than leaders majored in economics or business.

To further discuss the predicted probability of nuclear weapons pursuit according to leaders' socioeconomic factors, it is first necessary to readdress the results of factor analysis described in the earlier section. Previously, I performed a factor analysis and created a risk propensity index that includes age, economic major, socioeconomics, international experience, and military experience. As noted in section 4.2.3, the socioeconomic variable was created from the result that less education and an impoverished childhood were defined as Factor 1. Similarly, the military experience variable was newly generated because rebel experience and military service were defined as Factor 2. Given these results, therefore, several of the hypotheses described in Chapter 3 must be revised accordingly. Hence, I combine the previous Hypotheses 3 and 4 to test whether leaders with lower socioeconomic background levels are more likely to pursue nuclear weapons.

Finding 3: Leaders with lower levels of socioeconomic backgrounds are more likely to pursue nuclear weapons than leaders with higher levels of socioeconomic backgrounds.

As shown in Table 4.12, a newly created socioeconomic variable is strongly associated with the pursuit of nuclear weapons. In addition, the third figure in Figure 4.4 illustrates that, all other things being equal, leaders from a low socioeconomic background have about a 7% probability of pursuing nuclear weapons. Put differently, the marginal effect provides that, on average, these leaders are about 4 percentage points more likely than leaders from higher socioeconomic backgrounds to pursue nuclear weapons.

Next, as Model 2 in Table 4.12 shows, the coefficient of leaders' international experience is also positive and statistically significant. In addition, the fourth figure in

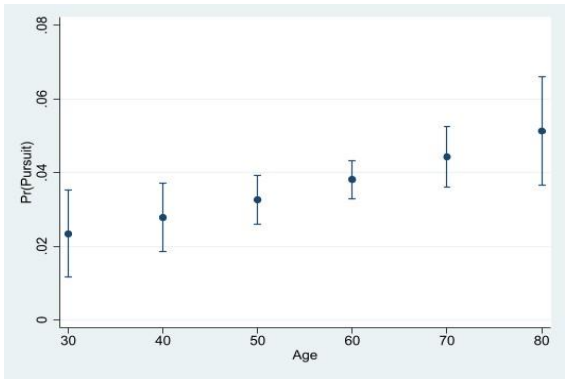
Figure 4.4, displaying the likelihood of nuclear weapons pursuit based on leaders' international experiences, shows that leaders who had international experiences are more likely to pursue nuclear weapons (4.6%) than leaders who have not had such experiences (3%). However, case studies on South Korean and Indian leaders Park Chung-hee and Indira Gandhi will be discussed later in Chapters 5 and Chapter 6; both studied abroad while they were attending college. In summary, I conclude that the results support Hypothesis 5.

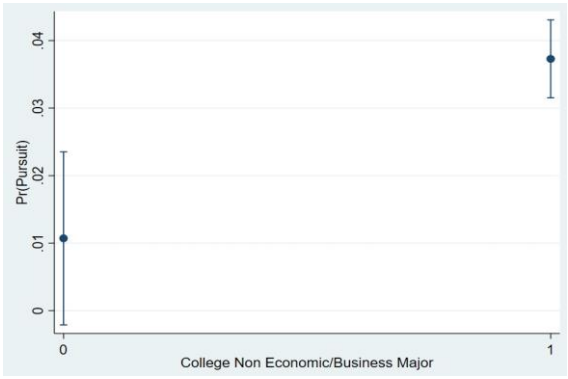
> Finding 4: Leaders with international experiences in colleges are more likely to pursue nuclear weapons than leaders who do not have such experiences.

The results of Table 4.12 and Figure 4.4 support Hypotheses 6 and 7 in that the coefficient on leaders' military experiences is positive and statistically significant, and the marginal effect shows that leaders who have had military experiences, including both rebel and general military service, are 2.7 percentage points more likely to pursue nuclear weapons than leaders without these experiences.

> Finding 5: Leaders with military experiences, including rebel and general service, are more likely to pursue nuclear weapons than leaders without those experiences.

Figure 4.4 Predictive Margins of Risk Propensity Indicators





In order to clarify the results of logit analysis, I further use the log-likelihood ratio (LR) test to check the joint significance of my risk propensity indicators. The LR test should help identify which helps to explain variance. Table 4.13 shows the χ^2 statistics of the log likelihoods of Model 2. Of the five independent variables the socioeconomic level clearly matters the most in regard to leaders' decisions to pursue nuclear weapons, followed by military experience, international experience, a non-economic major, and age. As shown, a leader's socioeconomic level is an influential factor in determining nuclear weapons pursuit, while the age variable has the least impact on the pursuit of nuclear weapons in the risk propensity index.

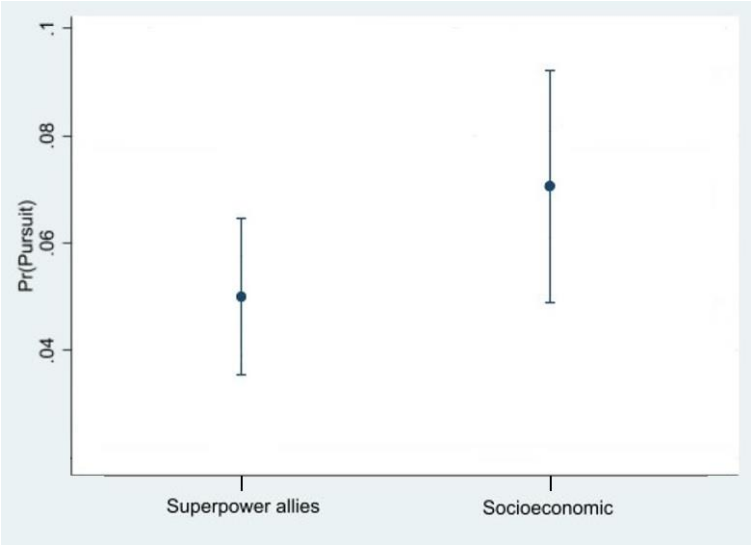
Table 4.13 Log-Likelihood Ratio Test

	Model 2
	Chi-Squire, Significant
Age	5.82*
Business/econ major	7.05**
Socioeconomic	21.53***
International experience	8.81**
Military experience	9.92**

In addition, I run a predictive probability of socioeconomic and compare it with one of the important explanatory variables – *superpower allies*. Figure 4.5 shows that leaders who have low socioeconomic backgrounds have a 7% probability of pursuing the bomb in a given year. Yet, under identical circumstances, leaders who do not have superpower allies in a given year have a 5% predicted probability of pursuing nuclear weapons. Despite the superpower allies variable is considered the most influential alternative factor in my model

that affects the pursuit of nuclear weapons, such effect is still smaller than the effect of leaders who have low socioeconomic backgrounds.

Figure 4.5 Comparison of Predictive Probability



The figure shows point estimates and 95% confidence intervals for the change in the probability of pursuing nuclear weapons based on Model 2 in Table 4.12.

I further compare the coefficients and statistical significances of my control variables with those of previous studies on nuclear weapons pursuit. In my logistic regression model, I include 10 control variables that might affect the pursuit of nuclear weapons: irregular entry, polity, superpower alliance, nuclear cooperation agreement, GDP per capita (ln), nuclear proliferation treaty, economic openness, civil war, interstate disputes, and rivalry.

Table 4.14 reveals the results of the statistical significances of the 10 control variables in various works including this dissertation. Most of my results mirror those of previous studies except for superpower alliance and GDP per capita.

Table 4.14 Statistical Significance of Control Variables in Other Studies

	Mine	2004 S&W	2007 J&G	2014 W&W	2014 B&L	2015 F&H
Irregular entry	No	.	.	.	.	No
Polity	No	No	.	.	No	No
Super alliance	**Yes**	**No**	**No**	.	**Yes**	**Yes**
NCA	Yes	.	.	.	.	Yes
GDP per cap (ln)	**No**	**Yes**	.	**No**	.	**No**
NPT	Yes	.	Yes	.	.	Yes
Eco openness	No	No	.	.	No	No
Civil war	No	.	.	.	.	No
Inter. disputes	Yes	.	.	Yes	Yes	.
Rivalry	Yes	Yes	.	.	.	.

Note: S&W = Singh and Way (2004), J&G = Jo and Gartzke (2007), W&W = Way and Weeks (2014), B&L = Bleek and Lorber (2014), F&H = Fuhrmann and Horowitz (2015)

First, although all of these studies, including this research, demonstrate that a superpower alliance (also called a security guarantee) is negatively related to the pursuit of nuclear weapons, they fail to reach the statistical significance of the works by Singh and Way (2004) and Jo and Gartzke (2007) studies. More specifically, Bleek and Lorber (2014) and Fuhrmann and Horowitz (2015) found that security guarantees from nuclear armed-allies decrease the pursuit of nuclear weapons, and these results were statistically significant. In contrast, Singh and Way reported that a superpower alliance was neither less nor more likely to be associated with the pursuit of nuclear weapons and was statistically insignificant. Jo and Gartzke found that the nuclear umbrella provided by nuclear-armed allies reduces the likelihood of nuclear weapons pursuit, but the result provided the statistically insignificant coefficient.

In order to understand the contradictory results, I revisit the four articles mentioned above. I find that the most significant difference among these studies is how they operationalize the term superpower alliance.

Singh and Way, on closer examination, used the Correlates of War (COW) alliance data to operationalize superpower allies as other studies have done. However, the difference stems from the coding rule. Bleek and Lorber, who specifically examine the role of security guarantees on nuclear proliferation, tackles this issue sophistically, and argues that Singh and Way's superpower alliance variable appears to be flawed.

> "[Singh and Way] code the Soviet Union as having extended nuclear security guarantees to various countries from the beginning of the data set in 1945, despite the fact that they do not code the Soviets as acquiring nuclear weapons until 1949, and in some cases also despite the fact that defense pacts were not signed until later. They code a number of ententes and neutrality treaties as though they were defense pacts. Some coding choices are particularly puzzling: Iran is coded as being under a nuclear umbrella from 1945 through 2000, Pakistan from 1954 through 2000, and Egypt from 1945 through 1976" (Bleek and Lorber 2014, 441-442)

Bleek and Lorber further assert that Jo and Gartzke's coding rule also appears flawed. It is important to note that Jo and Gartzke do not specify from where their security guarantee variable data are drawn. They illustrate only that their data are extracted using the software package EUGene. However, this software is often used to extract COW data in political science; thus, it seems likely that Jo and Gartzke employ COW data to operationalize the security guarantee variable. Bleek and Lorber's argument is as follow:

> "Most Strikingly, Japan, perhaps the most widely referenced example of a state benefiting from a patron's extended nuclear deterrent, is never coded

> as such. Neither are Australia and New Zealand, though the former has been part of the Australia, New Zealand, and United States Security Treaty since 1951 and the latter from 1951 until 1987, when antinuclear domestic politics led it to withdraw. The Philippines' mutual defense treaty with the United States is similarly unacknowledged. Spain was in a defense pact with the United States from 1970 onward, before it joined North Atlantic Treaty Organization (NATO) in 1982, but is not coded as such. Portugal is never coded as having a security guarantee despite the fact that it was a founding member of NATO in 1949. China is coded as having a security guarantee between 1951 and 1961, presumably from the Soviet Union, but this relationship is not coded as any degree of formal alliance in COW. And Taiwan is never coded as benefiting from a security guarantee although COW codes that relationship as a defense pact from 1954 until 1979" (Bleek and Lorber 2014, 443-444)

To correct these various errors, Bleek and Lorber alternatively use the Alliance Treaty Obligations and Provisions (ATOP) data in addition to the COW data, in turn introduces his own dataset on superpower alliance. As I believe that Bleek and Lorber's coding criteria and modifications are more persuasive, I use Bleek and Lorber's data to measure superpower alliance for this dissertation. With regard to Fuhrmann and Horowitz's superpower alliance variable, it is uncertain what data and coding rules they adopt. Although they do not specify the source of their data and measurement information, their coding decisions appear to be similar to Bleek and Lorber's data.

I now substitute Singh and Way's and Jo and Gartzke's variables for Bleek and Lorber's variable, which is used for this dissertation, and rerun my logistic regression model. As shown in Table 4.15, the superpower alliance variable, not surprisingly, is no longer statistically significant. I therefore conclude that the discrepancies in regard to the statistical significance of superpower alliance come from employing different coding rules and data.

Table 4.15 Using Different Data Examining Superpower Alliance

	SW Data	JG Data	BL Data	FH Data
Superpower alliance	-0.602 (-1.33)	-0.346 (-1.09)	-1.941*** (-4.58)	-1.628*** (-3.43)

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Next, the GDP per capita variable is positively linked to the pursuit of nuclear weapons in the studies by Singh and Way, Way and Weeks, and Fuhrmann and Horowitz as well as in this dissertation, but it only reaches statistical significance in Singh and Way's work. Given that all the studies discussed above use the same data to measure GDP per capita, one of the possible explanations for the inconsistent results might be the difference in the unit. In contrast to Singh and Way's work, which focuses on countries in general, my dissertation and the other two articles illuminate the specific types of leaders or regimes.

In summary, the effects of most of my control variables in Table 4.14, except superpower alliance and GDP per capita, support the conventional wisdom. Consistent with previous studies, I find that the NPT is negatively and significantly associated with nuclear weapons pursuit, meaning that membership in an NPT decreases the risk of pursuing nuclear bombs. Also consistent with previous works, the coefficients on nuclear cooperation agreements, interstate disputes, and rivalry are positive and statistically significant, suggesting that these variables increase actors' decisions to pursue nuclear weapons. However, irregular entry, polity, economic openness, and civil war are not salient factors that affect nuclear weapons pursuit. With respect to superpower alliance and GDP per capita, there are contradictory results on statistical significance. By revisiting previous works, I conclude that the discrepancy on superpower alliance comes from using different coding

criteria and data, while inconsistent results of GDP per capita stem from employing different unit analyses.

To conclude, all of the empirical findings discussed in section 4.3 provide strong support for the principal argument of this dissertation: Leaders' risk propensity variables are important factors regarding their decisions to pursue nuclear weapons. In the following section, I conduct further analysis to address a variety of robustness checks.

4.4 Further Analysis

4.4.1 Robustness Checks

It is necessary to devote special attention to various robustness checks as a means to further assess the substantive results of my logistic model. Most models for checking robustness are drawn from previous works that highlighting potential objections to nuclear proliferation (Fuhrmann and Horowitz 2015; Singh and Way 2004; Way and Weeks 2014). Because the unit of analysis in Fuhrmann and Horowitz's (2015) study is also at the individual level, the rest of the models heavily rely upon their criteria for robustness checks. Tables 4.16 and 4.17 report all of the results.

Singh and Way's Dataset (Model 4). As noted in 4.1.2 and 4.3.2, Singh and Way's data appear to include several flaws, especially concerning the variables of pursuing nuclear weapons and superpower allies. However, due to the importance of their dataset, which has been widely used by many international relations scholars, I substitute Singh and Way's variable coding of nuclear weapons with my own. Interestingly, using the dependent variable coded by Singh and Way does not have a major influence on the statistical

significance of my variables of risk propensity. In addition, the statistical significances values of the control variables are identical to those presented in Table 4.12.

Nuclear Weapons Exploration (Model 5). In Chapter 2, I explain why I have chosen the pursuit of nuclear weapons as a dependent variable for this dissertation. Briefly, the stage of pursuit gives a clearer indication of the demand for nuclear weapons than latency or exploration. In addition, it is inadequate to use an acquisition variable for this research, which entails only about 10 cases of approximately 8,000 observations. Nonetheless, Singh and Way (2004) used a hazard model and multinomial logistic model to estimate the correlates of the proliferation of nuclear weapons by applying exploration, pursuit, and acquisition as dependent variables. Because Singh and Way's findings provide some meaningful coefficients and statistically significant values regarding the explored-level of nuclear weapons, I substitute the pursuit of nuclear weapons with the exploration of nuclear weapons. As shown in Table 4.17, the results of Model 5 indicate that the variables of risk propensity are far more positively and statistically significant than Model 2 which uses nuclear weapons pursuit as its dependent variable. In short, applying a more lenient standard for defining a behavior of nuclear proliferation increases the substantive effects of my risk propensity variables.

Rare Events Logit (Model 6). Many scholars in international relations have expressed concerns about using conventional logistic regressions for rare events data. To correct the bias in underestimating the probability of rare events, King and Zeng (2001) have proposed an alternative statistical method. This method is similar to so-called "penalized likelihood," which is widely used in commercial software (Williams 2019). Although I am confident that my observations are unbiased enough to run a conventional logit model, I further conduct a

rare events logistic model. The findings, including those for variables of risk propensity and the control variables, are almost identical to the results found with Model 2.

Regime Type Dummies (Models 7 and 8). I use the Polity IV data to measure the polity score. Given that many studies on nuclear proliferation, including Bleek and Lorber's (2014), Jo and Gartzke's (2007), and Singh and Way's (2004), have involved using democracy to examine the determinants of nuclear weapons proliferation, I create variables for democracy and autocracy. I then rerun my logistic model using the newly created democracy variable instead of using the polity variable, followed by a similar procedure to examine the autocracy variable. Model 7 and Model 8 provide the results, respectively. Unsurprisingly, the core results of the risk propensity variables are similar to those found with Model 2. Moreover, the democracy and autocracy variables are not statistically significant, which mirrors the polity score in my original model.

Standard Errors Clustered by Country (Model 9). Clustering standard errors is necessary when some observations in the data appear to relate to each other. Because panel data usually trace and code individual characteristics or aspects of socioeconomic background over time, they often raise the issue of clustered standard errors. As using panel data for a leader-focusing theme of this dissertation, I cluster standard errors by leaders. At the same time, I also run my logit model that clustering standard errors by country. The findings are not largely altered by that alternative insofar as the risk propensity variables are positive and statistically significant.

Allies (Model 10). Following literature arguing that security guarantees from superpowers decrease the pursuit of nuclear weapons, I control for superpower allies. However, one may wonder whether an alliance with non-superpowers that possess nuclear weapons has a similar effect. I therefore substitute the variable of superpower allies with the

allies variable. As shown in Model 10, the core findings related to my risk propensity variables and other control variables are consistent; unsurprisingly, however, the coefficient of that variable weakens and does not provide a statistically significant effect.

Exclude Poor States (Model 11). Fuhrmann and Horowitz (2015) have posted that poor states are arguably unlikely to pursue nuclear weapons due to their lack of technological capacity and natural resources. To test that argument, they further conducted a robustness check model by excluding countries[28] coded less than 675 in terms of GDP per capita and reported results similar to those from their original model. I follow their procedure and rerun my logistic model. As shown in Model 11, the findings are similar to Fuhrmann and Horowitz's.

Personalist Regimes (Model 12). Way and Weeks (2014) have argued that previous findings showing that regime type has little or no effect on the proliferation of nuclear weapons are inaccurate. In their article, they demonstrate that personalist regimes[29] are more likely to pursue nuclear weapons than other types of regimes. Because some may argue that leaders with high risk propensity are more likely to rise power in personalistic regimes, I additionally include Way and Weeks's personalistic regime variable in my model. As Model 12 indicates, variables of leaders' risk propensities remain strongly and positively associated

[28] For example, these countries include Afghanistan, Burkina Faso, Burundi, Cambodia, Ethiopia, Guinea-Bissau, Malawi, Mongolia, Myanmar, Republic of the Congo, Rwanda, Tanzania, and Uganda, etc.

[29] As noted in Chapter 2, Way and Weeks (2014) show some leaders in authoritarian regimes enjoy more power and have enormous personal discretion. In such regimes, called as "personalistic regimes," leaders have dominant power over military or political parties, if not both. The authors also emphasized that a personalist regime differs from in so-called "neo-patrimonial regime" in that the former may have a well-developed bureaucracy while the regime is dominated by a paramount leader (Hymans 2008; Montgomery 2013). According to their explanation, for example, Iraq under Saddam Hussein was a personalist regime but not a neo-patrimonial one.

with nuclear weapons pursuit. Interestingly, although Way and Weeks's personalistic regime variable is positively related to the pursuit of nuclear weapons, it is no longer statistically significant in my model.

Table 4.16 Logit Analysis of Nuclear Weapons Pursuit

	Model 4 Singh & Way	Model 5 Explore	Model 6 Rare Event Logit
Age	0.0386**	0.0539***	0.0419*
	(2.63)	(4.67)	(2.44)
Business/econ major	1.682*	1.729***	2.767**
	(2.41)	(4.29)	(2.66)
Socio economic	1.841**	2.294***	2.376***
	(3.15)	(5.05)	(4.58)
Int. experience	1.340***	0.705*	1.173**
	(3.65)	(2.18)	(2.98)
Military experience	1.581**	1.169**	1.804**
	(3.08)	(2.83)	(3.10)
Time	-2.115***	-3.388***	-2.120***
	(-7.97)	(-9.52)	(-6.69)
Time squared	0.153***	0.396***	0.139***
	(3.72)	(5.44)	(4.83)
Time cubed	-0.00301*	-0.0124***	-0.00245**
	(-2.20)	(-3.55)	(-3.07)
Irregular entry	-0.0937	-0.315	-0.214
	(-0.22)	(-0.84)	(-0.46)
Polity	-0.0376	0.00261	-0.0536
	(-1.23)	(0.11)	(-1.49)
Super alliance	-0.711*	-1.593***	-1.924***
	(-2.00)	(-4.16)	(-4.57)
NCA	0.313***	0.186***	0.344***
	(6.38)	(5.29)	(6.46)
GDP per cap (ln)	0.161	0.670***	0.282
	(0.83)	(3.65)	(1.42)
NPT	-1.447***	-2.110**	-0.847*
	(-4.37)	(-6.26)	(-2.33)
Eco openness	-0.00228	-0.0108*	-0.00493
	(-0.35)	(-2.29)	(-0.65)
Civil war	0.0157	-0.275	-0.177
	(0.04)	(-0.68)	(-0.37)
Interstate disputes	0.401***	0.428***	0.396***
	(4.16)	(4.88)	(4.06)
Rivalry	1.127**	0.626*	1.207**
	(3.06)	(2.06)	(3.26)
Constant	-9.259***	-11.18***	-11.70***
	(-4.94)	(-6.92)	(-5.08)
N	6614	6609	6609

t statistics in parentheses $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Table 4.17 Logit Analysis of Nuclear Weapons Pursuit

	Model7 Demo	Model 8 Auto	Model 9 CSEs	Model 10 Allies	Model 11 Excl. poor	Model 12 Personalist
Age	0.0410*	0.0406*	0.0419*	0.0411*	0.0380*	0.0455**
	(2.34)	(2.39)	(2.35)	(2.52)	(2.24)	(2.75)
Bus major	2.690*	2.901**	2.769**	2.595*	2.675**	6.006***
	(2.56)	(2.75)	(2.72)	(2.45)	(2.77)	(5.44)
Socio	2.500***	2.472***	2.376***	2.339***	2.323***	2.490***
	(4.96)	(4.75)	(4.44)	(4.54)	(4.42)	(5.01)
Int. exp	1.148**	1.145**	1.173**	1.211**	1.033*	1.235**
	(2.93)	(2.98)	(2.75)	(3.06)	(2.52)	(3.19)
Mil. exp	1.691**	2.021***	1.804***	1.711**	1.442*	1.965**
	(3.09)	(3.30)	(3.62)	(3.09)	(2.33)	(3.23)
Irregular	-0.219	-0.122	-0.214	-0.0427	-0.0342	-0.145
	(-0.49)	(-0.26)	(-0.42)	(-0.09)	(-0.07)	(-0.31)
Polity			-0.0536	-0.0574	-0.0722	
			(-1.19)	(-1.70)	(-1.98)	
S. allies	-1.961***	-1.911***	-1.924**		-1.573***	-1.901***
	(-4.49)	(-4.73)	(-2.90)		(-3.86)	(-4.67)
NCA	0.358***	0.338***	0.344***	0.293***	0.342***	0.339***
	(6.30)	(6.68)	(4.96)	(6.28)	(6.60)	(6.69)
GDP (ln)	0.296	0.214	0.282	0.0714	0.210	0.241
	(1.41)	(1.03)	(1.05)	(0.30)	(0.92)	(1.14)
NPT	-0.884*	-0.743	-0.847*	-0.568	-0.807*	-0.841*
	(-2.32)	(-1.93)	(-2.02)	(-1.59)	(-2.08)	(-2.26)
Eco open	-0.00525	-0.00609	-0.00493	-0.00302	-0.00326	-0.00453
	(-0.66)	(-0.75)	(-0.50)	(-0.05)	(-0.44)	(-0.57)
Civil war	-0.275	-0.195	-0.177	0.0776	-0.121	-0.128
	(-0.57)	(-0.40)	(-0.34)	(0.16)	(-0.26)	(-0.27)
Int. disput	0.402***	0.380***	0.396***	0.387***	0.646***	0.351***
	(4.18)	(4.10)	(3.63)	(3.35)	(3.80)	(3.82)
Rivalry	1.277***	1.279***	1.207**	1.402***	0.892*	1.226***
	(3.47)	(3.56)	(2.64)	(3.68)	(2.33)	(3.30)
Demo	-1.091					
	(-1.93)					
Auto		0.320				
		(0.70)				
Allies				-0.558		
				(-1.25)		
Personal						0.624
						(1.14)
Time	-2.122***	-2.129***	-2.120***	-2.167***	-2.075***	-2.076***
	(-6.77)	(-6.72)	(-7.18)	(-6.26)	(-7.09)	(-6.63)
Time sq	0.139***	0.140***	0.139***	0.141***	0.134***	0.135***
	(4.87)	(4.82)	(5.48)	(4.49)	(4.95)	(4.66)
Time cub	-0.00247**	-0.00248**	-0.00246**	-0.00251**	-0.00235**	-0.00240**
	(-3.08)	(-3.03)	(-3.32)	(-2.94)	(-3.14)	(-2.93)
Constant	-11.31***	-11.48***	-11.70***	-10.32***	-10.86***	-15.14***
	(-4.78)	(-4.93)	(-4.67)	(-4.21)	(-4.36)	(-6.30)
N	6609	6609	6609	6620	6335	6652

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.4.2 Quadratic Effect of Age

As Table 4.18 shows, 43 leaders pursued nuclear weapons from 1945 to 2000. To investigate possible extreme cases among those leaders, I rerun my logistic regression model by excluding each of those 43 leaders, one at a time. For example, I first exclude Ernest Geisel in the model and estimate the logistic regression. Next, I reinsert Ernest Geisel into the model and exclude João Figueiredo and run the logistic regression. That procedure is repeated until it reaches the 43rd leader. Especially for age, my findings are largely similar to Model 2's except for the deletion of Kim Il-Sung; the variable of age is no longer statistically significant when Kim is excluded.

Table 4.18 Leaders and Nuclear Weapons Pursuit, 1945 – 2000

Country	Leader	Pursuit Years
Brazil	Ernesto Geisel	1975–79
	João Figueiredo	1979–85
	José Sarney	1985–90
China	Mao Zedong	1956–64
France	Pierre Mendes France	1954–55
	Edgar Faure	1955–56
	Guy Mollet	1956–57
	Maurice Bourges-Maunory	1957
	Felix Gaillard	1957–58
	Pierre Pflimin	1958
	Charles de Gaulle	1958–60
India	Lal Bahadur Shastri	1964–66
	Gulzari Lal Nanda	1966
	Indira Gandhi	1966,1972–75,1980–84
	Rajiv Gandhi	1984–87
Iran	Ruhollah Khomeini	1989
	Ali Khamenei	1989

	Akbar Hashemi Rafsanjani	1989–97
	Mohammad Khatami	1997–2000
Iraq	Ahmed Hassan Al-Bakr	1976–79
	Saddam Hussein	1979–91
Israel	David Ben Gurion	1955–63
	Levi Eshkol	1963–67
Libya	Muammar Qaddafi	1970–2000
North Korea	Kim Il-Sung	1980–1994
	Kim Jong-Il	1994–2000
Pakistan	Zulfikar Ali Bhutto	1972–77
	Muhammad Zia	1977–87
Russia	Josef Stalin	1945–49
South Africa	John Vorster	1974–78
	P. W. Botha	1978–79
South Korea	Park Chung-hee	1970–75
Yugoslavia	Josip Broz Tito	1953–62
	Petar Stambolic	1982–83
	Mika Spiljak	1983–84
	Veselin Djuranovic	1984–85
	Radovan Vlajkovic	1985–86
	Sinan Hasani	1986–87
	Lazar Mojsov	1987
United Kingdom	Winston Churchill	1945, 1951–52
	Clement Atlee	1945–51
United States	Franklin D. Roosevelt	1945
	Harry S. Truman	1945

Given that result, one may wonder whether the effect of age has a non-linear relationship with the pursuit of nuclear weapons. For instance, the effect of age could be negative until, for instance, the age of 50, but positive thereafter. Conversely, the effect of age could be positive up until the age of 50, and then negative thereafter. I therefore include a term of age squared in my logistic model, which allows discerning the effect of different age more accurately.

Table 4.19 shows the results. It is important to note that, in a quadratic model, the statistical significance of the linear and quadratic terms by themselves is meaningless and should never be interpreted in isolation only. The joint significance of both coefficients is meaningful for interpreting the model. The results reveal that the joint term of coefficients is not statistically significant.

Table 4.19 Quadratic Model

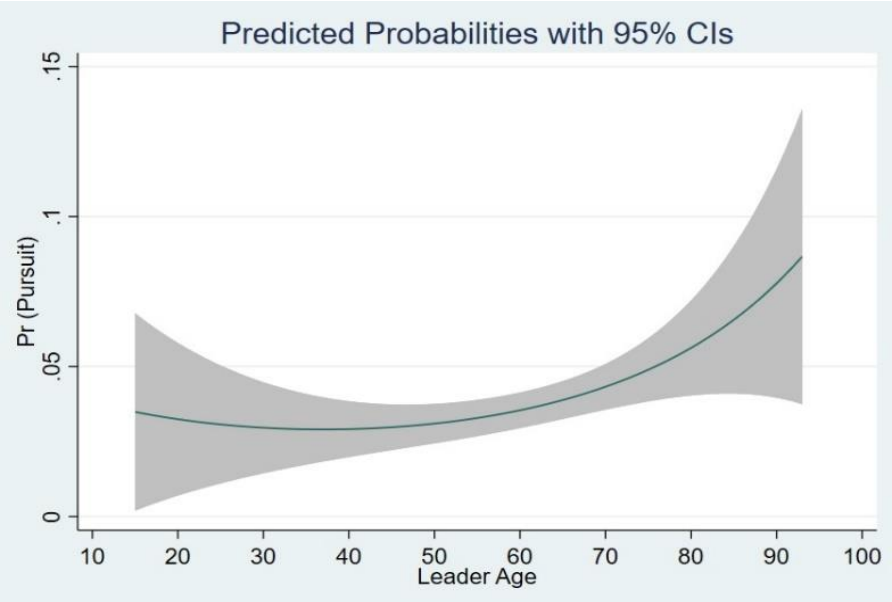
	Model 13 Age squared
Age	-0.0216
	(-0.23)
Age squared	0.000569
	(0.73)
Business/econ major	2.853**
	(2.63)
Socioeconomic	2.373***
	(4.80)
Int. experience	1.151**
	(2.99)
Military experience	1.837**
	(3.11)
(*output omitted*)	
N	6608

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The sign of the quadratic coefficient indicates whether the data show an upright or upside-down U-relationship, while its magnitude indicates the width and flatness of the parabola. More specifically, when the coefficient for the squared term is positive, the relationship is convex (i.e., U-shaped); by contrast, when the coefficient is negative, the relationship is concave (i.e., inverted U-shaped). As shown in Table 4.19, the coefficient of age squared is positive, which suggests that the relationship between squared age and

nuclear weapons pursuit is U-shaped. Because visualizing that relationship is useful, I plot Figure 4.6 to display a graph of the prediction that suggests the actual functional relationship.

Figure 4.6 Quadratic Model



Thus far, although the quadratic model provides a slight U-shaped pattern, it is not a remarkable change. In addition, the joint significance of the coefficients of age and age squared is not meaningful. I therefore conclude that it would be better to ignore that variation and exclude the quadratic term in the model.

4.5 Conclusion

Chapter 4 empirically fills a lacuna in literature on the proliferation of nuclear weapons in international studies by focusing on individual leaders. Borrowing from literature in

psychology and business management, I first show seven individual characteristics that are mostly associated with a leader's risk propensity. Next, I conduct a multicollinearity test to examine whether those seven variables are correlated and further perform a factor analysis. As the result of factor analysis, I find that the most succinct, accurate index of risk propensity comprises five variables: age, business/econ major, socioeconomic background, international experience, and military experience.

Seeking to demonstrate my argument that leaders with a high propensity toward risk are more likely to pursue nuclear weapons, I use a newly created dataset on leaders built with LEAD and Archigo data. The data analyses applying logistic regression models reveal considerable support for my argument. In addition, I present alternative models for robustness checks, all of which consistently reveal the strong, substantive effects of my variables for risk propensity.

Regardless of the comprehensive results of quantitative analyses discussed in this empirical chapter, they cannot explain the causal inference of each case. Therefore, in the following two chapters, I conduct case studies on several leaders to fully examine the relationship between leaders' risk propensity and their decision to pursue nuclear weapons.

CHAPTER 5

Nuclear Proliferation in South Korea

5.1 Introduction

A significant number of studies on South Korea's pursuit of nuclear weapons argue that President Park Chung-hee pursued nuclear weapons in the 1970s due to increasing uncertainty about the U.S. security commitment to South Korea. However, South Korean President Rhee Syngman, who served from 1948 to 1960, made quite a different decision with respect to nuclear proliferation in similar security circumstances. Why did Park pursue nuclear weapons, while in similar situations, Rhee did not? Unfortunately, the explanation of security concerns is not adequate to sufficiently explain the pursuit of nuclear weapons in South Korea. In line with the theory of this dissertation in which individual leaders play a crucial role in shaping international relations, particularly concerning nuclear weapons proliferation, this chapter specifically examines the pursuit of nuclear weapons in South Korea, focusing on Presidents Rhee Syngman and Park Chung-hee. Using the method of correlational and historical explanation, not only does this chapter analyze these leaders' characteristics, specifically their risk propensities, but it also investigates alternative variables such as GDP, polity level, superpower alliance, and interstate disputes.

Chapter 5 is organized as follows. Section 5.2 presents a general discussion of security characteristics under Rhee and Park. Sections 5.3 and 5.4 thoroughly investigate the two leaders' five risk propensity variables and their decisions to deal with nuclear proliferation

in the historical context of increasing uncertainty as to the security environment in the Korean peninsula. Finally, Section 5.5 concludes.

5.2 South Korea and Nuclear Proliferation

South Korea began pursuing nuclear weapons and medium-range surface-to-surface missiles in the early 1970s under President Park Chung-hee, continuing these efforts until Park was assassinated on October 26, 1979. Early scholars believed that Park suspended the nuclear weapons program in late December 1976 under pressure from the US, but the declassified CIA document, *South Korea: Nuclear Developments and Strategic Decision Making*, released in 2005, revealed that this proliferating activity continued after 1976. Although there is little consensus as to the year of nuclear reversal in South Korea, it has been widely argued in existing literature that South Korea pursued nuclear weapons during the 1970s, and the program was tightly controlled by President Park.[30]

Most of the existing scholarship on South Korea's pursuit of nuclear weapons agrees that the Park administration initiated its nuclear program due to a security concern about the U.S. commitment to South Korea (Hymans, Kim, and Riecke 2001; Jang 2016; Kim 2001). The supporters of the security model believe that endless provocations from North Korea, reductions of American troops, and the uncertainty of U.S. commitment to helping South

[30] Some studies argue that after Park's assassination in 1979, the Chun Doo-hwan administration froze the nuclear weapons program and downsized the missile program immediately after Chun was inaugurated in 1980 (Hayes 2011; Hong 2011; Jang 2016). However, several newspapers assert that President Chun secretly conducted chemical uranium enrichment from 1979 to 1981. Chun finally agreed to abandon the nuclear weapons program during a meeting with U.S. President Ronald Reagan in Seoul in November 1983 in an attempt to obtain recognition of his presidential legitimacy.

Korea are the primary reasons that President Park Chung-hee developed a nuclear weapons program.

Other studies argue that increasing nationalism within the Park administration and Park's patriotic personality were important drivers that led to the initiation of South Korea's nuclear weapons program (Kim 2001).[31]

Empirical variation among South Korean leaders, however, cannot be explained by existing models. For example, most literature argues that Park Chung-hee sought to develop nuclear weapons in the 1970s in response to a U.S. plan to withdraw its troops from South Korea. Park was worried that, after the withdrawal of U.S. troops, South Korea would not be able to match the superior military capability of North Korea. Park believed that Kim Il-sung would never give up his ambition to become a nuclear power and would invade South Korea in order to rule all of the Korean peninsula. Therefore, nationalist Park Chung-hee emphasized "self-reliance" in defending South Korea and ultimately decided to develop nuclear weapons.

However, interestingly, Rhee Syngman, the first president of South Korea from 1948 to 1960, took a different path in a similar situation. Although U.S. President Dwight Eisenhower proposed a withdrawal or reduction of American forces in South Korea in order to cut the military budgets during his presidency, Rhee did not seek to develop nuclear weapons. Instead, after numerous negotiations between Seoul and Washington, Eisenhower agreed to deploy 600–700 tactical nuclear weapons in South Korea and promised to

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Accordingly, President Chun dismissed over 800 researchers at ADD (The Agency for Defense Development) by 1982 (*Shindonga* 2004; *Yonhap News* 2017).

[31] Hymans (2006) demonstrated that oppositional nationalist leaders, who are infused with nationalism against enemies, are more likely to pursue nuclear weapons than are leaders who do not have these characteristics.

modernize South Korean military forces. Moreover, President Rhee was considered one of the most ardent nationalists in opposing communism.

Presidents Park and Rhee shared similar characteristics and both ruled the country when it faced significant threats from North Korea and uncertain commitments from the US; however, Park and Rhee found completely different solutions in addressing the proliferation of nuclear weapons. Therefore, important questions arise: If the security model is appropriate to analyze South Korea's pursuit of nuclear weapons, why did President Park pursue nuclear weapons whereas President Rhee in a similar security situation did not? If the nationalism hypothesis is suitable for explaining South Korea's nuclear proliferation, why did the two leaders, both considered ardent nationalists, take different paths in dealing with nuclear weapons development? This chapter seeks to answer these questions and expand upon the quantitative findings in Chapter 4.

5.3 Rhee Syngman

Rhee Syngman served as the first president of South Korea from 1948 to 1960. During this period, South Korea faced a number of security problems. The US proposed to withdraw or reduce its troops in South Korea, and there were ongoing and continuous provocations from North Korea, where the Chinese army was stationed to support the country. Section 5.3 examines the demographic characteristics and the security environment in Rhee's era in order to fully understand South Korea's nuclear proliferation.

5.3.1 Rhee's Risk Propensity

Age and *Socioeconomic Backgrounds*. Rhee Syngman was born in Pyongsan County, Hwanghae Province, on March 26, 1875.[32] His father, Rhee Kyong-son (1833–1912), was a descendant of the royal family of the Joseon Dynasty, while his mother, Kim Si-o (1833–1896), was the only daughter of Kim Chang-un, a prestigious provincial teacher.[33] Rhee Syngman was the youngest child among three sons and two daughters in the family, but his two older brothers died before he was born. This made him the sixth-generation only son in his paternal family line. Thus, Rhee was especially valued and was raised with much care and joy (Oliver 1955; Rhee Syngman Hakdang 2017; Ri 1987).

Rhee Kyong-son, Rhee's father, was a gentleman of the Confucian *Yangban* class.[34] He grew up in a wealthy family and was well educated. Although he lost a majority of his money long before he married, he always wore the formal gowns of the scholar and behaved with dignity. His neighbors described him as "a fine-looking, warm-hearted, [and] generous man" (Oliver 1955, 3). Rhee Kyong-son always reminded his little boy to treasure their ancestral books and to recite genealogies. More importantly, following the Confucian code of behavior, he emphasized courtesy, dignity, and rigidity in all manner of relationships and situations. Obviously, Rhee Syngman was raised to have a sense of noblesse oblige (Lew 2014; Oliver 1955).

Syngman's mother was a well-educated woman, which was extremely rare in her generation. She was little Rhee's closest friend throughout his childhood, and she personally

[32] Hwanghae Province is located in the northwest of Korea. It is now part of North Korea.

[33] The Joseon Dynasty, also transcribed as Chosun, was founded in 1392 and lasted until 1897.

[34] In the Joseon Dynasty, there were five social classes: (1) *Yangban* (aristocrats); (2) *Jungin* (middle class); (3) *Sangmin* (commoners); (4) *Cheonmin* (vulgar commoners); and (5) *Nobi* (slaves). The *Yangban* class was considered the highest social class during the Joseon Dynasty.

taught him *The Thousand Classics*, classical Chinese poetry (Ahn 2011). This strong maternal bond shaped Rhee's genuine personality and improved his emotional stability. His lifelong love of reading came from his mother. For example, she read a great deal of poetry to him in his early childhood (Ahn 2011; Oliver 1955). She was enthusiastic towards Rhee's education in that she persuaded Rhee Kyong-son to move to Seoul for a better educational environment in 1877 when Rhee was two years old (Lew 2014). Rhee Syngman recalled his early childhood as not being a wealthy one, but considering his description of the family, it is reasonable to assume that they were a middle-income household. Specifically, his house had one reception room that belonged to Rhee's father, and there he invited male friends for small parties (Rhee Syngman Archives 2017; Rhee Syngman Institute 2019).

Rhee's mother wanted Rhee Syngman to pass the civil service examination (*Kwago* in Korean), so she sent him to a traditional village school (*Sodang* in Korean) for almost 10 years. While attending *Sodang*, Rhee read almost all of the classical Chinese texts on Confucianism and improved his writing skills (Ahn 2011). Rhee always won first place in the exam at school. However, he was unfortunate with civil service examinations, and failed them several times. The situation became even more unpleasant for Rhee when he heard that the civil service examinations would no longer continue in 1894 as part of the Gabo Reforms.[35]

Therefore, Rhee stopped studying at *Sodang* and enrolled in the Paejae School on April 2, 1895. The school was founded in 1885 by the American Methodist missionary Henry Appenzeller a Christian mission, and Rhee had to attend chapel every morning (Oliver, 1955). Although he agreed to study the tenets of Protestant Christianity, his main reason for attending the school was academic.

Appenzeller, founder and one of the faculty members, encouraged Rhee to start a school newspaper in English in order to aid him and help improve his English at the same time. Rhee became the chief editorial writer, and Appenzeller edited all of his papers and corrected the English. During the time Rhee worked as chief editor, his English improved dramatically, and he became fluent in speaking, reading, and writing by the time he graduated from the school on July 8, 1898. (Lew 2014; Oliver 1955; Rhee Syngman Institute 2019).

Rebel Experience. The most significant learning experience Rhee had at the Paejae was learning about western-style democracy. Besides religion, the missionaries taught students about democracy, noting how the system vested power in the people and allowed the people to elect their own leaders. To Koreans, the democratic political system seemed imaginative, because Korea was still ruled by a king in the 1890s. However, Rhee was open to learning new ideologies (Ahn 2011; Oliver 1955; 1962).

Therefore, it was reasonable for him to assist in the foundation of newspapers, including *Maeil sinmun* and *Cheguk sinmun*, to educate Koreans and inform them about western-style democracy. These papers often criticized the reign of King Gojong and introduced a modern independent state on the opposite side of the world. The Independence Club, founded by Philip Jaisohon, was at the center of issuing these newspapers (Ahn 2011; Lew 2014; Rhee Syngman Institute 2019).

However, the Independence Club and its members, including Rhee, were falsely accused by the conservatives, who were loyal to King Gojong and thus opposed to the idea of a new,

[35] The Gobo Reform took place from 1894 to 1896 for pursuing modernization during the reign of King Gojong of Korea.

modern state.[36] At this time, Rhee was arrested on charges that he had agitated the Koreans by organizing anti-government protests through the newspapers with which he was deeply involved (Rhee Syngman Institute 2019). It is worth noting that his involvement in rebellious activities was far from a military rebellion to overthrow Emperor Gojong. Instead, having had no military experience, Rhee hoped to reform the country through "the power of the pen" rather than "the sword."

Rhee Syngman was incarcerated on January 9, 1899, and was held until 1904. While in prison, his American missionary friends often visited him and provided books and magazines to satisfy his desire for intellectual growth. At the same time, they pleaded Rhee's innocence and requested that the Korean government release him immediately (Lew 2014; Rhee Syngman Institute 2019).

Interestingly, while imprisoned Rhee opened a prison school and a library with more than 500 books and journals donated by American missionaries, and he devoted himself to educating his fellow inmates; he taught English, history, and mathematics to 13 children and 40 adults in prison (Lew 2020). In addition to teaching, he spent his time composing 142 poems in classical Chinese, which were published after his resignation from the presidency in 1961. Rather than wallowing in self-pity, Rhee actively and peacefully endured life in prison. In 1904, as a result of the Russo-Japanese war, most political prisoners, including Rhee, were offered amnesty.

International Experience and *Major in College*. On November 4, 1904, after being released from the prison, Rhee left home to continue his education in the US. He was fluent in English and had almost 20 letters of recommendation from renowned missionaries in

[36] The conservatives disclosed a fabricated document in which the Independence Club and its members had planned to overthrow King Gojong and establish a republican government with an elected president.

Korea, such as Dalziel A. Bunker, James S. Gail, and Horace G. Underwood. Thus, he had no problem enrolling in George Washington University (GWU).[37] After meeting with President Charles W. Needham of GWU, Rhee was allowed to register as a junior, having received credit for his study at the Paejae School. In addition, Needham helped him receive a pastoral scholarship that covered his tuition. This was possible because Rhee had expressed that he would become a minister (Lew 2014; Rhee Syngman Archives 2017).

While attending GWU as an undergraduate student, Rhee visited many churches across the US, delivering speeches and lectures on topics related to Korea. He presented more than 100 lectures, allowing him to interact with Americans of different backgrounds, races, and political views (Ahn 2011). The more lectures he delivered, the more open, friendly, and sociable he became. However, due to his frequent lecture trips, his academic performance was not great; his transcripts show that Rhee studied English, history, Greek, math, philosophy, and semantics, and he received on average B grades (Ahn 2011; Oliver 1955; Rhee Syngman Archives 2017). After spending two years at GWU, he received his BA on June 5, 1907, at the age of 32.

Immediately after graduating from GWU, Rhee applied to the Graduate School of Arts and Sciences at Harvard University. He began studying at Harvard in the fall of 1907 in pursuit of a PhD, but he ended up with a master's degree.[38] He wanted to receive a PhD in

[37] Rhee enrolled in Columbian College of Arts and Science. His reason for attending GWU was well explained in the *George Washington University Alumni Review*, published in November 1954. He said that "at the time, George Washington was the only university in Washington which had set up a program to accommodate students who were working in the government, and it was this fact that enabled me to enroll. Another reason was the fact that I already had become in my country a fervent admirer of George Washington, the father of American independence. I was also working for the independence of Korea, and George Washington seemed the perfect school for me" (Rhee 1954, 2).

[38] Rhee received his MA degree from Harvard in 1910, the same year he received his PhD from Princeton University. This was because his grades were not sufficient to graduate from Harvard, so the school asked him to re-take an American history class and obtain a

two years, but he later realized that it would be difficult for him to obtain that degree from Harvard as he had planned.[39] Thus, he began to search for another university through which to achieve his ambitious two-year plan. Having decided to finish studying at Harvard with only an MA degree, he took various courses to fulfill his intellectual curiosity. These courses included the following: American History, Diplomacy, Economics, European Industry and Commerce in the Nineteenth Century, History of Continental Europe From the Peace of Utrecht to the Fall of Napoleon, International Law, and Studies in the Expansion of Europe Since 1815 (Lew 2014; Rhee Syngman Institute 2019). It is important to note that he took an economics class even though it was not required of him to receive an MA in history.

After receiving various advice, Rhee applied to Princeton University for his PhD studies and, at the same time, visited the school and met with Andrew F. West, dean of the graduate school. During the meeting, he told West that his desire to complete a doctoral degree in two years was dictated by nationalistic concerns. He immediately added that a number of Koreans were waiting for him to come back to perform as a Christian educator, reformer, and political activist with a PhD from a highly prominent institutions such as Princeton. In response, the graduate division guaranteed Rhee a doctoral degree within two years and offered him a free dormitory room while he attended Princeton (Lew 2014; Rhee Syngman Institute 2019). It was Rhee's first great achievement in negotiating with Americans.

During his time at Princeton, Rhee became acquainted with Woodrow Wilson the then university president who went on to become the 28th president of the US and was often invited to Wilson's family dinners. Whenever Wilson had a chance to introduce Rhee to his other guests, he referred to him as "the young man who will redeem Korean independence"

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grade of B or above. While studying at Princeton for his PhD, he attended summer school at Harvard in 1909 and fulfilled the requirement to receive an MA degree (Rhee Syngman Archive 2017).

(Oliver 1962, 117). Having a social personality, Rhee cultivated close relationships with many other renowned people he met through Wilson. Rhee's genuine trait is well described by his close friend, Robert Oliver, who served as his personal ambassador in Washington: "The warmth of his personality, the vividness of his imagination, and the unselfish consecration of his life to the cause of his people combined to make him a very attractive person" (Oliver 1962, 120).

At Princeton, Rhee majored in political science with an emphasis on international affairs. Rhee took International Law and Diplomacy, American History to the Fall of the Federalist Party, and History of Philosophy. He wrote his dissertation, *Neutrality as Influenced by the United States*, and received his PhD in 1910, as he had planned. Upon finishing his PhD, Rhee returned to Korea in the fall of that year.

5.3.2 Security Environment and Rhee's Role

After a second atomic bomb was dropped on Nagasaki on August 8, 1945, Japan surrendered to Soviet and U.S. forces, who subsequently occupied northern and southern Korea, respectively, and Korea was divided by the artificial border of the 38th parallel. Although 30 years of Japanese colonial rule over Korea ended on August 15, 1945, Korea was not ready for a transition to nation building. The temporary 38th parallel not only divided American and Soviet troops; it also separated the people in Korea with competing political ideologies. Thus, the temporary boundary became permanent, and two separate governments in Pyongyang and Seoul were established. In Seoul, the Republic of Korea (ROK), also known as South Korea, was established, and the National Assembly chose Rhee Syngman as its first president on August 15, 1948. Three weeks later, the Democratic

[39] It seemingly was possible to receive a PhD in two years at GWU.

People's Republic of Korea (DPRK) was established in the communist North under the rule of Kim Il-sung (Chung 1963; Kim 1970).

The US unilaterally announced the withdrawal of its military forces just a month after Rhee took office. Indeed, the US withdrew 45,000 troops from South Korea in June 1949 because it did not consider Korea to have important strategic value at that time. In contrast, the Soviet Union outwardly withdrew its troops from North Korea, but more military weapons were flown into Pyongyang. Furthermore, having accepted Kim Il-sung's request to return Korean troops in the Chinese People's Liberation Army to North Korea, Chinese leader Mao Zedong sent two Korean divisions with their equipment to the North Korean Army in 1949. Later in January 1950, Mao returned an additional 14,000 Korean soldiers with military weapons to North Korea. Thus, more than 30,000 ethnically Korean soldiers from the Chinese People's Liberation Army with abundant combat experience were reorganized into the North Korean Army (Ahn 2011). During this time, North Korea's military capabilities were superior to those of the South, and this military discrepancy continued throughout Rhee's era. Tables 5.1 and 5.2 present a comparison of military capabilities between South Korea and North Korea in the late 1940s.

North Korean leader Kim Il-sung was determined to reunite the two Koreas, and appealed to his allies for their support. Despite North Korea's superior military forces, Stalin did not approve North Korea's plan to invade South Korea when Kim visited Moscow in 1949. However, the situation changed dramatically on January 12, 1950, when U.S. Secretary of State Dean Acheson under President Harry Truman announced that Korea was excluded from the U.S. defense line in Asia (Smith 1972). The so-called Acheson Line reignited Kim Il-sung's ambition to invade South Korea. At this time, Kim received a green light from Stalin as well as from Mao Zedong. Moreover, Mao promised to send Chinese

forces if the US entered the war (Ahn 2011). Kim was ready to liberate South Korea and to unify the Korean peninsula as he had two strong allies: the Soviet Union, which possessed nuclear weapons, and China.

Table 5.1 Comparison of Military Troops

	South Korea	North Korea
Army	96,140	191,680
Navy	6,956	4,700
Air Force	1,897	2,000
Total	105,752	198,380

Source: Institute for Military History, ROK Ministry of National Defense

Table 5.2 Comparison of Military Equipment

	South Korea	North Korea
Army	91 Howitzer 140 Anti-Tank Artillery 960 Mortar 27 Armored Personnel Carrier 0 Tank	552 Howitzer 550 Anti-Tank Artillery 1,728 Mortar 54 Armored Personnel Carrier 242 Tank
Navy	28 Patrol Boat 5 Others	30 Patrol Boat 80 Others
Air Force	22 Liaison Aircraft	211 Combat Aircraft/Fighter Bomber

Source: Institute for Military History, ROK Ministry of National Defense

The Korean War began at dawn on June 25, 1950, when the North Korean Army crossed the 38th parallel. President Rhee immediately asked for the introduction of U.S. troops into

Korea because that would mean UN member nations would assist South Korea as well (Ahn 2011; Howard, 1986). The North Korean Army swiftly overran Seoul only four days after the war was initiated, and in turn the Rhee government had to retreat, moving farther South toward Busan (the city located on the southeastern tip of South Korea). Although the US did not have any treaty-based obligation to help South Korea, President Truman finally approved the dispatch of American troops to Korea on June 30.

After a successful landing operation at Inchon led by Commander-in-Chief of the UN Command (CINCUNC) General Douglas MacArthur on September 15, the situation suddenly reversed. The issue for Rhee and MacArthur was no longer to retake Seoul and return to the pre-war status, but whether they should cross the 38th parallel and liberate North Korea, that is, so-called *Pukjin Tongil* (going northward to liberate communist North Korea for unification). Thus, President Rhee wrote a letter to President Truman emphasizing the necessity to go beyond the 38th parallel: "There is no longer any reason whatsoever for the 38th parallel to be maintained now that the North has violated the line. Therefore, it is not at all possible for us to return to the status before the war" (Rhee 1950). Truman positively responded to the letter at a press conference on September 1, saying, "Going beyond the 38th parallel is up to the UN" (Truman 1950).

However, the decision to cross the 38th parallel changed again when the communist Chinese army entered the war in support of North Korea in October. Sharing Rhee's concerns, MacArthur asked Truman to drop the atomic bomb on sanctuaries in Manchuria to destroy China's industrial capacity and block the Chinese coast. But Truman disapproved the use of nuclear weapons and even refused to go beyond the 38th parallel to unify Korea at that time (Truman 1950). The Korean War bogged down into a military stalemate.

At last, the Soviet Union proposed a ceasefire on June 23, 1951, and several armistice negotiations between U.S. representative to the UN George Kennan and Jacob Malik of the Soviet took place at Kaesong (Kennan 1972; Vatcher 1958). Because Rhee transferred the wartime operational control of Korean military forces to CINCUNC General MacArthur, South Korea was not invited to the armistice talks. In fact, South Koreans overwhelmingly supported going beyond the 38th parallel to unify Korea, and they opposed any armistice. Therefore, Rhee emphasized that his opposition to the truce should be considered to be representative of the Korean national will. It is important to note that even his political opponents supported Rhee's defiant stand on the armistice (Kim 1999).

The armistice negotiations to end the Korean War entered another phase when Dwight Eisenhower was elected 34th president of the United States in November 1952, and Stalin died of a heart attack in March 1953. Although South Korea did not abandon *Pukjin Tongil*, the Rhee administration modified its stance on the armistice and proposed five conditions for an acceptable armistice: (1) withdrawal of Chinese communists from North Korea; (2) a mutual defense treaty between South Korea and the US; (3) long-term economic support from the US with an initial $200 million grant; (4) modernization of the Korean military forces; and (5) regular high-level talks between South Korea and the US.[40] Moreover, Rhee demanded full assurance of a mutual defense treaty prior to the armistice.

Washington's reaction to Rhee's proposal was negative. In particular, Eisenhower was reluctant to offer a bilateral defense treaty between the US and South Korea. He instead offered Rhee a presidential declaration of economic and military assistance and the enlargement of Korean forces up to 20 divisions (Smith 1953). However, Rhee reiterated

[40] For more information, please see the conversation between Rhee and U.S. Assistant Secretary of State for Far Eastern Affairs Walter Robertson, June 29, 1953. Folder: Korea-Armistice Matters, March—December 1953 (5), Box 9 Subject Series, JFDP.

that without a full assurance of military defense and the modernization of Korean forces, he would continue to oppose the armistice and would cross the 38th parallel to liberate North Korea without the US forces. Interestingly, Rhee knew that South Korea's unilateral attempt to pursue unification by military force against militarily superior North Korea and its allies would be futile.

Later, during a meeting with Vice President Richard Nixon in Seoul in the fall of 1953, directly after the armistice was signed, Rhee admitted to Nixon that "in my heart I know that Korea cannot possibly act alone. We must act together with America" (Ambrose 1987, 323). In addition, he claimed that the *Pukjin Tongil* slogan was to "keep the Communist guessing, that it was good for the US and the free world that the Communists thought [I] was a madman out of control, that [my] unpredictability was a positive asset that tied down enemy troops" (Ambrose 1987, 323). This story shows that Rhee had a relatively lower level of risk propensity so he neither underestimated the cost nor overestimated the benefit.

Rhee also knew that the US would not give up on Korea and withdraw its troops at this stage after three years of bloody war because it would damage the U.S. prestige. This is well described by Eisenhower's own words: "The withdrawal of U.S. troops in Korea was tantamount to a surrender to the Chinese, handing them on a silver platter everything for which they had been fighting for three years" (Eisenhower 1963, 186).

Importantly, Rhee had the power to disrupt the armistice by ordering Korean military forces to go beyond the 38th parallel, regardless of the war outcome. A Special Estimate (SE-48) reported that South Korea had the capability to launch an all-out attack for three days, and the Korean army, police, and para-military groups had capabilities to engage in covert operations (Special Estimate, 1953).

Taken together, the *Pukjin Tongil* slogan was Rhee's calculated bargaining strategy. Rhee was not a person who easily took risks. Although the US understood that the image of unpredictability was thoroughly designed by Rhee, the US as well as the communists were uncertain about his true intentions. Therefore, Eisenhower finally promised Rhee a military defense treaty in order to proceed with the armistice. Accordingly, Rhee backed down on his *Pukjin Tongil* plan and nearly all of his demands, including the withdrawal of Chinese forces from Korea. The Korean armistice at last took effect on July 27, 1953; the Mutual Defense Treaty between the US and South Korea was initially signed on August 8, 1953, and it went into effect on October 1, 1953. Up to the present, the US has had wartime operational control over South Korean military forces ever since Rhee transferred it to the US during the Korean War.

The results of the Korean War were devastating. Approximately three million lives were lost during three years of war on the Korean peninsula. More than 17,000 South Korean industrial plants, 60,000 houses, and 4,000 schools were destroyed. Similarly, North Korea lost 8,700 industrial facilities, 600,000 houses, and 5,000 schools (Koh 1993). Both South and North Korea experienced negative economic situations after the war. Figure 5.1 shows polity, economic openness, and GDP level in South Korea during the Rhee era.

Directly after the war, Eisenhower asked the US Congress for $200 million to help South Korea. He also proposed increasing South Korean military forces by at least four more divisions, and he promised to provide additional aid through the Mutual Security Act. Moreover, he envisioned the rehabilitation of South Korea using United States Forces Korea (USFK). However, President Rhee, who holds a PhD in international relations from Princeton University, was worried about abandonment by the US amid the anarchic international system (The Secretary of State 1953). Therefore, outwardly, he never fully

gave up the *Pukjin Tongil* slogan to receive attention from the US raise his bargaining position (Kim 1999).

In order to solve the dilemma of abandonment, Rhee offered to deploy one division of Korean military forces to Indochina to relieve French forces in January 1954.[41] However, Eisenhower rejected his offer because he thought that the deployment of Korean troops to Laos would not be accepted by the American public while U.S. troops were still in Korea. In addition, Washington acknowledged that Rhee's offer was intended to obtain additional commitments from the US (NSC Meeting, 1954).

In a long-term plan, Rhee considered developing nuclear weapons in the event aid from the US was cut off. The presidential record shows that Rhee once asked his advisors whether South Korea had the capability to develop the atomic bomb (*Korea Energy Newspaper* 2013). However, Rhee did not seek to pursue nuclear weapons, because he continued to receive aid from the US. Rather, he began a basic nuclear research center in 1954 to secure South Korea's nuclear fuel cycle and made continuous efforts (Diamoia 2010; Yoon 2003).[42]

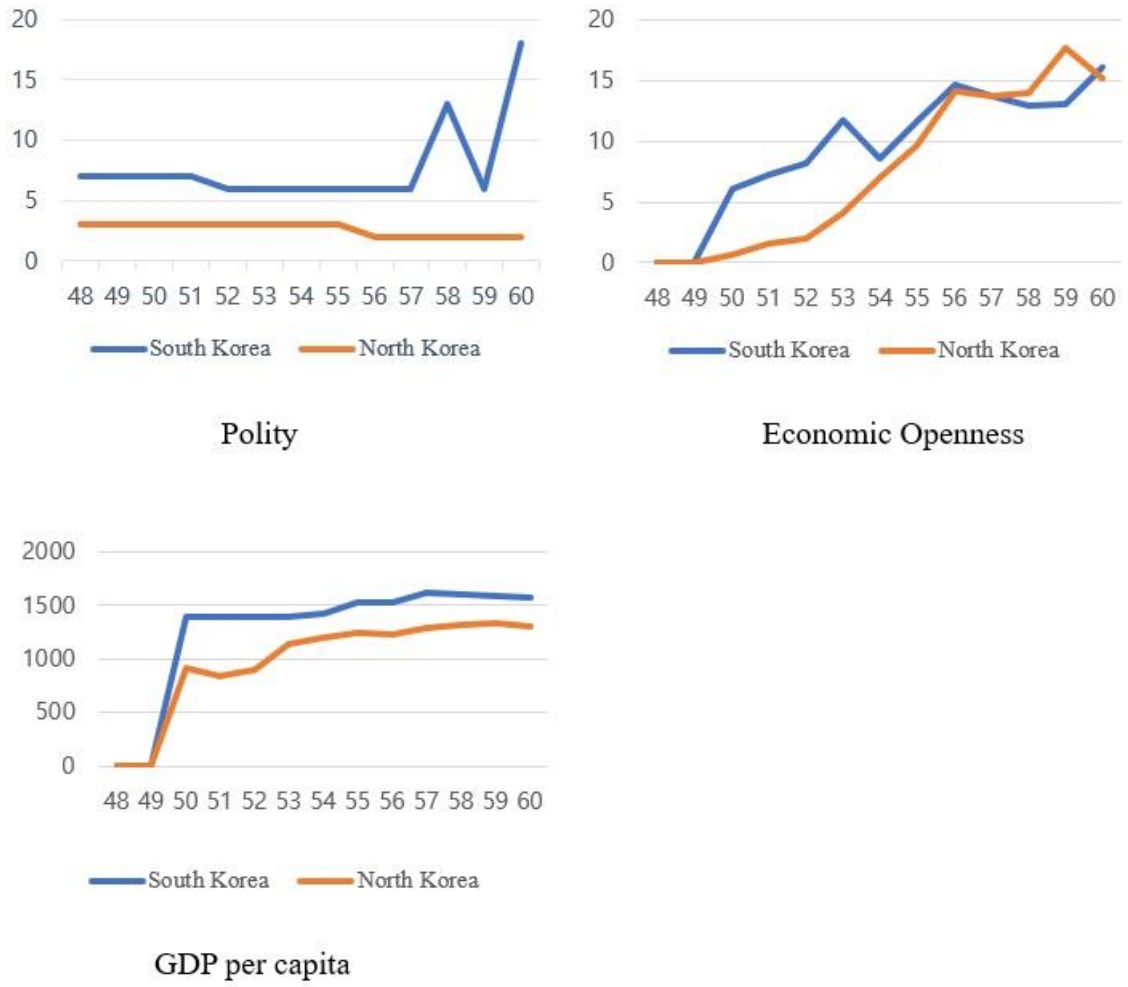
Rhee was not a reckless risk-taking leader but rather a calculating leader who tried to balance the cost and benefit of possible outcomes. This aspect of his personality was on display at a cabinet meeting on February 2, 1960. Rhee said, "The US is aiding us to deter communism, but this will not continue forever. In order to become self-reliant in the future,

[41] The Indochina War began on December 19, 1946 and lasted until July 20, 1954. It was initiated by the French as they did not recognize the independence of Vietnam. French forces were supported by the US, while Vietnam was supported by communist countries, such as the Soviet Union, China, East Germany, and Poland.

[42] He further established the Atomic Energy Research Institute (AERI) in March 1959.

we need to develop nuclear power even if it requires us to spend some money. However, try to find a way to balance defense and economy" (Cho 2011, 1).

Figure 5.1 Polity, Economic Openness, and GDP



In the middle of the 1950s, the Eisenhower administration issued the New Look Doctrine to reduce the U.S. budget deficit, which had increased due to three years of the

Korean War. In addition, Eisenhower initiated the Atoms for Peace movement, which allows the sharing of nuclear technology for peaceful purposes with allies. In particular, as part of this policy he reconsidered foreign aid to South Korea as the country was one of the largest recipients of U.S. foreign aid (Park 1999). Three specific plans were discussed: (1) reducing the Korean military and reducing or withdrawing U.S. troops from South Korea; (2) increasing Japan's role in Asia to lessen the U.S. burden in South Korea; and (3) increasing South Korea's military role through aiding in economic recovery and social stabilization (Park 2000).[43]

Not surprisingly, President Rhee strongly opposed the withdrawal of U.S. forces because it reminded him of the earlier U.S. troop withdrawal in the late 1940s that indirectly led North Korea to attack the South. In addition, ardent nationalist Rhee could not accept "$2 benefit for $1 aid" policy, which fostered Japan's industry by using Korean aid to purchase Japanese products (Oliver 2013; NSC 5516 1955).

Rhee feared abandonment even more and was suspicious of the U.S. commitment to its allies when he viewed how the US dealt with the Suez crisis and the Hungarian Revolution, both of which took place in 1956. Specifically, the US refused to support the Hungarian freedom fighters against the communist Soviet Union and would not help the British and French in the Suez crisis. Not only did Eisenhower opposed supporting his allies, but he also blocked loans to Britain from the International Monetary Fund (IMF) to influence Britain to withdraw its troops from Egypt (Calhoun 1991; Kunz 1991). This gave a clear message to Rhee that the US would not always support its allies.

[43] The US wanted to phase down Korean military forces, because it was an economic burden for the US to maintain a large Korean military.

During the 1950s, besides Eisenhower's New Look Doctrine, Rhee was faced with three other security problems: (1) acknowledging Kim Il-sung's ambition to develop nuclear weapons; (2) North Korean provocations; and (3) the Chinese army stationed in North Korea.

First, since the day of its foundation, North Korea has been interested in the effects of nuclear weapons. Regardless of the country's poor economic condition, Kim Il-sung started conducting a civil nuclear energy program even before the Korean War. In order to explore nuclear energy, Kim asked his allies for help. China sent nuclear experts to help North Korea search for nuclear materials, while the Soviet Union supported developing uranium deposits and the atomic industry through a nuclear cooperation agreement signed in 1956. In addition, the Soviet Union offered North Korea basic knowledge of how to initiate its own nuclear program (Mansourov 1995; Spector and Smith 1990). Although there is no concrete evidence that North Korea developed a nuclear program directly aimed at a military purpose, more and more scholars have recently argued that North Korea sought to develop its own nuclear program in the early 1950s, not only for civilian energy, but also for military purpose (Han 2018; Koo 1995; Park 2018).

Second, ambitious Kim Il-sung, who never gave up on liberating South Korea and unifying the Korean peninsula, continuously conducted provocations against South Korea throughout Rhee's era. For example, North Korean agents hijacked a Korean airline with 34 passengers in 1958. In the end, 24 passengers were released in March, but the rest of the passengers remained in North Korea. Table 5.3 presents examples of North Korean provocations against South Korea from 1953 to 2002.

Table 5.3 North Korean Provocations Against South Korea

Administration	North Korean Provocations
Rhee Syngman (1953-1960)	1958 Hijacking of a Korean Air Lines airplane with 34 passengers 20 cases of border violations and infiltration of armed saboteurs (Army) 16 cases of border violations and infiltration of armed saboteurs (Navy)
Park Chung-hee (1961-1979)	1968 The Blue House raid 1968 The Ulchin-Samcheok landings 1970 Bombing at the National Cemetery 1974 Assassination attempt on President Park Chung-hee 1976 The North Korean Axe Murders
Chun Doo-hwan (1980-1987)	1983 North Korea's Rangoon Bombing 1986 Bombing at Gimpo International Airport 1987 Bombing of Korean Air Flight 858
Roh Tae-woo (1988-1992)	4 cases of fishing boat hijacked 1 case of birder violation
Kim Young-sam (1993-1997)	1996 Gangneung Submarine infiltration incident 1996 Diplomatic consul to Vladivostok Choi Deok-geun was killed 1997 North Korean defector Yi Han-young was shot 1997 North Korea threatened South Korea's daily newspaper *Choson Ilbo* and South Korea's state-run Korean Broadcasting System (KBS)
Kim Dae-jung (1998-2002)	1999 The First Battle of Yeonpyeong 2002 The Second Battle of Yeonpyeong

Source: Institute for Military History, ROK Ministry of National Defense, CRS Report for Congress

Third, after the Korean War, China viewed the Korean peninsula as having an important strategic value in increasing its power in Asia. Therefore, the Chinese army did not withdraw its troops from North Korea until 1958. For Rhee, it was the Chinese army, not the Soviet Union, that most threatened the security of South Korea because of its large number of ground forces. This is why Rhee instructed Foreign Minister Pyun Yung-tai to strongly request the withdrawal of Chinese military forces from North Korea at the Geneva Conference in 1954 (Kim 1999; Park 2000).

At this point, the U.S. State Department proposed more specific plans regarding a reduction in the level of South Korean forces and withdrawal of U.S. troops.[44] Having considered South Korea's security concerns, the US promised to help South Korea develop atomic energy for peaceful purposes in 1954. However, regardless of Eisenhower's liberal policy with respect to nuclear proliferation under the Atoms for Peace movement, military officials on the Joint Chiefs of Staff (JCS) and in the State Department could not reach agreement on the matter of deploying tactical nuclear weapons to South Korea. Military officials on the JCS assured that the 280 mm atomic cannon and the 762 mm Honest John atomic rocket were dual-purpose weapons, but the State Department officials believed that these weapons might be perceived by other states as nuclear weapons. Moreover, Secretary of State Dulles argued that the deployment of nuclear weapons to South Korea would "mark a departure from the terms of the Armistice" (Greenstein 1982, 133).[45] Eisenhower understood that the deployment of nuclear weapons in this situation might be a double-edged sword, so he deferred making a decision on the deployment of nuclear weapons for the time being (Kim 1999).

However, facing the three security problems mentioned above, Rhee remained frustrated. Rhee did not consider pursuing nuclear weapons as it might provoke the US, but he strongly opposed the reduction of US forces and emphasized that this would be acceptable only if South Korean forces became similar to North Korean forces in terms of both quantity and quality of weapons (AWF/DEPL 1957). Rhee reiterated that North Korea was armed with superior weapons, including its ally's nuclear weapons, so another invasion might come at any moment (Kyungmudai Memorandum 1957). Thus, Rhee returned to *Pukjin Tongil*, from

[44] The reduction of South Korean forces from the current level of 20 active and 10 reserve divisions, 3 active and 3 reserve jet squadrons.

[45] 311th NSC Meeting, 1/31/57. Box 8 NSC Series, AWF/DEPL.

which he had earlier backed down. It is important to note that Rhee's *Pukjin Tongil* option was not only intended to increase his bargaining position with the US and manage the security dilemma of abandonment; it was also aimed at domestic politics and Korean nationalism.

As shown in Figure 5.1, South Korea's economy and living standards remained at miserable wartime levels. In spite of this economic stagnation, Rhee Syngman was re-elected at the age of 81 on May 15, 1956, receiving 55.6% of votes cast, while his rival Cho Pong-am received 22.8 percent. The high level of voter turnout during this dismal time was possible because educational opportunities had grown and, in turn, the illiteracy rate had decreased due to Rhee's emphasis on the importance of education.[46] More significantly, he was able to win the election because a majority of Koreans were still enthusiastic about Rhee's stubborn anti-communist policy. Therefore, in order to overcome the opposition party's criticism regarding economic stagnation and to receive support from the Korean public, Rhee believed that *Pukjin Tongil*, the fantasy of a unified Korea, was needed more than ever (Kim 1999).

The US again found itself in a dilemma in negotiating with Rhee, who was diplomatic and had keen insight. Washington already knew that Rhee Syngman was a difficult person with whom to negotiate. In the end, Secretary of State Dulles retreated from his previous opposition to deploying nuclear weapons to Korea, and the Eisenhower administration finally decided to provide tactical nuclear weapons to U.S. troops (not to South Korean forces) in South Korea while reducing South Korean forces up to four divisions as it had planned. Although former political scientist Rhee was well aware of the deterrent effect of

[46] Even during the Korean War, Rhee did not close schools. For example, although most schools were destroyed or used for military bases, middle school education continued to take place in tents, mountains, and beaches (Ahn 2011).

nuclear weapons, Rhee officially rejected Washington's offer of providing nuclear weapons to American forces while reducing South Korean troops. He added that if nuclear weapons had to come, they must come to South Korean forces, not U.S. forces. Rhee's true objective "was to maximize American defense commitment to Korea in the form of nuclear weapons for U.S. forces and modern weapons for South Korean forces, while minimizing troop reductions" (Kim 1999, 298).

It should be noted that "Rhee had first taken advantage of American reluctance to provide nuclear weapons for American forces to reject troop reduction, then exploited American refusal to grant nuclear weapons to South Korean forces to bargain for a lesser reduction in troops and to receive additional modern weapons" (Kim 1999, 306). At last, Rhee agreed to reduce South Korean forces by two divisions, modernize its forces, and deploy tactical nuclear weapons to American forces (the 280 mm atomic cannon and the 762 mm Honest John atomic rocket) in 1958.[47]

In summary, Rhee contemplated developing nuclear weapons only for the probable condition that the US would suspend its aid in the future. Therefore, he was hesitant to take the risk of pursuing nuclear weapons that might jeopardize the US-ROK alliance. Rhee's lower level of risk propensity made him neither overestimate the benefit nor underestimate the cost of pursuing the bomb. Moreover, he was cautious about spending a large amount of money only on defense or the economy. Instead of pursuing nuclear weapons, Rhee made South Korea come under the US nuclear umbrella.

[47] Washington had originally planned to reduce South Korean forces by four divisions.

5.4 Park Chung-hee

Park Chung-hee, at the age of 46, assumed power in a military coup on May 16, 1961, and he remained in office until he was assassinated on October 26, 1979. To understand South Korea's pursuit of nuclear weapons under the Park government in the 1970s, Section 5.4.1 traces his demographic characteristics in order to uncover the relationship between Park's level of risk propensity and his risk-taking decisions regarding the pursuit of nuclear weapons. Section 5.4.2 then thoroughly examines the security environment in the Park era and his role in pursuing nuclear weapons.

5.4.1 Park's Risk Propensity

Age and *Socioeconomic Backgrounds*. Park Chung-hee was born to parents Park Sung-bin (1871–1938) and Paek Nam-ui (1871—1938) in Sangmo County, Kumi Province – then under Japanese colonial rule – on November 14, 1917. Park was the youngest child of five brothers and two sisters in a poor family. Park often said that, "the poverty that my father imposed on me was my teacher and benefactor" (Park Chung-hee Presidential Museum 2020).[48]

Park's father, Park Sung-bin, was in fact born into a *Yanban* family, part of the ruling class. However, Park Sung-bin joined the Donghak Peasant Revolution (1894–1895), an armed rebellion led by peasants and Korea's traditional religious practitioners. Park Sung-bin's poverty was the result of joining this military rebellion in his youth. Importantly, Park Chung-hee, who later led a military coup d'état to assume power, once spoke of his father's

[48] Further details can be found at The Park Chung-hee Presidential Museum & Library. Available at https://www.presidentparkchunghee.org/index.php

involvement in the Donghak rebellion, describing it as an admirable act in that "he wanted a change, a revolutionary change, hoping for something better" (Lee 2012, 9).

Paek Nam-ui, Park Chung-hee's mother, grew up in a relatively wealthy family and had no hardship experiences before she married Park Sung-bin. She was an educated woman who could read and write a skill possessed by very few women in that period. However, after her marriage, she lived in economic hardship until her death in 1938. When she was pregnant in her mid-forties, Paek Nam-ui felt despair and embarrassment because raising another child would be a huge burden for the poor family. Indeed, her first daughter was also pregnant, and their due dates were close together. In the depths of despair, Paek Nam-ui drank a liter of soy sauce, leapt off a pile of firewood, and tried other means to abort the fetus, all to no avail (Cho 2001; Park Chung-hee Presidential Museum 2020).

Despite his mother's persistent attempts to abort him, Park Chung-hee came into the world. Immediately after Park's birth, she spent days agonizing over whether to throw Park into the mire, but she could not carry out the plan. Due to the repeated attempts to abort him, Park was not born healthy. As he was growing up, his mother often told him the story of the plan to abort him. This traumatic experience was deeply rooted in the small boy, and he frequently experienced fear of abandonment. Park's mother, who felt guilty for what she had done, poured all her dedications into Park alone out of the seven children (Cho 2001; Kim 2017; Park Chung-hee Presidential Museum 2020). In his autobiography, Park explained in detail her affection in such poor family conditions.

> How she woke him early each morning with breakfast and a wash bowl of warm water ready; how she stood at the edge of the pine forest to watch her son leaving for the two-hour walk to school before sunrise and waited for his return after dark; how she washed his muddy cotton-padded socks every night and laid them on the heated floor to dry for the next day; and how she wrapped eggs in socks for him to carry to the

> Japanese-owned store by the school to exchange for pencils or notebooks.[49]

Park Chung-hee attended Kumi elementary school, located five miles from his house. Only one of his older brothers attended this school because the poor family could not afford to educate all the children. Park's memory of school life was that it was miserable. This was well described in the dialogue between Park and Kim Chong-ryom, who served as chief of staff in the Park administration.

> When I returned home after school, walking the 20 ri (8 kilometers or 5 miles) distance, I would get very hungry. I would go to the kitchen and lift the lid of the cooking pot but it was all empty. I wanted to chew some seasoned turnip but there was none. So I would dip a little soy sources on my finger and suck it. I wish we had a chestnut tree or two in the back of our house. I would have loved to eat boiled chestnuts. Do you know why I have small body? It is because I did not have enough to eat when I was a child.[50]

Park's elementary school transcripts indicate that he received the academic excellence award every year. While attending the school, Park read a number of books about war and battles, and he was deeply impressed by two historical figures: Admiral Yi Su-shin of the Joseon Dynasty and Napoleon Bonaparte of France (Park Chung-hee Presidential Museum 2020). The more he read about war, the more his aspiration for power intensified.

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[49] The original text can be found at the Park Chung-hee Presidential Museum, but the sentences here were translated and requoted by Lee Chong-sik. For further details, please see the book, *Park Chung-hee: From Poverty to Power*, page 25.

[50] The original text can be found in Kim Chong-ryom's autobiography, *Ah, Park Chung-hee*, published in 1997. The sentences here were translated and requoted by Lee. For further details, please see his book, *Park Chung-hee: From Poverty to Power*, page 34.

Upon graduating from Kumi elementary school, Park was accepted at the Taegu normal school, which was run by the Japanese colonial government in Korea. The school was established to foster elementary school teachers loyal to Imperial Japan. Thus, tuition including room and board was free, but only a few intelligent students were offered admission: 90 Koreans and 10 Japanese students out of 1,070 applicants were admitted (Park Chung-hee Presidential Museum 2020).

The Taegu normal school followed a military system in that every student had to live in the dormitory under strict rules and learn military drills, including bayonet and rifle practice. Park did not do well in the academic curriculum, but he performed well in the drills. This caught the eye of one of the instructors, Arikawa Kazuichi, a lieutenant colonel who had graduated from the Japanese Military Academy. Spurred on by enthusiastic encouragement and motivation from Arikawa, Park's dream of a military career seemed to finally be coming true (Kim 2017; Park Chung-hee Presidential Museum 2020).

Military Experience, *International Experience*, and *Major in College*. However, Park's class ranking steadily declined as he was often absent. It is not clear why he had so many absences and did so poorly academically. Presumably, his consistent poverty affected his gloomy and inactive personality. Although tuition and board were free, Park still had to pay for meals. His teacher's comments on the transcript support this explanation: "Gloomy; Inactive; Appears to be suffering from poverty" (Lee 2012, 68). One of his classmates, Seok Kwang-su, described Park as "a taciturn person who hardly ever smiles. He did not have any close friends" (Kim 2017, 40).

Although Park graduated without honors, he was lucky to find a teaching position at Mungyeong elementary school, located in the northern part of Gyeongsang Province, Korea. According to his students, Park was a nationalistic teacher who often taught the history of

Korea and the meaning of *Taegeukji* (the national flag of Korea). Moreover, he asked students to speak only in Korean to avoid the eyes of Japanese surveillance (*JoongAng Daily Newspaper*, 2010).

However, his life as a teacher did not last very long. In order to pursue a military career, Park left Mungyeong for the Manchurian Military Academy. The question still remains why nationalistic Park Chung-hee attended the Japanese-run military academy to become a Japanese officer. Park's political supporters assert that he wanted to gain a modern military education so as to carry out an independence movement in the future; while opponents denounce him as a national traitor who served the Japanese army. Such controversial views have not yet been settled, but many scholars agree that Park did not choose a Japanese military education for either a future independence movement or pro-Japan activities. It should rather be considered the unfolding of a vigorous young man's career aspirations (Ahn 2015; Cho 2001; Lee 2012; Kim 2017). Kim Jong-shin, former presidential secretary, once asked Park why he joined the Manchurian Military Academy. Park's answer was short and clear: "To gird on a long sword!" (Kim 2017, 59).

The Manchurian Military Academy, located in northeast China, was an attractive place for Park because the academy gave a few of the top cadets opportunities to continue their studies at the Japanese Imperial Military Academy near Tokyo, Japan. Park had always excelled at the Manchurian Military Academy, unlike at the Taegu normal school. He had already learned basic military drills and experienced the regimented dormitory life. Above all, he did not need to pay for meals and other expenses as he had at the Taegu. Presumably, these factors allowed Park to concentrate on his studies and become an excellent cadet. There is no record of what specifically he learned at the academy, but most of the classes were on military strategy and bayonet practice (Lee 2012).

One of the most important events Park experienced at the academy was meeting Captain Kano Hiroshi, who had participated in the military coup d'état known as the "February 26 Incident." Kano taught Park what to avoid in order to carry out a successful military coup. It is an undeniable fact that Kano's lessons later served as a model for the May 16 military coup d'état which Park launched in 1961. Finally, Park became one of the top graduates and was given a chance to study abroad at the Japanese Imperial Military Academy (Chong 1997; Kim 2017).

Upon completing the two-year course at the Manchurian Military Academy in April 1942, Park headed to Japan to continue his military training. Following the ethos of the academy, Park had to learn how to manage the fear of death so as to die honorably (Chong 1997). Many classes were devoted to teaching the values of bravery, frugality, and decisiveness. Undoubtedly, Park's military education abroad in the Manchurian and Japanese academies enhanced his fearless and tenacious disposition. At last, he graduated with distinction on April 22, 1944. Among 1,267 cadets, he was ranked fifty-seventh. Immediately after graduation, he was dispatched to command the Manchurian army in Sinjing, Manchuria as a second lieutenant (Lee 2012).

Park's life dramatically changed when Japan surrendered to the Allies on August 15, 1945. The Manchurian army was forced to disarm and, in turn, Park lost his elite military position. Now that Park's entire military education and career were associated with defeated Japan, he seemed useless in liberated Korea. However, he was lucky to join the Korean Kwangbok Army, led by the Korean Provisional Government in Chongqing, China. Regardless of his previous pro-Japanese career, the leaders in the Provisional Government needed more young soldiers to create a strong Korean army. Therefore, they not only

accepted Park, but they also gave him an important leadership position (Park Chung-hee Presidential Museum 2020).

Around this time, Park Chung-hee joined the Worker's Party of South Korea, a communist party that existed from 1946 to 1949. However, it would be wrong to assertively identify him as a communist. In fact, Park himself once admitted his membership in the South Korean Worker's Party, but denied being a communist:

> It was when I was a Captain serving as instructor at the Military Academy. One day, Yi Chae-bok, a good friend of my brother, came from Taegu and told me there would be a gathering of the friends from my hometown that Sunday and I should be there. It was a little boring at the Academy and having been told it was for my honor I did go to the gathering. I found out later that all my brother's friends at that gathering were Reds. I did not sign any application or put a seal to any document, but the event caused me to suffer sever torture and face the Court Martial.[51]

It is still uncertain why Park Chung-hee joined the Worker's Party. The most plausible reason involves his brother's death. His beloved brother Park Sang-hee was killed by the police during the 10.1 Taegu Uprising of 1946, and Park believed that the U.S. Army Military Government in Korea stood behind the violent suppression by the police.[52] Therefore, the South Korean Worker's Party's resistance against the U.S. forces and its

[51] The original text can be found at the Park Chung-hee Presidential Museum, but the sentences here were translated and requoted by Lee Chong-sik. For further details, please see the book, *Park Chung-hee: From Poverty to Power*, page 221.

[52] The 10.1 Taegu Uprising of 1946 took place in the southern province of Korea. Thousands of peasants and workers gathered in Taegu asking for better working conditions from the U.S. Army Military Government in Korea. In order to suppress the protest, the US mobilized the police and U.S. troops. As a result, 38 policemen and 236 civilians were killed.

reformative efforts attracted Park (Cho 1992). Indeed, it was a way to avenge his brother's death.

Although there is no agreement as to his true intentions in joining the Communist party, it is clear that Park Chung-hee was an impulsive person who did not much consider future consequences. Importantly, in 1948, the year the ROK government was established in the South, Park was sentenced to death and nearly executed due to his membership in the Worker's Party.

After being released from prison with the help of colleagues he met in the Manchurian Military Academy, there came a chance for Park to recover his military prestige. The Korean War began in 1950, and Park proved both his ability as a military officer and his loyalty to South Korea. He was steadily promoted, becoming a brigadier general by the time the war ended in 1953 (Park Chung-hee Presidential Museum 2020).

South Korea during the early 1960s was fraught with frustration due to the April Revolution of 1960 and President Rhee Syngman's subsequent resignation. Chang Myon, who temporarily took office after Rhee's ouster, was not charismatic enough to control the government that had placed him in power. Therefore, Park Chung-hee and his allies formed a junta in 1961, which came to be known as the "May 16 military coup d'état." The rebellion was successful and Park took office, remaining president until his 1979 assassination.

5.4.2 Security Environment and Park's Role

After the Korean peninsula was divided into South Korea and North Korea as a result of the Korean War, the security alliance with the US was a main pillar in South Korea's defense against the threat of further communist aggression.

However, as part of the Nixon Doctrine of July 1969, the US decided to withdraw one combat division, reducing U.S. troop strength in South Korea from 61,000 to 40,000 (Kim 2001). [53] Park Chung-hee, who witnessed the US retrenchment in Vietnam, feared abandonment by the US. The South Korean government felt betrayed because the plan for troop reduction arose while South Korea had 50,000 troops stationed in Vietnam, as it had since 1965. In addition, President Park believed that Nixon had sent a clear message that South Korea was exempt from such reductions during the South Korea-US summit in Honolulu in August 1969 (Kim 2001). Thus, when U.S. Ambassador William Porter and Vice President Spiro Agnew visited Seoul in March 1969 and August 1970, respectively, President Park strongly expressed his resistance to Washington's unilateral decision to withdraw American troops from South Korea. In particular, Park told Porter that "[the US] would not be allowed to take troops out, [and] that [the US] had no right to do that" (US House of Representatives 1978). During the meeting with Agnew, President Park remained opposed to the withdrawal and explained that such a plan was against the spirit of the Brown Memorandum of 1966 in that it might jeopardize the so-called "blood tie" alliance relationship between South Korea and the US (Oh 1996).[54]

[53] The Nixon Doctrine is also called the Guam Doctrine. At the time President Nixon took office in January 1969, the US had been engaged in war in Vietnam for nearly four years. The war had resulted in more than 30,000 deaths of American troops. Therefore, anti-war demonstrations against the Vietnam War took place in cities and college campuses across the US. During a press conference in Guam on July 25, 1969, President Nixon assured America's allies in Asia that it would honor its treaty commitments. However, at the same time, he declared that "as far as the problems of international security are concerned…the US is going to encourage and has right to expect that this problem will be increasingly handled by, and the responsibility for it taken by, the Asian nations themselves." This meant that U.S. troops would be slowly withdrawn from the conflict in Asian countries.

[54] The Brown Memorandum, delivered in 1966, is a five-page document containing the U.S. promise to modernize South Korean forces. It specifies that neither the US nor South Korea would reduce its troops in Korea or Vietnam.

Despite Park's efforts, Nixon continued to put the plan into practice while promising the modernization of South Korean military forces (Jang 2016). The US eventually withdrew 20,000 of the 61,000 American troops from South Korea, but, at the same time, the US had to agree to assist in a five-year military modernization package through foreign grants of 1.5 billion dollars (Kim 1996). However, the US Congress frequently delayed the military aid and finally reduced it because of budgetary concerns and human rights issues that occurred under the military dictatorship in South Korea (Miller 2014; Yager 1985).

President Park Chung-hee believed that such changes in the security environment were untimely because South Korea was still facing threats from communist North Korea, which continued to receive military support from the Soviet Union and China. As discussed earlier, ever since the Korean peninsula was divided into two, North Korea unceasingly conducted provocative activities against South Korea. In particular, during the Park administration, North Korea attempted the so-called "Blue House raid" on January 21, 1968. In an attempt to assassinate President Park, North Korea sent 31 commandos to Seoul. The commando unit successfully infiltrated Seoul and came within 800 meters of the Blue House (the presidential residence of South Korea). President Park was fortunately unharmed, but South Korean casualties totaled 26 killed and 66 wounded. In addition, four American soldiers who tried to block the escaping infiltrators at the Demilitarized Zone (DMZ) were also killed.

The administration and South Koreans were filled with anger and resentment over the January 21 incident and tried to seek revenge against the North. However, the U.S. response seemed lukewarm in that Washington was trying to avoid any further escalation of the conflict between the South and the North. When US Ambassador William Porter met with President Park, he reiterated Washington's position by saying, "The US would not

retaliate…Any South Korean attempts at retribution would meet with strong U.S. opposition" (Cha 2000). This reminded President Park of the U.S. retrenchment in Vietnam, which led him to be concerned about further American retrenchment in Asia. Despite the U.S. tactical nuclear weapons which had deployed to South Korea (1958–1991), Park constantly feared that the US would gradually reduce its security commitment and might abandon its allies when its help was needed most. Park's concerns were even greater because North Korea's military capabilities had been superior to South Korea's since the country's birth in 1948 (Kim 2001).

Table 5.4 Comparison of Military Troops

	South Korea	North Korea
Army	560,000	408,000
Navy	18,900	17,000
Air Force	25,000	45,000
Total	633,500	470,000

Source: Institute for Military History, ROK MND, The Military Balance (IISS)

Table 5.5 Comparison of Military Equipment

	South Korea	North Korea
Army	1,000 Mortar 150 Armored Personnel Carrier 750 Tank/Anti-Tank Artillery	6,000 Mortar 200 Armored Personnel Carrier 1380 Tank/Anti-Tank Artillery
Navy	128 Patrol Boat/Mortar Gunboat/Others	187 Patrol/Mortar Gunboat/Others
Air Force	195 Combat Aircraft	598 Combat Aircraft

Source: Institute for Military History, ROK MND, The Military Balance (IISS)

Tables 5.4 and 5.5 show the discrepancy in military forces between South Korea and North Korea in the 1970s. Although South Korea had a larger number of military forces compared to the North, the military capabilities of the North Korean army, navy, and air force were far superior to those of the South.

Moreover, following the 1956 nuclear cooperation agreement with the Soviet Union, North Korea continued to develop a nuclear program. In 1965, the Soviets further supplied nuclear-related equipment, including several hot cells and 2 MWt research reactors. Only two years later, North Korea raised the power of the research reactor to 8 MWt through its own capabilities (Hymans et al. 2001).

Around this time, Washington requested that Seoul sign the NPT. Park grappled with this issue because joining the treaty would mean a blockade on developing nuclear weapons in the future. What made Park more hesitant about signing the treaty was a possible nuclear threat from China, which had yet to sign the NPT at that time. Therefore, in a meeting with U.S. Ambassador Porter on July 1, 1968, Minister of Foreign Affairs Choi Kyu-hah demanded the reassurance of U.S. security commitment to South Korea against nuclear threats from the communists as an essential precondition for signing the NPT (ROK MND Institute for Military History 2005).

It is widely known that Park finally decided to sign the NPT in 1968 and joined it in 1975 in order to increase the U.S. security commitment and avoid the abandonment issue. However, Park pursued nuclear weapons during this period of negotiation from 1968 to 1975. These paradoxical behaviors made Park's intention to join the NPT seem ambiguous. Recent declassified documents from the Ministry of Foreign Affairs of the South Korean government suggest a plausible answer (MOFA Diplomatic Archives 1975; *Yonhapnews* 2005). The document, "The Ratification of NPT Issue," written on January 20, 1975, states

that Park's decision to join the NPT was aimed at strengthening nuclear technology capabilities. He was well aware that South Korea required support in atomic energy development from countries possessing the most advanced nuclear technology, such as Canada, France, the US, and the UK, and he acknowledged that if South Korea did not join the NPT, it would not be possible to receive support from those NPT member countries (MOFA Diplomatic Archives 1975).

Given this dilemma, two factors affected Park's final decision: (1) Article X of the NPT, which allows a state to withdraw from the treaty after giving three months' notice; (2) nuclear technology could be ambiguously used for both civilian and military purpose (MOFA Diplomatic Archives 1975; *Yonhapnews* 2005). Therefore, it is logical to conclude that Park's decision to join the NPT was intended to strengthen South Korea's nuclear capabilities through receiving support from NPT member states while concealing the true intention of pursuing nuclear weapons.[55]

It is widely believed that President Park embarked on his own nuclear weapons program in the early 1970s, but it still remains unclear when Park initially started to pursue these weapons. Because of the secrecy in Park's military dictatorship, there is a lack of official documents related to the starting date of the development of nuclear weapons (Jang 2016; Hong 2011; Kim 2001). However, according to a 1978 CIA report that was declassified in

[55] According to a declassified CIA document issued on March 18, 1986, "North Korea-USSR: Implications of NPT Accession," North Korea also signed NPT for Soviet military support. It specifically says, "North Korea's accession to the NPT was no doubt a condition for Soviet Help to its nuclear program and conceivably a condition for increases in conventional military and economic assistance." (CIA Report 1986). For more details, please see the following link: https://www.cia.gov/library/readingroom/docs/CIA-RDP86T01017R000605680001-5.pdf

2005, the South Korean government started to consider developing nuclear weapons in the late 1960s (CIA Report 1978).

From his inauguration as President of South Korea in 1963, Park Chung-hee, who possessed a nationalistic sentiment, emphasized the importance of "self-reliance." This political slogan was primarily focused on economic modernization in the early 1960s, but Park broadened its application to defense later on in the 1960s and 1970s as the security environment and the U.S. commitment became unfavorable. In accordance with the new application of self-reliance, a program for developing nuclear weapons Project 890 was born.

Notably, Park launched the Weapons Exploitation Committee (WEC) in the Blue House to directly manage the procurement and production of weapons, and he established the Agency for Defense Development (ADD) in 1970 to support the modernization of South Korean's military forces as part of developing nuclear weapons (Jang 2016; Hong 2011; Kim 2001). According to the declassified presidential documents, during the same period Park directed Senior Secretary for Economic Affairs Oh Won-chul to specifically cultivate scientists specializing in atomic energy technology (Presidential Archives of Korea 1972).

Meanwhile, Park ordered the ADD to develop surface-to-surface missiles in December 1972 (Koo 1998). Park personally wrote out a detailed course of action regarding the development of missiles, and he secretly handed that memo to Koo Sang-hoi, who was in charge of the missile project. The memo read, "At the first stage, develop 200 km range surface-to-surface missiles by 1975, and then progressively expand the range in later stage, aimed at strategic target for the purpose of destruction. Develop missiles that have enormous destructive power, but should also consider the warhead convertibility" (Koo 1998; National Museum of Korean Contemporary History 2020). Park, who had abundant military experience and profound knowledge of weapons systems, attended to every detail from

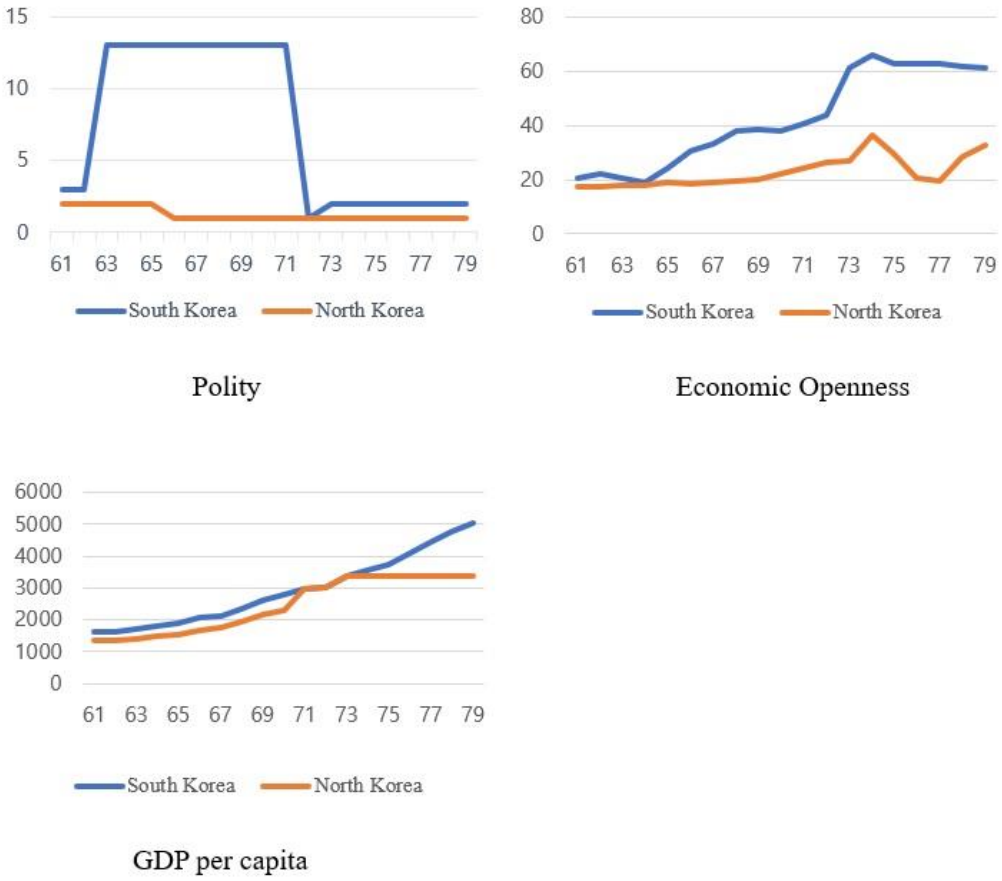
beginning to end. Not surprisingly, authoritarian leader Park did not need the approval of other politicians or scientists for his decisions: the program was tightly controlled by President Park himself (Hong 2011).

Economic conditions during the 1960s and 1970s were better than in the 1950s, but South Korea still suffered from poverty. Figure 5.2 displays the polity, economic openness, and GDP of South Korea and North Korea from 1961 to 1979. Due to poor economic conditions and lack of technology, developing surface-to-surface missiles seemed an unachievable goal.[56] Seo Jeong-uk, the former President of ADD who was in charge of communication device development, said, "We were ordered to do something that seemed impossible. We were nearly in despair at first. Older members said this was not something that can be done just by trying" (National Museum of Korean Contemporary History 2020). Despite these technical obstacles and poor financial conditions, development of the missile project finally succeeded in 1978 with strong support from President Park. Park, who had a high–risk propensity, strongly believed that he would achieve his goal; he clearly overestimated the benefit and underestimated the cost of nuclear weapons. The reason that Park put every effort into developing the missiles along with nuclear weapons in such an unfavorable situation was clear: Park's intention to develop the missiles was to use them as delivery systems for nuclear weapons (Hong 2011; Kim 2001; Nolan 1991). A recently declassified document from the US supports this argument (DNSA 1978).[57]

[56] "It took them more than two years just to identify the cost and technological requirements for missile development and plan out a development program" (National Museum of Korean Contemporary History 2020).

[57] For more information, please see the Memorandum for Bob Kimmitt from Wisston Haydon, "Interagency Study on Trends in LDC Arms Production and Implication" (January 31, 1980), NLC-21-6-7-2-3, JCL.

Figure 5.2 Polity, Economic Openness, and GDP



Clearly, Park's decision to clandestinely develop nuclear weapons and missiles constituted risk-taking behavior. He was never afraid of taking risks for his goal. What made his decision riskier is that the U.S. attitude toward nuclear proliferation at this time had become strict due to India's nuclear test on May 18, 1974. In response to the Indian nuclear test, the White House issued NSSM 202:

> This study should review present US policy concerning non-proliferation and the NPT in the light of changed conditions since completion of NSSM 13, and, in particular, in light of India's announcement of its underground nuclear test. The study should consider the full range of issues posed by the changed circumstances affecting our posture toward non-proliferation and the NPT and present options for future US policy. It also should consider specifically whether the US should press for renewed support for the treaty by those now party to it and accession to the treaty by those not yet signators, and if so how and to what extent. The options should include consideration of public, congressional and diplomatic posture for the US (NSSM 202, 1974).[58]

The US viewed the Indian test as a signal that the likelihood would increase of further nuclear proliferation around the world. In particular, the US now worried that Pakistan might attempt to match India's nuclear capability. Therefore, President Nixon discarded his previous liberal attitude toward nuclear proliferation and issued NSDM 255 to tighten the U.S. policy on sensitive nuclear exports to other countries.

> The President has approved the recommended consultations with other countries – particularly present or potential suppliers of materials, technology and equipment – with the objectives detailed in the USC report. The initial consultations should emphasize…(1) establishing agreed international guidelines, preferably based on US practice, to ensure the physical security of weapons useable and highly toxic materials whether internationally transferred or indigenously produced; (2) reaching some common principles regarding the supply of sensitive enrichment technology or equipment; (3) avoiding or applying stricter terms for supply in situations where special hazards could be present; and (4) encouraging, where appropriate, multinational enrichment, fuel fabrication and reprocessing facilities (NSDM 255).[59]

[58] This document was issued by Henry Kissinger on May 23, 1974. A full document can be seen in the Nixon Library, available at https://www.nixonlibrary.gov/sites/default/files/virtuallibrary/documents/nssm/nssm_202.pdf

[59] This document was issued by Henry Kissinger on June 3, 1974. A full document can be seen in the Nixon Library, available at https://www.nixonlibrary.gov/sites/default/files/virtuallibrary/documents/nsdm/nsdm_255.pdf

President Gerald Ford, who took office after the resignation of Nixon on August 9, 1974, made significant progress in inhibiting the further spread of nuclear weapons. Accordingly, the US sought to pressure South Korea to give up its nuclear weapons program and imposed restrictions on the development of other conventional weapons, including surface-to-surface missiles (Miller 2018).

Although many previous scholars believed that President Park gave up his attempt to pursue nuclear weapons in 1976 under U.S. pressure, recently declassified documents prove that Park secretly continued his pursuit up until his death from assassination. The most important point is that Park chose the riskiest option – to clandestinely develop nuclear weapons and other missiles – in response to the security problem based on the fear of a reducing U.S. security commitment.

In summary, Park Chung-hee always held firm to his nuclear agenda even if others perceived it as impossible. His confidence stemmed from his high risk propensity, which made him overestimate the benefits and underestimate the costs of nuclear weapons. Park's risky decision-making style had appeared not only in defense policy, including nuclear proliferation and missile development, but also in other fields such as economic policy.

5.5 Summary and Comparison

Chapter 5 examines the relationship between leaders' risk propensities and their risk-taking behaviors regarding the pursuit of nuclear weapons through the South Korean case. The majority of existing literature argues that external security threats, such as the withdrawal of US troops and North Korea's incessant provocations, are considered the most influential factors that made President Park Chung-hee pursue nuclear weapons.

However, the first South Korean President Rhee Syngman, predecessor to Park, also faced similar security threats in the 1950s, but never considered the option of pursuing nuclear weapons. In addition, South Korea under both leaders had relatively low levels of democracy, economic openness, and GDP. Despite these similar circumstances, Rhee strengthened the alliance relationship with the US and secured the deployment of U.S. tactical nuclear weapons on South Korean soil, while Park emphasized "self-reliance" and secretly pushed forward the development of nuclear weapons and surface-to-surface missiles that might isolate South Korea from international society.

Rhee Syngman was reared in a relatively stable family environment. It is important to ensure a stable environment for a child as it is vital for healthy growth and positive personality development. Growing up as an open-minded and genuine person, Rhee sought to study abroad to obtain a PhD in international affairs and law. One of the components of Rhee's risk propensity index was the fact that his transcript shows he took economics even though he did not major in the subject, and it was not required for him to take the course to obtain his MA at Harvard.

Before he left South Korea to study abroad, Rhee was arrested on charges of organizing anti-government protests through the newspapers, and he spent seven years in prison. Despite this rebellious experience, it is worth noting that Rhee had no military experience and, more importantly, his participation in demonstrations was far from military activity. He was "very careful to advocate peaceful and diplomatic solutions rather than violence in the fight or Korea's sovereignty" (Lew 2014, 962). For example, when two nationalistic Koreans attempted to assassinate a pro-Japanese diplomat, Durham Stevens, Rhee condemned the act of assassination and refused to help those Korean youths (Lew 2014).

Table 5.6 Security Environment in the Rhee Era

Security Environment	Explanation
Irregular entry	He was elected as the first president of South Korea.
Polity	The average score from 1948 to 1960 was 8.
Superpower alliance	US-ROK signed the mutual defense treaty in 1953.
NCA	There was no nuclear cooperation agreement.
GDP per capita	The average score from 1948 to 1960 was 1494.
NPT	NPT had not existed.
Economic openness	The average level from 1948 to 1960 was 11.26.
Civil war	The Korean War began in 1950 and lasted until 1953.
Interstate disputes	The average level of interstate disputes from 1948 to 1960 was 2.37.

Table 5.7 Rhee's Risk Propensity

Risk Propensity Index	Explanation
Age	He was 74 years old when he became the first president of South Korea.
Business/econ major	He did not major in economics, but Rhee took an economics class while attending Harvard for his MA.
Socioeconomic	He grew up in a middle-class family and achieved a PhD from Princeton University.
Int. experience	He studied at George Washington University, Harvard University, and Princeton in the US.
Military experience	His rebellious activity was far from military rebellion. He had no military experience.

There exists a number of contradictory descriptions on Rhee's personality: patient and impatient, diplomatic and ill-managed, and as well as wise and injudicious. However, thoroughly examining his autobiography and other historical evidence together, this study concludes that the image of him as a madman out of control was created by Rhee himself to gain a predominant position over both allies and enemies in negotiations.

It is clear that Rhee had a lower level of risk propensity and preferred to seek peaceful and diplomatic solutions to political and military issues. Faced with an unstable security environment and domestic problems, Rhee sought a way to strategically increase U.S. commitment to South Korean security and to gain public support for Korean nationalism. During the ebb and flow of negotiations with the US, Rhee often seemed to be an unpredictable and risky person in his insisting on unilateral military action against North Korea. However, the evidence shows that this was part of his so-called madman strategy. In spite of Eisenhower's liberal policy on sharing nuclear technology for civilian purposes under the Atoms for Peace movement, Rhee did not conduct unilateral military action or develop nuclear weapons, which might have isolated South Korea from the world society. Instead, Rhee persuaded the US to sign a mutual defense treaty with South Korea, which eventually brought South Korea under the U.S. nuclear umbrella.

On the contrary, Park Chung-hee was raised in dire poverty in a rural county of Korea. Growing up, Park constantly heard from his mother that she had made every effort to abort Park due to the hardships of life. These unfavorable conditions aggravated his fear of abandonment and his impetuous personality. According to his students at Mungyeong elementary school, teacher Park was an ardent nationalist who secretly taught Korean history and spoke in Korean under Japanese colonial rule. Ironically, he voluntarily attended the Japanese Military Academy to become a Japanese officer, and he later joined the

Communist party in protest against the U.S. Army Military Government in Korea and to revenge his brother's death during the Taegu uprising. Having considered his inconsistent paths and ideologies, one can conclude that Park had a high level of risk propensity. He was a goal-oriented person who often exhibited risk-taking behavior. Moreover, his academic background, largely focused on military training, strengthened his belligerent attitude. In fact, Park himself assumed power through a military coup d'état in 1961.

Park's anxious, pugnacious, and risky behaviors were exemplified in many ways during his presidency. In particular, Park always questioned the U.S. commitment to its allies and emphasized a self-defense policy. When South Korea was faced with the withdrawal of U.S. troops and continuous provocation from North Korea, Park made a risk-taking decision in developing nuclear weapons and surface-to-surface missiles rather than drawing on enhanced cooperation and commitment from allies.

According to scientists' recollection of the development of nuclear weapons and missiles, the project was an almost impossible mission given South Korea's poor economic conditions and lack of technology. However, Park pushed forward his self-reliance defense as he planned and achieved the growth of these weapons systems. With high risk propensity, he often overestimated the benefit and underestimated the cost in his decision-making. Park's dream of South Korea becoming a nuclear state was on the verge of completion, but the plan died on the vine with his assassination.

As shown in Tables 5.6 and 5.8, the security environment in Rhee and Park's periods was similar. Under these two leaders, South Korea had experienced a low GDP and low economic openness and had undergone continuous North Korean provocations. Taking all the evidence together, this study concludes that South Korea's pursuit of nuclear weapons

had its roots in Park's ambitious, impetuous, and risk-taking personality. Tables 5.8 and 5.9 display the simplified results of all the variables examined in Sections 5.4.1 and 5.4.2.

Table 5.8 Security Environment in the Park Era

Security Environment	Explanation
Irregular entry	He assumed power through military coup d'état.
Polity	The average score from 1948 to 1960 was 7.
Superpower alliance	US-ROK signed the mutual defense treaty in 1953.
NCA	Signed the Nuclear Cooperation Agreement since 1975.
GDP per capita	The average score from 1961 to 1979 was 2920.
NPT	South Korea joined NPT in 1975.
Economic openness	The average level from 1961 to 1979 was 42.
Civil war	Continuous North Korea's provocations and uprisings.
Interstate disputes	The average level of interstate dispute from 1961 to 1979 was 2.73.

Table 5.9 Park's Risk Propensity

Risk Propensity Index	Explanation
Age	He was 46 years old when he became the president of South Korea, and remained in office until the age of 63.
Business/econ major	He did not major in economics. Park's education is largely focused on military training.
Socioeconomic	He grew up in dire poverty, but attended the military academy, which was equivalent to a BA.
Int. experience	He studied abroad both in Manchuria, China and near in Tokyo, Japan.
Military experience	He had abundant military experiences and assumed power through military coup d'état.

5.6 Conclusion

By comparing all the alternative variables in addition to the risk propensity index, this chapter demonstrates that a leader's risk propensity is a critical factor that affects their decision to pursue nuclear weapons. After thoroughly examining historical explanations, the results of the South Korean case study add weight to the risk propensity theory and the argument of Chapters 3 and 4 in this dissertation.

However, there are limitations in a qualitative case study. For example, the NPT was opened for signature in 1968 and took effect in 1970. In other words, the NPT did not exist during the 1950s while President Rhee was in his presidency. Although Park initiated pursuing nuclear weapons in the late 1960s, not controlling the discrepancy of this NPT variable in the two leader cases reduces the credibility of the results. Moreover, by considering Park's intention to join the treaty as a way to receive technical nuclear support from the NPT member states, the NPT variable needs to be controlled.

Therefore, increasing the confidence in the generalizability of this dissertation requires examination of other cases that show variation of nuclear proliferation activity after the NPT was created. India would be a suitable case to solve this problem. Specifically, Indra Gandhi sought to pursue nuclear weapons in 1974, but her successor, Morarji Desai, halted this pursuit directly after he was inaugurated in 1977. However, Indira Gandhi took office again in 1979 and resumed pursuing nuclear weapons. Chapter 6 therefore examines the risk propensity of Indira Gandhi and Morarji Desai and their decisions to pursue nuclear weapons.

CHAPTER 6

Nuclear Proliferation in India

6.1 Introduction

India has a distinctive history of pursuing nuclear weapons. Indira Gandhi pursued nuclear weapons during her first prime ministership in the early 1970s, and Morarji Desai halted the pursuit of nuclear weapons immediately after he succeeded Gandhi in 1977. However, when Gandhi began her second term as prime minister in 1979, she resumed pursuing nuclear weapons. These leaders adopted different approaches, despite governing the same country with similar security and domestic situations. Without understanding the role of national leaders, therefore, one cannot fully understand this unusual aspect of Indian nuclear policy. This chapter examines Indian nuclear proliferation with particular attention paid to Prime Ministers Indira Gandhi and Morarji Desai.

Chapter 6 is organized as follows: Section 6.2 discusses security characteristics under Gandhi and Desai with regard to nuclear proliferation and the limitation of current scholarship on the issue. Sections 6.3 and 6.4 examine security and domestic environments during the leadership of Indira Gandhi and Morarji Desai and their roles in developing nuclear weapons. Subsections 6.3.1 and 6.4.1 specifically investigate these leaders' demographic characteristics. Finally, Section 6.5 concludes.

6.2 India and Nuclear Proliferation

India conducted its first nuclear explosion in the Rajasthan desert near Pokhran on May 18, 1974. The Indian government declared this test, naming it "Smiling Buddha," as a peaceful nuclear explosion (PNE) geared toward enhancing nuclear power technology to embark on the path of industrialization for solving its energy shortage. The entire world was astonished by this detonation because the intelligence community could not find any signs of the test. Indeed, despite India's claim of a civilian purpose, the successful nuclear test demonstrated India's capability to develop nuclear weapons. Although India succeeded in concealing the process of its first nuclear test, it has been widely acknowledged from various sources that Prime Minister Indira Gandhi decided to envision a nuclear explosion in 1971 and formally authorized a PNE on September 7, 1972 (Hymans 2006; Perkovich 1999).

Most of existing literature examining the causes of India's decision to develop nuclear weapons focuses on system-level and state-level factors, with particular attention to international security threats and domestics politics (Cohen 1987; Frey 2006; Hymans 2006; Kapur 1979; Karnad 2008; Pant and Joshi 2018; Perkovich 1999; Sagan 2009; Tellis 2001). Specifically, neorealists who support a security model argue that India decided to pursue its bomb as a response to the Chinese nuclear test in 1964. In addition, Pakistan's continuous military threat was another convincing reason for India's nuclear build-up.

However, according to the domestic politics model, India's nuclear pursuit was not directly driven by international threats. If that had been the case, India should have pursued nuclear weapons immediately after the Chinese test, instead of in 1972. With regard to Indo-Pakistan relations, India's conventional weapons were overwhelmingly superior to those of Pakistan. It is more reasonable to argue that India's nuclear explosion in 1974 spurred the beginning of Pakistani nuclear weapons in the 1970s (Pant and Joshi 2018). Under the

domestic model's logic, bureaucratic actors such as scientists are viewed as important political decision makers who create the conditions that favor pursuing nuclear weapons.

Scholars who support the logic of domestic politics recognize that security threats can contribute to weapons decisions, but argue that such threats have a marginal effect on nuclear proliferation. Realists also recognize the role of domestic politics, but they do not consider it the central cause of pursuing nuclear weapons. Interestingly, both theoretical arguments acknowledge that Indian prime ministers played a critical role in the decision to pursue nuclear weapons, yet few scholars have paid attention to individual leaders.

History has shown that although bureaucratic actors were able to exert influence toward the bomb, they could hardly be free from a top-down decision. For example, the Atomic Energy Commission (AEC) has been placed under the direct charge of prime ministers. Indeed, prime ministers had authority to appoint the chairman of the AEC and other departments related to science and technology, and they worked closely with senior scientists and technologists. It is important to recognize that during the three years of the Indian nuclear tests in 1974, 1988, and 1998, India took steps forward in developing nuclear weapons while the nation was ruled by strong leaders over whom bureaucrats had hardly any influence in the determination of political decisions (Hymans 2006).

If India decided to develop nuclear weapons because of pro-bomb scientists' active lobbying for increasing defense budget and prestige flowing to their laboratories, prime ministers in India should have made a relatively concerted decision in pursuing nuclear weapons. However, Indira Gandhi pursued nuclear weapons during her first and second terms as the prime minister (1966–1977 and 1980–1984) and Morarji Desai (1977–1979), who served between the two Gandhi terms, did not pursue them. Existing theories cannot fully explain this unusual nature of Indian nuclear policy. Why do different leaders within

the same country with similar situations take such different paths with regard to developing nuclear weapons? This question may be impossible to answer completely without considering the role of individual leaders. This is not to argue that security and domestic considerations have been unimportant; instead, individual leaders play an important role in making a decision to pursue nuclear weapons considering all those environmental factors.

Therefore, in line with my theory discussed in Chapter 3 and as a supplemental work to my quantitative analysis in Chapter 4, Chapter 6 analyzes the roles of Gandhi and Desai with regard to the decision to pursue nuclear weapons in the historical context of security and domestic politics. Institutionalists generally expect the rise of non-proliferation norms over time and, in turn, this enhanced international pressure toward developing nuclear weapons. Thus, India, which had experienced reversal and proliferation of nuclear policy during 1970s and 1980s, is an extremely important case to address this time-dependent issue.

6.3 Indira Gandhi

Indira Gandhi, the daughter of the first prime minister of India Jawaharlal Nehru, served as prime minister from 1966 to 1977 and again from 1980 to 1984. Gandhi, the first and only female prime minister in Indian history, enhanced nuclear technology and paved the way for India to become a nuclear weapon state.

6.3.1 Gandhi's Risk Propensity

Age and *Socioeconomic Backgrounds*. Indira Gandhi was born Indira Nehru to parents Jawaharlal Nehru (1889–1964) and Kamala Nehru (1899–1936) in Allahabad on November

19, 1917.[60] Indira had a younger brother but became an only child when he died early. She grew up at the Anand Bhaban, a mansion with 42 rooms that had been built to offer the Nehru family, including Indira's grandparents and cousins (Jayakar 1992). Despite living in a close family with abundant wealth, little Indira felt lonely because her father and grandfather were often imprisoned, while her mother suffered from tuberculosis and pleurisy, which eventually caused her early death at the age of thirty-six. In a candid interview, an adult Indira said, "I did not see enough of anybody. We hardly saw each other because people in the house left early in the morning on some sort of work or other in different directions" (Kalhan 1973, 143).

Indira's father, Jawaharlal Nehru (1889–1964), played a leading role in the Indian independence movement against British rule, and he later became the first prime minister of an independent India, serving from 1947 to 1964. Nehru was often away from home because of his political activities and incarcerations, so Indira communicated with her father mostly through letters during her childhood.[61] Under such circumstances, Nehru frequently worried that Indira would develop emotional problems (Frank 2001).

Kamala Nehru (1899–1899), Indira's mother, entered into an arranged marriage with Jawaharlal Nehru on February 8, 1916. At the time, Kamala was only sixteen years old. She was from a Kashmiri Pandit family from Delhi and had received little formal education. While Nehru was in jail, Kamala remained an outsider in Anand Bhaban. She was looked down upon by her mother-in-law and sisters-in-law, which made her ill at ease and

[60] Allahabad, officially known as Prayagraj, is a large city in the Indian state of Uttar Pradesh located in northern India.

[61] In October 1922, while Nehru was in prison, he began writing letters to his daughter, Indira. The book, *Letters from a Father to His Daughter*, is a collection of these letters in which Nehru discussed a wide range of topics, including nature, history, and civilizations.

depressed. Even worse, she had suffered from minor ailments from the time she gave birth to Indira. Little Indira, who stayed with her mother most of the time, was the only one who could feel Kamala's grief (Frank 2001). She was deeply attached to her mother. One day, Indira argued with her grandmother and aunts in defending Kamala; she told her father about their tangled relationship, but it was to no avail. From this experience, Indira learned to hide her emotions and became "aware that silence was a powerful weapon" (Jayakar 1992, 40).

Indira's education was incomplete and fraught with insecurity. She was sent to kindergarten at the Modern School in Delhi, but soon after, her grandfather transferred her to St. Cecilia's in Allahabad, a private school run by three British people. Since the school was British and thus had mostly British students, Indira had a miserable time in adapting to the new culture. After several months, Indira withdrew from the school and was subsequently taught by Indian tutors at home. As she grew older, Indira read many of the books in her grandfather's small library. Among these, she was especially inspired by the story of Joan of Arc (Gandhi 1982; Mohan 1970). When she became the prime minister, Indira said that "I was fascinated by Joan of Arc because she fought the British and because being a girl, she seemed closer to me than other freedom fighters" (Gandhi 1982, 17).

Meanwhile, Kamala became pregnant with a boy, but the baby died two days after he was born. Almost immediately, Kamala was diagnosed with tuberculosis, having a high fever and severe cough. In order to find tuberculosis specialists for Kamala's treatment, the Nehru family moved to Europe in 1926, expecting to stay there for six months. At the time, Indira was nine years old. It was her first trip abroad, and she was exposed to foreign landscapes and cultures that greatly appealed to her (Jayakar 1992).

While Kamala was undergoing a cure at a sanatorium in Montana, Switzerland, Indira attended L'École Internationale de Genève, where she learned both French and English. However, a few months later, Nehru sent Indira to a family-run boarding school in Chesières in order to cultivate her self-reliance and autonomy. The school was located in the mountains, a four-hour journey from her parents, meaning that Indira could see her family only during school holidays (Sahgal 2013). Although she learned and enjoyed outdoor activities such as skiing at Chesières, she was unhappy most of the time because of the school's strict policies. For example, every student had to work long hours in the garden and chop wood for fire. Students who broke school rules were confined indoors for a time. So, when she went home to Montana at Christmas, Indira chose not to go back to Chesières. Nehru allowed her to move to L'École Nouvelle at Bex, only two hours away from Nehru and Kamala. While attending school there, Indira travelled a lot, both alone and with her father. She was now fluent in French and became remarkably independent and resilient (Frank 2001).

Kamala's health improved, but she was by no means fully recovered from tuberculosis. Nonetheless, Nehru determined to return home in order to rejoin the political fray as the independence movement in India had ignited at the time. The Nehru family finally arrived in India on December 25, 1927. Back at the Anand Bhaban, Indira went to St. Mary's Convent in Allahabad, and Kamala was sent to a hill station in the Himalayas to improve her health (Frank 2001; Jayakar 1992). As Kamala's health greatly improved, she returned to the Anand Bhaban. However, the happiness of a family reunion did not last long. On April 14, 1930, Nehru was again arrested for his leading role in the Indian independence movement. While Nehru was away, Kamala astounded the household by her active participation in a demonstration: she organized voluntary services and picketed, facing the police (Kalhan

1973). Indira also wished to join in the organized action, and so she left St. Mary's Convent to be involved in the freedom struggle (Domermuth-Costa 2001; Frank 2001; Mohan 1970).

Rebel Experience. Indira applied for membership in the Indian Congress Party to participate in the struggle against British colonial rule, but she was denied because she was only twelve years old at the time. Angry at being refused active participation, Indira ventured out to become a leader by forming her own children's brigade, the Vanar Sena (also known as the Monkey Brigade). The Vanar Sena consisted of children from five to 18 years old. Under Indira's leadership, the group addressed envelopes, made flags, cooked meals, conveyed messages, and posted information about demonstrations. It also conducted risky acts such as carrying secret messages to hiding congressmen (Gandhi 1982). Hearing of Indira's rebellious activity, the incarcerated Nehru wrote a letter to Indira on July 23, 1930: "Congratulations to the little monkey…Take care of yourself — little soldier boy" (Nehru 1984, 666).[62]

Nehru was released from jail on February 1, 1930, and his father Motilal Nehru died only a week later. Given the insecurity of the family situation and the possibility that he would be imprisoned again, Nehru persuaded Indira to join the People's Own School in Poona in May, 1931. Upon graduating, she went on to study at Santiniketan, which became Visva-Bharati University in 1951.[63] Indira quickly adapted to her new life. At Santiniketan, Indira took history, English, Hindi, French, painting, and classical Indian dance (Gopal 1976; Gandhi 1989). This worried Nehru; he thought that Indira was studying only artistic

[62] To view the full letter, please see *The Selected Works of Jawaharlal Nehru*, Volume 12, p.666.

[63] The school was founded in 1921 by Rabindranath Tagore, a famous Bengali poet, writer, and philosopher. It had three main departments: Fine Arts, Music, and Indology (Dutta and Robinson 1995)

courses, and he therefore urged her to take some science courses as well. In response, Indira enrolled in chemistry but soon withdrew (Frank 2001; Jayakar 1992; Nehru 1982).

International Experience. At that time, Indira received a telegram saying that her mother had suffered a severe attack of pleurisy which caused breathing difficulty and might require medical surgery in Europe. Although Indira thrived at Santiniketan, she finally decided to leave school after nine months. It is important to note that, from early childhood, Indira had learned to take her own decisions and to plan her own life (Frank 2001). While Nehru was in prison, Indira assumed the heavy responsibility of taking her mother to Europe (Gandhi 1986; Jayakar 1992). By the end of June 1935, Indira, Kamala, and Kamala's cousin, Dr. Madan Atal, had arrived in Berlin, Germany, where Kamala had been advised to undergo an operation. After surgery, Indira took Kamala to a sanatorium in Badenweiler in the Black Forest of Germany. Nehru came to Germany and united with the family after being released from prison on September 4, 1935. However, Kamala's health deteriorated again, and she died while surrounded by Indira and Nehru on February 28, 1936.

Major in College. Meanwhile, Indira decided to continue her education at the University of Oxford in England, but, having just lost her beloved mother, she was swamped with grief, making it difficult to study for the Oxford entrance exam (Gandhi 1986).[64] After the tragedy of Kamala's death, however, Nehru left Indira behind in Europe and returned to India. He wanted to give her independence of mind (Nehru 1982). Indira had been disciplined to grow up with strength and courage, which probably affected her decision-making style as prime minister. Nehru's intention was clearly stated in a letter to eighteen-year-old Indira:

[64] Indira's depression was silent but severe. When she became the prime minister, a journalist asked her how long it took her to recover from her mother's death. Prime Minister Indira Gandhi said, "I don't know. I don't like the word recover because I think that a wound like this never heals. The scar and the effect of it are always there in some way. I don't think of her as if she were here quite often" (Gandhi 1989, 185).

> Many years ago I used to dream that when you grew up, you would play a brave part in what is called public life in India, to shoulder this heavy burden, to help in putting brick upon brick in the building of the India of our dreams. And I wanted you to train and fit your-self in body and mind for this engrossing task. But I am not sure that I desire you to do this now, and to experience the heartache and the crushing of spirit that this involves. For me there is no escape, no refuge, till the inevitable escape that comes to us all. But why should I encourage others who are dear to me to enter into the heartbreaking business? Your loving, Papu (Gandhi 1989, 216)

Prior to attending the University of Oxford, Indira travelled to Italy with her friends. Then, she spent a couple of months in London. This was when Feroze Gandhi, her future husband, and Indira developed their romantic relationship, even though they had known each other in India for a long time (Jayakar 1992). At Oxford, she was daunted by choices and did not know what to study. In fact, except for her time at Santiniketan, Indira never enjoyed school life. According to her biography, Indira took courses in history, politics, constitutional law, French, and Latin; she passed all the courses but failed Latin twice. In order to remain at Oxford, she had to pass Latin, a compulsory subject (Frank 2001; Jayakar 1992; Gandhi 1986). Although Indira did not perform well academically, she actively participated in political life; she joined the Indian student's union, called the Oxford Majlis Asian Society, the youth wing of the Labour Party at Oxford, and the Left Book Club in London (Jayakar 1992).

Unfortunately, Indira's education was again interrupted when she became ill and had to go to Switzerland to recover. While she was being treated, the international security environment in Europe became precarious as Nazi Germany was on the road to conquering Europe. Under such circumstances, as her health improved, Indira wanted to do some work

related to independence in India and decided that she would not go back to Oxford. She did not consult with Nehru or anyone else in this decision (Gandhi 1986). Indira finally returned to India with Feroze in April 1941 without completing her bachelor's degree. It is important to note that since Indira began kindergarten, her education had been consistently disrupted by factors such as family matters, illness, and maladaptive behaviors; there had been no continuity.

Throughout her life, Indira often showed her obstinate and courageous disposition; she was not afraid of taking risks at every stage in her dynamic life. Indira was certainly "a rebel, anti-traditional and anti-establishment" (Jayakar 1992, 158). The story of Indira's marriage with Feroze Gandhi confirmed her tough and adamant personality. After the couple arrived in India on April 16, 1941, Indira announced to her family her decision to marry Feroze. Not surprisingly, the Nehrus, who belonged to a prestigious Kashmiri Pandit family, were horrified and strongly opposed her decision to marry Feroze, who came from a different class: a Parsee family of Gujarat. Moreover, Nehru believed that Feroze was a poor match for Indira because he did not have a college degree or a secure job with which to earn a steady income. Nonetheless, "Indira was more determined than ever to marry Feroze. Now, as throughout her life, objections and obstacles merely strengthened her resolve" (Frank 2001,141). Again, Nehru could not dissuade Indira from her decision. He reluctantly gave Indira his permission to marry, but urged her not to have children because he worried about her poor state of health (Nehru 1982). The doctors in Switzerland had warned Indira about the danger of pregnancy, but this did not dissuade her. She told her father that she would marry Feroze and try to have children (Gandhi 1986). In fact, Indira and Feroze eventually had two sons, Rajiv Gandhi and Sanjay Gandhi. After her marriage, Indira Gandhi helped

Nehru unofficially as a political supporter and assistant during his prime ministership, and eventually became the first female prime minister in Indian history.

6.3.2 Security and Domestic Environment and Gandhi's Role (1966–1977)

According to neorealist theorists, India under Prime Minister Indira Gandhi pursued nuclear weapons and conducted a nuclear test in 1974 due to the precarious security environment: India faced China's possessing nuclear weapons and the Pakistani military threats. However, if one delves into deeper causes of India's pursuing the bomb, this realist logic is not sufficient to explain Indira Gandhi's decisions on nuclear issues in the 1970s.

China detonated its nuclear device in October 1964. If the Chinese nuclear test was the direct cause of exercising a nuclear option, India's effort to pursue the bomb would likely have occurred immediately after the Chinese test (Hymans 2006; Perkovich 1999; Sagan 1996). Given the relatively advanced nuclear technology India had at the time under Prime Minister Nehru, India could have pursued nuclear weapons and detonated nuclear explosive by the late 1960s; however, there is no evidence that such a plan was made. Remarkably, Homi Bhabha, the first chairman of the AEC, mentioned to Nehru that India would take about a year to develop an atomic bomb in the late 1950s.[65] While this estimation was controversial among scientists and engineers working for the AEC, the CIA report noted that the Indian government had the capability to produce a nuclear weapon and assemble a bomb in five years (Bunn 1992; Lavoy 2010).

[65] Major General Kenneth D. Nichols, who worked for the U.S. Atomic Energy Commission (USAEC) and worked closely with the Indian government in early 1950, recorded the conversation between Prime Minister Nehru and Bhabha in his memoir. When Nehru asked Bhabha, "Can you develop an atomic bomb?" Bhabha replied "I estimate that it would need about a year to do it." However, Nehru concluded by saying "Well, don't do it

Although the Chinese nuclear test resulted in a shift in Indian foreign policy, the relationship between the two countries had improved as India sent an ambassador to China in the mid-1970s for the first time since 1961 (Perkovich 1999). There was no acute Chinese threats to India's security in the early 1970s,[66] meaning that Gandhi's decision to pursue nuclear weapons was not directly derived from Chinese threats.

In addition to the Chinese factor, realists argue that the India-Pakistan War in 1971 triggered India to pursue nuclear weapons.[67] However, it is important to note that India was the overwhelming victor in the war, and Pakistan did not emerge as a dangerous threat at the time. Notably, India's military capabilities were superior to those of Pakistan. Table 6.1 shows a comparison of military capabilities between the two countries in the early 1970s. The war ended after Pakistan signed the Instrument of Surrender in December 1971. As a result, Pakistan was bifurcated and Bangladesh was created as a sovereign state the same year. The Pakistani factor in India's developing nuclear weapons is less supportive because Indian Prime Minister Indira Gandhi and President Zulfikar Ali Bhutto of Pakistan signed the Simla Agreement[68] on July 2, 1972 to ease the hostile relations between the two countries that had surfaced due to the 1971 war.

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until I tell you to." For more detail, see Kenneth D. Nichols, *The Road to Trinity* (NY: Morrow, 1987), p.9.

[66] Even after China conducted its nuclear test in 1964, Indian newspapers, editorials, and op-eds in the late 1960s on the nuclear weapons issue were rare (Frey 2006).

[67] It is important to note that India has experienced five major wars since India became an independent nation in 1947: the Indo-Pakistani War of 1947–1948 (also known as the First Kashmir War), the Indo-Pakistani War of 1965, the Indo-Pakistani War of 1971, the Kargil War of 1999, and 2020–2021 India-Pakistan border skirmishes.

Table 6.1 Comparison of Military Equipment

	India	Pakistan
Army	2790 Tank 1300 Armored Personnel Carrier	1600 Tank 645 Armored Personnel Carrier
Navy	64 Warship	38 Warship
Air Force	750 Combat Aircraft	350 Combat Aircraft

Source: The Military Balance 1970–1971

With respect to Pakistan's nuclear weapons, most scholars agree that India's nuclear test of 1974 provided Pakistan a legitimate reason for its nuclear weapons aspirations (Frey 2006; Pant and Joshi 2018). Pakistan made a great leap forward to developing the bomb through the illicit network that A.Q. Khan created in 1975 in order to supply an ultracentrifuge for uranium enrichment. It was only in 1978 that India was aware of the A.Q. Khan network. At the time, the Indian government revised its earlier assessment on Pakistani nuclear capabilities and reported that Pakistan would be able to conduct the test detonation of nuclear weapons in a year or two (Subrahmanyam 1998).

In addition to the Chinese and Pakistani threats, it is necessary to examine India's security situation with regard to the two Cold War superpowers, the US and the Soviet Union. Since India gained independence in 1947, the country had received military supplies from the Soviet Union and economic aids from the US. Under the Eisenhower administration, the US maintained a liberal attitude on sharing nuclear technology and weapons with allies. Eisenhower believed that, in order to restrain the Soviet Union and other enemies, U.S. allies should have nuclear weapons (Miller 2018). When John F.

[68] The Simla Agreement contains several principles to establish durable peace and harmonious relationship between India and Pakistan: respect for each other's territorial integrity, sovereignty, internal affairs, national unity, and political independence.

Kennedy entered the White House in 1961, he announced that the US would renounce Eisenhower's liberal proliferation policies; however, Kennedy did not completely abandon his predecessor's liberal approach to nonproliferation in that his nuclear policy was not aimed to prevent all prospective nuclear states. Instead, it focused primarily on preventing China and West Germany from acquiring nuclear weapons (Burr and Richelson 2000; Trachtenberg 1999). According to the memorandum from State Department official George McGhee to then-Secretary of State Dean Rusk, there were growing opinions in the State Department that the US needed to help India acquire nuclear weapons to "beat Communist China to the punch by detonating a nuclear device first."[69] Opinions within the Kennedy administration on nuclear dealings with India were divided. In the end, Kennedy agreed to sign a bilateral agreement on August 8, 1963 to provide low enriched uranium fuel to the Tarapur Atomic Power Station (TAPS) for peaceful civilian purposes only (Noorani 1981). As 1964 began, the newly-inaugurated Lyndon Johnson favored a nonproliferation policy similar to the Kennedy administration (Brands 2007).

However, by the time China conducted its first nuclear test on October 16, 1964, U.S. nonproliferation policy had significantly changed. The US believed that the Chinese test would trigger domino effects of nuclear proliferation, especially in Asian countries such as India and Japan.[70] As a result, the Johnson administration decided to prevent further spread of nuclear weapons whether friends or foes. The report by Gilpatric on January 21, 1965 stated:

[69] The memorandum from McGhee to Rusk, "Anticipatory Action Pending Chinese Communist Demonstration of a Nuclear Capability," September 13, 1961. Please see FOIA files on India, National Security Archive, Washington, D.C.

[70] Former Deputy Secretary of Defense Roswell Gilpatric warned that India would go for nuclear weapons due to the Chinese test. India's nuclear weapons could give Pakistan a reason to build these weapons, which in turn could spur Israeli and Egyptian proliferation.

> The Chinese Communist nuclear weapons program has brought particular pressure on India and Japan which may both be approaching decisions to undertake nuclear weapons programs. Although one might be tempted to accept Indian or Japanese nuclear weapons to counterbalance those of China, we do not believe the spread of nuclear weapons would or could be stopped there. An Indian or Japanese decision to build nuclear weapons would probably produce a chain reaction of similar decisions by other countries, such as Pakistan, Israel and the UAR.[71]

As the concern for nuclear domino effects grew, the US and the Soviet Union finally reached a tentative agreement on several principles of the NPT in October 1966, opening the door to ratifying the treaty (Brands 2007). Subsequently, the treaty was opened for signature on July 1, 1968 and entered into force on March 3, 1970.[72] However, Prime Minister Indira Gandhi refused to sign the NPT because she believed that the main purpose of the treaty was to restrict possession of nuclear weapons to the five countries – China, France, the Soviet Union, the UK, and the US – that already had the bomb before January 1, 1967.

Although U.S. President Richard Nixon, inaugurated in 1969, had a relatively lukewarm attitude toward the NPT compared to his predecessor Lyndon Johnson, the Nixon administration expressed concerns over Indian proliferation (Miller 2018). Even if the US supplied large amounts of economic aid and nuclear technology for peaceful purposes, India-US relations had become exacerbated due to the Indo-Pakistan crisis and war during that time. Specifically, a few months before the war broke out in December 1971, Indira

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He also argued that if the US allowed Japan to proliferate, it would lead German and Italian arsenals. For more details, see Johnson Administration, FRUS, 1964–1968, vol.11, doc. 49.

[71] Please see the report by the Gilpatric Committee on the nuclear proliferation issue. For more details, see Johnson Administration, FRUS, 1964–1968, vol.11, doc.64.

[72] Moreover, on May 26, 1972, the first Strategic Arms Limitation Talks (SALT I) was signed by these two superpower countries in order to restrain the arms races in strategic ballistic missiles, such as intercontinental ballistic missile (ICBM), submarine-launched ballistic missile (SLBM), and nuclear weapons.

Gandhi traveled to Washington to rally U.S. support for India in the Indo-Pakistan crisis. Gandhi and Nixon held meetings, but they were unsuccessful. Henry Kissinger, National Security Advisor and Secretary of State under the Nixon administration, called the two Gandhi-Nixon sessions "the two most unfortunate meetings Nixon had with any foreign leader" (Kissinger 1979, 842). Despite the U.S. effort to prevent hostilities between India and Pakistan, Nixon realized that Gandhi had already made a bold decision to exploit the crisis to attack Pakistan (Hollen 1980; Kissinger 1979; Perkovich 1999). Gandhi, with a high level of risk propensity, was assured of winning the war and eventually moved Indian military forces to cross its western border in late November.

In contrast, the Indian-Soviet relationship had been strengthened by 1971, and in turn India became increasingly reliant on Soviet military supplies. Therefore, as the war between India and Pakistan unfolded, not surprisingly, the Soviet Union supported India while the US moved closer to Pakistan's side by deploying the 7th fleet (Enterprise) in the Bay of Bengal.[73] The Soviet Union assured India that Moscow would deploy its naval forces to the region if the US intervened and threatened India (Garthoff 1994; Perkovich 1999).[74] Indian-Soviet relations clearly buttressed India's security, meaning that the Enterprise incident did not generate India's perceived threat to national security (Frey 2006).

[73] Early on August 9, 1971, the Soviet Union and India signed the Indo-Soviet Treaty of Peace, Friendship and Cooperation. Article IX of this mutual strategic cooperation states that "in the event of either Party being subjected to an attack or a threat thereof, [the other] Party shall immediately enter into mutual consultations in order to remove such threat and to take appropriate effective measures to ensure peace and security of their countries" (Appadorai and Rajan 1985, 139).

[74] Given Sino-Pakistan political relations, China denounced India's military actions, but it did not enter the fray militarily on Pakistan's side (Perkovich 1999).

Without facing an acute security threat, Gandhi nevertheless authorized the pursuit of nuclear weapons and conducted a nuclear test. The international community had the strongest reaction to Gandhi's aggressive decision. For example, the US and other industrial countries reached the August 1974 agreement in which certain items that may trigger nuclear proliferation would not be supplied to India. In addition, the Nuclear Suppliers Group (NSG) was established in response to the Indian nuclear test. The NSG became an important nonproliferation cartel that strengthened the safeguard and effectively controlled nuclear technology.

Interestingly, historical evidence revealed that Gandhi did not expect such strong international condemnation. In a 1996 interview with Perkovich, Homi Sethna, then-chairman of the AEC, stated that "we thought the US would stick to its agreement. We thought the fuel supply relationship was a treaty which the US could not break" (Perkovich 1999, 174). Republican Senator Charles Percy also noted that Gandhi exploded a nuclear device "without any concern that they would have any sanctions imposed against them" (Perkovich 1999, 207). Gandhi calculated that nuclear weapons would only increase India's international prestige without inviting any sanctions. In other words, Gandhi's high risk propensity caused her to underestimate the enormous cost of pursuing nuclear weapons while overestimating the benefits (Perkovich 1999).

The security model fails to examine key decision-makers, who have a vested interest in making choices with respect to national security. In addition, the emergence of security threats and decision-makers' decision to pursue nuclear weapons were not closely correlated in time (Sagan 1996). These problems suggest that it is necessary to conduct a more in-depth analysis of the decision-making process and the role of domestic actors. The rest of this section therefore discusses a domestic politics model and examines the explanations of

India's nuclear proliferation that flow from this logic. Over the decades, a domestic politics model made significant progress in the shadow toward Indian nuclear weapons. Under this logic, officials in state-run scientific laboratories and politicians are considered important domestic or bureaucratic actors who influenced the Indian government from pursuing nuclear weapons; however, this approach neglects the role of individual leaders. Given that scientists and politicians cannot achieve their goals without a top-down decision to develop nuclear weapons, this study not only examines the role of these types of domestic actors but also national leaders.

Under the leadership of Prime Minister Indira Gandhi during the late 1960s and early 1970s, scientists and politicians did not make a concerted effort to pursue nuclear weapons. The Indian government was caught in a prolonged debate between actors who wanted to encourage India to pursue nuclear weapons as soon as possible and others who opposed them and supported the international norm of non-proliferation and Indian membership in the NPT (Sagan 1996).[75]

Along with the Atomic Energy establishment at Trombay, later called the Bhabha Atomic Research Center (BARC), the AEC has been the leading research center in atomic science and technology in India.[76] Nehru placed these research centers under the direct

[75] I provide tables that show some of the pro-nuclear bomb proponents and anti-nuclear bomb proponents and explanations for their positions in Appendix II.

[76] The Indian Atomic Energy Commission was set up by Prime Minister Nehru in 1948. Nehru later created the Department of Atomic Energy (DAE) in 1954, and the AEC became one of the important governing bodies of the DAE in 1958. Later, the Atomic Energy Act of 1962 granted power to the AEC that any organization or person does not have the right to invent anything related to atomic energy without authorization by the AEC (Agarwar 1996). There are numerous research centers under the DAE, including the Bhabha Atomic Research Center (BARC), Tarapur Atomic Power Project, Rajasthan Atomic Power Project, Madras Atomic Power Project, Jaduguda Mines Project, Thumba Equatorial Rocket Launching Station, Space Science and Technology Center, Experimental Satellite Communication Earth Station, Atomic Minerals Division, and Trombay Township Project.

authority of the prime minister and appointed his personal friend, Homi Bhabha, as the first chairman for both the AEC and BARC. Bhabha obtained extraordinary functional and decision-making autonomy for the atomic program, but he did not have authority to initiate developing nuclear weapons. Accordingly, Bhabha constantly asked for the prime minister's permission to acquire nuclear weapons, but Nehru rejected his proposals, saying that nuclear weapons were the corrupted product of Western modernity (Agarwar 1996; Perkovich 1999).

After Bhabha died in 1966, Indira Gandhi appointed Vikram Sarabhai, anti-nuclear bomb proponent, as Bhabha's successor at the AEC, and Homi Sethna, pro-nuclear bomb proponent, as chairman of the BARC. Not surprisingly, these two scientists disliked each other (Perkovich 1999). As this competitive tension existed, Gandhi finally decided to pursue nuclear weapons in the early 1970s. In meeting with these scientists, her decision was the result of an ad hoc process. According to Ramanna, "[Gandhi] didn't speak in the meeting. She listened and then decided. That's all. It's difficult to say what was on her mind" (Perkovich 1999, 176). As mentioned in Section 6.3.1, Gandhi learned to hide her emotions from her childhood experiences. This suggests that even if a group of scientists' continued lobbying for or against the development of nuclear weapons was critical to affecting India's nuclear policy, the final decision was exclusively made by Prime Minister Indira Gandhi.

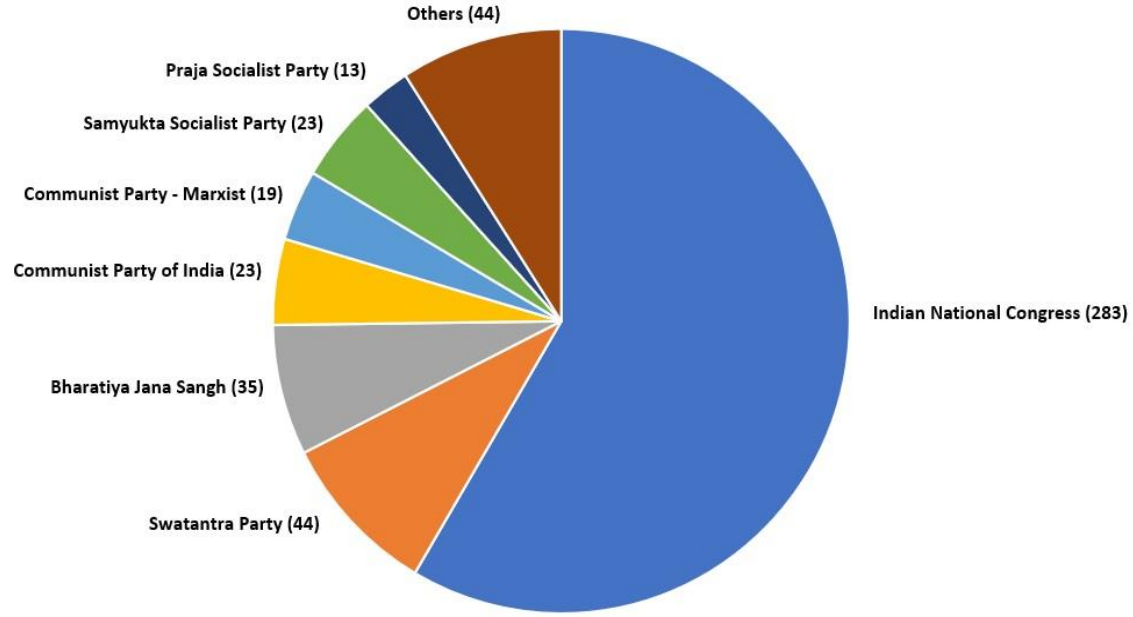
Compared to scientists and state-run laboratories, politicians and the Lok Sabha (Indian Parliament) were relatively less influential in Indian nuclear policy. A profound scholar of Indian nuclear policy, Ziba Moshaver, found that "from 1968 to 1974 there was no pressure from the Lok Sabha, the bureaucracy, the media, or the public on the government to change its nuclear policy" (Moshaver 1991, 43). As has been noted, the AEC and BARC were the two most supreme supervisory institutions of the nuclear program and these were directly

under charge of prime ministers, meaning that the Lok Sabha and bureaucratic organizations had no control over their nuclear decisions (Frey 2006).

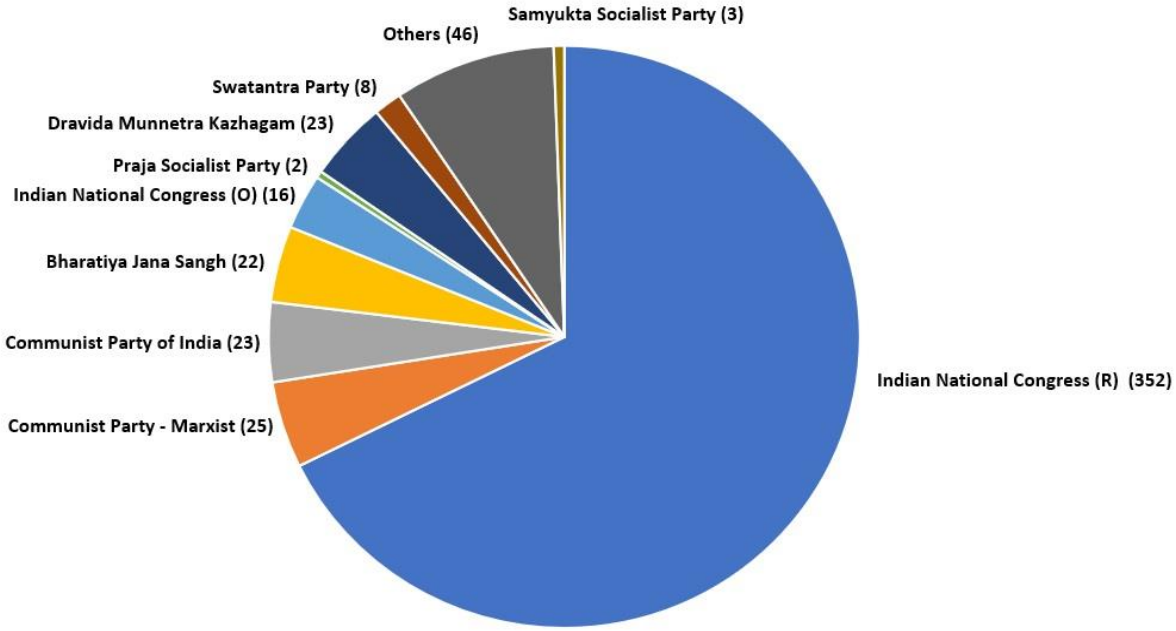
For example, the Ministry of External Affairs has traditionally dealt with issues on arms control and non-proliferation, but it has not been involved in the development of nuclear or other missile technologies. The Ministry of Defense also has had a limited influence on nuclear policy decisions. It is important to note that since the foundation of independent India in 1948, the country decided to separate the military from national security decision-making, as leaders at that time feared the potential military coups that had been common in developing countries (Cohen 1971).

Along with these executive departments, the Lok Sabha or legislative branch had little influence on nuclear policy beyond its roles in asking questions to government ministers and overseeing financial operations (Perkovich 1999). The results of the Lok Sabha elections demonstrate that the parliament did not substantially affect Indira Gandhi's decision to pursue nuclear weapons in the early 1970s. As Figure 6.1 shows, the Bharatiya Jana Sangh Party (BJP) and the Samyukta Socialist Party (SSP), the most vocal pro-nuclear weapons parties, lost their representations in the Lok Sabha in 1971. Specifically, the BJP won 35 seats out of 523 total seats in 1967; it won 22 seats out of 521 in 1971. The SSP won 23 seats in 1967; however, it only won 2 seats in 1971.

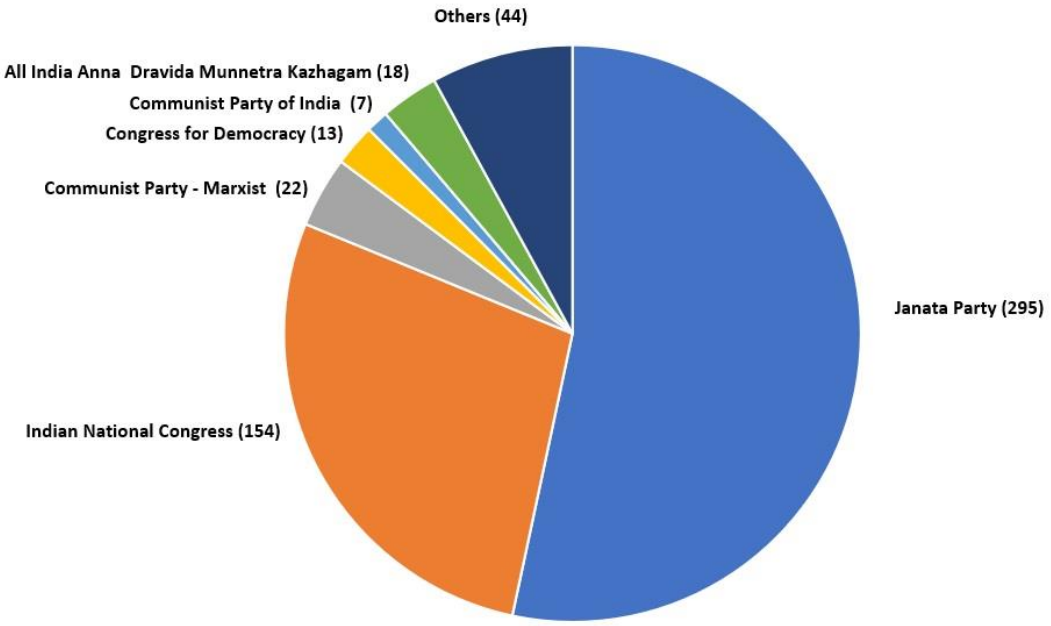
Figure 6.1 Lok Sabha Elections 1967, 1971, 1977, and 1980



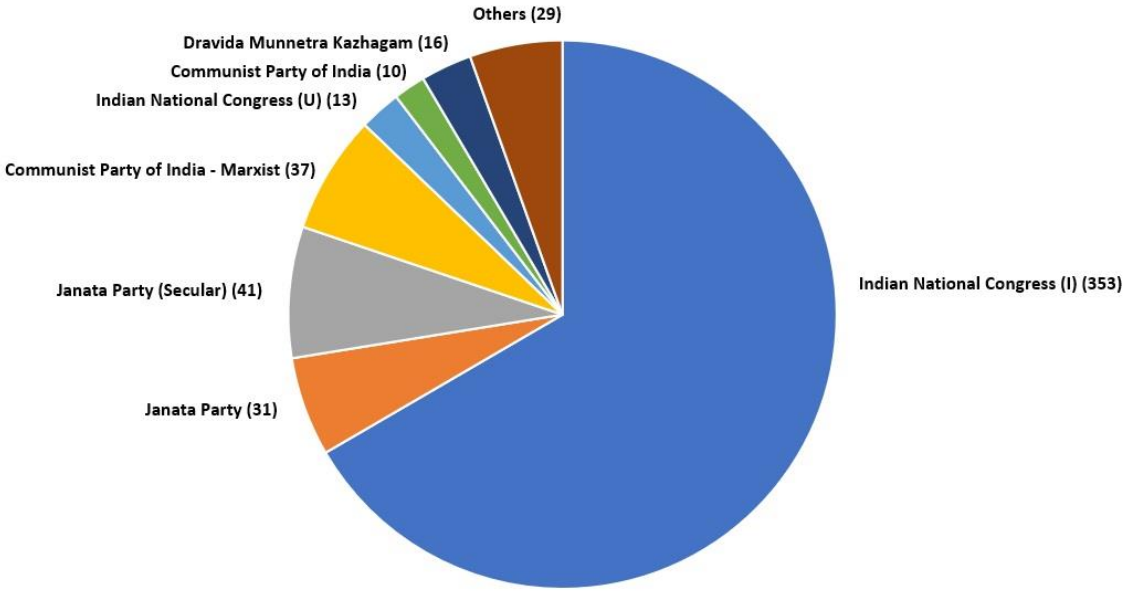
1967



1971


Others (44)
All India Anna Dravida Munnetra Kazhagam (18)
Communist Party of India (7)
Congress for Democracy (13)
Communist Party - Marxist (22)
Janata Party (295)
Indian National Congress (154)

1977

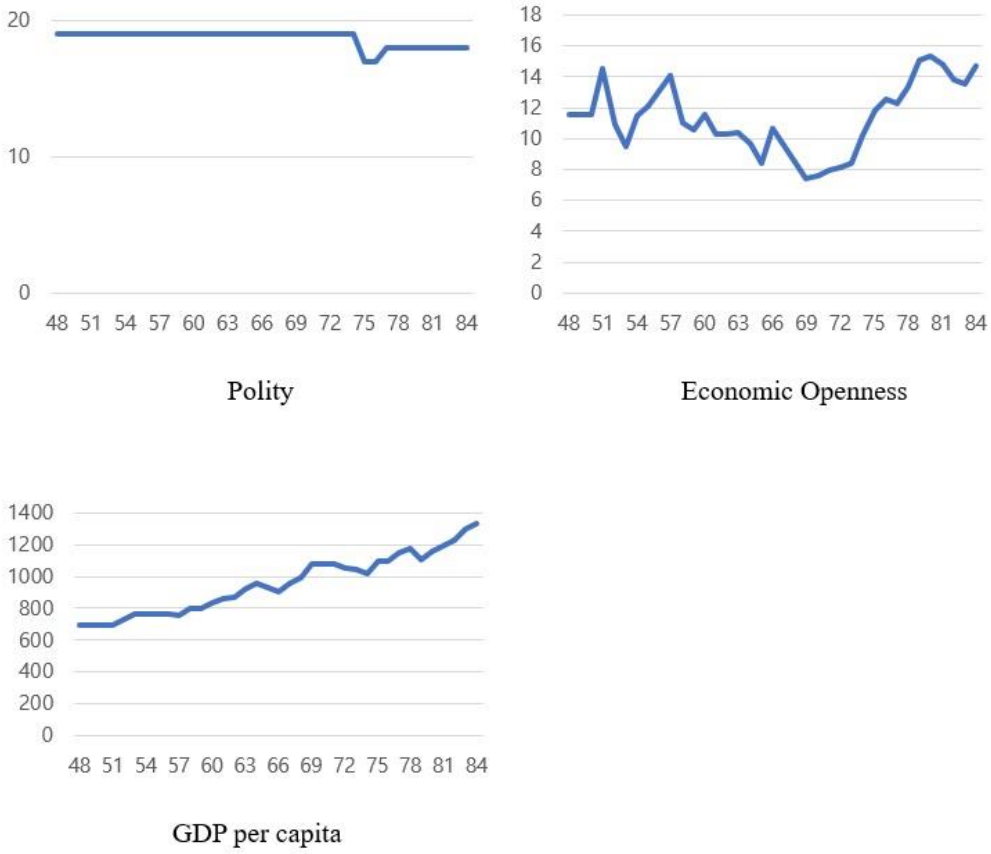

Others (29)
Dravida Munnetra Kazhagam (16)
Communist Party of India (10)
Indian National Congress (U) (13)
Communist Party of India - Marxist (37)
Janata Party (Secular) (41)
Janata Party (31)
Indian National Congress (I) (353)

1980

In contrast, the Indian National Congress (INC) Party, in which Prime Minister Gandhi was the supreme and central figure, increased its representatives from 283 to 352. As it had been the ruling party for nearly four decades, the INC adhered to Mahatma Gandhi's doctrine of non-violence and class harmony. Accordingly, Indira Gandhi's father Jawaharlal Nehru, the first prime minister of independent India and the party leader of the INC, declared that India would not develop nuclear weapons. Despite the motto of the INC, interestingly, Indira Gandhi pursued nuclear weapons. This proves that the parliament, parties, and politicians do not provide adequate explanations of the Indian nuclear pursuit.

A number of observations suggest that Gandhi's nuclear policy decision was not aimed at winning the Lok Sabha elections. As shown in Figure 6.2, economic growth of the Gandhi government had slowed in the early 1970s. If Gandhi viewed nuclear weapons as a useful tool to gain public support and in turn win the election, the PNE would likely have occurred before the election in March 1971. In fact, according to the Indian Institute of Public Opinion, an August 1970 poll revealed that 69% of respondents in four major cities wanted India to go nuclear (Indian Institute of Public Opinion 1970). Indeed, public support for Gandhi increased by one-third a month after the nuclear test (Cortright and Mattoo 1996). In an interview with the U.S. defense analyst Rodney Jones, Gandhi publicly told him about India's pursuit of nuclear weapons: "How could it have been political? There were no elections coming up. There was no way for it to serve a political purpose" (Jones 1985; 114).

Figure 6.2 Polity, Economic Openness, and GDP



Unfortunately, there is no firm evidence as to why Prime Minister Gandhi pursued nuclear weapons and conducted a PNE in the early 1970s. Due to the secrecy of the Indian nuclear program, it is impossible to know whether Gandhi decided to pursue and test the bomb in response to domestic politics (e.g., scientists, politicians, and public support) or security threats (e.g., Chinese nuclear test and Pakistani military threats). All of these would likely be important factors to motivate Gandhi to pursue nuclear weapons. Therefore, this research does not argue that domestic or security factors are incorrect explanations to understand the Indian nuclear policy; it rather emphasizes the role of national leaders. More important, Prime Minister Indira Gandhi, who had a high risk propensity, made a final risky decision to pursue nuclear weapons given all these security and domestic factors.

6.3.3 Security and Domestic Environment and Gandhi's Role (1980–1984)

Indira Gandhi won the January 1980 election and returned power. She served as prime minister until she was assassinated on October 31, 1984. By the time Gandhi began her second tenure, security and domestic environments in India had not changed much compared to the period under the leadership of Prime Minister Morarji Desai, who halted nuclear weapons programs and found a diplomatic way to improve relations with Pakistan and the US. Pakistan, India's erstwhile adversary, emerged the most real nuclear threat in 1975, and its conventional military capability was continuously augmented by the US. Indeed, after India's nuclear test in 1974, the international community enhanced non-proliferation of nuclear weapons.[77]

The Desai government (1977–1979) did not last long because internecine political conflict drove Desai from power. Immediately after Gandhi came to office in January 1980, she revisited the nuclear policy and reversed Desai's moderate position. She did not waste time in making her government's nuclear policy. On March 13, 1980, Gandhi said that she would "end the confusion about India's stand on peaceful nuclear tests…[T]here would be no hesitation in conducting these in the national interest" (Chakma 2005, 221). This shows that security or domestic factors were not critical in driving Gandhi to re-pursue nuclear weapons. Therefore, this section focuses on Gandhi's foreign and domestic decision-making and illuminates her risk propensity and risky decision with respect to nuclear policy.

From 1980 to 1984, Prime Minister Indira Gandhi made significant efforts to strengthen India's security in dealing with the emerging nuclear threat from Pakistan. First, Gandhi

[77] According to the Military Balance 1982–83, Pakistan's military capabilities still lagged far behind India's.

brought Raja Ramanna, who was relegated from the BARC to the Defense Research and Development Organization (DRDO) under the Desai government, back to his earlier position as chairman of the BARC and gave him additional power as a secretary to the Department of Atomic Energy (DAE). Ramanna wished to revive the nuclear weapons program now that his political benefactor, Gandhi, was back in power, and he believed that Gandhi anticipated this. The Gandhi government utilized his return not only as a means to strengthen the BARC but also to remind domestic audiences that the Desai government made a mistake in its nuclear policy (Perkovich 1999). Moreover, Gandhi shuffled her cabinet in order to create favorable conditions to develop a nuclear program: she repositioned her trusted Finance Minister Ramswamy Venkataraman, a strong supporter of nuclear technology and industry, to Minister of Defense. As expected, his appointment as defense minister helped improve India's nuclear and missile program (Perkovich 1999).

The second tactic was to increase India's military spending. In the beginning of her second term, Gandhi declared that she would increase spending on military in order to modernize forces with advanced weapon systems. In May 1980, Gandhi signed an arms supply deal with the Soviet Union. According to the agreement, Indian purchased $1.63 billion in arms, including T-72 tanks and MiG-25 Foxbat aircraft (Smith 1994). Later in 1982, Gandhi announced that India would buy 40 Mirage 2000 fighter bombers, worth $850 million, from France to counter Pakistan's purchase of 40 F-16 warplanes in 1981 from the US (Lewis 1982).

As part of modernizing military forces, the Integrated Guided Missile Development Programme (IGMDP) was created in 1983 to produce ballistic missiles. The program was managed by the Ministry of Defense under the leadership of Vekataraman and strongly supported by Prime Minister Gandhi. The short range surface-to-surface Prithvi I missile

and the longer-range Agni missile were developed under this program: Prithvi I was capable of carrying a payload of 1,000 kg with a range of up to 150 to 300 km; on the other hand, Agani, a medium to intercontinental range ballistic missile with a range of 700–1,200 km, had a maximum warhead mounting capability of 1,000 kg. Notably, these missile were capable of carrying nuclear warheads.

Moreover, in June 1983, the Gandhi government finally commissioned the Madras Atomic Power Station (MAPS) at Kalpakkam in Tamil Nadu. This plant could produce plutonium for the purpose of nuclear explosions. Construction of the MAPS was started in 1970 and finally finished in 1982, but it was delayed operationally because of a shortage of heavy water (Mihollin 1986).[78] In order to avoid international safeguards on the MAPS, India sought to acquire additional heavy water from underground sources. According to a US report, India clandestinely purchased about 100 tons of heavy water from unknown sources between 1982 and 1983, and those purchases presumably continued through 1987 (Chengappa 2000; Mihollin 1986). However, the Indian government steadfastly denied that India acquired heavy water through trafficking because this would reduce India's national prestige and increase risk in security (Perkovich 1999).

Third, Gandhi in the second term used diplomacy to ease tensions with Pakistan and to improve relations with the US; however, it was a dual-track strategy in that she contemplated attacking Pakistan's nuclear facilities and planned to conduct a second nuclear test while holding warm and productive bilateral meetings with the leaders of these two countries.

Meanwhile, the Reagan administration (1981–1989) came into power a year after Gandhi assumed power in 1980. It was fortunate to the Gandhi administration that the

Reagan administration took a relatively less activist approach to nonproliferation compared to the Carter administration. Reagan revisited Carter's restrictive policy on nuclear exports that appeared to undermine the U.S. nuclear industry and relations with other countries. Therefore, the Reagan administration decided to relax export controls regarding plutonium reprocessing especially in less threatening countries that could work cooperatively with the US (Clausen 1993). It was Gandhi's diplomatic achievement that the Reagan administration finally agreed in 1982 to let France provide nuclear fuel to India on behalf of the US (Bajoria and Pan 2010).

Gandhi's effort to put relations with Pakistan on a warmth track appeared successful as well. Prime Minister Indira Gandhi and Pakistani President Muhammad Zia-ul-Haq held a meeting in New Delhi on November 1, 1982, the first official bilateral summit between leaders of the two countries in ten years.[79] As a result, Gandhi and Zia agreed on a no-war pact and created an Indo-Pak Joint Commission to continue dialogue and promote peace, cooperation, and friendship (Ehrlich 1982).

However, at the same time, Gandhi planned to attack Pakistan's uranium enrichment plant located in the small village of Kahuta and a reprocessing facility at Rawalpindi. Although India never admitted its contingency plan for a preemptive attack against Pakistan's nuclear facilities, Indian scholar W.P.S. Sidhu found indirect evidence that the Gandhi government reviewed the feasibility of attacking the Kahuta plant in June 1981 (Perkovich 1999). Moreover, it is widely believed that Gandhi and her closest advisors, including Cabinet Secretary Krishnaswamy Rao Sahib and Principal Secretary P.C. Alexander, had a meeting to consider a prospective nuclear test sometime in late 1982 or

[78] Specifically, India possessed about 550 tons of heavy water by 1983. Of that volume, 321 tons came from the Soviet Union.

early 1983 (Perkovich 1999). Unfortunately, there is no public record or clear evidence of her deliberations on either a preemptive attack on Pakistani's nuclear plant or the second nuclear test, but a number of former Indian officials and US intelligence sources leaked reports on her plans (Benjamin 1982).

Since the summer of 1982, Gandhi faced severe domestic political trouble, and this drew a significant amount of her attention. Specifically, the Gandhi government confronted Sikh militants led by Sant Jarnail Singh Bhindranwale, who had occupied the Golden Temple in Amritsar. The Sikh believed that the government would be reluctant to rout them by entering the sacred Golden Temple. However, Gandhi's high risk propensity led her to underestimate the cost of attacking the sacred place. On June 5, 1984, Gandhi authorized a full-scale assault called Operation Blue Star. The result was devastating: many important buildings were damaged, and the government reported that approximately 500 people were killed and 86 were injured.[80] Operation Blue Star clearly impacted Indian nuclear policy, because Indira Gandhi was assassinated by her Sikh bodyguards on October 31, 1984. This meant that a change in India's nuclear policy would be unavoidable.

In summary, from the beginning of her second term in office, Prime Minister Gandhi rejuvenated the nuclear program even under similar circumstances to the Desai government. Gandhi's nuclear policy was not directly motivated by security or domestic factors; instead, Gandhi's decision was made primarily based on her high risk propensity and resolve. Gandhi publicly emphasized that India's nuclear weapons were for a peaceful purpose, and India would not conduct further peaceful nuclear explosions and would instead seek to

[79] Gandhi and Zia informally met in the former Rhodesian capital of Salisbury at the celebrations of Zimbabwe's Independence Day in 1980.

[80] Some argue that the government's assessment on the number of casualties was downsized. According to Tully and Jacob (1985), at least 1,600 people were killed and wounded.

improve ties with Pakistan and other countries. In spite of those assurances, she kept the nuclear testing option open and considered a decisive and risky preemptive attack against the Pakistani nuclear threat. Undertaking counterfactual thinking, if Gandhi with her high risk propensity had not been assassinated and instead maintained power for a longer period, India would likely have conducted a second nuclear test much earlier than 1998.

6.4 Morarji Desai

Morarji Desai, who led the Janata Party, served the 4th Prime Minister of India between 1977 and 1979. As soon as Desai took office in 1977, he put his foot on the brake pedal in regard to pursuing nuclear weapons; indeed, he condemned India's long-standing interest in PNE that had been accelerated by his predecessor Indira Gandhi for a decade. Unfortunately, Desai's short-lived government came to an end when political conflict in the Janata Party drove him to resign from office in 1979.

6.4.1 Examining Desai's Risk Propensity Variables

Age and *Socioeconomic Backgrounds*. Morarji Desai was born in Bhadeli, Bulsar District, on February 29, 1896.[81] Desai was the eldest son of three brothers and two sisters. He was born into his maternal grandfather's house, because at that time women used to go to their parents' house for giving birth. Therefore, Desai spent his very early childhood with his grandparents' family, who were middle-class farmer (Bhattacharya 2014).

[81] Bulsar district, currently known as Valsad district, is located in the western part of India. It is one of the 33 districts in the state of Gujarat.

Desai's father, Ranchhodji Nagarji Desai, was a school teacher in the Bhavnagar district in the Saurashtra region of Gujarat. As the head-master of a middle school, Ranchhodji Desai was a very strict disciplinarian who took good care that his children were not engaging in delinquent behaviors. Yet, Ranchhodji Desai was a very peace-loving person: he never used harsh words towards his children nor argued or quarreled with anyone in the family (Morarji Desai Archives 2019). Until Ranchhodji's death, Desai spent most of his time with his father, who had influenced him in many directions.[82] Desai recalled him saying,

> He was not accustomed to expressing his love ostentatiously, but I had always a feeling that he had great affection for me. He had great faith in God. He was always satisfied with what he got. He performed his duties conscientiously. He had great affection for his students and regard for his companions. I did not know of any quarrel he had with anyone. I inherited from him a sense of duty, religious faith and equanimity in all circumstances. It is difficult to imagine a more precious inheritance (Desai 1974, 7)

Vajiaben Desai, Desai's mother, was raised in a deeply religious family consisting of her parents and two brothers. As Desai grew up in his maternal grandfather's house in his early childhood and for a certain period of time after the death of his father, his grandfather asked him to read the religious books – the Ramayana and the Mahabharata. Although Desai was not a voracious reader, these two books greatly formed his views about morality. He said that "These books gave me my religious sense...[and because of these books] I used to keep away from all wrong habits and vices" (Desai 1974, 11). Vajiaben Desai was also very

[82] His father had fallen into the well and died when Desai was fifteen years old. Whether his death was due to an accident or a suicidal attempt remains suspicious.

religious. She sometimes expressed her quick temper, but this was only seen when someone conducted unrighteous behaviors. In addition, she was frugal in that she never spent more than what her economic situation permitted. Accordingly, she managed the household well within the limits of budget (Desai 1974).

Major in College. While Desai was attending high school, he developed the habit of working hard as a student, never broke a single school rule, and performed well academically. He passed his matriculation examination in the top fifty students at the age of 16. At that time, Elphinstone College was considered a better college than Wilson College in Mumbai, but tuition and the cost of life at Elphinstone appeared to be more expensive than that of at Wilson. Therefore, he decided to attend Wilson because he was admitted to the Goculdas Tejpal free boarding house, which provided his tuition, boarding, and food that could cover his college life at Wilson (Singh 2019).

Desai remembered that his college life was congenial. He used to live with nine other students in a room at the boarding house, and there he grew acquainted with many good friends with whom he studied and played tennis. By the time Desai entered the college, he was the shortest person in his class and was very timid, could not sleep alone, and did not have the courage to fight with anyone. However, during his life at Wilson, his height grew and he became healthy, sturdy, and self-reliant (Chtterjee 1969; Desai 1974).

At Wilson, Desai majored in physics and chemistry, and took mathematics, history, Sanskrit, English, and Bible classes (Desai 1974). While attending the college, he maintained very close relationships with professors in the science department, and this helped Desai stay focused on his studies. As he developed the habit of being diligent in his studies throughout his childhood, Desai continued to put great effort into his studies and

achieved an academic success. After passing with good scores in all of his examinations, which lasted for six days, Desai finally obtained his BS degree in 1917 (Desai 1974).

While Desai was at college, he was also interested in extracurricular activities outside of school from which he learned a lot. Although he did not have enough money to travel abroad, he would not hesitate to go to any part of the city where he could watch cricket matches and public speeches. He usually walked, but if it appeared not to be a walking distance, he took trains. As the Home Rule movement[83] had just started in colonial India at the time, he attended many public meetings with respect to the movement and worked as a volunteer for an annual session of the Indian National Congress. At one session, he heard Mahatma Gandhi's speech for the first time and was deeply impressed by his non-violent struggle. Desai did not actively participate in the freedom struggle at the time; however, from then on, "[his] sense of patriotism became stronger and stronger" (Desai 1974, 19). By the time Desai graduated from college, he did not have a specific career plan in mind. He wanted to work in the civil service and applied to the position in Mumbai, but the result was unsuccessful.

Military Experience. Amidst World War I in June 1917, the Indian leaders pushed the British government to allow the entry of Indians into the army and to initiate defense courses in college. As a result, the University Training Corps (UTC) was founded in several colleges in Mumbai. While waiting for another job vacancy, he joined the UTC, which was open to college students, professors, and lecturers, and he stayed there for one short year. Although Desai did not get sufficient training in actual fighting, such as the use of firearms at a shooting range, he learned all the basic training through drills. He performed well at UTC

[83] The Home Rule movement was started to achieve self-government within British India and lasted for two years from 1916 to 1918. Annie Besant and Bal Gangadhar Tilak of the Home Rule League led the movement (Haynes 1991).

and therefore had a chance to join the army to become a King's Commissioned Indian Officer (KCIO)[84], but he declined to do so. Desai said that "I did not like the idea of going to England for two years for training, leaving the family in a helpless situation. So I did not succumb to the temptation of securing a place in that elite service" (Desai 1974, 29). In the meantime, Desai sent another application to work in the provincial service. Along with an excellent certificate that he received from Captain Cisson at UTC, he was finally appointed as a probationary deputy collector in Ahmedabad in May, 1918 (Desai 1974).

During a two-year probationary period, Desai attended a six-week course in treasury work because his duties as a deputy collector included both revenue and criminal cases. Although Desai did not take an economic course in college, he gained sufficient knowledge about economics and finance to eventually become the minister of finance (1967–1969). As a deputy collector in relation to revenue work, he had to estimate what amount of revenue had to be collected after poor rainfall resulting in low crop yields in the district. He traveled from village to village and met with farmers who often underestimated the crop possibilities in order to pay less revenue. After much discussion, Desai arrived at an arrangement that could satisfy both farmers and the government. At the time, Desai was widely known as a reasonable and good negotiator. Desai recalled of this work that "[it] gave me very good training in being careful not to take decisions on the basis of preconceived notions. I have used this training in all the decisions that I have since taken in my life. This has enabled me to do my duty conscientiously" (Desai 1974, 51).

After twelve years in the government service, Desai resigned from it on May 21, 1930. He then joined the Gujarat Pradesh Congress Committee and soon after he was appointed as

[84] The KCIOs consisted of Indian officers of the British Indian Army who received training at the Royal Military College, Sandhurst, in England. In order to be a KCIO, one must spend two years in England.

a new leader succeeding Shri Hariprasad Mehta, the president of the committee. However, the government in October 1930 declared the committee illegal, and in turn Desai was arrested because his leadership in the committee. He was sentenced to a three-month imprisonment and fined about 300 rupees. After his release from prison, he went to Delhi and met Mahatma Gandhi. At the time, Gandhi was leading a non-violent resistance or civil disobedience called the Satyagraha movement (Majmudar 2005). Desai joined the Satyagraha movement and was re-arrested in 1932 and sentenced to two years in prison.

One story about his life in jail shows his personality well. At Nasik jail where Desai was incarcerated, several political prisoners related to the Satyagraha smuggled newspapers into the jail that were prohibited. Desai, with several other satyagrahis including the Kumarappa brothers, refused to read these papers because they believed that it was not proper behavior for a satyagrahi [85] One day, the Kumarappa brothers severely condemned this behavior and threatened the co-prisoners, who were involved in the smuggling act, that they would inform the jail superintendent if they continued to do this practice (Desai 1974). As the quarrel became very serious, Desai took a step forward to negotiate between them. He made his fame as a good arbitrator even in jail.

> It is not our duty to keep an eye on violations of jail rules or to inform the jail authorities about them. It is, of course, improper for our colleagues to violate jail rules, but it does not behove us to complain about this to the jail authorities. It would not be proper behavior for a satyagrahi. It is not necessary to speak any untruth. You should tell the superintendent, if he ask you, that you are not bound to give him any information. Thus we can avoid putting our colleagues in an awkward position and need tell no lies. We are all living together as co-prisoners and it is necessary to maintain good relations amongst us. It is enough that we do not read the forbidden newspapers ourselves. If some of our friends weaken in their resolve, it is neither right for us nor is it our duty to weaken them further by exposing them. We should not defend wrong actions, but we should also not be spies for Government (Desai 1974, 102)

[85] Someone who participates in the Satyagraha movement is called a satyagrahi.

After Desai was released from jail in July, 1934, he continued to act for the freedom struggle adhered to the Gandhian ideology of non-violence and hold many important positions in Bombay State.[86] After India had become an independent state, Desai continued to evolve as an influential politician and served as deputy prime minister and finance minister under the Indira Gandhi government. On March 24, 1977, Morarji Desai finally became the prime minister of India.

6.4.2 Security and Domestic Environment and Desai's Role (1977–1979)

From the security model's perspective, one would expect that reversals of nuclear weapons in the Desai government occurred when external threats are reduced. There are a number of reasons why the realistic logic cannot sufficiently explain Desai's nuclear policy. In the late 1970s, India's security environment remained precarious. China conducted its 22nd nuclear test on September 17, 1977, and ongoing border tensions with Pakistan persisted. What is worse, the US announced in February 1975 that Washington would help Pakistan obtain up to $100 million in conventional weapons (Perkovich 1999). In addition, when Henry Kissinger visited Pakistan on August 8, 1978, he also promised Pakistan "one billion dollars of worth fighter planes, in accordance with Bhutto's demand for 80 to 100 A-7 bombers, as an inducement to keep away from developing nuclear weapons" (Yadava 1980, 311). India criticized that US support to Pakistan would increase instability and create new tensions in Asian countries. More importantly, Pakistan continued to accelerate its desire to develop nuclear weapons under the leadership of nuclear physicist A.Q. Khan since

[86] Bombay State was created in 1947 and continued to exist until 1960. On May 1, 1960, Bombay State dissolved and split into the two states of Gujarat and Maharashtra.

1975.[87] With his efforts, it is suggested that Pakistan was able to leap forward in developing nuclear weapons. During the mid-1970s, Pakistan's nuclear program emerged as a major security threat to India.

As has been discussed in the previous section, the tension between the US and India increased as India a exploded nuclear test in 1974. The Ford administration tightened its non-proliferation policy, and accordingly the U.S. Congress enacted the Symington Amendment in June 1976. The amendment prohibited U.S. economic and military assistance to any countries that receive nuclear enrichment or reprocessing technology unless they comply with IAEA inspections on all of their facilities. This momentum continued under Jimmy Carter who assumed the presidency in January, 1977.

Under such circumstances, Morarji Desai won the election and became the prime minister in March 1977. Throughout his short-term leadership, he adhered to a moderate foreign policy, using diplomacy to stabilize relations with other countries. Unlike his predecessor Indira Gandhi, who continued close relations with the Soviet Union while maintaining distance from the US, Desai tried to balance relations with both the Soviet Union and the US (Puri 1980). With regard to the nuclear weapons issue, Desai renounced Gandhi's bold stance of pursuing nuclear weapons. In his first press conference on March 24, he made a clear statement that India did not believe in the necessity of developing nuclear weapons and another PNE (Morarji Desai Press Conference 1977). Desai assured the new

[87] He worked at a Dutch engineering firm, a cooperative company of the European Uranium Enrichment Company (URENCO). It is important to note that a Dutch court later accused A.Q. Khan of stealing classified information on ultracentrifuge uranium enrichment for the company. The US government also assessed that A.Q. Khan clandestinely obtained designs for URENCO. More details can be found in the National Security Archive in Washington D.C. FOIA files, Pakistan, "The Pakistani Nuclear Program," June 23, 1983. Also see the unclassified document: "Pakistan: Security Planning and the Nuclear Option." https://digitalarchive.wilsoncenter.org/assets/media_files/000/001/711/1711.pdf

U.S. ambassador to India, Robert Goheen, that "I will never develop a bomb and, yes, we will engage in discussions [with the US]" (Kux 1994, 349).

Desai always disparaged the idea of developing nuclear weapons, even when he was Minister of Finance (1967–1969) under the Gandhi administration. His position against nuclear weapons was not only related to the moral views of Gandhi's father, Nehru, but also his low risk propensity and strategic calculation. Given the cost-benefit analysis, Desai believed that (1) nuclear weapons have no practical uses; (2) India could not afford a nuclear arms race; and (3) nuclear weapons would finally reduce foreign assistance (Perkovich 1999; Poulose 1982). Desai did not overestimate the benefit and underestimate the cost of pursuing nuclear weapons.

With Desai's efforts, Indo-American relations significantly improved during his leadership; President Jimmy Carter traveled to India on January 1, 1978, and Desai made a reciprocal visit to the US in June in the same year. During Carter's two-day trip to India, the two leaders issued the Delhi Declaration, which reassured their commitment to democracy, a stable and equitable economic order, and the reduction and eventual elimination of nuclear weapons (Narayan 1978). As a result, the US increased its bilateral aid to India, which had been suspended for a decade (Kux 1994). Especially on the issue of nuclear fuel supply for a civilian purpose to India, Carter stated in the Lok Sabha on January 2, 1978:

> We also have a long record of cooperation in the development of nuclear power, another important element of India's energy plans. Our work together will continue in this field, as well. This is a cold, technological subject. But Prime Minister Desai and I had warm and productive discussions about this field. We have notified him that shipments of nuclear fuel will be made for the Tarapur reactor.[88]

Although Desai claimed the anti-nuclear weapons agenda, he refused to sign the NPT. When the international community pressured India to sign the treaty, Desai said that "We refused to sign the NPT…because those who asked us to sign the treaty were themselves keeping atomic weapons. And they asked us not to do it. How can we sign it?...Unless [they] give up these weapons, I can't sign" (Desai 1987). Moreover, when the U.S. Congress passed the Nuclear Non-Proliferation Act on March 10, 1978, a domestic legislation to impose restrictions and the full scope of safeguards on the non-nuclear nations, Desai openly clarified that "India will not permit any nuclear power to examine its installations unless it gets reciprocal rights to make similar inspections" (Nucleoics Week 1974, 14). In fact, he opened a window for a future nuclear weapons program.

The historical observation suggests that the domestic politics model also cannot sufficiently explain Desai's nuclear reversal. The Desai government was politically weak and unstable throughout the short period of 28 months because of the history of the Janata Party. Before Desai headed the Janata Party, he was a prominent leader within the INC party. However, when the Gandhi government proclaimed a national emergency in 1975 due to a number of domestic problems (e.g., the railway workers' strike[89] and the Bihar movement[90]), several oppositional politicians against Gandhi were arrested, including Morarji Desai. Desai was released from jail when Gandhi relaxed the state of emergency on January 18, 1977 to allow open elections that would be held in March. The next day, leaders of the four

[88] For a full speech, please see *The American Foreign Policy: Basic Documents, 1977-1980*, Part X: South Asia. Document 468, p.886-891, published by the U.S. Department of State.

[89] The 1974 Railway strike was initiated on May 8, 1974 and lasted until May 24. The protestors demanded an eight-hour work day as well as improved conditions and wage increases for all rail workers.

[90] The Bihar Movement was also known as J. P. movement. It was initiated by students in Bihar in 1974 in protest against corruption in the state government. It later turned against the central government and Prime Minister Indira Gandhi.

parties against the Gandhi government gathered at Desai's house to discuss a combined campaign: the Jana Sangh, the INC party (O) that had spilt with Gandhi in 1969, the Socialist party, and the Bharatiya Lok Da (Pillai 1977; Sarita and Sharma 2009). In the end, these parties decided to form a coalition party, the Janata Party, under the leadership of Morarji Desai. As shown in Figure 6.1, the Janata party defeated the INC vehemently and Desai became the prime minister on March 24, 1977.[91]

Since the Janata Party was an alliance group with different ideologies, there were continuous political conflicts within the party. Not surprisingly, the Desai government never had a united voice on many issues, especially the nuclear policy. Specifically, Desai, who had taken an anti-nuclear stance even when he was a minister under the Gandhi government, was staunchly opposed to developing nuclear weapons, whereas Foreign Minister Atal Bihari Vajpayee[92] from the Jana Sangh party advocated pursuing the bomb. Desai's position against nuclear weapons did not reflect the majority of politicians within his party. Nonetheless, the prime minister remained unchallenged and exercised tremendous power on nuclear policy: Desai halted the nuclear weapons program immediately after he assumed power.

Desai's moral aversion and anti-nuclear policy was not impact by the views of scientists nor those of the mass public, who are usually considered important driving forces for the development of nuclear weapons. After the successful nuclear explosion in 1974, the majority of Indian scientists were in favor of pursuing nuclear weapons. According to the United News of India survey conducted in January 1979, "an overwhelming number of scientists favored continuation of India's underground nuclear explosions for peaceful

[91] The Janata Party won 295 seats out of 544 total seats. The INC lost 198 seats compared to the 1971 election; it only won 154 seats in 1977.

purposes" (Pathak 1979, 41). After Desai became the prime minister, he restructured the internal dynamics of these scientific institutions. Specifically, he transferred the chairman of the BARC, Raja Ramanna, to the Defense Research and Development Organization, where he worked as the secretary of defense research in New Delhi.[93] Desai's intention of removing Ramanna to New Delhi was to keep an eye on one of the most prominent scientists in India and prevent the potency of his unexpected nuclear establishment in the future (Perkovich 1999). Public opinion did not prompt Desai's non-pursuit of nuclear weapons. The Indian Institute of Public Opinion described public attitudes on Desai's nuclear policy at the time: "There is no overwhelming consensus on nuclear policy in Indian public opinion and there is more ambivalence towards nuclear development" (Indian Institute of Public Opinion 1978, 10). All the historical evidence proves that his nuclear roll back decision was not derived from domestic factors.

In summary, Desai appeared to reverse Gandhi's nuclear policy immediately after he took office. His decision stemmed from his low-level of risk propensity and it was not directly influenced by security threats or domestic politics. However, it is important to note that, as has been noted, Desai neither signed the NPT nor abandoned the entire nuclear weapons program. His moderate decision on the nuclear option was firmly rooted in his belief that the cost of developing nuclear weapons overrode the benefit: it would reduce the economic foreign aid from other countries, and nuclear weapons could not replace the conventional military forces capable of countering China and Pakistan. Therefore, one can conclude that Desai rather slowed down the nuclear program while improving relations with

[92] Atal Bihari Vajpayee became the 10th prime minister of India and conducted five nuclear tests between May 11 and 13 in 1998.

[93] Dr. Ramanna was replaced by Dr. Shri Fareedudin, who had been deeply involved in the Indian heavy water program. Desai also appointed Dr. Atma Ram, a former Director

other countries, such as the US, to increase foreign aid. His low-level of risk propensity was an important factor behind his "decelerated" nuclear program.

6.5 Summary and Comparison

Chapter 6 analyzes the relationship between leaders' risk propensities and their decisions to pursue nuclear weapons through the Indian case. The cause of nuclear weapon development in India during the 1970s under Prime Minister Indira Gandhi has remained one of the most controversial topics among scholars. Some argue that India pursued nuclear weapons in response to the Chinese nuclear test and Pakistan's military threats, while others assert that domestic factors were the central cause of pursuing nuclear weapons in India. There are still ongoing debates between these scholarly groups. Interestingly, these existing theories and explanations of security and domestic models recognize that the Indian prime ministers took an important role in nuclear policy decision-making. Yet few scholars have paid attention to the role of national leaders.

Chapters 3 and 4 demonstrate that individual leaders' risk propensities are important factors in predicting their decisions to pursue nuclear weapons. In line with my theory and statistical results, Chapter 6 examines Indira Gandhi's risk propensities and her risk-taking behaviors in respect to the pursuit of nuclear weapons while also considering security and domestic factors in the period of her prime ministership. The same analysis is applied to Prime Minister Morarji Desai.

General of Council of Scientific and Industrial Research (CSIR), as a principal advisor to the prime minister (Sharma 1983).

Although Indira Gandhi was born into a wealthy and prestigious family, her childhood was relatively unstable and full of loneliness because Indira's father Jawaharlal Nehru, was often imprisoned, and her mother suffered from multiple diseases. Under such circumstances, Gandhi could not adapt well to school. After frequently moving from place to place, Gandhi decided to continue her education at the University of Oxford in England. However, she returned to India without completing her B.A. degree and married Feroze, whom her whole family strongly opposed because of the difference in religion and social status. After careful review of her biography and other historical evidence, one learns that Indira Gandhi was a quiet but obstinate person who knew how to hide her emotions, and she persisted in her decisions without being easily swayed by others. Throughout her childhood, Gandhi was not afraid of taking risks when she believed them worthwhile: she established the Vanar Sena to fight for freedom against British rule. Indeed, she did not give up on having children despite the doctors' warning her of the danger of pregnancy.

Gandhi's resilient, strong, and risk-taking behaviors continuously appeared in her audacious leadership and decision-making style during her tenure as the prime minister in 1966–1977 and 1980–1984. As in her childhood, Prime Minister Gandhi did not say much or express her emotions during meetings with her advisors. Most officials who served close to Gandhi said that it was quite difficult to know her mind. For Gandhi, risk was not something to avoid, but something to face in order to achieve whatever difficult goals she might have. She was clearly a risk-taker who often underestimated the risk of failure and overestimated positive outcomes. Accordingly, even under pressure from the international community, Prime Minister Gandhi did not give up on India's nuclear aspirations, but continued to pursue nuclear weapons, conducting nuclear tests during her first term. When she came back to office in 1980, while hiding her aggressive intentions, Gandhi immediately

resumed nuclear weapons programs, which had been halted under Prime Minister Desai. She planned to conduct a second nuclear test and contemplated an attack on Pakistani nuclear facilities. Tables 6.2 and 6.3 present brief explanations of all the variables discussed in Section 6.3.

Table 6.2 Security Environment in the Gandhi Era

Security Environment	Explanation
Irregular entry	She was elected to the prime minister twice.
Polity	The average scores were 19 (1966–1977) and 18 (1980–1984).
Superpower alliance	The Indo-Soviet Treaty of Peace, Friendship, and Cooperation was signed in 1971.
NCA	Signed the Nuclear Cooperation Agreement in 1962.
GDP per capita	The average scores were 1044 (1966–1977) and 1243 (1980–1984).
NPT	India never joined NPT.
Economic openness	The average levels were 14 (1966–1977) and 9 (1980–1984).
Civil war	She confronted Sikh militants during her second term.
Interstate disputes	The average levels of interstate disputes were 2.22 (1966–1977) and 1.16 (1980–1984).

Table 6.3 Gandhi's Risk Propensity

Risk Propensity Index	Explanation
Age	She was 49 years old when he became the prime minister in 1966. She returned to office in 1980 and remained there until she was assassinated at the age of 67.
Business/econ major	She did not major in economics. Gandhi's education largely focused on history and the arts.
Socioeconomic	She grew up in a wealthy family. She studied at the University of Oxford but returned to India without completing a B.A.
Int. experience	She travelled Europe a great deal with her father and on her own.
Military experience	She formed her own children's brigade, the Vanar Sena.

On the contrary, Morarji Desai was raised in a relatively stable family. Growing up with peace-loving parents, he formed an equanimous personality in all circumstances. At Wilson College in Mumbai, Desai did not take economics, which is considered an important factor in evaluating one's risk-propensity. However, he was trained in treasury work before working as a probationary deputy collector in Ahmedabad. From his early experience as a deputy collector in the revenue department, Desai learned how to carefully calculate the cost and benefit of a matter and often took an arbitrative role in disputes. Interestingly, Desai joined the UTC and received a basic military training through drills while he was searching for a job in public service. Regardless of his one year of military experience, Desai, as an adherent of the Gandhian ideology of non-violence, never engaged in armed rebellion.

Desai's moderate disposition and somewhat risk-averse personality had been on display throughout his life. For example, as a deputy collector in revenue work, he rationally examined cause and effect relationships. If there was a dispute among different groups, he

explained to them the costs and benefits of all the possible outcomes for each side. In the end, he always found a resolution that satisfied all parties.

As the prime minister of India, his prudent personality was noticeable in respect to nuclear policy. Even when Desai had been the minister of finance under the Gandhi government, he carefully examined the cost and benefit of pursuing nuclear weapons and strongly opposed development of the bomb at the time. Accordingly, when Desai became the prime minister, he immediately halted the pursuit of nuclear weapons and sought to improve foreign relations, especially with the US. Taking all the historical evidence together, this study concludes that Desai's decelerated nuclear policy had its roots in his equanimous, prudent, moderate, and risk-averse personality. Tables 6.4 and 6.5 present the simplified results of all the factors examined in Section 6.4.

Table 6.4 Security Environment in the Desai Era

Security Environment	Explanation
Irregular entry	He was elected to the prime minister.
Polity	The average score from 1977 to 1979 was 18.
Superpower alliance	The Indo-Soviet Treaty of Peace, Friendship and Cooperation was signed in 1971.
NCA	Signed the Nuclear Cooperation Agreement in 1962.
GDP per capita	The average score from 1977 to 1979 was 1144.
NPT	India never joined NPT.
Economic openness	The average level from 1977 to 1979 was 14.
Civil war	There was no civil war record from 1977 to 1979.
Interstate disputes	The average level of interstate disputes from 1977 to 1979 was 0.53.

Table 6.5 Desai's Risk Propensity

Risk Propensity Index	Explanation
Age	He was 81 years old when he became the prime minister in 1977.
Business/econ major	Desai did not major in economics; however, he attended a six-week course in treasury work and worked as a deputy collector in the revenue department.
Socioeconomic	He grew up in a middle-class family. He studied at Wilson College and obtained his B.S.
Int. experience	He traveled abroad only after he became a politician.
Military experience	He joined the UTC and received a basic military training through drills. Even if Desai participated in the free struggle against the British rule, he, as an adherent of Gandhian ideology of non-violence, did not engage in armed rebellion.

6.6 Conclusion

The Indian case study, focusing on Gandhi and Desai, is important for two main reasons. First, along with the South Korean case of Chapter 5, the Indian case allows us to understand a causal mechanism that statistical analysis cannot verify. Second, comparing two leaders, who ruled the country in different time periods, cannot be free from time-dependency issues. Specifically, some scholars argue that the establishment of the NPT, which took effect in 1970, forced states to develop nuclear weapons. Moreover, the non-proliferation norms have been increased over time. And, in turn, this would prevent countries from pursuing nuclear weapons. Therefore, it is necessary to examine a case that can show variations of nuclear proliferation behaviors in the passage of time after the creation of the NPT. Having considered that India had experienced relatively stable levels of

GDP per capita, polity, and economic openness as shown in Figure 6.2, India is a suitable case to cope with the issue of time-dependency. India experienced ebbs and flows of nuclear pursuit during the 1970s and 1980s; Indira Gandhi (1966–1977 and 1980–1984) pursued nuclear weapons, but Morarji Desai (1977–1979) did not.

Briefly, Indira Gandhi showed her high level of risk-propensity throughout her life. From childhood, she had pushed on carrying through what she decided even if it involved a potential for risk. Her risk-taking behaviors were noticeable while she was in office as the prime minister. Gandhi pursued nuclear weapons and never gave up nuclear aspiration even under pressure from the international community. On the contrary, Morarji Desai, who had a moderate, prudent, and risk-averse personality, often rationally examined the cost and benefit of possible outcomes throughout his life. While he was working as a deputy collector with revenue works, he was well known as a reasonable and good negotiator. As the minister of finance under the Gandhi government, he was strongly opposed to pursue nuclear weapons because of his belief that the punishable costs outweigh the benefits. Therefore, immediately after Desai assumed power as the prime minister, he halted the nuclear weapons program and sought to improve relations with foreign countries. However, he did not join the NPT and maintained an open nuclear option. Taking all the evidence together, therefore, it would be more accurate to conclude that risk-averse Desai slowed down India's nuclear weapons program and waited for a proper time in which the benefits of pursuing the bomb would certainly outweigh the costs.

As has been emphasized many times throughout this chapter, this study does not argue that security and domestic factors are inaccurate explanations for understanding the Indian nuclear weapons proliferation. Instead, this attempts to bring leaders back into the discussion of nuclear proliferation in India. Given all the security and domestic factors, this

chapter concludes that Prime Minister Indira Gandhi took a critical role in that she made a final risky decision to pursue nuclear weapons.

CHAPTER 7

Conclusion

7.1 Summary of the Findings

The purpose of this dissertation is to identify what makes leaders pursue nuclear weapons for their countries. For decades, a burgeoning body of international relations scholarship has focused much attention on the system- and state-level variables that influence nuclear proliferation. However, few of these studies have explored the impact of individual leaders on the proliferation of nuclear weapons. National leaders play a crucial role in nuclear decisions and are the proximate cause of national policy that drive international politics. While recognizing the importance of leaders, this research links together two important research areas for international relations scholars: the proliferation of nuclear weapons and the role of national leaders. Why do some leaders pursue nuclear weapons, whereas others facing similar security or domestic situations do not pursue the bomb? Why are some leaders more likely to take the riskier decision, which is pursuing nuclear weapons?

There has been a long discussion in the literature of the field of psychology documenting the factors affecting individuals' risk-taking decisions. Most of the researchers in this field agree that individuals' propensities to take risks directly affect their risk-taking behaviors. In other words, individuals who have a relatively high level of risk propensity are more likely to make a riskier decision. Incorporating theories and empirical studies from psychology and

leadership study in business management, this research thus begins to develop for the first time a risk propensity index that can shed light on how leaders make decisions across a variety of issue areas. The risk propensity index presented in this dissertation allows us to test the relationship between the age, socioeconomic backgrounds, college majors, military experience, and international experience of national leaders and the leaders' decision to pursue nuclear weapons. Empirically, I find that certain demographic characteristics, which can be used as proxies for risk propensities, are significantly correlated with nuclear weapons pursuit. This provides suggestive evidence that leaders possessing relatively higher levels of risk propensity are more likely to pursue nuclear weapons than leaders with lower levels of risk propensity. These statistical results are further confirmed by more in-depth case studies.

Given this research objective, Chapter 1 presents the importance and relevance of the research questions as to why individual leaders matter in the nuclear proliferation literature. This chapter includes the objective of this dissertation and the outline of each chapter.

Chapter 2 begins with an introduction to the historical background of nuclear proliferation and the causes of nuclear weapons proliferation. In line with the main focus of this research examining actors' motivations to develop nuclear weapons, I review the three theoretical frameworks that are widely used in international relations research for analyzing nuclear proliferation behaviors: the security model, the domestic politics model, and the norm model. After careful review of each model with historical evidence, I suggest a new research agenda in which we need to consider an individual leader as an important variable to understand the proliferation of nuclear weapons.

In Chapter 3, given the relative paucity of individual level analyses in the mainstream quantitative international relations scholarship, I review the literature in psychology and the

leadership study of business management. Building upon theories and empirical studies from these disciplines, this chapter suggests that individuals' risk propensities directly affect their decision-making that involves risks; and individuals' demographic characteristics are valid proxies of their psychological characteristics, which are recognized important factors for explaining the effects on risk propensity. Based on this theoretical framework, I propose a proposition and subsequently present hypotheses.

Chapter 4 statistically tests the hypotheses presented in the previous chapter. In the first section, I lay out the research design that guides the quantitative research on examining the relationship between leaders and their decision to pursue nuclear weapons. The second section of this chapter presents how the risk propensity index has been developed. After conducting various statistical analyses, including factor analysis, I finally propose an accurate and concise risk propensity index, which comprises five variables – age, non-economics college major, socioeconomic background, international experience, and military experience. The third section reports the statistical results of testing the hypotheses by applying this newly developed risk propensity index.

The results highly support my proposition and hypotheses. First, while holding other factors constant, older leaders are more likely to pursue nuclear weapons than younger leaders. This finding supports Horowitz et al.'s (2005) study in which older leaders are more likely to initiate and escalate militarized disputes than younger leaders. This relationship may be linked to the idea that older leaders are more concerned about how long they could maintain leadership due to their health issues and, in turn, they tend to make risky decisions to maintain a grasp on their great reputation and legacy. Second, leaders who majored in economics or business in college are less likely to pursue nuclear weapons than leaders who did not major in these fields. This result is in line with the existing studies that found

individuals who trained in economics and business are pragmatic because they are more likely to calculate the opportunity cost of their decisions compared to those who do not have these training skills. Therefore, these people often display more risk-averse tendencies. Third, I find that leaders with lower-level socioeconomic backgrounds are more likely than leaders from higher socioeconomic backgrounds to pursue nuclear weapons. Of the five variables of risk propensity, this is the most influential factor affecting leaders' decisions to pursue nuclear weapons. The fourth hypothesis that leaders with international experience during their college years are more likely to pursue nuclear weapons than leaders who do not have such a background is also verified and supported. This result is similar to the findings of some empirical studies in education discovered that an individual's risk propensity is highly associated with the choice of study abroad while attending college. Finally, the statistical result supports the fifth hypothesis that leaders with military experience, including rebel and general service, are more likely to pursue nuclear weapons than leaders who have no military experience.

The final section of this chapter shows various robustness checks to assess the substantive effect. All of the comprehensive results of statistical analyses discussed in this chapter highly support my theory and argument: Leaders who have relatively high risk propensity are more likely to pursue nuclear weapons than leaders who have a lower level of risk propensity.

Chapters 5 and 6 detail the analyses of two case studies that add qualitative evidence for the relationship between leaders and nuclear proliferation. Chapter 5 examines the South Korean case with particular attention to two former presidents – Rhee Syngman and Park Chung-hee. Th majority of studies argue that external security threats are the important factor that made South Korea opt to pursue nuclear weapons during the 1970s; however, this

explanation cannot sufficiently explain why President Rhee did not seek to pursue the bomb under very similar circumstances as in Park's case. My theory and argument focusing on individual leaders' risk propensities fill this lacuna. After careful review, I find that President Park had a relatively higher level of risk propensity than Rhee, and this characteristic led Park audaciously to pursue nuclear weapons. On the other hand, President Rhee, who had a calculative personality, did not even consider the option of pursuing nuclear weapons. Instead, he diplomatically brought South Korea under the nuclear umbrella of the U.S. This chapter concludes that South Korea's nuclear proliferation during the 1970s was feasible because President Park Chung-hee's impetuous and risk-taking personality made the final decision to pursue the bomb.

In Chapter 6, I compare two Indian Prime Ministers – Indira Gandhi and Morarji Desai. India had a unique history when it came to pursuing nuclear weapons. For example, under the prime ministership of Indira Gandhi (1966–1977), India pursued nuclear weapons in the 1970s. However, her successor, Morarji Desai, who governed the nation from 1977 to 1979, halted the nuclear weapons program. Interestingly, after Gandhi returned to office in 1980, she immediately reversed Desai's moderate nuclear policy and re-pursued nuclear weapons until she was assassinated in 1984. Existing theories, such as security threats and domestic politics, cannot completely explain this ebb and flow of nuclear proliferation during the 1970s and 1980s. However, an in-depth case study on India reveals that Prime Minister Indira Gandhi personally took a crucial role in making the final decision to pursue nuclear weapons and her risky decision was rooted in her relatively higher level of risk propensity. On the contrary, Prime Minister Morarji Desai, who possessed a moderate and risk-averse personality, took a significantly different path on nuclear policy, even in similar security and domestic situations as in the periods of Gandhi's rule.

7.2 Contribution and Policy Implication

The analyses presented in this dissertation test the relationship between leaders and nuclear proliferation, concluding that leaders with high-risk propensities are significantly more likely to pursue nuclear weapons than those with lower levels of risk propensity when they face risks, such as security threats. My findings have important implications for both scholars and policymakers.

First, I suggest an alternative theoretical framework for understanding why countries pursue nuclear weapons. Rather than focus exclusively on system- or state-level factors, scholars should pay attention to the characteristics of individual leaders. My research does not argue that the system- and state-level analyses are unimportant, nor that national leaders will ignore their security environments or domestic circumstances. Rather, I highlight how national leaders play crucial role in determining the nature of security policies. Put differently, while countries are influenced at the systemic level by external threats and international norms, each individual leader will balance these pressures in different ways based on their own individual characteristics. By connecting psychology and business scholarship to apply knowledge to the critically important issue of nuclear weapons' pursuit, I explore for the relationship between individual leaders and nuclear weapons proliferation the first time.

By highlighting the importance of leaders' risk propensities, this research has important implications for evaluating the implications of new technological and destructive weapons in the future battlefield environment. Some scholars argue that new and emerging technologies in military weapons systems would rapidly alter the battlefield environment and

international systems. They further predict that due to autonomous systems, national leaders would play a limited role in taking militarized decision. However, this is short-sighted to claim that individual leaders would still play important roles in determining whether their countries pursue or adopt such technologies. For example, history has shown that it was President Lyndon Johnson who authorized and then ended Operation Rolling Thunder, the aerial bombing campaign designed to interdict North Vietnamese transportation during the Vietnam War, regardless of the availability of new technology, such as laser-guided bombs.

Third, my dissertation is one of the first attempts to systematically study leader characteristics and nuclear proliferation through cross-national statistical analyses. By assembling a leader risk propensity index, I am able to how individuals' risk propensities correlate with a leader's probability of pursuing nuclear weapons. Shedding light on the importance of risk propensity may be a useful framework for policymakers hoping to understand nuclear proliferation decisions in the future. Leaders with demographic characteristics that are strongly associated an increased risk propensity (such as childhood poverty) may be more likely to engage in nuclear proliferation when in situations of threat.

7.3 Limitation and Future Research

One of the limitations of this research is that it does not show under what conditions, leaders matter for nuclear proliferation. Therefore, it is necessary to first analyze what factors in individual leaders systematically affect their decisions to pursue nuclear weapons, and then examine the extent to which different international or domestic systems constrain those decisions. For example, it would be useful to consider executive constraints to

measure leaders' discretion to investigate how and to what extent leaders' risk propensities will be constrained by the environment.

An additional challenge is that the number of nuclear proliferation cases is relatively small. In my dataset, 43 leaders from 16 countries pursued nuclear weapons from 1945 to 2000. Therefore, in addition to two case studies presented in this dissertation with particular attention to examining Indira Gandhi and Morarji Desai of India and Rhee Syngman and Park Chung-hee of South Korea, future research should conduct more case studies to generate and enhance a multi-faceted understanding of the issue.

National policies, such as the pursuit of nuclear weapons, are complex and we therefore need to acknowledge that the study of individual leaders is only one aspect of a larger whole. However, ignoring the importance of individual leaders might result in the misinterpretation of the whole picture. More generally, I hope that this dissertation spurs a renewal of the first image analysis that has been neglected within the discipline of international relations for decades. This outcome, therefore, will allow us to better understand national security policy and forecast international political events.

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Appendix I

In the Appendix, I justify the coding decisions made for the key variables in my dissertation.

Coding Sources

My new data-set extends the Leader Experience and Attribute Descriptions (LEAD) dataset, a rich source for the background experiences of more than 2,000 leaders from 1875 to 2004 (Horowitz et al. 2015), by incorporating data on leaders' attributes such as college major, previous international experience at college, and childhood wealth before assuming power.

Since the LEAD dataset was built upon the Archigos dataset (Goemans, Gleditsch, and Chiozza 2009) that provides basic information on political leaders between 1874 and 2004, I reviewed the Archigos dataset for reference. I consulted not only academic books, journal articles, and newspapers but also national archives and presidential libraries for information on each leader. Principal sources were *Heads of States and Governments* (Lentz 1994), http://www.rulers.org, and http://www.worldstatesman.org.

Coding Protocols

I generally followed the simple coding rules of the LEAD and Archigos dataset for identifying effective leaders. In parliamentary systems, the prime minister is considered to be the leader that exercises *de facto* power in a country. By contrast, in presidential systems, the president is coded as the effective leader. If a country combines elements of both presidential and parliamentary systems, then the LEAD and Archigos datasets code the president as the leader, because presidents control foreign policy, including nuclear policy. In communist countries, those data consider the chairman of the party to be the head of state.

Because the coding for college major and previous international experience at college does not include any explicit measures for uncertainty, I gathered those data myself. However, another researcher and I gathered data on the childhood wealth of each leader, because such data are less objective than college major and previous international experience. If we saw the words "poor," "impoverished," and "harsh" in describing leaders' childhood wealth, then we agreed to code the leader as 1. If we saw the words "middle," then we coded the leader as 2. If we saw the words "wealthy" and "rich," then we coded the person as 3. If the sources did not provide a clear description, then we conducted further research on the leaders' parental status, potential orphan status, father's occupation, and mother's occupation. Beyond that, I conducted additional research in national archives and online presidential libraries. In cases with what appeared to be large discrepancies in coding, a third research assistant was asked to conduct research on the same leader. After the discussion, all three of us made a final decision. Data collection took 8 months to complete. Table 1 presents the scope of the variables used for the dissertation.

Table A.1 Scope of the Variables

Variable	Description
Alphabet Country Code	COW Country Abbreviation
Country Code	COW Country Code
ID	LEAD Leader ID
Name	Leader Name
Birth Year	Leader Birth Year
Death Year	Leader Death Year
Age	Leader Age in a given leader-year
Office Start Date	LEAD Leader Entry into Office
Office Exit Date	LEAD Leader Exit from Office
Major	
College Major	College Major (Text)
Econ/Business Major	1 = Yes 0 = No
Education	
Education Level	1 = Secondary and Lower 2 = University 3 = Graduate and Higher
Low Education	1 = Lower than University Level 0 = Higher than University Level
Childhood Wealth	
Parental Status	0 = Together 1 = Divorced
Orphan	0 = No 1 = Yes 2 = One Parent
Father Occupation	Father Occupation (Text)
Mother in Labor Force	1 = Yes 0 = No
Childhood Income	1 = Poor 2 = Middle 3 = Wealthy
Childhood Poverty	1 = Yes 0 = No
International Experience	
International Experience in College	1 = Yes 0 = No
Military Experience	
Military Service	1 = Yes 0 = No
Rebel Experience	1 = Yes 0 = No

Appendix II

Table A.2 shows some of the pro-nuclear bomb proponents and explanations for their positions during this period, followed by Table A.3 that presents several anti-nuclear bomb proponents and their arguments.

Table A.2 Pro-Nuclear Bomb Proponents (1960s–1970s)

Proponents	Explanations
Homi Bhabha, AEC Chairman (1948–1966) and BARC Chairman (1954–1966)	Bhabha emphasized the economic merits of nuclear power; he claimed that India could produce nuclear weapons in one to three years after a decision was made.
Homi Sethna, BARC Chairman (1966–1972) and AEC Chairman (1972–1983)	Nuclear weapons are required to deter Chinese nuclear and military threats.
Raja Ramanna, BARC Chairman (1972–1978) and AEC Chairman (1983–1987)	Ramanna supported the deterrence argument with other prominent scientists, including Dr. R. Chidambaram and Dr. P. K. Iyengar
Bibhuti Mishra, Indian National Congress Party, Member of Parliament (1952–1977)	Nuclear weapons would increase Indian prestige and reduce military costs; possessing nuclear weapons would not threaten both allies and enemies.
Nath Pai, Praja Socialist Party, Member of Parliament (1957–1971)	Nuclear weapons are required to preserve Indian sovereignty; Pai strongly agreed with Bhabha's cost figures on developing nuclear weapons.
Deendayal Upadhyaya, Bharatiya Jana Sangh Party 10th President (1967–1968)	Nuclear weapons are needed for military balance in South Asia to deter Chinese nuclear weapons.
Frank Anthony, Independent Party, Member of Parliament (1952–1989)	Nuclear weapons are required to preserve Indian sovereignty; developing nuclear weapons is cheaper than producing advanced conventional weapons.

Sources: This table was created by author, who compiled information from various sources

Table A.3 Anti-Nuclear Bomb Proponents (1960s–1970s)

Proponents	Explanations
Vikram Sarabhai, AEC Chairman (1966–1971)	Sarabhai believed that even if India successfully conducted a nuclear test or two, this would hardly make India a nuclear power state.
Basanti Dulal NagChaudhuri, DRDO Director (1966–1972)	Nuclear weapons would frighten other neighbors in South Asia and foster further nuclear proliferation.
Som Dutt, IDSA Director, Major General (1966–1968)	It would be better to strengthen conventional military forces; nuclear weapons are not a plausible substitute for conventional military forces.
Lal Bahadur Shastri, Indian National Congress Party President and 2nd Prime Minister (1964–1966)	Indian nuclear weapons would increase the domino effect in South Asia; it would be better to strengthen conventional military forces to reduce foreign economic and military assistance.
Morarji Desai, Finance Minister during the early 1970s and 4th Prime Minister (1977–1979)	Nuclear weapons and other WMDs are immoral and have no practical uses; India does not have sufficient space and budget to conduct nuclear test. The possession of nuclear bombs would reduce foreign economic and military assistance.
Y. B. Chavan, Defense Minister (1962–1966), Minister of Home Affairs (1966–1970), Minister of Finance (1970–1974), Minister of External Affairs (1974–1977)	Nuclear weapons would make India isolated from the world and reduce India's prestige.
Biju Patnaik, Indian Congress Party, Member of Parliament, Chief Minister of Odisha (1961–1963), Minister of Steel, Mines and Coals (1977–1980)	The pursuit of nuclear weapons is against Mahatma Gandhi's peaceful tradition.

Sources: This table was created by author, who compiled information from various sources