

A Thousand Suns:

Political Motivations for Nuclear Weapons Testing

by

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B.S., Physics (2001)
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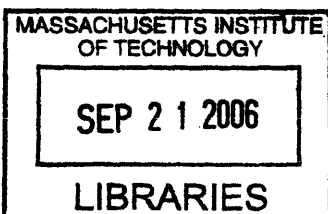
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ABSTRACT

Nuclear weapon testing is the final step in the nuclear development process, an announcement of ability and strength. The consequences of a nuclear test are far from easy to bear, however: economic sanctions can be crippling and nuclear capability automatically makes one a nuclear target. Why, then, do states test nuclear weapons? This thesis aims to determine the answer to this question using India as a model. It is well known that India tested nuclear weapons in 1974 and in 1998, but less well known are the near-tests of 1983, 1995, and 1996. This thesis examines the situation in these years and the details of the nuclear decisions based on four hypotheses: technical concerns, security and power, domestic politics, and norms and ideas.

This study shows that while all four of these theories play a role, technical concerns (contrary to popular belief) are very minor portion of the overall decision to test a nuclear weapon and are relegated to an excuse for scientists. Domestic politics, especially the political fortunes of those in power, play a large role, especially when combined with real, existential security concerns. Similarly, the prestige and status that leaders believe is imparted by nuclear ability is of major import. Understanding the reasons for nuclear testing will lead to fewer nuclear surprises in the future and may help to address the concerns of the growing number of states with latent nuclear capabilities.

Thesis Supervisor: Harvey Sapolsky
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I INTRODUCTION

Nuclear proliferation has been a concern since nuclear weapons were first developed¹. Recent events, such as the exposure of the A. Q. Khan nuclear black market and the intransigence of the Iranian regime with regard to International Atomic Energy Agency (IAEA) verification activities, have returned the focus to the inadequacy of the Nuclear Non-Proliferation Treaty (NPT) to address modern-dual use challenges. Largely absent from these debates, however, is a discussion of the final stage of the nuclear weapons acquisition process: nuclear testing itself. The reasons for nuclear testing are often dismissed with the explanation that states must test for simple technical reasons, to make sure weapon designs are feasible, or to react in-kind to another state's nuclear test. If these straightforward answers are the only reason, however, then the absence to date of a North Korean nuclear test is puzzling, and the restricted testing campaigns of India, Pakistan, and, most likely, Israel, cannot have satisfied the engineering concerns. We are thus left with this question: What other considerations do emerging nuclear states have when conducting their first nuclear weapons tests?

Testing is the final step in the nuclear weapon acquisition process, a dramatic announcement of accomplishment and capability. Once a nuclear test has been performed, there is no longer a question of the nuclear intentions of a state or the existence of its nuclear arsenal. As the verification of the nuclear capability of a state brings with it international consequences, including the security concerns accompanying nuclear states², economic sanctions, and diplomatic condemnation, for an emerging nuclear state to decide to test a nuclear weapon is more than just a technical feat, it is a national and international statement.

The first nuclear test was conducted on July 16th, 1945, in the New Mexico desert. Since then, over 2000 nuclear tests have been conducted. The last nuclear weapons test was conducted on May 30th, 1998 as Pakistan and India engaged in a series of tests over

¹ For a thorough discussion of clandestine nuclear development and US concern over the advances in the nuclear capabilities of other states, see Jeffrey T. Richelson, *Spying on the Bomb: American Nuclear Intelligence from Nazi Germany to Iran and North Korea* (New York: W. W. Norton & Co Ltd, 1996).

² Nuclear states are generally considered nuclear targets. Most nuclear states have a policy against attacking non-nuclear states with nuclear weapons.

the course of a few weeks. The time elapsed since that test is the longest time span without a nuclear test since their invention. What accounts for this interval between nuclear tests?

This thesis addresses the question of why emerging nuclear states undertake nuclear weapons tests. It does not attempt to analyze long-term testing campaigns such as those carried out by the five nuclear powers throughout the second half of the twentieth century, but instead focuses on the rationale of new nuclear powers in an age where nuclear testing is opposed by the majority of the international community and the announcement of new nuclear weapons brings international condemnation and isolation³. This question is a part of the larger theoretical consideration of why states develop nuclear weapons. This thesis focuses solely on the decisions that precipitate testing rather than on the acquisition process as a whole.

The ramifications of the answers to this question are important when analyzing the impact of US nuclear weapons testing policies as well as those of other countries. An understanding of the issues that drive states to test will improve our ability to predict the effect of, for example, a nuclear weapons test by North Korea on China and the United States, a test by Iran on Israel, or the worldwide impact of a resumption of nuclear testing by the United States. In addition, an understanding of what political circumstances drive states to test could help to strengthen the nuclear nonproliferation regime by incorporating an understanding of these issues into future test ban treaties.

Theories of Nuclear Proliferation

As previously stated, the distinction between simply *maintaining* a nuclear weapons program and *demonstrating* that the weapons work is significant. As the world

³ International disapproval may be only temporary, however. Sanctions were imposed on the Pakistani and Indian regimes after the 1998 tests, but lifted in 2001 in response to the cooperation received after the September 11, 2001 terrorist attacks. In any case, the usefulness of sanctions is hotly debated, and it is unclear if a nation that has sacrificed money and scientific energy to gain nuclear weapons would give them up under the threat of sanctions. For examples of the literature debate on sanctions, see Robert A. Pape, "Why Economic Sanctions Do Not Work," *International Security*, Vol. 22, No. 2 (Autumn, 1997), pg. 90-136; George Tsebelis, "Are Sanctions Effective? A Game-Theoretic Analysis," *The Journal of Conflict Resolution*, Vol. 34, No. 1 (March, 1990), pg. 3-28; and Kimberly Ann Elliot, "The Sanctions Glass: Half Full or Completely Empty?" *International Security*, Vol. 23, No. 1 (Summer 1998), pg. 50-65.

has observed with North Korea, nuclear weapons programs can be used as leverage to gain support or material goods from other states, without resorting to testing. North Korea provides a good example of profiting from the threat of nuclear weapons: In 1994, the Clinton Administration offered North Korea an agreement to provide light-water reactors, fuel oil, and reduced “economic and financial restrictions” in exchange for full adherence to the NPT and a freeze on work related to plutonium reprocessing⁴. The Agreed Framework held until North Korea was accused by the U.S. in 2002 of secretly enriching uranium and the U.S. suspended its commitments under the Agreed Framework. North Korea is again making demands from the U.S. in exchange for fully halting its nuclear program⁵.

Starting down a path of nuclear weapons development without testing also provides some assurances of security, even if the end result is not a display of nuclear capability. Israel, for example, is widely suspected of maintaining a nuclear arsenal but is not itself a nuclear target. India, in the years between its 1974 and 1998 tests, preserved nuclear ambiguity, in part to maintain its “non-nuclear” status. Finally, again, North Korea may perceive some security benefits from its uncertain nuclear status. While the U.S. and its allies may not know that the DPRK possesses nuclear weapons, the belief that they might may lead to more caution in international affairs dealing with the North⁶.

These examples show that there are tangible benefits to developing a nuclear program without disclosing the end result, namely, testing the final device. Extensive study by many scholars has resulted in a large body of literature on the causes of nuclear proliferation. Because nuclear testing and nuclear proliferation are closely linked, and because this thesis draws extensively on the theories of proliferation to explain testing behavior, it is appropriate to briefly discuss the reasons states develop nuclear weapons. .

⁴ See the U.S.-DPRK Agreed Framework Fact Sheet at www.state.gov.

⁵ See Glenn Kessler, “N. Korea Sets Terms for Return to Nuclear Talks,” *The Washington Post*, March 9, 2006, pg. A16.

⁶ Charges of this sort were levied against the Bush Administration when the war with Iraq in 2003 was started. Critics claimed that the lesson states would draw from the war was to develop nuclear weapons as fast as possible clandestinely, as North Korea was safe from attack because of the threat posed by their possible nuclear arsenal.

The most widely cited reason for nuclear proliferation is the security threat posed by other nuclear states⁷. Scholars of this theory believe that states will be forced to develop nuclear weapons or secure a nuclear guarantee when faced with a nuclear adversary. States that face enemies with overwhelming conventional force may also be driven to develop nuclear weapons. Another theory, which was championed in the early days of nuclear weapons but has since been moderately discredited, describes nuclear technology as its own force. In other words, once a state has the technology that would enable a nuclear weapons program, they will start one, regardless of other factors⁸. Nuclear technology, once obtained, has a life of its own and a “technological imperative” exists to propel nuclear proliferation⁹. Nuclear weapons programs have also been attributed to domestic politics. Scholars have argued that domestic organizations have led states to develop nuclear weapons¹⁰. This argument tends to favor strong organizational advocacy for nuclear weapons, even in the absence of real security threats. Finally, international norms and prestige have been attributed to the rise of nuclear weapons programs¹¹. For these scholars, the prestige gained from becoming a nuclear power is the impetus for a nuclear weapon. States that view nuclear weapons as a means to demonstrate their international political clout will develop nuclear weapons¹². Obviously, none of these hypotheses will apply in all situations or describe perfectly every case of proliferation; many states may decide to build nuclear weapons based on a combination of these factors.

⁷ For example, see Bradley A. Thayer, “The Causes of Nuclear Proliferation and the Nonproliferation Regime,” *Security Studies*, Vol. 4, No. 3 (Spring 1995), pg. 463-519, Benjamin Frankel, “The Brooding Shadow: Systemic Incentives and Nuclear Weapons Proliferation” and Richard K. Betts, “Paranoids, Pygmies, Pariahs and Nonproliferation Revisited,” both in *Security Studies*, Vol. 2, No. 3/4 (Spring/Summer 1993). Scott Sagan also discusses the role of security in “Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb,” *International Security*, Vol. 21, No. 3 (Winter 1996-1997), pg. 54-86.

⁸ See Peter L. Lavoy, “Nuclear Myths and the Causes of Nuclear Proliferation,” *Security Studies*, Vol. 2, No. 3/4 (Spring/Summer 1993), pg. 194.

⁹ This hypothesis has been largely discredited over time as the number of states with nuclear capability but no nuclear weapons program has increased. States such as South Korea, Japan, Taiwan, Sweden, and others have started down the road to nuclear weapons but have ultimately given up their programs.

¹⁰ See Sagan, “Why Do States Build Nuclear Weapons?” and James Joseph Walsh, *Bombs Unbuilt: Power Ideas and Institutions in International Politics*, Ph.D. Dissertation, Massachusetts Institute of Technology, June 2001.

¹¹ Sagan, “Why Do States Build Nuclear Weapons?”

¹² The most often cited example of prestige-induced proliferation is the French, who explicitly stated the need to make sure France maintained its importance in the world.

These theories describe what drives states to decide to undertake nuclear weapons programs. As mentioned, development is separate from the decision to test. In fact, some scholars believe that testing “...should not be considered an integral part of [a nuclear weapons] program”¹³. According to this logic, the decision actually to test is made for reasons other than (or in addition to) technical needs. This thesis will build on the theories of proliferation described above to explain nuclear testing decisions.

Organization of This Thesis

This thesis is organized into five sections. The second section summarizes the hypotheses about nuclear proliferation and international relations that have been discussed in the literature and may be relevant to nuclear weapons testing. The tests and predictions that follow from these hypotheses are subsequently outlined. The last part in this section is a discussion of the choice of case studies. The third and fourth sections are case studies, following the nuclear testing program of India from 1974 to 1998. The final section concludes with the implications that follow from these tests.

¹³ Stephen M. Meyer, *The Dynamics of Nuclear Proliferation* (Chicago: University of Chicago Press, 1984), pg. 28.

II HYPOTHESES, TESTS, AND CASES

As nuclear weapon testing is the culmination of the production process, this thesis builds on the models outlined in the previous section for weapons development to explain why and when an emerging nuclear state would herald its achievements through a full-scale nuclear test. This section describes ten hypotheses which could explain why a state would conduct a nuclear test. These ten hypotheses fall into four broad categories: technological assessment, power and security, domestic politics, and norms and ideas.

Technical Assessment

The first of these categories can be considered the baseline case for nuclear testing. To understand whether and how a weapons works, a state must test a nuclear weapon for purely technical reasons, such as verification of design, weapons effects, and training purposes¹⁴. The Comprehensive Test Ban Treaty (CTBT) was developed on the belief that testing was essential for a nuclear weapons program¹⁵. Although the first known nuclear test conducted by every nuclear state has been successful, the design process and the engineering of nuclear weapons are far from simple.

Two basic designs have been tested and fielded by the nuclear weapon states. The first is a simple gun-type, uranium-based weapon. The gun-type weapon uses explosives to fire a small uranium “bullet” into a larger uranium “target” to create a critical mass of uranium and trigger nuclear fission¹⁶. Given the amount of uranium involved, the gun-type design was thought to be certain to work without the need for

¹⁴ Training in this case can mean many things. For instance, military personnel who are responsible for nuclear weapon delivery need to train on such things as flight patterns and missile launches, those who must fight in a nuclear environment must train for the effects of electromagnetic and ionizing radiation. Weapons lab personnel who are responsible for design and testing procedures must also be trained.

¹⁵ The success of all known first tests calls into question the idea that states *must* test. Indeed, it can be argued that a state can be relatively confident in rudimentary designs and not much technical information can be gained from one test, only from a series of tests. Information such as how many conventional weapons can be replaced with nuclear warheads, targeting, and delivery can be assessed based on the information regarding yield and reliability that a sustained testing campaign can deliver.

¹⁶ Plutonium cannot be used in a gun-type device due to the high rate of spontaneous fission of the contaminant plutonium-240.

testing. Indeed, the Little Boy device dropped by the United States on Hiroshima in 1945, a gun-type weapon, had never been tested before deployment.

Although the gun-type weapon has an obvious advantage in its straightforward design and nearly foolproof reliability, the weapon is large, difficult to handle, prone to accidental detonation, and relatively inefficient. The size and shape of the weapon excludes its use as a warhead for missile delivery, confining its means of delivery to large bombers. This constraint, combined with the safety concerns and the inability to use plutonium in gun-type designs, led to the development of implosion-type weapons. However, the technology involved with implosion weapons is much more complicated.

Implosion devices incorporate a subcritical uranium or plutonium spherical core surrounded by lenses of high explosive. The explosives are detonated simultaneously, exerting pressure on the metal core and compressing it to the density required to ignite a nuclear chain reaction. The design of this weapon is much more involved than that of a gun-type weapon. The complexity of implosion designs and the difficulties encountered by the Manhattan Project are documented by Lansing Lamont:

“Unfortunately, the implosion effort at Los Alamos foundered in a sea of troubles. A new, unproven technique, it demanded new equipment and special personnel...The scientists at Los Alamos had conducted dozens of inconclusive tests on implosion...Indeed, Conant and Groves were privately so discouraged that they gave up any idea of using the first uranium from Oak Ridge in an implosion weapon.”¹⁷

Despite the technical difficulties, implosion-type weapons have many advantages over gun-type weapons. These include the use of uranium or plutonium as fissile material, greater stability and safety, and size and shape. Most important, implosion-type weapons can be delivered by missiles as well as bombers, making them the more highly desired nuclear weapon.

¹⁷ Lansing Lamont, *Day of Trinity* (Kingsport, TN: Kingsport Press, Inc., 1965), pg. 67. Further discussions on the difficulty of implosion devices can be found in Richard Rhodes, *The Making of the Atomic Bomb*, (New York: Simon and Schuster, 1986), pg 541-545.

In addition to the fundamental fission designs of nuclear weapons, more advanced designs push the envelope of reliability and functionality. These advanced designs include modifications of nuclear weapons to include fusion devices and miniaturized warheads. The amount of fissile material contained in these weapons and the complexities of the designs are generally believed to require significant amounts of test data to prove their dependability. Finally, the effects of nuclear weapons of all types on equipment, structures, and personnel in combat arenas have been studied through a variety of nuclear test scenarios¹⁸.

The combination of sophistication, desirability, and effectiveness leads to two hypotheses regarding nuclear weapon testing:

- 1) A state will test to prove the validity of a nuclear weapon design; a state will not test if it has confidence in the design's ability to perform as expected.
- 2) A state will conduct nuclear tests in order to modernize its nuclear arsenal or to gain more information about a weapon design or its effects; if no modernization is planned, tests will not be required.

The first hypothesis can be difficult to test. While some states may have open discussions about the need to test in order to maintain confidence in their arsenals or to test new designs, others, especially those states with clandestine programs, may not give any indication of a nuclear program, much less the need to test. However, public or private statements by those involved with nuclear weapons development to leading policymakers could provide evidence that the nuclear establishment is concerned about a workable weapon designs.

The second hypothesis is somewhat easier to test. Again, discussions between policymakers and leaders of nuclear programs should indicate concern or unknown information regarding advanced designs or effects from scientists or military leaders.

¹⁸ *The Effects of Nuclear Weapons, 3rd Edition*, Samuel Glasstone and Philip J. Dolan, Eds., United States Department of Defense and the Energy Research and Development Administration, 1977, especially chapters V-IIV.

Another test, however, would be the development of modern, nuclear-capable missiles. An improvement in missile technology, for example from liquid-fueled, single-warhead missiles to solid-fueled, MIRVed (Multiple Independently-targetable Reentry Vehicles) missiles, could indicate that a state is simultaneously modernizing its nuclear warhead designs.

Power and Security

International security is the most often cited reason why states develop nuclear weapons, especially in cases of nuclear rivals. It follows, then, that a demonstration of the results is required – after all, what use is a nuclear weapon for security purposes if those you are trying to deter are unaware of your capabilities? For states that develop nuclear weapons for security purposes, testing of nuclear weapons can be thought of as the culmination of that process.

Realist thought, embodied by Kenneth Waltz's *Theory of International Politics*, asserts that states occupy an anarchic world, where self-help reigns and countries are in a perpetual state of war¹⁹. In this anarchic, competitive structure, Waltz expects states to become socialized to the system, to conform to the behavior of competing states. National security, in an anarchic world, is paramount: states will seek to minimize their insecurity either through balancing against their enemies or by bandwagoning with them. Balancing can occur either internally, through domestic means, or externally, by allying with others.

When it comes to nuclear proliferation, states unwittingly cause additional proliferation²⁰. Each state that develops nuclear weapons to counter a nuclear rival inspires its own adversaries to obtain nuclear weapons to balance against the new nuclear state, creating a nuclear proliferation spiral. This produces two policies: states either develop nuclear weapons through a concerted effort of domestic production, or seek a

¹⁹ Ken Waltz, *Theory of International Politics* (New York: McGraw-Hill, 1979)

²⁰ Proliferation spawning additional proliferation is what is known as the "spiral model". See Robert Jervis, "Cooperation Under The Security Dilemma," *World Politics*, Vol. 30, No. 2 (Jan. 1978), pg. 167-214, and also Robert Jervis, *Perception and Misperception in International Politics* (Princeton: Princeton University Press, 1978) especially chapter 3.

guarantee of nuclear defense from another. During the Cold War, there are a number of examples of states that sought superpower protection rather than develop an indigenous nuclear weapons program, perhaps most notably Japan, South Korea, and Israel²¹.

To a lesser extent, an adversary's overwhelming conventional force has also been cited as a reason for states to develop nuclear weapons programs²². In many cases, claims have been made that deterrence via nuclear weapons is a cheaper and more efficient means of countering an enemy's conventional forces than attempting to assemble a correspondingly formidable conventional military force. For this thesis, however, the primary concern is that a threat is posed, rather than the conventional or nuclear character of the threat.

Nuclear weapons development out of security concerns is then predicated on securing a nuclear deterrent and announcing to enemies, or those who have upset the security balance, that the security situation has once again equalized. Without the announcement of nuclear capability, an aggressor is left to assume that the aggressed is militarily insecure, inviting an attack²³. Without a test, the verbal threats may not be credible. This suggests the following hypothesis:

- 3) A state that already has a well-established nuclear program will conduct a nuclear weapon test when it feels that its security is severely threatened by a nuclear or conventional adversary; a state that is not threatened will not test.

This hypothesis rests on one fundamental assumption – that the decision to build nuclear weapons has already been made and a nuclear weapons program is already underway. If this is not the case, then the security situation has driven the threatened state to *proliferate*, not to *test*. This distinction is sometimes muddled, but in this thesis a

²¹ Mitchell Reiss, *Without the Bomb: The Politics of Nuclear Nonproliferation* (New York: Columbia University Press, 1998). Although Tel Aviv made repeated entreaties to the United States to provide nuclear defenses, Washington refused. Unable to secure a superpower's protection, Israel turned to development of its own nuclear weapons as a deterrent force.

²² Again, Israel provides a nice example of a state interested in nuclear weapons due to the conventional forces of its neighbors. See Reiss, *Without the Bomb*.

²³ Obviously, the aggressor is free to assume that their enemies have developed a secret nuclear capability. This may be the case, as with Israel and possibly North Korea, or the threatened state may be vulnerable. Regardless, in the absence of demonstrable proof of a nuclear deterrent, a state may not achieve the security it was hoping to obtain with nuclear weapons.

clear line should be drawn between the two. For this hypothesis to be true, a state must already have a well-established nuclear weapons program.

Three separate predictions can be made based on this hypothesis. First, a congruence test can be applied to the situation. If this hypothesis is true, then a state should test after a build-up of conventional strength, escalating military rhetoric, or other threatening actions on the part of an aggressor state. The vulnerable state, if it has a nuclear weapons program, should be seen to act quickly to test and assert its strength.

The second two tests come from process tracing. In some instances, policymakers may make public or private statements regarding the security situation and nuclear weapons. Finally, we can look at military budgets. States with limited funds may not be at liberty to spend significant amounts of money on nuclear weapons and conventional forces. In cases where it is believed that nuclear weapons will deter an adversary and the decision to test is made, the budgetary allocation for the organization in control of nuclear affairs may increase.

A second hypothesis that can be made, similar to the first security-related hypothesis, is:

- 4) A state will test a nuclear weapon as a reaction to another state's nuclear test.

This hypothesis is quite similar to Hypothesis 3 in that a state is reacting to another's actions according to Realist logic: if one state tests, its adversaries are bound to follow to restore the status quo. It differs in that the first state to test is not required to be aggressive. In other words, State A's test could be due to the technical reasons discussed in the previous section; even if State A does harbor thoughts of aggression or deterrence against another state, it may harbor no thoughts of active aggression against State B²⁴. However, State B may perceive State A's test as a upsetting the security situation and may initiate nuclear tests to restore it. Again, this hypothesis requires that State B

²⁴ State A and State B do not necessarily have to be in active confrontation with each other to be concerned over nuclear tests. States with uneasy relationships or regional power issues may have adversarial relationships that would cause them to react to each other.

already has a nuclear program underway, not that a nuclear program is started *because* of State A's test.

Process tracing and congruence tests can be used to test this hypothesis as well. It follows from this hypothesis that in the event of a nuclear test by State A, we should observe nuclear tests conducted by State A's opponents as soon as possible given the status of their nuclear programs. Discussions, both public and private, among senior leaders should also indicate that policymakers believe that nuclear testing is an appropriate response.

International power is not confined simply to military security. International political power can also be a persuasive reason for states to act. "Coercive diplomacy" is defined as the threat of force or the limited use of force to change an adversary's behavior.

The power of coercive diplomacy rests on the credibility of a state to impose its stated threats or policies on others²⁵. Credibility is a function of capability and intent. A state that clearly demonstrates its capability has more credibility than one which does not. Capability is a function of a variety of things, including the number and quality of forces, power projection capabilities, and geographical proximity²⁶. The more capable a state is judged to be, the more likely it is that a coerced state will accede to its demands, as the cost of doing so is less than that of defiance.

Intent is somewhat more difficult to define. One argument is that a state's intent is measured based on its past actions. In other words, states that have followed through on commitments or statements in the past can be counted on to do the same in the future²⁷. Others argue that the past actions of a state are not good indicators of intent, that the most powerful influence on intentions is the specifics of the current situation. For example, Daryl Press argues that a calculation of current interests and capabilities is a

²⁵ For a discussion of perception and credibility, see Robert Jervis, "Deterrence and Perception," *International Security*, Vol. 7, No. 3 (Winter, 1992-1993), pg. 3-30.

²⁶ Geographical proximity can mitigate the need for power projection, and similarly, power projection can reduce the disadvantage inherent to distance for states taking the offensive.

²⁷ See Thomas Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1966)

better indicator of whether or not a state will be perceived as having credible intent²⁸. Finally, others have argued that the reputation of a state has significant influence on how it is perceived by others²⁹.

The capability of a state is greatly enhanced with the attainment of nuclear weapons. Although intention is still difficult to assess in the abstract and depends heavily on the situation and countries involved, the availability of nuclear power lends credibility to a state's coercive diplomacy.

5) States will conduct nuclear tests if they believe a test will allow them to blackmail, threaten, or coerce other countries.

6) States that feel unduly pressured or coerced by others will test.

Tests for these hypotheses rely primarily on process tracing. The statements by senior leaders, especially demands made or threats communicated, will indicate whether policymakers believe that coercive diplomacy will have an effect. In some cases, a state may threaten to test to gain some benefit from other states in exchange for not following through on the test. In other cases, states may test to demonstrate their power in order to coerce other, weaker countries. In either of these cases, the statements made by leaders will be instructive. A secondary means of hypothesis testing will be to identify the characteristics of the states at which the threat or coercive behavior is aimed. Instances of blackmail should be aimed at states which can be providers, while coercive threats should be directed at states which are in a vulnerable position relative to the tester.

²⁸ Daryl Press, *Calculating Credibility: How Leaders Assess Military Threats* (Ithaca, NY: Cornell University Press, 2005)

²⁹ Adam Marshall Horst, *Foreign Perceptions of American Casualty Sensitivity: Is Your Reputation Worth Fighting For?* S.M. Thesis, Department of Political Science, Massachusetts Institute of Technology, February 2004

Domestic Politics

Domestic affairs can play an important role in a decision maker's thought process. In this thesis, I separate "domestic politics" into two subgroups: Organizational Politics and Constituent Politics to examine the effects of both bureaucracies and publics on weapons testing decisions. Organizational politics can best be described by borrowing the definition of states from Graham Allison: "The actor is not a monolithic nation or government but rather a constellation of loosely allied organizations on top of which government leaders sit."³⁰ Thus, the decisions taken by government leaders may follow directly from the assessments and choices of the organizations which have some stake in the matter at hand. The question then becomes, how do organizations come to decide on a position? Allison and Halperin describe the process by which organizations make decisions:

"Members of an organization, particularly career officials, come to believe that the health of their organization is vital to the national interest. The health of the organization, in turn, is seen to depend on maintaining influence, fulfilling its mission, and securing the necessary capabilities. The latter two interests lead to concern for maintaining autonomy and organizational morale, protecting the organization's essence, maintaining or expanding roles and missions, and maintaining or increasing budgets."³¹

According to these explanations of organizations and states, organizations can be viewed as moderately autonomous entities within the governmental structure, with relatively independent motives and objectives³². The influence of organizations can be

³⁰ Graham T. Allison, "Conceptual Models and the Cuban Missile Crisis," *American Political Science Review*, 63, No. 3 (September 1969), pg. 699. For a similar argument, see Graham T. Allison and Morton H. Halperin, "Bureaucratic Politics: A Paradigm and Some Policy Implications," *World Politics*, Vol. 24 (Spring 1972), pg. 43: "What a government does in any particular instance can be understood largely as a result of bargaining among players positioned hierarchically in a government."

³¹ Graham T. Allison and Morton H. Halperin, "Bureaucratic Politics: A Paradigm and Some Policy Implications," pg. 48.

³² I use the qualifiers "moderately" and "relatively" to emphasize that organizations are not generally untethered bodies run amok. Rather, these organizations are free to advocate positions that are advantageous to the organization as a whole within the broad confines of a national security strategy.

seen in the U.S. nuclear weapons program. Concern over the impending retirement of all U.S. nuclear weapons designers and testers has led to calls for a return to testing to train new scientists. Due to the lack of testing, however, many new or prospective employees at the national laboratories have come to see careers in nuclear weapons design or testing as “dead-end” jobs and look elsewhere for employment. The weapons labs have argued for a resumption of testing not only to demonstrate capability, but also to address these concerns³³. Thus, we can develop a hypothesis of nuclear testing based on organizational politics:

- 7) States test nuclear weapons because domestic organizations that would benefit promote nuclear testing; organizations that stand to lose from a nuclear test advocate against testing³⁴.

This hypothesis can be subject to simple congruence tests. If the hypothesis is correct, then a correlation should exist between organizational interests and the policy choices that are advocated. Promoters of nuclear testing should stand to gain, for example through an increase in budgetary dollars, personnel, or stature. Those organizations that will not benefit from nuclear testing, and especially those that stand to lose, should advocate policy positions or make proposals against nuclear testing.

The second form of bureaucratic politics theory that can be applied to nuclear testing is the role of domestic politics. Political leaders in democratic countries gain or stay in power due to the support of the electorate, political parties, or governmental coalitions. Nuclear testing decisions, then, may be constrained and dictated by the opinions of those with electoral power. The opinions of the electorate are often said to

³³ The weapons labs are torn on the approach to a resumption of testing. Some argue that a resumption of testing will reduce the concern over hiring and retention of new nuclear scientists while maintaining confidence in the U.S. stockpile. On the other hand, a significant amount of money has been allocated to “stockpile stewardship” programs which would stand to lose funding if testing was resumed. Either way, the money and employment opportunities related to both programs and the laboratory support for them is evidence of the impact of organizational priorities in decision making.

³⁴ Examples of those organizations that stand to lose from nuclear testing would be military organizations that rely solely on conventional forces and fear the loss of money for conventional weaponry, civilian nuclear energy programs that fear the exodus of personnel to the more exotic field of nuclear weapons, foreign policy establishments that worry about the reactions of others and loss of face, etc.

have influenced the proliferation decisions of many states, including India, Sweden, and Japan³⁵. Autocratic or dictatorial leaders can also be influenced by their publics. Leaders who are fearful of coups or of civil unrest may test to gain support and dissuade coup attempts or riots. The hypothesis on nuclear testing can be developed from these ideas:

- 8) A state will test a nuclear weapon when it is in the domestic interest of the state leaders.

For this hypothesis to be valid, two requirements hold. First, voters, or party officials, or another group, must hold some power to shape the actions of the state leader. Generally, this is in the form of elections, but can take the form of parliamentary or internal party votes as well. Second, public opinion must favor nuclear weapons if they are to be used as a tool to increase support for the ruling party. Public attitudes towards nuclear weapons can be gauged from public opinion polls; when support for nuclear weapons is high, one would expect state leaders to act in ways that are pro-nuclear. For nuclear weapons tests, public opinion surveys on security concerns or the leadership qualities of the party or person in power can also provide some insight into the decisions by state leaders. A leader facing declining approval ratings, public or party concern over the leader's stance on state security could be expected to test nuclear weapons to boost approval ratings.

Another possibility exists in which a leader may choose to test nuclear weapons based on electoral politics. In times of economic or political crisis, state leaders may seek to draw attention away from domestic problems by testing nuclear weapons. This shift in public focus can improve a leader's standing among the electorate by shifting attention to areas in which the leader's strengths are emphasized. Again, this is easily tested through public opinion surveys and historical records of the domestic landscape prior to nuclear tests.

We can also look to the communications record to substantiate this theory. Discussions between senior leaders that have been made a part of the public record can

³⁵ Scott Sagan, "Why Do States Build Nuclear Weapons?"

be expected to show a correlation between concern over public opinion and a party's or a leader's standing, along with possible policy choices and their consequences.

Norms and Ideas

The final set of hypotheses falls into a category loosely defined by norms and values. Instead of serving the security, organizational, or political functions of a state, norms and ideas pertain more to international ideas of statehood and status. Unfortunately, "prestige" and "status" are often used as blanket reasons to explain cases that can't be easily understood by the more familiar themes of security, bureaucracy, or politics. However, normative theories can be quite useful in explaining behavior in situations in which accounting for states' actions are otherwise difficult.

Rather than basing its rationale for state behavior on national security concerns or bureaucratic interests, "institutional" explanations rely on symbolic and normative values to explain proliferation:

"In contrast to more traditional arguments, which view arms proliferation as the aggregate result of rational security decisions by autonomous nation-states, we emphasize the significance of weapons as value-laden icons within a highly structured international normative order. Beyond their strategic potential, technologically sophisticated militaries have come to symbolize modernity, efficacy, and independence."³⁶

According to institutional logic, the international system creates a set of behavior and actions that generates "institutional isomorphism". In other words, a set of norms and ideas is created which all states ascribe to. These norms dictate not only what legitimate state behavior is, but also define what attributes characterize a modern state. Thus, to be recognized as a modern, independent state, all states, regardless of the costs and benefits, behave in a way that the international arena has defined³⁷.

³⁶ For examples of symbolic and normative arguments, see Mark C. Suchman and Dana P. Eyre, "Military Procurement as Rational Myth: Notes on the Social Construction of Weapons Proliferation," *Sociological Forum*, Vol. 7, No. 1 (March 2002), pg. 14.

³⁷ Martha Finnemore, "International Organizations as Teachers of Norms: The United Nations Educational, Scientific, and Cultural Organization and Science Policy," *International Organization*, Vol. 47, No. 4 (Autumn 1993) pg. 565-597. Finnemore argues that UNESCO "decided" that scientific bureaucracies were

Normative theories of this sort can help to explain both the build up of conventional militaries as well as the taboo against the use of chemical, biological, and especially nuclear weapons. According to Suchman and Eyre, the spread of advanced conventional weapons to Third World militaries cannot be adequately explained by conventional theories of state insecurity or organizational advocacy. Rather, large, high-tech militaries have become emblematic of the modern nation-state. Advanced weapons become “value-laden” icons. As pointed out by Suchman and Eyre, the “symbolic qualities of advanced weapons overshadow their functional capabilities”³⁸. These views compel states to increase military spending to demonstrate the sophisticated nature of the state, instead of as a response to organizational pressure or external security threats.

Similarly, global norms have been cited in the literature as the prevailing reason for the “nuclear taboo”³⁹. Scholars of the nuclear taboo claim that a prohibition on the use of nuclear weapons was constructed not due to traditional realist concerns or rational behavior, but actually against the wishes of the great powers and largely due to the rise of a global anti-nuclear movement, non-nuclear states, and the United Nations. The development of a set of norms that described the use of nuclear weapons as abhorrent and amoral subsequently influenced the way states viewed the use of nuclear weapons until the use of such weapons is almost unthinkable.

Many norms have been codified into formal international regimes. These include the bans on chemical and biological weapons, support of human rights, the Geneva Convention, and the NPT. The NPT, along with the anti-nuclear establishment and the IAEA, has been given credit by many for the low number of nuclear states because the negative connotations of nuclear weapons described by these structures were incorporated into the behavior of nations⁴⁰. A hypothesis then follows:

advantageous, regardless of the individual capabilities of states. Thus, scientific bureaucracies were developed from a “supply-side” argument, rather than demand-driven, because states came to view scientific bureaucracy as an indication of modernity.

³⁸ Suchman and Eyre, “Military Procurement as Rational Myth,” pg. 150.

³⁹ Nina Tannenwald, “Stigmatizing the Bomb: Origins of the Nuclear Taboo,” *International Security*, Vol. 29, No. 4 (Spring 2005), pg. 5-49.

⁴⁰ See Nina Tannenwald, “Stigmatizing the Bomb” and Martha Finnemore, “International Organizations as Teachers of Norms” for examples of how international structures have constrained or encouraged states to adopt cultural norms and ideas.

- 9) States that subscribe to the nonproliferation regime will not test nuclear weapons.

By “nonproliferation regime,” this hypothesis refers to the NPT and the Comprehensive Test Ban Treaty (CTBT) as the dominant nonproliferation elements⁴¹. The test for this hypothesis is a simple congruence test: States that are signatories to the NPT especially should not engage in nuclear tests. States that are signatories to the CTBT should also not engage in nuclear tests, although the non-binding nature of this treaty makes this test less authoritative⁴². Difficulty in testing this hypothesis may be encountered, however, by the low number of states that have developed nuclear weapons.

The previous examples highlight the effect that institutionalized norms can have on states’ decisions. Norms can also influence the way states view themselves and their role in international society in a more nebulous way: through the idea of prestige. While institutionalized norms create a legal framework and a set of beliefs that are adhered to, the ideas that create these frameworks also contribute to the way states behave outside of legal structures. For example, states are not required to field Olympic sports teams, but many underdeveloped and impoverished countries do. The impression of modernity and sense of nationalistic pride conveyed by Olympic athletes inspires countries to participate.

With respect to the development of nuclear weapons, the belief that nuclear weapons confer a degree of prestige and status upon a state has driven some to begin nuclear weapons programs⁴³. According to the Duelfer report on Saddam Hussein’s weapons of mass destruction,

“He [Saddam] aspired to the prestige associated with the advanced arts and sciences. In his view the most advanced and potent were nuclear

⁴¹ Although the CTBT has not yet entered into force (barring the signature and ratification of a number countries), a self-imposed nuclear test moratorium has been observed since the 1998 round of tests in South Asia, and even longer for the five nuclear states. This treaty, though not legally binding, is still seen by many as an authoritative document.

⁴² By “signatory,” I am referring to those states that have both signed and ratified the treaty.

⁴³ “Prestige” is a difficult concept to define. In this paper, prestige is meant to convey a sense of power, of status, and of modernity and independence.

science and technology. By all accounts and by the evidence of the massive effort expended by the Regime, nuclear programs were seen by Saddam as both a powerful lever and symbol of prestige.”⁴⁴

Leaders of other countries have also discussed the role prestige played in the development of nuclear arms, including France and Australia⁴⁵.

These examples show the importance that nuclear weapons have for international prestige, but nationalism can play a role as well⁴⁶. National prestige, or nationalism, can be used to develop or maintain a sense of national identity, of pride, and of support for the leadership. The development of nuclear weapons can be a source of pride, especially for underdeveloped or marginalized states. Leaders of these states can use nuclear weapons to tap into that nationalistic streak to bolster public approval and national pride.

Nuclear weapons development is, however, fairly ineffective as a source of prestige unless the national and the international community are made aware of the fact that a country has developed nuclear arms⁴⁷. Separate from nuclear proliferation and the decision process to acquire nuclear weapons, nuclear testing is the demonstration of those efforts. Prestige cannot be conferred unless a successful nuclear test is announced, as a successful test demonstrates the crossing of a very distinct line between nuclear and non-nuclear status⁴⁸. A hypothesis on nuclear weapons testing then takes the form of:

- 10) A state will test a nuclear weapon to demonstrate its importance and gain prestige.

⁴⁴ United States Central Intelligence Agency, “Comprehensive Report of the Special Advisor to the DCI on Iraq’s WMD,” Transmittal Message, 23 September 2004.

⁴⁵ See Sagan, “Why do States Build Nuclear Weapons,” pg. 78. Sagan quotes the French 1951 Five-Year Plan as pronouncing that nuclear power and nuclear weapons would “ensure that in 10 years’ time France will still be an important country”.

⁴⁶ For a survey of nationalism, see Anthony D. Smith, *Theories of Nationalism*, 2nd ed. (New York: Harper & Row, 1983).

⁴⁷ The advantage of nuclear testing is that it generates considerable amounts of attention. National and international audiences cannot fail to notice and comment on a nuclear test, whereas development of nuclear weapons without testing can occur in relative obscurity.

⁴⁸ In the common parlance, “nuclear” is reserved for those five states that have internationally recognized nuclear weapons programs, i.e., the United States, Russia, China, the United Kingdom, and France. Although India and Pakistan have demonstrated their nuclear ability and Israel is widely suspected of maintaining a nuclear arsenal, these states are not official “nuclear powers”. However, this is a legal point, not a practical one. Explosion of a nuclear device clearly establishes the nuclear credentials of a state, regardless of their legal international status.

This hypothesis is most easily tested using the statements of leaders regarding their actions and decisions. Private statements among leaders and policymakers regarding the potential effects of a nuclear test, especially with regard to nationalism, are illuminating. Public statements, such as newspaper accounts, speeches, or retrospective accounts provide insight into policymaker's actions. Because prestige, or lack of prestige, is a difficult quantity to measure, congruence tests are moderately unhelpful as the dependent and independent variables are hard to define.

India as a Model

Five cases were chosen for analysis in this thesis, all from India: India's first nuclear test in 1974, three near or aborted tests in 1983, 1995, and 1996, and the five tests in 1998. The use of India as a template to study the causes of nuclear tests provides valuable information on the decision making that leaders undertake when deciding to conduct initial nuclear tests. Although this thesis focused on Indian decision-making, it still provides insight into other countries and other leaders. India has an unusual nuclear establishment structure in which there is little oversight save for the prime minister. This leads to the prime minister making virtually all the important decisions under a veil of secrecy imposed by law. While this will not be the case in many countries, it is probable that all countries' *first* nuclear tests will be carried out under intense secrecy and the final decision will be made by the top leader of the country. The prime ministerial control over nuclear decision-making in India thus provides a reasonable example of what the process may be in other countries.

With respect to domestic politics, India again provides an instructive case on which to base these theories. Most, if not all, countries with a nuclear program have a separate organizational bureaucracy established to oversee the program. In the case of the United States, the bureaucracy is the Department of Energy combined with the national laboratories. In Iran, the nuclear establishment is directed by the Atomic Energy Organization of Iran (AEOI), while in Japan, the Japan Atomic Energy Research Institute (JAERI) controls the nuclear program. These organizations all function based on

bureaucratic principles, i.e., they fight for budgets, control, and programs that are advantageous to the organization. The Indian establishment is not alone in this and provides a good study of a fairly well-researched organization as a guide to organizational behavior and influences in other countries.

India is a large democracy, which provides both insight and problems for application to non-democratic countries. We can expect other democratic countries such as South Korea, Japan, and Israel to behave in similar ways as India when constrained by electoral approval, public opinion, the uncertainty of elections and ire of political opponents. However, public opinion is important in non-democratic countries as well, and India also provides instructive evidence for countries like Iran and Egypt. While leaders of these countries may not need to garner public support in the same way as true democracies, public opinion is still important. Leaders in non-democratic countries may act even more boldly than democracies in attempting to foster and capitalize on prestige and national pride. The relative transparency of Indian decision-making when compared to other states offers helpful information on the impact of various politico-security theories regardless of the country to which these theories are applied.

III A PEACEFUL NUCLEAR EXPLOSION

India's Nuclear Program, 1947-1974

India's 1974 "peaceful nuclear explosion" was the culmination of almost three decades of work on nuclear physics. Even before India gained independence from Britain in 1947, Indian scientist and father of the Indian nuclear program Homi Bhabha had convinced India's leaders that modern technology was the means to pull India from its colonial roots and established the Tata Institute of Fundamental Research (TIFR) in 1945⁴⁹. A few strong personalities held control over the direction of the program in its early stages, while a series of short-term international and domestic crises drove long-term decisions during the 1960s and 1970s.

Jawaharlal Nehru, India's first Prime Minister, was in principle committed to the peaceful application of nuclear energy:

"On behalf of my government, and I think I can say with some assurance, on behalf of any future government of India, that whatever may happen, whatever the circumstances, we shall never use this atomic energy for evil purposes. There is no condition attached to this assurance..."⁵⁰

As the Prime Minister of India from its independence and head of the Department of Atomic Energy, Nehru was the primary decision-maker on nuclear policy until his death

⁴⁹ India's nuclear science program has been the subject of numerous books and articles. This summary is drawn primarily from George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation*, (Berkeley: University of California Press, 1999), Kamal Matinuddin, *The Nuclearization of South Asia*, (Karachi, Pakistan: Oxford University Press 2002), Chapter 3, Shyam Bhatia, *India's Nuclear Bomb* (Vikas, NY: Advent Books, 1979), and Sumit Ganguly, "Sumit Ganguly, "India's Pathway to Pokhran II: The Prospects and Sources of New Delhi's Nuclear Weapons Program," *International Security*, Vol. 23, No. 4 (Spring 1999) pg. 148-177. Perkovich has written an incredibly detailed, authoritative account of the history of India's nuclear program, drawing on declassified documents and many interviews with Indian policymakers; for this reason, his book is used as a primary source by many when writing about India's nuclear program. Hereafter, quoted as Perkovich.

⁵⁰ Quoted in Ziba Moshaver, *Nuclear Weapons Proliferation in the Indian Subcontinent* (New York: St. Martin's Press, 1991), pg. 28. While Nehru was a true believer in peace and Gandhian principles, the 1962 war with China shook his peaceful beliefs. Later decisions were made that held open the possibility of nuclear weapons, even as Nehru publicly disavowed this option.

in 1966. He and Homi Bhabha forged a close relationship that endured throughout his term as Prime Minister.

The Atomic Energy Act (AEA) in 1948 laid the groundwork for India's nuclear program by creating the Atomic Energy Commission (AEC). The AEC was charged with training scientists and engineers in nuclear fields and developing India's indigenous deposits of nuclear material such as thorium and uranium. The AEA called for complete secrecy of the research conducted and state ownership of all materials. The secrecy surrounding a purportedly peaceful enterprise raised concern within the Lok Sabha (the Indian lower house of parliament whose members are elected directly by the people) as the Act was debated, but Nehru's reputation for an unvarnished desire for peace weighed heavily in the body's vote to pass the Act⁵¹. Bhabha became the head of the AEC, although oversight was given to the prime minister. Here, as with many aspects of India's nuclear program, the close relationship between Bhabha and Nehru appears to have resulted in Bhabha's free rein over the research agenda of the AEC. The secrecy written into the AEA's charter also meant that Bhabha was free from the oversight of Parliament and could deal almost exclusively with his friend Nehru. The 1954 establishment of the Department of Atomic Energy with Bhabha as its head further solidified the Nehru-Bhabha relationship.

As the lead scientist on all matters pertaining to nuclear science, Homi Bhabha enjoyed the trust and respect of the Indian populace as well as the government⁵². Therefore, his claims were rarely questioned, especially in the public sphere. Bhabha continued to improve India's nuclear capability by claiming that nuclear power had significant economic advantages over conventional sources of energy⁵³. Moreover, he claimed that India's indigenous reserves of thorium would allow India unfettered access

⁵¹ For a discussion of the brief debate surrounding the passage of the Atomic Energy Act and the caution sounded by some lawmakers, see Perkovich, pg. 18-20. It is also worthwhile to note that although Nehru was forceful in his belief in disarmament and nonproliferation, he also recognized the inherent dual-use aspects of nuclear power. Nehru was not blind to the fact that future Indian governments might want to use nuclear technology for weapons purposes; by fully supporting a "peaceful" nuclear program, Nehru allowed the infrastructure for weapons to be fully developed.

⁵² This trust was also partly due to the fact that the AEA imposed such secrecy on the nuclear program that no oversight, save for Nehru's friendly collaboration, was imposed on Homi Bhabha. Therefore, the claims that he made regarding the program were generally not put to the test of independent review or assessment.

⁵³ Perkovich, pg. 27. India's civilian program has been plagued to this day by cost overruns, malfunctioning equipment, accidents, and abysmal efficiency.

to nuclear power, irrespective of the Great Powers and their attempts to control nuclear technology⁵⁴. These arguments allowed Bhabha to persuade the government to grant a significant amount of money to the nuclear establishment even though resources were scarce in the newly independent country.

Homi Bhabha was never quite as adamant in his views against nuclear weapons as Nehru. In 1958, Bhabha told an English colleague that he hoped to build nuclear weapons⁵⁵. History has shown that he often overestimated the time and expenditure required to build nuclear explosives, and maintained that the ability to field a nuclear weapon would require only a few years after a decision was made to do so⁵⁶. In public, however, and certainly before 1964, Bhabha made clear his intention to make India energy-independent and prosperous through the use of nuclear power reactors and rarely mentioned their application to nuclear weapons.

Central to Bhabha's plan was the production of plutonium for the fuel in breeder reactors. A crucial step was accomplished when India reached an agreement with Canada to construct a heavy-water nuclear reactor, the Canada-India Reactor, US (CIRUS) in Trombay, India, the site of TIFR (later changed to the Bhabha Atomic Research Center – BARC. The United States supplied the heavy water for CIRUS). CIRUS first became operational in 1956, beginning a cycle to produce plutonium in the spent fuel that was eventually used in India's 1974 explosion. To extract the plutonium, Bhabha built a plutonium extraction facility, named Phoenix, at Trombay⁵⁷. Plutonium was produced by Phoenix from spent fuel from the CIRUS reactor beginning in 1964.

⁵⁴ This was a common theme throughout the Indian nuclear program, regardless of leadership: India was determined to rise above its colonial status and ensure that she was never subordinate to other states. Indigenous supplies of thorium would have allowed India to build its nuclear energy program irrespective of the help provided by outside countries; however, breeder technology and thorium reactors have proven to be much more difficult than advertised.

⁵⁵ Perkovich, pg. 35, and Bhatia, *India's Nuclear Bomb*, pg. 114.

⁵⁶ Perkovich, pg. 35-36. In the early stages of Bhabha's nuclear aspirations, he emphasized the Plowshare project and the desirability of nuclear explosives for peaceful purposes. However, the difference between nuclear explosives for peaceful purpose and for nuclear weapons is only a matter of intent, and Bhabha was well aware of this. For information on the Plowshare program and the use of nuclear weapons for civilian engineering projects, see Dan O'Neill, *The Firecracker Boys* (New York: St. Martin's Griffin, 1995).

⁵⁷ The Phoenix plant blueprints were supplied by the US, although the Indians modified them slightly when they built the plant. This did not stop the Indians from claiming that the reprocessing facility was purely designed by the Indian nuclear establishment with no outside aid. See Roberta Wohlstetter, *The Buddha Smiles": Absent-Minded Peaceful Aid and the Indian Bomb* (Los Angeles: Pan Heuristics, 1977), pp. 63-64

Nineteen sixty-two brought a significant shift in India's security situation and in the frequency and tone of debates over nuclear weapons. Nehru's policy towards China had been to acquiesce rather than confront: India relinquished control over Tibet to the Chinese, had supported China's bid to join the United Nations, and generally championed a friendship between China and India⁵⁸. However, the Sino-Indian border war that erupted in October 1962 and ended with an overwhelming Indian defeat at the hands of the Chinese altered the security environment. No longer able to rely on friendly overtures to inhibit China, Nehru, the Congress Party, and the rest of Parliament were forced to re-evaluate Indian security. Calls for the development of nuclear weapons were made in the Indian Parliament. Although Nehru was able to resist these demands and the nuclear program continued on its peaceful track⁵⁹, the fact was obvious that India was lacking in security.

If 1962 marked a turning point in discussions regarding nuclear weapons, 1964 brought about a shift in action on India's nuclear program. Nehru's death in May 1964 and the accession of Lal Bahadur Shastri to Prime Minister radically changed the power structure in India: where Nehru was the dominant player in the Indian domestic and international political arenas, Shastri was a quiet, "unassuming" man with virtually no foreign policy experience⁶⁰. Shastri inherited what he believed was an entirely peaceful nuclear program, although the first spent fuel from the CIRUS reactor was sent to the Phoenix reprocessing center for the separation of plutonium in June 1964⁶¹. Although many political decisions needed to be made and engineering obstacles remained to be overcome, the separation of plutonium was the first step towards making a nuclear explosive.

⁵⁸ Sumit Ganguly, "India's Pathway to Pokhran II: The Prospects and Sources of New Delhi's Nuclear Weapons Program," *International Security*, Vol. 23, No. 4 (Spring 1999) pg. 148-177. See also Perkovich, pg. 43.

⁵⁹ Nehru did not change the nuclear policy in the direction of nuclear weapons. However, the nuclear research agenda was *already* moving in the direction of "peaceful nuclear explosives"; a formal shift in intent may not have changed the ongoing work on plutonium separation and metallurgy in any practical way.

⁶⁰ Perkovich, pg. 63-64.

⁶¹ All public statements by Prime Minister Nehru indicate the peaceful nature of India's nuclear program. Since nuclear decision-making was so secretive, it is unlikely that Shastri had any knowledge of the military potential of India's nuclear program beyond the basic inherent possibility.

Prime Minister Shastri faced significant domestic problems in the beginning of his leadership. India in 1964 was wracked by a widespread food shortage. The Indian government, instead of focusing on the impending Chinese nuclear test, was instead preoccupied with the domestic situation. Shastri faced a vote of no-confidence from opposition parties as well as a revolt of factions within the Congress Party. Although he remained prime minister, his authority was weakened. These domestic troubles both overshadowed and contributed to India's non-response to China's nuclear test on October 16, 1964. Shastri's only response was to call for China to sign the Partial Test Ban Treaty and a reiteration that India would not build a nuclear weapon in response to China but would limit nuclear energy to peaceful purposes⁶².

China's nuclear test had two significant impacts on Indian politics: first, the test and Shastri's tepid response reinforced the opposition to the current Indian government, and, second, the shift in the security environment with the emergence of a nuclear adversary on Indian borders caused many inside and outside government to call for a nuclear deterrent⁶³. Inside the Lok Sabha, debate raged over the future of the Gandhian nonviolence movement promoted by Nehru. Homi Bhabha gave his opinion in a speech on All India Radio on October 24 which has now become famous. In his October 24 address, Bhabha claimed that "A 10 kiloton...explosion would cost \$350,000..." and that "atomic weapons give a State possessing them in adequate numbers a deterrent power against attack from a much stronger State."⁶⁴ Bhabha's view of deterrence, the low cost he estimated for production of a nuclear stockpile, his claims that weapons could be build in eighteen months, and his status as the premier nuclear scientist in India gave weight to those who adopted his arguments in favor of the bomb⁶⁵. On November 27, 1964,

⁶² Marquis Childs, "Indians Pondering A-Bomb Decision," *The Washington Post*, November 23, 1964, pg. A12.

⁶³ Newspapers and opposition leaders editorialized that the appropriate response to the Chinese nuclear threat was an Indian nuclear weapon: "Nath Pai Wants to Produce the Bomb," *Indian Express*, 19 October 1964; "India Urged to Produce Atom Bomb," *Times of India*, October 26, 1964, in Perkovich, pg. 65; also see Bhatia, *India's Nuclear Bomb*, pg. 116.

⁶⁴ Homi Bhabha, quoted in Perkovich, pg. 67. While acknowledging that these numbers came from a study on the "peaceful" application of nuclear explosives, Bhabha could recognize the similarity of peaceful and military explosives. However, these numbers neglected any cost of building facilities, including reactors, reprocessing centers, or any other infrastructure. Bhabha's figures were taken as gospel by the pro-bomb advocates.

⁶⁵ "Bhabha: India Can Make Atom Bomb in 18 Months," *National Herald*, October 5, 1964

although managing to win a vote against the explicit development of nuclear weapons, Shastri bowed to pressure from inside and outside his party and instructed Bhabha and the nuclear establishment to conduct research toward the preparation of peaceful nuclear explosives. Bhabha took advantage of this opportunity to ask in November 1965 for permission to begin work on a subterranean nuclear explosion project⁶⁶. The intent of this project was to conduct research on the design of a nuclear explosive and prepare for an underground nuclear test so that India would be ready to test within three months of a political decision to do so. Shastri approved the project in December 1965.

These research plans were derailed, however, by the deaths of both Homi Bhabha and Prime Minister Shastri in January 1966. Indira Gandhi replaced Shastri as Prime Minister, and after significant discussions and debate with AEC personnel, chose Vikram Sarabhai to replace Homi Bhabha as head of the nuclear energy establishment. Sarabhai, previously the head of Indian space research, was not welcomed by all in the AEC⁶⁷. According to Raja Ramanna, the director of physics at the Atomic Energy Establishment, many doubted that Sarabhai “would be able to get a grip on atomic energy developments,” given his past work on space-related projects, and worried that he was a “Gandhian, [believing] in peace at all costs” and therefore would not devote his energy to nuclear explosives⁶⁸. These fears were well-founded: within a few weeks of taking over as Chairman of the Atomic Energy Commission, Sarabhai cancelled the peaceful nuclear explosive project⁶⁹.

Indira Gandhi, for her part, faced serious economic and domestic problems when she assumed the role of Prime Minister in 1966. Food was scarce, inflation was high, the gap between the rich and the poor was widening, and sectarian politics was increasing. Indira Gandhi and the Congress Party were increasingly seen as unable to manage the crises. The election in 1967 resulted in large losses for the Congress Party in Parliament,

⁶⁶ Reiss, *Without the Bomb*, pg. 221

⁶⁷ Perkovich, pg. 141.

⁶⁸ Raja Ramanna, quoted in Perkovich, pg. 114.

⁶⁹ The reasons for this are many. Firstly, given Sarabhai’s antipathy towards nuclear weapons, he may have canceled the project out of distaste. Secondly, in a speech on June 1, 1966, Sarabhai stated that India’s security would not be enhanced by nuclear weapons. Finally, India was currently receiving significant amounts of nuclear aid from Canada, including construction of the Rajasthan Atomic Power Station and negotiations for a second CANDU reactor. If the nuclear explosive project became publicly known, it was feared that Canada would withdraw its assistance. See Perkovich, pg. 119-123, and Reiss, *Without the Bomb*, pg. 221.

with Indira Gandhi barely maintaining her post. Amid her political problems and the domestic emergencies in India, nuclear policy was not high on her agenda. As a result, the nuclear establishment appears to have gone largely unsupervised. In late 1967 or early 1968, Ramanna ordered the physicist Rajagopala Chidambaram to find out the equation of state for plutonium, the necessary theoretical stepping stone to determining the amount of plutonium and high-explosive necessary for nuclear device⁷⁰.

In 1971, the national security environment in India changed. India and the Soviet Union signed a Treaty of Peace, Friendship, and Negotiation in August. As the Sino-US relationship warmed, the Indian relationship with the US became more estranged. In November, war broke out with Pakistan. While China refused to become involved, the US sent the *USS Enterprise*, suspected of carrying nuclear weapons, into the Bay of Bengal. Although the US did not intervene militarily, the act of sending a nuclear-armed ship compelled some to argue that India needed a nuclear deterrent.

It was in this environment that the formal decision to develop a “peaceful nuclear explosive” was made. Some debate exists over when, precisely, the decision was officially sanctioned, but it is likely that the initial support was given by mid-to-late 1971, with official approval from Mrs. Gandhi coming in September 1972⁷¹. The Bhabha Atomic Research Center, in conjunction with the Defence Research and Development Organization and the Terminal Ballistics Research Laboratory worked throughout 1972 and 1973 to perfect a device and test the non-nuclear components. On May 18, 1974, India detonated a nuclear explosive in Pokhran. With a stated yield of ten to fifteen kilotons (others would put the yield lower, from two to six kilotons) and code-named Smiling Buddha, the “peaceful nuclear explosive” brought India into the nuclear club.

The following four sections, corresponding to the four broad categories outlined in the previous section, will analyze the driving forces behind India’s decision to detonate a nuclear explosive in 1974.

⁷⁰ This decision was made without Sarabhai’s assent, although later in 1968 he became aware of the renewed effort towards nuclear explosives. Personal and professional issues between Sarabhai and other directors within the atomic energy establishment resulted in Sarabhai not being informed of the work; when he did become aware of it, he made no effort to stop it.

⁷¹ See Perkovich, pg. 170-172. The chronology given here comes from his assessments of interviews with principal actors.

Indian Technical Requirements

When discussing technical reasons for testing, the first thing that comes to mind is the question “does it work” (Hypothesis 1)? Of the hypotheses in this thesis related to technical requirements, this is the only hypothesis that applies to the Indian case, as the 1974 explosion was their first test and it occurred as a single detonation rather than a sustained campaign. The nuclear device tested was a plutonium implosion device, the sort of design in which scientists generally have less confidence. In fact, Indira Gandhi was quoted:

“[The PNE] was simply done when we were ready. We did it to show to ourselves we could do it. We couldn’t be sure until we had tried it. We couldn’t know how to use it for peaceful purposes until doing it...We did it when the scientists were ready...How could it have been political? There were no elections coming up...It would have been useful for elections. But we did not have any.”⁷²

This quotation implies that the reason to test was for the simple reason that the scientists wanted to know if their design would work. The explosive was not built for overt military purposes (indeed, India gave no indication of simultaneously developing delivery systems, miniaturization for delivery, or a concerted effort to manufacture more plutonium for additional explosives), negating the need to ensure its viability before its deployment. Presumably, the practical question of its successful operation was a concern of many involved, but that concern did not have to be addressed at any specific time. There was no overwhelming drive to prove the functionality of the explosive at that particular time, given that there were no preparations for its use. Even more telling, India’s stated purpose for the 1974 event was the use of the explosive for peaceful purposes. The concept of using nuclear weapons for nonmilitary purposes was not new: the US Plowshare program had investigated the use of nuclear explosives during the

⁷² Quoted in Rodney W. Jones, “India,” in *Non-Proliferation: The Why and the Wherefore*, ed. Jozef Goldblat (Philadelphia: Taylor & Francis, 1985) pg. 114.

1950s and 1960s. Between them, the US and Russia had conducted at least seventy “peaceful” nuclear tests by 1974, even though the US terminated its program in 1975. Although nuclear explosives were never used on a large scale for peaceful purposes, and by 1974, India maintained her, and every other state’s, right to peaceful applications of nuclear energy.

By calling the 1974 explosion a test of a “peaceful nuclear explosive,” India hoped to avoid international criticism and the sanctions and trade interruptions that could accompany it. The Indian claims that the device would be used for peaceful uses, such as building canals, would seem to indicate that testing was required for the explosive to be used in the manner for which it was designed⁷³. However, India had not developed the explosive with any application in mind. In fact, when asked about the proposed uses for the new device, Homi Sethna, the Chairman of the AEC replied “It is too early to give a definite indication... I would like to impress upon you that we are looking into it.”⁷⁴ This lack of direction, and lack of even a stated hypothetical purpose for using the explosive, suggests that India was not testing the device for actual use. The test was not undertaken to determine, for example, whether the yield was large enough to construct canals or man-made lakes or any other purpose. There was no pressing need to test to assess the properties of the explosive for any identified use, just as there was no need to test at any specific instance to determine whether the design worked or not.

Power and Security as Motivation

Was the 1974 nuclear test caused by security concerns held by the Indian elite? Or was it a means of power projection? Of the hypotheses related to security discussed in Section 2, only the first applies (Hypothesis 3). The second, states will test in response to another state’s nuclear test, does not apply in this case. Although some scholars have offered the Chinese 1964 nuclear test as the instigating factor for the Indian explosion a

⁷³ Both the US and the USSR conducted a series of tests to determine that nuclear explosives would work as designed to create canals and reservoirs, locate oil fields, and a variety of other civilian applications. In many cases, the tests did not validate the ideas. It is unlikely that the Indians would have engaged in large civilian nuclear projects without a hands-on understanding of the effects of the explosive.

⁷⁴ Quoted in Reiss, *Without the Bomb*, pg. 231.

decade later, this argument belongs in a discussion of why states *develop* nuclear weapons, not why they test them. As mentioned previously, the Indian nuclear explosive program had not yet begun when the first Chinese nuclear test occurred, so the Indian 1974 blast cannot be considered a direct response. By May 1974, the Chinese had conducted 15 nuclear tests, including advanced fission and fusion designs, so the Indian nuclear test was likely not in response to any single Chinese testing event.

The first security hypothesis, however, could provide answers for the timing of the 1974 test. Although referred to as a peaceful nuclear explosion, many have pointed out that there is no difference between a “peaceful” nuclear explosion and a nuclear weapon. The demonstration of ability is what matters, as the intent on use can change according to circumstance. If India was feeling threatened, or if the security environment had worsened, it is possible that the 1974 test was a show of strength, a demonstration of power, or an attempt to ward off an aggressive foe.

As mentioned, the existing threat could be either nuclear or conventional in scope. With regard to nuclear powers, India faced a regional threat from China as well as what the Indian government viewed as meddling by the US. Conventionally, India and Pakistan fought a series of small wars throughout the first thirty years of their existence in addition to the conventional aspects of the mightier Chinese army. What did the security situation on the subcontinent look like with respect to these factors when the decision to undertake a nuclear test was made in 1971-1972?

The Indian-Pakistani war in 1971 occurred at approximately the same time as the initial decisions to prepare for nuclear testing. The 1971 Indo-Pak war was the third war between the two countries in their brief history. The war began in late March, 1971, when the Pakistani Army began a systematic slaughter of Hindus living in East Pakistan, the elimination of the East Pakistan political representation, and the resumption of control of East Pakistan by the Pakistani military regime⁷⁵. By June, tens of thousands of refugees were streaming into India, creating a “security threat of major proportions”⁷⁶.

⁷⁵ The events of the 1971 war are concisely described in Onkar Marwah, “India’s Military Intervention in East Pakistan, 1971-1972,” *Modern Asian Studies*, Vol. 13, No. 4. (1979), pg. 549-580.

⁷⁶ *Ibid.*, pg. 560.

The Indian army formally began military operations on December 6, 1971⁷⁷. On December 16th, the Pakistani army had surrendered and the independent state of Bangladesh was born.

While the previous two wars in 1948 and 1965 over the disputed region of Kashmir proved inconclusive, the 1971 crisis was an overwhelming Indian victory. In the words of Sumit Ganguly, “India emerged as the preeminent power on the subcontinent.”⁷⁸ India had guaranteed a large, friendly neighbor to the East while simultaneously shrinking the Pakistani population by 75 million people. This left Pakistan with a population less than 10 percent of India’s. Militarily, India had redefined the balance of power between New Delhi and Islamabad. The Indian army was indisputably superior to the Pakistani military and had gained the support and respect of the Indian populace. Politically, Indira Gandhi received a large boost in approval from the Indian public, manifesting itself in large gains in the March 1972 election. Pakistan’s response to the 1971 crisis was to remove President Yahya and install Zulfikar Ali Bhutto as the head of state. Throughout his term in office, Bhutto spent considerable energy improving Pakistan’s international status and addressing domestic issues. Thus, the India that grew out of the 1971 Indo-Pak crisis was stronger militarily and politically with respect to Pakistan than at any previous time and regional tensions were eased by improving relations with Pakistan⁷⁹. It seems unlikely, then, according to realist thought, that India’s decision to undertake a nuclear test was based on threats from Pakistan.

One outcome of the 1971 war that many allege had a critical impact on India’s nuclear testing decision was the conveyance of the US nuclear carrier *USS Enterprise* into the Bay of Bengal, ostensibly for the evacuation of American citizens from Bangladesh, but also confirmed as a “show of force” for India and the USSR⁸⁰. Widely

⁷⁷ The Indians waited until December to send military forces into East Pakistan for two primary reasons: the first, because the monsoon rains had abated by December, leaving the ground hard enough for military vehicles, and second, to guard against a Chinese incursion over the Himalayas, which by December should have been covered with snow.

⁷⁸ Sumit Ganguly, “India’s Pathway to Pokhran II,” pg. 159.

⁷⁹ India did not emerge from the 1971 crisis completely unscathed: she lost some of her peaceful image and consequently some moral standing in the international community, signified by a 104 to 11 vote in the UN against the Indian military intervention. The rout of Pakistan risked incurring more international support for Pakistan against India. However, these drawbacks were fleeting, relatively unimportant, and in the future, whereas the benefits were immediate.

⁸⁰ Tad Szulc, “Enterprise is Flagship,” *The New York Times*, December 16, 1971, pg. 1.

believed to be armed with nuclear weapons, the presence of the *Enterprise* was fiercely condemned by India and the Soviet Union⁸¹. Some Indian writers argued that nuclear weapons were the only way to keep the US from interfering in Indian affairs and would provide a deterrence capability to make the US think twice about intervening on the subcontinent⁸². In addition to the affront felt by New Delhi from the *Enterprise* incident, Indian relations with the US foundered over the moral and material support the US provided to Pakistan and the normalizing of Sino-US relations in the same time period, although the US-Indian relationship began to improve following an effort by both sides starting in 1973.

An analysis of the US relationship with India around the time of the Indian decision to test nuclear weapons reveals similar characteristics of the Pakistani role: while India's security was never overtly threatened by the US, the *Enterprise* likely played some role in India's decision making in 1971/1972 due to the implicit threat of nuclear weapons in the Bay of Bengal. An important factor to note is the timing of the *Enterprise* incident relative to the first informal decisions on nuclear tests. If, as some allege, the first authorization of the nuclear test was in September of 1971, then the first decisions were made before the *Enterprise* ever was directed to the Bay of Bengal. Regardless, by the time of test in 1974, relations had healed somewhat, India was never explicitly threatened by the US, and New Delhi's security had, if anything, improved. This is not to say that the *Enterprise* incident was not a factor, but as in 1998 (see pg. 65), the threatening aspects of this action were likely seen as an excuse. China was India's main fear, not the actions of the United States.

In addition, India could not hope to gain security or mitigate a nuclear threat from the US by developing a nuclear arsenal, even if the 1974 test was the beginning of a nuclear weapons program. Although the 1974 test was a demonstration of *ability*, India made no moves toward militarizing its nuclear power: the test was not repeated, no delivery systems were built for years, no command and control structure was put in place, and no nuclear doctrine was conceived. The US nuclear weapons program by 1970 was

⁸¹ Hedrick Smith, "Moscow Assails US Step," *The New York Times*, December 14, 1971, pg. 17; Fox Butterfield, "Indian Animosity Grows," *The New York Times*, December 16, 1971, pg. 1.

⁸² K. Subrahmanyam, "India: Keeping the Option Open," in *Nuclear Proliferation: Phase II*, ed. Robert M. Lawrence and Joel Larus (Lawrence: University of Kansas Press, 1974), pg. 122.

large and advanced, while the small number of weapons India could potentially produce if they had wanted to would not have been sufficient to supply a deterrent capability for India. On the contrary, the production of nuclear weapons would potentially have made India a target of the United States, a much larger and stronger enemy, rather than warding off a threat. Furthermore, by the summer of 1971 (probably before any decisions on nuclear testing were made), India had secured a treaty of “Peace and Friendship” with the Soviet Union, virtually obtaining a nuclear guarantee.

Did India’s feelings of insecurity *vis-à-vis* China play a role in India’s nuclear decisions in the early 1970s? Although India had fought a losing war with China in 1962, enough time had passed that this event cannot have been a pivotal factor in India’s 1974 decisions⁸³. China did not intervene militarily in the 1971 war with Pakistan despite Beijing’s strong moral and material support, leading some to conclude that the Chinese were reluctant to fight India, although observers and peripheral players believed they would⁸⁴. In the words of John Garver, “In this high-stakes card game India was the only player without nuclear weapons.”⁸⁵ This fact was certainly not lost on Indira Gandhi as she gave approval for nuclear tests in 1971.

One important event likely impacted India’s newfound sense of security on the subcontinent: In 1972, China deployed its first nuclear-capable missile with a range long enough to reach India⁸⁶. Although China had been a nuclear power for ten years, the deployment of the DF-3 represented the first modern missile threat to all cities in India from its neighbor⁸⁷. Although relations between the countries were improving, Indian security *vis-à-vis* China was reduced significantly by this new development.

Most importantly for long-term Sino-Indian relations, following the 1971 war, India began to make quiet overtures to the Chinese, culminating in an exchange of

⁸³ The constant threat from China is important, but I have defined the reasons for nuclear testing for security purposes to be an *imminent* threat.

⁸⁴ Robert W. Bradnock, *India’s Foreign Policy since 1971*, (London: Royal Institute of International Affairs, 1990), pg. 61.

⁸⁵ John W. Garver, *Protracted Conflict: Sino-Indian Rivalry in the Twentieth Century* (Seattle: University of Washington Press, 2001), pg. 322.

⁸⁶ John Wilson Lewis and Hua Di, “China’s Ballistic Missile Programs: Technologies, Strategies, Goals,” *International Security*, Vol. 17, no. 2 (Fall 1992), pg. 5-40.

⁸⁷ The DF-2 had a range of 1250 kilometers and was deployed beginning in 1968-1969.

ambassadors in 1976⁸⁸. China aligned itself with Pakistan, providing military, economic, and, eventually, nuclear, support to India's closest enemy. The tensions between the two states simmered, but China did not directly threaten India (save for potential involvement in the 1971 war). Regardless of the thaw in relations, the Chinese deployment of modern intermediate range missiles was pivotal for Indian security. In 1974, India may have been cultivating better relations with China, but real Indian security had decreased with the development of the DF-3.

With respect to power, the Hypotheses 5 and 6 could both apply to the situation on the subcontinent in the first half of the 1970s. These two hypotheses relate to the ability of a country to either exert power over others or to remove the exertion of power by others, respectively. An examination of these ideas shows that they are unlikely to have played a major role in testing decisions, although Hypothesis 6 may be a small factor.

Hypothesis 5 states the premise that a country will test a nuclear weapon if it believes that it can blackmail, coerce, or threaten other countries. This is unlikely to apply to the situation in India for the following reasons. First, there is no evidence that India ever tried to blackmail or coerce other countries. Unlike North Korea, for example, which demanded material goods and support in exchange for terminating its nuclear program in the 1990s, and more recently threatened to produce more weapons if demands were not met, India never threatened other countries with its nuclear ability. New Delhi never held its nuclear program as a negotiating tool. Characterizing the 1974 test as a "peaceful" explosion, and passing over any attempt to weaponize suggests that India was not trying to blackmail or coerce other countries by a show of force⁸⁹. Finally, there is no record, either in interviews, between government officials, or in the open press, or any

⁸⁸ Although ambassadors were not exchanged until two years after the 1974 test, it does indicate that the relationship between India and China was improving during the first half of the 1970s.

⁸⁹ A skeptic would say that they put a "peaceful" face on it to cover up real intentions, but those meant to see the real military threat – the US, China, and Pakistan, for example, would have no trouble seeing through the peaceful rhetoric. There is some truth to this: in 1997, Raja Ramanna, one of the principle scientists in 1974, told an interviewer that the 1974 test was a "bomb" and "not all that peaceful." See "Top Indian scientist rejects 'peaceful' nuclear test claim," *Agence France Press – English*, October 10, 1997. However, it was recognized at the time that any nuclear explosion signifies a weapon capability, but India made no moves towards developing delivery systems of any sort.

Indian leader (and especially Indira Gandhi, the primary decision-maker), in which coercive behavior was discussed with regard to nuclear testing.

Similarly, the “threatening” aspect of Hypothesis 5 requires that a state have an adversary that they want to threaten. India in the early seventies was devoid of such an enemy: India could not hope to threaten the US or China with a single, non-weaponized nuclear explosion given the much larger and more advanced state of their nuclear programs. The only other serious enemy was Pakistan, which was devastated in the 1971 war by conventional forces. India had no need to threaten Pakistan; New Delhi had just demonstrated its power.

Hypothesis 6, that states will conduct nuclear tests if they feel unduly pressured by another country, could have some bearing on Indira Gandhi’s decisions. India has been constantly aware of its previous colonial status and maintains a tremendous effort to remain outside of any control by a greater power. The “anti-colonialism” explanation was the justification used for not signing multiple international non-proliferation agreements, with negotiators claiming that any attempt to stifle Indian production or independence was unacceptable. Further, India maintained a strict policy of non-alignment during the first decades of the Cold War. Even the 1971 Peace and Friendship Treaty with the Soviet Union states that “The Union of Soviet Socialist Republics respects India’s policy of non-alignment.”⁹⁰ Indian scientists repeatedly proudly announced “indigenous” ideas and development, even in situations (such as the Phoenix reprocessing plant) where significant support was obtained from third parties. This desire for independence and anti-colonialism caused some pro-bomb advocates to lobby for weaponization on the grounds that it would demonstrate India’s autonomy. Indeed, one scholar wrote that “The arguments for the bomb now were...that it would proclaim India’s independence of the Soviet Union...”⁹¹ Thus, even in the absence of any real proof that the Soviet Union believed India to be a “client state,” the omnipresent Indian concern of sovereignty could have had some effect on the decision to test⁹².

⁹⁰ Treaty of Peace, Friendship, and Cooperation Between the Government of India and the Government of the Union of Soviet Socialist Republics, August 9, 1971, Article IV.

⁹¹ Bhabhani Sen Gupta, *Nuclear Weapons? Policy Options for India* (New Delhi: Sage, 1983), pg. 4

⁹² India’s approaches towards improving relations with China in the early 1970s could also indicate a shift away from the Soviet Union and could signify India’s desire to retain her nonalignment policy.

Domestic Imperatives

Domestic factors, Hypotheses 7 and 8, probably are both significant factors in India's nuclear test in 1974. Hypothesis 7 relates to the effect of bureaucracies in the decision making process. For nuclear issues in India, there is only one influential organization within the Indian government: the Atomic Energy Commission and its subgroups. While one might expect the military to play a role in nuclear decision-making, this is not actually the case in India. The military is kept at arms-length from the civilian leaders and, until recently, had no direct input on key decisions. The military was apparently excluded from any discussions regarding the nuclear explosion⁹³.

The AEC, on the other hand, had full access to the prime minister. Restrictions on the AEC by the Atomic Energy Act of 1962 placed even more control over the nuclear matters in the hands of the central government while tightening the already strict secrecy surrounding nuclear energy. The prime minister formally had direct control over the AEC and its research objectives. The director of the AEC was able to report directly to the prime minister and therefore held undue influence over nuclear decisions.

The decisions made regarding nuclear testing were made by Indira Gandhi without the input of her advisors except that of the AEC. Indira Gandhi made the formal decision to move forward on development of the nuclear device in September 1972 while on a tour of BARC. While no complete chronology exists for the discussions prior to that decision, she apparently told the scientists present at BARC to assemble a device and develop a test site, but not to test until she gave final word. A series of meetings was held from February 1974 through May 1974 regarding the test and whether to proceed. Few were present at these meetings; only the former and incumbent principle secretary to the prime minister, the scientific advisor to the defense minister, the chairman of the AEC, the director of the BARC, and Indira Gandhi⁹⁴. Although the two principle secretaries warned of international consequences, their influence was too small to

⁹³ Perkovich has conducted numerous interviews of former officials. Selected quotes can be found in Perkovich, *India's Nuclear Bomb*, pg. 175-178.

⁹⁴ This list is according to Raja Ramanna, then director of BARC and a personal friend of Indira Gandhi in his autobiography, *Years of Pilgrimage: An Autobiography* (New Delhi: Viking Penguin Books India, 1991).

override the enthusiasm of the scientists and Mrs. Gandhi ordered the tests to proceed. According to Ashok Kapur, the defense minister was not consulted about the test and was not informed until May 8 of the impending detonation⁹⁵. Likewise, the foreign minister was not informed until two days before the test. This compartmentalization of information and decision-making, combined with a lack of strong, independent, and politically savvy advisors, gave a huge advantage to those in the nuclear field who were advocating a nuclear test.

Would a nuclear test have helped the nuclear establishment in an absolute sense and justified their desire to test beyond the simple rationale of “scientific progress”⁹⁶? It seems this may have been the case. By 1970, the Indian atomic energy complex was producing significantly less power than intended. The budget for the Department of Atomic Energy was less than 70% of the requested funding level⁹⁷. Although Vikram Sarabhai, the director of the AEC at the time, was not an ardent supporter of nuclear weapons unlike Homi Bhabha, his predecessor, he still couched his ten year plan for 1970-1980 in terms of international security rather than energy development⁹⁸. Presumably, the hope was to shift critical opinion from the failures of the civilian sector to meet the nuclear power projection and onto the benefits that could be realized from atomic energy, civilian *and* military. The successful detonation of a nuclear explosive would be a welcome diversion from the disappointing results of the power plants.

The domestic political situation in 1974 points even more directly than bureaucratic organizations to a sizeable role for domestic factors in nuclear decision-making. Indira Gandhi won her second election in 1971 with the slogan “Abolish Poverty”. She faced a poor, hungry electorate, and although she ran on the platform of reducing poverty, she had no specific ideas on how to accomplish this goal. These concerns were overshadowed by the overwhelming victory in the 1971 Indo-Pak war. Mrs. Gandhi’s approval ratings were high after the war; she was seen by many Indians as

⁹⁵ Ashok Kapur, *India's Nuclear Option: Atomic Diplomacy and Decision Making*, (New York: Praeger Publishers, Inc., 1976) pg. 198.

⁹⁶ This is often enough of a reason for scientists to advocate a position. Completion of a new idea or an experiment is, by definition, success for those whose job it is to discover and build new things.

⁹⁷ Perkovich, pg. 152.

⁹⁸ Perkovich, pg. 153

the “liberator of Bangladesh”. This high was not to last, however. 1972 brought a severe drought, leaving tens of thousands hungry, while 1973 brought further hardships due to the Arab oil crisis. Unemployment was high, food was scarce, the number of people living in poverty was growing, the economy was foundering, and Indira Gandhi’s approval ratings plunged. In the midst of this turmoil, Mrs. Gandhi was accused of rigging the 1971 election and charges were brought against her for voter fraud. Oppositional voices in the Lok Sabha were growing louder in support of exercising the nuclear option.

Although she repeatedly denied that electoral effects factored into her decision to authorize the 1974 test, Mrs. Gandhi did admit in interviews that a nuclear explosion would have been useful politically⁹⁹. In fact, opinion polls after the explosion showed a significant, though short-lived, increase in public approval of Mrs. Gandhi and the Congress Party. The public favored the nuclear explosion: 90% of those who knew of the explosion approved. The Indian Institute of Public Opinion went so far as to state that “both she [Gandhi] and the Congress Party have been restored to the nation’s confidence.”¹⁰⁰

It is not difficult to jump to the conclusion that the final authorization for the nuclear test in early 1974 was due in large part to a combination of domestic factors¹⁰¹. In 1974, Indira Gandhi was under pressure from all sides: the electorate was turning against her, the economy was faltering, and she was losing the support of her party to those in the Lok Sabha who advocated for nuclear weapons. It is precisely these situations that may cause politicians to make decisions that they know will improve their standing, and the timing of the 1974 test can best be explained from a domestic politics rationale combined with a deteriorating security situation due to the Chinese missile deployment.

⁹⁹ Rodney W. Jones, “India,” in *Non-Proliferation: The Why and the Wherefore*, Jozef Goldblat, ed. (Philadelphia: Taylor and Francis, Inc., 1985), pg. 114.

¹⁰⁰ Sagan, “Three Models in Search of a Bomb”.

¹⁰¹ Other authors have made the same conclusion, although they differ as to the importance of domestic factors. See Sagan, “Why Do States Build Nuclear Weapons,” Perkovich, *India’s Nuclear Bomb*, and Sumit Ganguly, “India’s Pathway to Pokhran II,” for example.

Normative Arguments

Hypothesis 9 declares that states that adhere to the international norms regarding nuclear weapons such as the NPT and the CTBT will not test. This argument does not apply to India in 1974, as the CTBT had not yet been introduced and India refused to sign the NPT without a time-bound clause for disarmament of the nuclear states¹⁰². Hypothesis 10, however, can easily apply to India in 1974. Hypothesis 10 asserts that states that wish to gain or maintain prestige within the international community will test nuclear weapons. Given India's fear of "second-class" status and its fight to maintain independence, New Delhi was obviously apprehensive about India's status in the world.

Mrs. Gandhi was apparently quite sensitive to the world's perception of India. According to one author, Mrs. Gandhi told him that, "Washington did not look kindly upon strong, independent countries in Asia, did not apparently wish to see the emergence of a strong India."¹⁰³ The Indian representative to the NPT negotiations echoed these comments: "...no real or effective effort is being made to deny prestige to possession of nuclear weapons. On the contrary, reports indicate that the nuclear-weapons Powers are being given an overwhelmingly privileged position in the propositions which are being elaborated these days."¹⁰⁴ Mrs. Gandhi described her rationale for the nuclear test in the same interview with Rodney Jones cited previously: "...it was done despite the big powers trying to prevent India...the developing countries congratulated India. We had to do it to demonstrate our independent capability."¹⁰⁵

The domestic response to the 1974 explosions seemed to vindicate ideas that nuclear explosive capability would improve India's prestige. A *Washington Post* correspondent wrote, "Yesterday's underground test blast in the Great Indian Desert of Rajasthan not only propelled India into the elite six-nation nuclear club, but also silenced critics of Mrs. Gandhi and her government... 'Now we're the same as America and Russia and China,' said a young man delivering newspapers on his bicycle. 'We have the

¹⁰² India did, however, abide by the terms in the Partial Test-Ban Treaty by detonating the 1974 device underground.

¹⁰³ V.P. Dutt, *India's Foreign Policy* (New Delhi: Vikas, 1984), pg. 90.

¹⁰⁴ Quoted in Jain Girilal, "India," in *Non-Proliferation: The Why and the Wherefore*, Jozef Goldblat, ed. (Philadelphia: Taylor and Francis, Inc., 1985), pg. 92-93.

¹⁰⁵ Rodney W. Jones, "India," in *Non-Proliferation: The Why and the Wherefore*, Jozef Goldblat, ed. (Philadelphia: Taylor and Francis, Inc., 1985), pg. 114.

atomic bomb’.”¹⁰⁶ These sentiments show how enmeshed technical prowess, especially in the nuclear field, is with international power. India’s reluctance to sign the NPT and the nuclear community’s statements of autonomy and self-sufficiency (even when untrue) also show the weight given to international and domestic perceptions of India’s abilities.

However, these reasons are likely not the only, or even the primary, driving factors in Indira Gandhi’s decisions. The 1974 test did not propel India into “elite” status in the world; India is still not officially recognized as a nuclear power. The arguments for prestige and independence are designed more to appease a public eager to believe in India’s abilities: 90% of those polled after the test reported feeling “personally proud” of the achievement¹⁰⁷. If other factors such as security and domestic concerns had not been present, prestige alone would likely not have been sufficient to warrant a nuclear test.

Summary

The 1974 “peaceful nuclear explosion” was the result of almost thirty years of nuclear research and development. Designed to demonstrate India’s nuclear prowess but still maintain a “non-nuclear” stance to satisfy the Gandhian aspects of Indian society, the explosion was announced as a test of nuclear explosions for civilian purposes. While it is unlikely that India truly wished to use nuclear explosives in national engineering projects given the lack of planning, use, or subsequent development, it is also just as likely that India was not intending to develop a nuclear arsenal. This is apparent not only from the statements made by Indira Gandhi, but also seen in the absence of the development of delivery systems, nuclear doctrine and planning, and focused nuclear weapon development, including additional nuclear tests. What was the impetus, then, for the explosion of a nuclear device in 1974?

In late 1971 through mid 1972, when most observers place the date of Mrs. Gandhi’s original authorization to prepare for nuclear tests, it appears that security concerns and the advice of nuclear scientists may have played a significant role, or at least a larger role, than either domestic politics or normative causes. Although India

¹⁰⁶ Lewis M. Simons, “A-Blast Temporarily Muffles Gandhi Critics,” *The Washington Post*, May 20, 1974, pg. A18.

¹⁰⁷ Sagan, “Why Do States Build Nuclear Weapons?”

decisively won the 1971 war with Pakistan, Chinese support for India's Pakistani enemy and, especially, the entry of the US nuclear carrier *Enterprise* likely triggered security concerns in India. Most importantly, India was determined not to allow three nuclear powers, China, the US, and the USSR, to control events on the subcontinent. In addition to the real security concerns facing India, the scientists involved in nuclear research were strongly advocating for nuclear tests as the next "step" in their experiments. This lobbying took place in secret meetings without political advisors, leading to a skewed perception of the need and consequences for nuclear tests.

When the final decisions were made in 1974, the situation was similar, although important aspects had changed. The heightened sense of vulnerability imparted by the *Enterprise* incident had abated, replaced with an India as strong as she had ever been. Relations with Pakistan, China, and the United States were all improving, and India had secured a virtual nuclear guarantee from the USSR. China, however, in deploying the DF-3 had improved their ability to hold all Indian cities at risk of nuclear weapons. Although relations were improving, this threat to Indian security could not be overlooked. In addition, domestically Indira Gandhi was facing historically low approval ratings, economic woes due to a major railway strike, the 1973 oil embargo, and a severe drought, and a significant fraction of the populace lived in poverty. She was still advised almost exclusively by nuclear scientists: her domestic advisors, foreign advisors, and military advisors were not included in the decision-making; they were not even informed of any plans until 48 hours before the test occurred. This is not to say that informal discussions did not take place, but there was no official exchange of ideas between the weaponeers and Mrs. Gandhi's advisors.

While the desire for prestige, international recognition, and scientific self-sufficiency certainly play a role in India's decisions making, it seems that these factors play more into domestic politics rather than international consumption. Indian leaders made a point of telling the public that the nuclear program was entirely domestic, when in reality, the program would never have survived without the support of Canada and the United States. The international community was well aware of the origins of India's reactors, heavy water, and plutonium reprocessing centers; only the Indian public was unaware. Similarly, the idea of gaining international prestige seems to play into the

desires of the Indian populace, as evidenced by the *Washington Post* quote cited previously: “Now we’re the same as America and Russia and China.” India is unique in that they have long advocated for parity among states, especially in the nuclear realm, to eliminate colonialism and the creation of a “nuclear second-class”. The support for the 1974 blast clearly shows that the Indian public concluded that becoming nuclear-capable made them feel modernized. Unfortunately, this perception did not translate from the Indian public to the international community: India’s nuclear test was widely condemned and did little to advance India’s interests. It can be concluded here that the 1974 test, was the outcome of a combination of security concerns and domestic pressures. Both Indira Gandhi’s declining approval and domestic strife as well as the excessive influence of nuclear scientists affected her calculations. The fact that the nuclear test played into Indian perceptions of prestige and autonomy was a secondary factor in the political calculations.

IV NUCLEAR TESTS, ABANDONED AND COMPLETED

India's second round of nuclear testing occurred in May of 1998, although many reports indicate that preparations for testing were detected in 1995 and even earlier. The five nuclear devices detonated over two days in May led to Pakistan responding by exploding its own nuclear weapons two weeks later. The two long-time foes, now unquestionably nuclear-capable, triggered an international nuclear crisis resulting in sanctions, international criticism, and an increase in tension on the subcontinent¹⁰⁸. In light of the consequences, why did the Indians chose to test in 1998, and if true, why did they plan to test in 1995 but hold back? This section will address these questions, beginning with a review of India's nuclear program since 1974.

India's Nuclear Program, 1974-1998

Surprisingly, India's nuclear test of 1974 did little to advance the prospects of nuclear energy in the years immediately following. While the scientists were hailed as heroes, India's domestic problems still existed. Indira Gandhi's approval ratings increased following the Pokhran test, but within a few months had fallen to new lows. Like the preceding three decades, the direction of India's nuclear program was subjected to the whims of the prime minister, absent a stable research path or continuous high-level support¹⁰⁹.

Contrary to international expectations, India did not continue with a nuclear testing program after the May 1974 Pokhran test. As Indira Gandhi was prime minister and the prime minister was responsible for nuclear energy decisions, the choice to persist

¹⁰⁸ I refer to the states as "nuclear-capable" rather than "nuclear-armed" since the weapons were not immediately deployable in 1998.

¹⁰⁹ This summary again draws largely from Perkovich, *India's Nuclear Bomb*, as well as Kamal Matinuddin, *The Nuclearization of South Asia*, Ashok Kapur, *Pokhran and Beyond* (New Delhi: Oxford University Press, 2001), especially chapters 7 and 8, Sumit Ganguly, "India's Pathway to Pokhran II", and Brahma Chellaney, "South Asia's Passage to Nuclear Power," *International Security*, Vol. 16, No. 1 (Summer 1991), pg. 43-72.

in testing was hers to make¹¹⁰. However, the consequences following the Pokhran blast were greater than Mrs. Gandhi had been expecting. Most importantly, Canada immediately halted all assistance for the Rajasthan II reactor and a heavy-water plant, demanding that India submit to safeguards before cooperation continued. India was also dependent on US-supplied fuel for the two reactors at Tarapur, an agreement which would be strained for years to come. Additionally, the US sought to strengthen export controls. In cooperation with other countries, a “trigger list” of dual-use items was established. Items on this list were not to be exported to countries that were not under IAEA safeguards. Directly in response to India’s nuclear test, the US acted unilaterally to stem nuclear proliferation by passing the Symington Amendment to the Foreign Assistance Act in 1976 and the Nuclear Non-Proliferation Act in 1978. The former denied US economic or military assistance to states without IAEA safeguards on enrichment or reprocessing facilities, while the latter barred all nuclear cooperation with states without IAEA safeguards. As a result of tighter export controls and, especially, Canada’s unwillingness to continue cooperation on nuclear facilities, work in the nuclear sector was seriously restricted.

In addition to the limitations on nuclear activities, India’s domestic fortunes had taken a downturn as well. Mrs. Gandhi’s political fortunes were declining, with opposition united against her, social unrest throughout India, and a declining economy. In 1975, Mrs. Gandhi was found guilty of corrupt election practices, invalidating her hold on power. In response, she called for the President to proclaim a national emergency, allowing her to arrest opposition leaders and opponents within her own party, censor the press, and put a virtual hold on democracy in India until 1977. During this time, her efforts were spent on improving the economy and the fortunes of the poor, rather than on nuclear energy. Mrs. Gandhi showed no interest in expanding nuclear power, and it was obvious that nuclear weapons were of little value to the Indian people. Even Pakistan’s increasing efforts to develop nuclear weapons did not inspire India to devote more energy to weaponization of its nuclear program.

¹¹⁰ Perkovich captures the influence held by the prime minister when it comes to nuclear matters. Homi Sethna is quoted: “We said to Mrs. Gandhi, ‘Do you want another [test]?’ She said, ‘I’ll let you know.’ She never let us know, so we stopped.” Perkovich, pg. 192.

Indira Gandhi's downfall and the rise of her longtime political enemy, Morarji Desai, into the prime ministership in 1977 heralded new problems for the nuclear energy establishment. While Mrs. Gandhi was willing to entertain nuclear ambitions, Morarji Desai was vehemently anti-nuclear, reportedly telling an interviewer, "I will give it to you in writing that we will not manufacture nuclear weapons. Even if the whole world arms itself with the bombs we will not do so."¹¹¹ Desai's commitment to the nuclear arena was devoted to ensuring continuation of the supply of US fuel for Tarapur and to global disarmament. Under Desai's leadership, the atomic energy establishment lost much of its power and influence.

Desai's government, however, would not last. His government failed in early 1979, and in July, Charan Singh was elected Prime Minister. He, too, had a short time in power. Indira Gandhi was re-elected in January 1980, whereupon she reversed Desai's commitment to abstaining from nuclear explosions by asserting that "there would be no hesitation in conducting these in the national interest."¹¹² Mrs. Gandhi inherited a nuclear establishment that over the previous six years had suffered greatly from a sort of benign neglect: heavy-water plants were years behind schedule, construction of new facilities was delayed, and scientists were disenchanted.

In the midst of India's internal power struggles, Pakistan's military capabilities, both nuclear and conventional, slowly expanded. In 1979, the US intelligence community informed Congress that the Kahuta uranium enrichment plant had begun to process uranium. While Pakistan encountered similar procurement problems as India due to restrictions on export controls and safeguards, General Zia was unwavering in his determination for nuclear technology. The Soviet invasion of Afghanistan in late 1979 drove the US to increase its support to Pakistan by removing sanctions and supplying billions of dollars of conventional weapons, including F-16 fighters able to target sites in India. In a probable over-exaggeration, the chairman of the Atomic Energy Commission in 1981 claimed that Pakistan could detonate a nuclear device within months¹¹³.

¹¹¹ Morarji Desai, quoted in Perkovich, pg. 201.

¹¹² Quoted in Perkovich, pg. 224.

¹¹³ Perkovich, pg. 228.

Mrs. Gandhi, aware of the growing threat from Pakistan and the neglected nuclear establishment, moved to strengthen the nuclear capability of India and restore the power of the AEC. According to press reports, the Bhabha Atomic Research Center began to manufacture nuclear explosive components, including twelve kilograms of plutonium¹¹⁴. In 1981, US intelligence discovered evidence of excavations in possible preparation for an underground nuclear test at Pokhran¹¹⁵. Although 70% of those polled favored nuclear weapons in 1981 and discussions in parliament leaned toward a more robust nuclear policy, Mrs. Gandhi declared that a nuclear device would be detonated only if “it is in the interest of our science or development.”¹¹⁶

In late 1982 or early 1983, however, Mrs. Gandhi was asked by leaders of the atomic energy establishment to approve a second nuclear test. According to interviews conducted by Perkovich and a single published source, BARC director Ramanna and the director general of the Defence Research Development Organization (DRDO) presented a plan to Mrs. Gandhi and her top advisors to test a new nuclear device¹¹⁷. According to the scientists involved, this test would be a single “experiment” to determine if a new design, significantly lighter but with a much higher yield-to-weight ratio than the 1974 device, would detonate as predicted. While giving initial approval to such a test, Mrs. Gandhi apparently changed her mind and rescinded her authorization.

Pakistan, however, moved ever closer to a nuclear weapon, with Dr. A.Q. Khan declaring in 1984 that Pakistan had enriched uranium needed for a weapon. As the threat from Pakistan grew, so did Mrs. Gandhi’s domestic troubles. She did not change the stated policy that nuclear energy would be used only for peaceful purposes, and attempted instead to address internal security threats apparent between the Sikhs and the Hindus. A symptom of the political unrest, she was assassinated in October 1984 by Sikh bodyguards, her son Rajiv gaining power over nuclear decision-making.

¹¹⁴ Perkovich, pg. 229

¹¹⁵ Judith Miller, “Cranston Says India and Pakistan are Preparing for Nuclear Testing,” *New York Times*, April 28, 1981, pg. 1.

¹¹⁶ Perkovich, pg. 229-230.

¹¹⁷ Ramanna was central to the 1974 nuclear test, and at that time, Indira Gandhi relied heavily on his opinions. He was removed from control by Desai, but reappointed by Mrs. Gandhi with increased power in 1980. See Perkovich, pg. 242-244. The 1983 authorization was revealed in a newspaper article in 1998 following the Pokhran II blasts. See “India was ready for nuclear test in 1983,” *The Hindu*, May 27, 1998.

Rajiv, like his grandfather, was outwardly committed to the abolition of nuclear arms. Like many of the prime ministers before him, he strove to keep the nuclear option open. However, Rajiv was quite used to making decisions without advice, and therefore clashed with leaders of the atomic energy establishment who were accustomed to his family's reliance on their counsel. While Rajiv focused most of his energy on the Indian economy and shoring up relations with the US, Pakistan, and China, BARC continued to modernize nuclear weapon designs and advance civilian nuclear power.

During Rajiv's tenure as prime minister from 1984 through 1989, the nuclear establishment stayed in the background, quietly studying new designs and producing components of nuclear weapons, without pushing for a nuclear test. In 1988, the Indian missile program made a leap forward by testing a short-range Prithvi missile, the accuracy of which was appropriate only for nuclear warheads. The Prithvi test was followed in 1989 by a test of the medium-range Agni missile, able to reach targets in China. By 1990, India had developed ready-to-assemble nuclear weapons that could be delivered by plane, although the means of delivery had not been tested, and the beginnings of a missile delivery program.

The years 1990-1995 brought little change in the nuclear program. Scientists continued to develop new theories on nuclear weapons design and the missile program proceeded apace. The new Clinton administration in the United States, however, sought to impose new restrictions on nuclear exports and pressed India to join the NPT. While India was in favor in principle of global disarmament and nonproliferation treaties such as the NPT, the fissile material cutoff treaty, and the CTBT to stop the spread of nuclear weapons, New Delhi refused to sign anything that would limit the abilities of the nuclear have-nots without putting a time frame on the disarmament of the five nuclear powers. Viewing such treaties as unfairly repressing the technological growth of developing countries and instruments of colonialism, India rebuffed any attempts to constrain its nuclear program.

In 1995, US intelligence agencies reported that India was again making improvements to the Pokhran test site, possibly in preparation for a nuclear test¹¹⁸. While Indian officials referred to the allegations as “totally speculative,” they did not deny them outright. Afraid that an Indian nuclear test would encourage a responding test by Pakistan, Washington had been engaged in private diplomacy to try and halt the Indian test before the reports became public. Once in the public domain, however, the Indian press picked up the story as yet another affront to Indian sovereignty. Prime Minister Narasimha Rao was faced with the American government urging restraint and the Indian press and opposition parties condemning the interference of the Americans and urging Rao to assert Indian independence. Rao ultimately decided against authorizing a nuclear test due primarily to economic factors, concerned that the international backlash would significantly harm India’s economy¹¹⁹.

While nuclear policy regarding deterrence and doctrine loomed large in political debates following the abandoned 1995 test, the public was still more concerned with domestic problems and political corruption scandals than nuclear weapons. The Rao government lost the round of elections in May 1996 to the Bharatiya Janata Party (BJP) which had long advocated for the nuclear option to be exercised. The margin of victory for the BJP was not large enough to allow the party to govern without the support of its opposition in the Lok Sabha. Given two weeks to achieve a vote of confidence in his newly formed government, one of the first acts Prime Minister Atal Behari Vajpayee undertook was to authorize a nuclear test¹²⁰. Upon further reflection and discussions with advisors, though, Vajpayee chose to delay the nuclear test until the outcome of confidence vote was known. His government was voted down, and the subsequent government prohibited the nuclear test from going forward.

Following the no-confidence vote and the denial of nuclear tests, the Indian nuclear community fell back into the role it had played for the previous ten years. The

¹¹⁸ Tim Weiner, “US Suspects India Prepares to Conduct Nuclear Test,” *The New York Times*, December 15, 1995, pg. A9 and R. Jeffrey Smith, “Possible Nuclear Arms Test by India Concerns US,” *The Washington Post*, December 16, 1995, pg. A17.

¹¹⁹ Rao’s decision-making is documented in Perkovich, pg. 370, based on interviews with unnamed government advisors and confidantes.

¹²⁰ US intelligence reportedly discovered the resumption of activity at the test site and US officials made private overtures to halt the test in May 1996. See Mark Hibbs, “Indians Deny New Regime Will Lead To Bomb Test, Access Freeze,” *Nucleonics Week*, December 4, 1997, Vo. 38, No. 49, pg. 10.

nuclear scientists continued to study nuclear weapons designs, manufacture nuclear weapons components, and lobby for nuclear tests. Efforts were made to improve nuclear power plants by upgrading the existing plants. In the international arena, the CTBT was under negotiation, forcing India to once again refuse to adhere to an international nonproliferation agreement without a timeline for the superpowers' disarmament. Once again, the government was plagued with domestic problems and the prime minister resigned in November 1997. New elections were called for February and March, 1998.

The primary concerns in the 1998 elections were, again, domestic, with the BJP and Congress the main rivals. Nuclear policy factored little into the domestic leadership debate, even though the BJP's manifesto called for India to "re-evaluate the country's nuclear policy and exercise the option to induct nuclear weapons" as well as develop more accurate, longer-range Agni missiles¹²¹. Although the BJP in the past had been founded on nationalistic principles with a hard-line national security message, the leaders of the party in 1998 tried to downplay these foundations to encourage support from more moderate members of the public. The BJP again won slightly less than a majority of the seats in the Lok Sabha, running on a platform of inclusiveness. The BJP formed an alliance coalition, with Vajpayee sworn in again as prime minister on March 19, 1998.

Quite soon after the new government had taken control, on April 6th, Pakistan tested a medium-range Ghauri missile. Caught off-guard and surprised by the Pakistani missile test, the BJP government had to respond or risk domestic condemnation given its assertive base concerned with national security. In what initially appeared to be a response to the Pakistani missile test, India tested five nuclear weapons in early May, 1998 – three on May 11th and two more on May 13th. In response, Pakistan tested six nuclear weapons of their own two weeks later, certifying the nuclear status of the Asian subcontinent.

Technological Advances

From 1974 through 1998, Indian nuclear scientists significantly advanced the technological basis of their nuclear weapons program. Progressing from simple

¹²¹ Perkovich, pg. 407

plutonium fission devices of the sort tested in 1974, the scientists studied more advanced boosted fission devices, fusion weapons, and sub-kiloton designs, as well as modifications to the simple 1974 device to improve its yield-to-weight ratio¹²². These warheads, designed to be delivered by aircraft or to be fitted on ballistic missiles, were more complicated than earlier designs. According to the second hypothesis outlined in the second section of this thesis, Indian scientists were presumably interested in conducting nuclear tests for the fundamental reason that tests would ensure that the new designs detonated as expected and could be used as warheads on the new Agni and Prithvi missiles.

With regard to the first goal, guaranteeing that the new weapons functioned as designed, it is highly probable that the nuclear scientists saw this as a principal factor in support of nuclear tests. While the Indian nuclear establishment had access to computer simulations and had reportedly conducted lab-scale assessments of non-fissionable explosive components, the weaponeers lacked experimental data to support their computational analyses. While the United States and other technically advanced countries could calibrate computer models to experimental data from hundreds of nuclear tests, the Indians were without experimental calibration sources, save for the 1974 test. Nuclear tests of the new designs would allow weaponeers a greater understanding of weapons physics for future weapon designs and allow them to improve upon the current designs if necessary.

The modernization of warheads was necessary in order to use them with the new ballistic missiles under development since the mid-1980s¹²³. The first flight test of the Prithvi missile occurred in 1988; the first test of the longer-range Agni in 1989¹²⁴. Flight tests of both missiles continued throughout the early 1990s. Given the poor accuracy of the Prithvi and early versions of the Agni, the missiles were generally considered useful

¹²² See David Albright, "The shots heard 'round the world," *Bulletin of the Atomic Scientists*, Vol. 54, No. 4 (July/August 1998), pg. 20-25 for a discussion of the new designs tested in 1998.

¹²³ The Indian missile program was begun in 1983. If India had been planning a sustained campaign to weaponize its nuclear capabilities, presumably the missile program would have been started much sooner.

¹²⁴ For more information on the development and capabilities of the Prithvi and the Agni missiles, see Z. Mian, A. H. Nayyar, and M. V. Ramana, "Bringing Prithvi Down to Earth: The Capabilities and Potential Effectiveness of India's Prithvi Missile," *Science and Global Security*, 1998, Vol. 7, pg. 333-360, and Gary Millhollin, "India's Missiles – With a Little Help from Our Friends," *Bulletin of the Atomic Scientist*, Nov. 1989, Vol. 45, No. 9, pg. 31.

only when tipped with a nuclear warhead¹²⁵. For weaponization, then, the missile and nuclear communities would need to know that the miniaturized nuclear weapons would produce the desired yield and the missiles could accommodate them.

The development of new weapons and the means to deliver them combined with the nuclear weaponeers' desire to continue their work through to a detonation seems to give credibility to the "technical" hypothesis for testing nuclear weapons. However, two factors make this hypothesis unlikely for the testing decisions made between 1980 and 1998. First, the nuclear scientists may have understood that computer simulations and theory does not take the place of actual experimental evidence, but political decision-makers may not. Scientists, on the other hand, with no national policy experience and a job that depends on technical results, may not take into account the broader national picture of what nuclear tests would mean outside of their area of expertise. Chidambaram, a leader in nuclear weapons development, recognized this fact: "I am not a strategist. Other people work on that."¹²⁶ Thus, decisions to test may have been influenced by the desires of the nuclear scientists, but their concerns were likely not the deciding factor.

The second, and more important, factor that implies that the tests were not conducted because of technical concerns is that technical questions regarding the nuclear devices were present and constant throughout the period in question. The nuclear scientists were advocating nuclear tests as soon as they had developed a new design that they wanted to demonstrate. Their lobbying did not change, for example, between 1982 and 1985, so it cannot explain the aborted decision to test in 1983 but the apparent absence of any discussion of testing in 1985. If technological factors really are the driving force behind the Indian nuclear testing decisions, then we would expect Indira Gandhi to have listened to the scientists in 1982/1983 and followed through with the tests instead of canceling them, and we would expect the same in 1995 when Prime Minister Rao decided against testing.

¹²⁵ Z. Mian, A. H. Nayyar, and M. V. Ramana, "Bringing Prithvi Down to Earth"

¹²⁶ Perkovich, pg. 365

Security Concerns and International Powers

Concerns over India's security, military superiority, and international pressure to renounce nuclear weapons all contributed to nuclear decision-making, especially throughout the 1990s. Real apprehension over renewed US-Pakistani military cooperation following the Soviet invasion of Afghanistan and Chinese assistance to Pakistan's nuclear and missile programs dominated the regional landscape. International pressure to adhere to the nonproliferation regime, and especially the CTBT, surely contributed to the decisions made in the 1990s. Of import to note, however, is the lack of any evidence that India was attempting to pressure or coerce its neighbors, weaker states, or the international community by threatening or carrying out nuclear tests. This is not surprising – India has a long tradition of declaring itself independent and self-reliant; an overt instance of blackmail would be uncharacteristic. Thus, this section focuses on India's regional security and the international climate at times when nuclear tests were discussed, as these factors undoubtedly played a role in three separate prime ministers' decision making.

New Interests, 1983

India's security situation changed significantly in 1980 and again following the fall of the Soviet Union in 1991. In late December 1979, the Soviet Union invaded Afghanistan. Although the US had previously invoked the Symington Amendment, prohibiting the sale of military equipment to Pakistan due to suspected nuclear activity, the Soviet invasions prompting the United States to reverse its course. In 1981, the US and Pakistan formalized an agreement that would supply Pakistan with 3.2 billion dollars worth of military and economic aid¹²⁷. Included in this deal were forty F-16 fighter bombers, six of which were delivered in early 1983. The sale of F-16 fighters to Pakistan was especially worrisome to India: due to the mountainous terrain of Afghanistan, F-16s were unusable in the Soviet-Afghan conflict, but they could easily be used against Indian

¹²⁷ V. Longor, *The Defence and Foreign Policies of India* (New Delhi: Sterling Publishers Private Limited, 1988) pg. 297.

targets. The increase in military aid to Pakistan, especially the sale of F-16s, began to equalize the balance of power on the subcontinent.

Concern over Pakistan's nuclear abilities was also growing. In 1983, a classified US assessment of Pakistan's nuclear capabilities began by stating that, "There is unambiguous evidence that Pakistan is actively pursuing a nuclear weapons program."¹²⁸ Presumably, given their concern over Pakistani activities, the Indians were aware of this as well¹²⁹. Furthermore, cooperation between Pakistan and China in the nuclear realm was coming to light at the same time¹³⁰. Given Pakistan's recent purchase of nuclear-capable F-16s and their growing nuclear weapons program, India likely felt pressure to demonstrate its own capability.

The declining security situation in 1982 and 1983 may have played a role in Indira Gandhi's personal thoughts on nuclear testing, but there was seemingly no discussion of security rationale in her talks with Ramanna and Arunchalam. Moreover, Mrs. Gandhi pursued alternate means to reduce the security threat posed by a newly-resurgent Pakistan. In January 1982, she offered to sign a security pledge with Pakistan forswearing the use of force against each other, and although the process was tenuous, relations between Pakistan and India slowly improved. Mrs. Gandhi also sought to India's standing with the United States, including a 1.8 billion dollar arms deal as well as increased cultural and scientific ties¹³¹. She may have been reluctant to continue with a nuclear test once reminded that the US would likely rescind its offer of military aid following a nuclear test.

Sino-India relations were also improving during the 1980s. The Chinese foreign minister, Huang Hua, visited India in 1981, in the first visit to India by a Chinese government official in over twenty years. Around the same time, the Chinese Premier Zhao Ziyang stated that China hoped to "solve certain problems concerning the bilateral

¹²⁸ State Department Briefing Paper, "The Pakistani Nuclear Program," June 23, 1983 (SECRET). Declassified February 7, 1996.

¹²⁹ Alain Cass and John Elliot, "India Fears Pakistan Nuclear Intentions," *Financial Times (London)*, 25 February 1983, Section I, Pg. 14

¹³⁰ Simon Henderson, "Why Pakistan May Not Need To Test a Nuclear Device," *Financial Times (London)*, 14 August 1984. Section I, Overseas News, Pg. 3.

¹³¹ Bernard Weinraub, "Mrs. Gandhi in US Tomorrow to Seek Better Ties," *The New York Times*, July 26, 1982, Section A, pg. 1, col. 3, Foreign Desk; and Bernard Weinraub, "India Said to be on Verge of \$1.8 Billion Arms Deal With US," *The New York Times*, May 20, 1983, Section A, pg. 8, col. 2, Foreign Desk..

relations between China and India in a step-by-step fashion via friendly consultations in a spirit of mutual understanding and accommodation.”¹³² While a shift in hostility between the two countries did not occur immediately, encouraging Sino-Indian relations began to increase.

Thus, a picture begins to emerge regarding the security situation in India in the early 1980s: India’s military advantage compared with Pakistan’s was lessening, due to extensive American military and economic support to Pakistan. In contrast, Indian connections with China and the United States were positive and increasing, including promises of aid and cooperation. While it is likely that security concerns played a role in her initial decision to allow a nuclear test, upon further reflection, the security concerns were probably not enough to outweigh the economic consequences of a nuclear test¹³³. India’s greatest enemy has always been China, not Pakistan, so the military buildup by Pakistan in 1983 was not as great a threat as the Chinese missile deployment in 1972. Although the beginnings of a nuclear program were apparent, Pakistan was not yet a nuclear power, so the purchase of F-16s and missiles were a conventional threat, not a nuclear one. India, with its strong conventional military, likely felt that these threats were manageable.

International Pressure, 1995-1996

The security situation in 1995 and 1996 was radically different in one respect from previous years: the collapse of the Soviet Union left India devoid of a super-power nuclear guarantee and major military supplier. While India had lost its nuclear protector and ally, New Delhi and Beijing were forging new bonds¹³⁴. Continuing the momentum begun in the 1980s, Sino-Indian relations moved towards reconciliation and friendly discussion. High-level contacts between the two states led to a thaw in the dispute over border issues, culminating in “The Agreement on Maintenance of Peace and Tranquility

¹³² Quoted John W. Garver, *Protracted contest: Sino-Indian rivalry in the twentieth century* (Seattle: University of Washington Press, 2001), pg 219.

¹³³ Mrs. Gandhi’s defense minister may also have played a role in dissuading her from following through on nuclear testing, fearful of alienating the United States and losing military aid.

¹³⁴ Wang Hongyu, “Sino-Indian Relations: Present and Future,” *Asian Survey*, Vol. 35, No. 6 (June, 1995), pg. 546-554.

along the Line of Actual Control in the Sino-Indian Border Areas.” An increase in cooperation in science, technology, trade, and military affairs also contributed to strengthening relations. By 1995, India and China were enjoying the best associations since the 1962 conflict.

This is not to say that there were no areas of concern. In particular, Chinese nuclear activities were particular irksome to the Indians. Immediately following the successful negotiation of the CTBT in 1996, China detonated what it termed its final nuclear tests before declaring a moratorium and acceding to the CTBT. India viewed these tests as an affront to the nonproliferation regime and a threat to Indian security, with China only adhering to the CTBT because their nuclear program had advanced significantly that no other tests were required¹³⁵. In addition, China continued in the first half of the 1990s to contribute substantially to Pakistan’s nuclear program¹³⁶.

Pakistan was also a security concern for India. In 1995, Pakistani Prime Minister Benazir Bhutto launched a major foreign policy initiative to improve relations with the United States¹³⁷. In April 1995, Mrs. Bhutto traveled to the US in an attempt to persuade President Clinton to authorize the release of F-16 fighter jets to Pakistan that had been paid for in 1990 but not delivered. She was unsuccessful in negotiating the delivery of the F-16s, but did manage to secure a pledge from President Clinton to work towards the removal of sanctions imposed by the Pressler amendment¹³⁸. In September 1995, the US congress voted to allow the sale of millions of dollars of military equipment to Pakistan. In light of reports that the Chinese had helped the Pakistanis with missile and nuclear technology, the renewal of military ties between the US and Pakistan in the face of noncompliance with the Pressler amendment aggravated Indian elites¹³⁹. Indo-Pakistani

¹³⁵ Seth Faison, “China Sets Off Nuclear Test, Then Announces Moratorium,” *The New York Times*, July 30, 1996, pg. 4.

¹³⁶ Steven A. Holmes, “China Denies Violating Pact by Selling Arms to Pakistan,” *The New York Times*, July 26, 1993, pg. 6.

¹³⁷ Robert LaPorte, Jr., “Pakistan in 1995: The Continuing Crises,” *Asian Survey*, Vol. XXXVI, No. 2, February 1996, pg. 179-189.

¹³⁸ Nancy Dunne, “Clinton pledges help for Bhutto,” *The Financial Times (London)*, April 12, 1995, pg. 7; Thomas W. Lippman, “Administration Proposes Compromise to Transfer Some Weapons to Pakistan,” *The Washington Post*, July 26, 1995, Section A, pg. A19.

¹³⁹ R. Jeffrey Smith, David B. Ottaway, “Spy Photos Suggest China Missile Trade; Pressure for Sanctions Builds Over Evidence That Pakistan Has M-11s,” *The Washington Post*, July 3, 1995, Section A, pg. A11; Jonathan S. Landay, “India Cries ‘Tilt’ After US Aids Pakistan,” *The Christian Science Monitor (Boston, MA)*, October 31, 1995, The World, pg. 1.

relations were also at a low: Tensions over the disputed area of Kashmir flared¹⁴⁰. Prime Minister Bhutto declared “Kashmir is an unfinished agenda of partition” while Prime Minister Rao proclaimed that the only “unfinished task” is the “liberating of the Pakistan-occupied Kashmir.”¹⁴¹ As the fighting in Kashmir accelerated, India surely felt pressured to demonstrate its strength and control.

Of greatest import, however, in the time period surrounding the 1995-96 testing decisions was the renewal of the NPT in 1995 and the negotiations on the CTBT in 1996. India, as it had since the NPT was first signed, opposed an extension of the treaty and refused to sign it without a time-bound guarantee of complete disarmament. India had hoped that the NPT would not be extended; when the American delegation managed to secure its extension, India came under intense pressure to sign. The CTBT was even more of a direct threat than the NPT. While India could still refuse to sign the NPT and would only be subjected to the curbs on nuclear exports to those countries outside of the treaty (which it had endured already for thirty years), but the CTBT had an “entry into force” clause that would cause the treaty to be enforced after only forty-four countries with nuclear programs had signed it. New Delhi feared that sanctions or other intense international pressure would be imposed if it refused to ratify the treaty but forty-four other nations did, triggering the entry into force clause.

India saw this constraint on its ability to test nuclear weapons as hampering national security. Arundhati Ghose, the Indian ambassador to the Geneva Conference on Disarmament in June of 2006 stated:

“Nuclear testing which has been carried out even as our negotiations proceeded has been justified as essential for national security and for permitting completion of work on new designs and gathering of data to enable computer simulation and modeling to preserve and refine capabilities into the distant future...it is natural that our national security considerations become a key factor in our decision making.”¹⁴²

¹⁴⁰ John F. Burns, “Battle Over Kashmir Seems Only to Worsen,” *The New York Times*, July 9, 1995, Section 1, pg. 3, col. 1, Foreign Desk.

¹⁴¹ Quoted in Alka Lahori Handoo, “Scepticism over India-Pakistan ties,” *New Straits Times (Malaysia)*, September 27, 1995, pg. 12.

¹⁴² Statement by Arundhati Ghose, plenary of the Conference on Disarmament, June 20, 1996. Available at www.indianembassy.org (accessed July 8, 2006).

India was not willing to relinquish its ability to perform nuclear tests while its long-time rival, China, was still testing throughout the negotiation process. India believed that the Chinese had obviously collected sufficient data on its nuclear program to be able to rely on sophisticated computer models without needing to resort to further testing. Unlike China, India did not have the data from experimental nuclear tests to use in validating computer models. India certainly felt that its long-term security was weakened by this development, but felt even more so that the country was being pressurized into adhering to international regimes that would effectively relegate India to a lower status. New Delhi believed that the CTBT would forever make India subordinate to the five declared nuclear powers, a politico-security arrangement which was untenable. Scientists and government officials demanded nuclear tests prior to the entry into force of the CTBT. India's decisions on the 1995 and 1996 tests came as the CTBT was in the final stages of negotiation, circumstances which are likely not coincidental.

Pakistan Looms, 1998

On April 6, 1998, Pakistan surprised the world by conducting a test of its medium-range Ghauri missile. Built with the help of North Korea, the Ghauri missile flew 700 kilometers, short of its maximum range of 1500 kilometers, but still far enough to reach important targets in India¹⁴³. The Ghauri was a substantial threat to India: although the Agni had been previously testing, the program had essentially been dormant since 1994 and the Prithvi had a much shorter range than the Ghauri¹⁴⁴. More importantly, Pakistan was now able to hold Indian urban centers at risk with a missile that could be armed with nuclear warheads, which it was apparent that Pakistan had produced. Believing that the Pakistanis were not as technically advanced as Indian scientists, the

¹⁴³ The Indians initially believed that the Pakistanis had received help from China, but US intelligence reports claim that the Ghauri was based on the North Korean No-Dong missile design (Time Weiner, "U.S. Says North Korea Helped Develop New Pakistani Missile," New York Times, 11 April 1998, p. A3). This discrepancy led the Indians to claim that the Americans were siding, once again, with Pakistan and China against India. Further testing of the Ghauri missile demonstrated its capability to attain maximum range.

¹⁴⁴ The United States had pressured India to stop flight tests of the Agni in 1994, although work resumed after the Pakistani flight test of the Ghauri, culminating in a test of the Agni II in April 1999. The Prithvi has a range of 250 kilometers vs. 1500 for the Ghauri.

sudden and unexpected shift in the defense equilibrium on the subcontinent had both shaken India's sense of security and its technical self-confidence.

The timing of the May 1998 tests and especially reports that place the date of the decision to test on April 8th or 10th indicate that the Ghauri missile test was a substantial factor in India's 1998 tests. Unable to respond immediately with a missile test and feeling the need to demonstrate military superiority over Pakistan, the Ghauri test was that catalyst for India's nuclear tests. Vajpayee likely tapped the nuclear community for a nuclear test that all parties involved had wanted¹⁴⁵. Further, his main advisor considered the Ghauri test as a "good enough excuse" for a nuclear test¹⁴⁶.

China also factored in the BJP's rationale for nuclear tests. In international statements announcing the blasts, Vajpayee declared that the nuclear tests were in direct response to the "deteriorating security environment" facing India¹⁴⁷. In a letter to President Clinton explaining the rationale for the 1998 test, he claimed that "We [India] have an overt nuclear weapon state on our borders, a state which has committed armed aggression against India in 1962."¹⁴⁸ Vajpayee's defense minister joined the anti-China rhetoric, claiming that China was India's "potential threat number one."¹⁴⁹ There were (and are) serious security issues remaining to be resolved with China, including the ongoing territorial disputes, the status of Tibet and the Himalayan region, and Sino-Pakistan relations, especially military and nuclear cooperation, to name a few. However, none of these issues was new or constituted an imminent threat by the Chinese; many of the disputes had been decades in duration. Was China a constant concern of India's? Doubtless, and justifiably so, as a large nuclear power with a shared border and a history of antagonism. However, citing the 1962 war as a reason for the 1998 tests is dubious. It is more likely that India used the Chinese support to Pakistan for its missile program, undermining Indian military superiority, and reports that China had placed nuclear

¹⁴⁵ Vajpayee, as leader of the BJP, had advocated for exercising the nuclear option for years, while the scientists involved in the test had been lobbying prime ministers to authorize nuclear tests for over a decade.

¹⁴⁶ Raj Chengappa, *Weapons of Peace* (New Delhi: HarperCollins Publishers, 2000), pg. 45.

¹⁴⁷ Howard Diamond, "India Conducts Nuclear Tests, Pakistan Follows Suit," *Arms Control Today*, May 1998.

¹⁴⁸ Quoted John W. Garver, *Protracted contest: Sino-Indian rivalry in the twentieth century* (Seattle: University of Washington Press, 2001), pg. 336.

¹⁴⁹ *Ibid.*, pg. 336.

weapons in Tibet near the Indian border as excuses to carry out its preordained nuclear tests¹⁵⁰.

Domestic Factors

Domestic factors almost certainly played a role in the authorization (or cancellation) of nuclear tests. The nuclear establishment collaborated with the DRDO after its formation, likely as a means of garnering more money and support for its endeavors, as the civilian nuclear program, as always, was plagued by delays, accidents, and cost overruns. This partnership proved to be long-lasting and productive, as the two organizations lobbied heavily for both missile and nuclear development. Politically, the governments throughout the 1980s and 1990s were characterized by large, unstable coalitions that led to a number of premature elections and dissolved parliaments. Poverty was rampant and increasing violence between Hindus and Sikhs threatened internal security. All the prime ministers in this period came under political attack by opposition leaders and some in their own coalitions, forcing them to make decisions to, in some cases, save their political lives.

1983 Aborted Test

In 1983, with Indira Gandhi once again installed as prime minister, the nuclear establishment sought to detonate another nuclear device. Details of this event are thin, but it appears that the head of BARC, Raja Ramanna, and of the DRDO, Arunchalam, sought a meeting with the prime minister while she was at the Ministry of Defense for meetings on other subjects. During this meeting, the two scientists pressed their case for another nuclear test.

A significant change had taken place in the decision-making apparatus since the previous nuclear test authorized by Mrs. Gandhi. In 1974 meetings with scientists, her only other companions were two principle secretaries (one former and one current) to the

¹⁵⁰ Mark Nicholson, "China 'Greatest Threat to India'," *The Financial Times (London)*, May 5, 1998, Asia-Pacific, pg. 8.

prime minister and the defense science advisor. The meetings were dominated by the eagerness of the nuclear scientists. In 1983, however, the meeting included the Principle Secretary, the Cabinet Secretary, and the Minister of Defense. The first two of these men were well versed in both science and politics and had the trust of the prime minister, while the presence of the Minister of Defense provided an additional voice for strategic decisions. After listening to the scientists' recommendations (another change from 1974 – Mrs. Gandhi was not involved in the deliberation process in the scientific community until she was asked to make a decision regarding proceeding with the test), Mrs. Gandhi accepted the scientists' arguments and authorized a nuclear test¹⁵¹.

Less than twenty-four hours later, however, Mrs. Gandhi cancelled her approval. While no written record apparently exists of her decision to cancel the test, some events can shed light on the subject. Chengappa writes that India's Foreign Secretary was confronted by US officials over evidence of preparations at the Pokhran test site, coincidentally within hours of Mrs. Gandhi's approval¹⁵². Unaware of the decision, the Foreign Secretary confronted Mrs. Gandhi with arguments against testing, specifically, that the economic costs of testing due to international responses would be immense. It is also quite possible that the others at the meeting who were more versed in politics and aware of the possible repercussion of nuclear tests privately persuaded Mrs. Gandhi to reverse her decision on the basis of economic sanctions that the country could ill afford. Regardless, the fact remains that the atomic energy establishment wanted to test and lobbied heavily, but their desire was ultimately insufficient to persuade Mrs. Gandhi to support a nuclear test in the face of economic hardship.

Politically, Mrs. Gandhi's Congress Party was weakening. In local elections held in 1982 and in early 1983, the Congress Party lost seats to opposition parties in elections widely viewed as a referendum on Mrs. Gandhi's popularity¹⁵³. Vajpayee, leader of the BJP, called for Mrs. Gandhi's resignation and new elections¹⁵⁴. Given this kind of

¹⁵¹ *Kargil Review Committee Report*, tabled to Parliament 23 February 2000, chaired by K. Subrahmanyam.

¹⁵² Raj Chengappa, *Weapons of Peace* (New Delhi: HarperCollins, 2000), pg. 256-258.

¹⁵³ Richard S. Ehrlich, "Mrs. Gandhi weakened by local elections," *United Press International*, May 23, 1982; Sanjoy Hazarika, "Mrs. Gandhi Loses Grip on 2 States," *The New York Times*, January 7, 1983, Section A, pg. 1, col. 1, Foreign Desk.

¹⁵⁴ Stewart Slavin, "Opposition calls for Mrs. Gandhi's resignation," *United Press International*, January 8, 1983.

political pressure, it is possible that Mrs. Gandhi authorized a nuclear test as a means to distract from her political problems. However, given the events in 1974, she or her advisors may have concluded that a nuclear test in another politically difficult situation, combined with the inevitable hardship of sanctions, would harm the prime minister even more than her opposition.

1995 and 1996 Near Tests

Domestic politics seems to have played a role in 1995 and 1996 as well. The AEC was still actively involved in lobbying for tests, as they had been for years. According to former officials, scientists involved in weapons development had made three primary cases for nuclear testing: first, to demonstrate their capabilities and move forward with research, second, only full-scale tests, not simulations or “cold” tests could prove this, and finally, tests were needed to improve morale, recruit new scientists, and retain the current work force¹⁵⁵. While Prime Minister Rao had authorized the preparations for a nuclear test, he did not go so far as to authorize the emplacement of a device or detonation¹⁵⁶. While the nuclear weapons community was able to make its voice heard and persuade Rao to take the necessary steps, they were not able to convince him of the *need* for testing as had happened in 1974 and 1983.

Domestic political pressure from the opposition parties in 1995 also likely played a role in Rao’s decisions. With the collapse of the Soviet Union and lacking a nuclear deterrent of its own, BJP leaders demanded that New Delhi develop a nuclear arsenal¹⁵⁷. By late 1995, Rao’s Congress Party was lacking political and public support due to widespread government scandal¹⁵⁸. Rao himself faced a revolt by leaders in the Lok

¹⁵⁵ Perkovich, pg. 365.

¹⁵⁶ India’s Nuclear Weapons Program, *The Momentum Builds: 1989-1998*, at <http://nuclearweaponarchive.org/India/IndiaMomentum.html>

¹⁵⁷ New Delhi, “Indian opposition wants nuclear weapon to counter Pakistan,” *Agence France Presse – English*, August 24, 1994, International News; “BJP government will develop nuclear weapons if voted to power,” *BBC Summary of World Broadcasts*, July 8, 1995;

¹⁵⁸ See Stefan Wagstyl, “India’s PM plans cabinet purge,” *Financial Times (London)*, December 14, 1996, pg 4; Narayan Swamy, “Pay-off Scandal Rocks Leaders,” *Herald Sun*, October 17, 1995; Krishnan Guruswamy, “Bribery Scandal Threatens Top Levels of Indian Politics,” *The Associated Press*, January 18, 1996.

Sabha¹⁵⁹. A public opinion poll taken in late 1994 demonstrated that over 50% of those polled supported the government's current "keep the option open" policy, while another 33% thought that India should develop nuclear weapons. Only 8% thought that India should relinquish the nuclear option¹⁶⁰. By authorizing preparations in Pokhran for a nuclear test, he put himself in a position where he could quickly authorize one to placate his critics, quiet those clamoring for a nuclear option, or take the focus off his own political problems, without alienating the electorate. In fact, the *Hindustan Times* editorialized, "Mr. Narasimha Rao's Congress Party stands a fair chance of winning if he undertakes fresh nuclear tests which would be widely seen by Indian voters as the act of a brave national hero."¹⁶¹

Why Prime Minister Rao eventually chose not to test nuclear weapons is likely similar to the reasons Indira Gandhi chose not to test in 1983. When confronted with evidence of test preparations by the United States, Rao backed down from testing to avoid crippling sanctions. In the face of economic hardship and lacking a significant security threat, domestic politics was not sufficient to warrant a nuclear test.

When Vajpayee took the reins as Prime Minister in 1996, the BJP had narrowly won a plurality in the Lok Sabha. The BJP had long held the stance that nuclear weapons should be included in the Indian arsenal. The same circumstances were present in May of 1996 as in 1995 when Rao authorized preparations for testing: the economy was poor, large numbers of the populace lived in poverty, the government was divided and unstable, and government corruption was rampant. As in years past, domestic issues were at the forefront of parliamentary concern; nuclear policy held little salience with the public – only six percent found nuclear policy to be the first- or second-most important issue, while poverty, economic stability, and the issue of Kashmir all ranked higher¹⁶².

¹⁵⁹ M.R. Narayan Swamy, "Indian PM faces key test, ruling party confident," *Agence France Presse – English*, May 17, 1995, International News.

¹⁶⁰ David Cortright and Amitabh Mattoo, "Indian Public Opinion and Nuclear Weapons Policy," in *India and the Bomb*, David Cortright and Amitabh Mattoo, eds. (Notre Dame, IN: University of Notre Dame Press, 1996), pg. 11.

¹⁶¹ "A Test Balloon," *Hindustan Times*, December 18, 1995, pg. 8.

¹⁶² David Cortright and Amitabh Mattoo, "Indian Public Opinion and Nuclear Weapons Policy," in *India and the Bomb*, David Cortright and Amitabh Mattoo, eds. (Notre Dame, IN: University of Notre Dame Press, 1996), pg. 13.

There were two primary differences between the situation in 1995 when Rao came close to authorizing a test and 1996 when Vajpayee did authorize and then delay the test: first, the political party in power, and second, the fact that the American discovered the preparations for the 1995 test but not, apparently, for the 1996 test. One would expect, given the BJP's nuclear and nationalist rhetoric over the previous five years and the international pressure to sign the CTBT, that upon taking office, the BJP would authorize nuclear testing. That Vajpayee would cancel the test once it was clear that the BJP would not win a vote of confidence shows that either he was a considerate leader who would not want to saddle a new government with the consequences of a nuclear test, or that he and the BJP hoped to take credit for a nuclear test sometime in the future. The second factor, American knowledge of the impending test, may be one of the reasons that Rao ultimately decided not to test¹⁶³. Without the American pressure and direct threat of economic sanctions, Vajpayee was free to make the decision to test on his own terms.

Shakti, 1998

Political concerns also seem to have played a significant role in the timing of the 1998 tests, as well. In March 1998, the BJP prevailed in a confidence vote in the Lok Sabha, announcing that "There is no compromise on national security. We will exercise all options including nuclear options to protect security and sovereignty."¹⁶⁴ Clearly, the BJP and the prime minister were not hesitant about developing nuclear weapons; the BJP had been a strongly militant party since its inception and the induction of nuclear weapons had been a strong piece of the party platform and had already authorized a nuclear test in 1996 but failed to follow through. A non-response to the Pakistani missile test in the beginning of April would have been unthinkable for a party that had advocated stronger measures against Pakistan for years.

¹⁶³ According to Raj Chengappa, Rao backed down from testing in the face of international pressure but left instructions to be ready to test within 30 days. See Raj Chengappa, "The Bomb Makers," *India Today*, June 22, 1998.

¹⁶⁴ Statement Issued by the Prime Minister, Mr. Atal Bihari Vajpayee, on the Release of the National Agenda for Governance, April 14, 1998.

For Vajpayee in particular, the decision to test was one which established his authority in the new government. In fact, on May 11th, an article appeared in Outlook Magazine that declared: “The dividing line between being accommodative and exhibiting weakness, seemed to get fuzzier by the day,” referring to the prime minister’s ineffectuality¹⁶⁵. An editorial was titled “How a ‘Tired’ PM became a ‘Bold’ PM,” highlighting the public disapproval that Vajpayee faced¹⁶⁶.

In addition to the negative public perceptions of his rule, Vajpayee also presided over a fractious coalition of parties with disparate agendas. In order to keep the coalition together, maintain control of government, and avoid being forced to call new elections, it was imperative that the BJP and Vajpayee especially demonstrate leadership. For the first time, the party had legitimate, long-term control over Indian politics: to have shown weakness so soon and renege on campaign promises could have been disastrous.

Another factor of primary importance is the role that the AEC and the defense establishment played in 1998 relative to other advisors. As in 1974, few in the government were included in discussions regarding nuclear testing or even informed once the decision had been made. According to one account, the head of the DRDO, Kalam, and the DAE, Chidambaram, were called by Vajpayee on April 8th, 1998 and told to ready a nuclear test¹⁶⁷. The defense minister, president, foreign secretary, and military chiefs were not told about the impending tests until one or two days prior, while others were left completely out of the loop. The decisions were made by Vajpayee, Chidambaram, and Kalam, with only informal input from political advisors¹⁶⁸.

Normative Input

As in 1974, India had not adhered to the NPT by the time of the near-tests or actual tests in the 1990s, but was an integral participant in the negotiations of the CTBT

¹⁶⁵ Ishan Joshi, “Breaking the Shackles,” *Outlook India Magazine*, May 11, 1998. The thrust of the article is a discussion of the prime minister’s reassertion of authority; if true, it lends credence to the idea of the prime minister authorizing a nuclear test to boost his standing.

¹⁶⁶ Vinod Mehta, “How a ‘Tired’ PM became a ‘Bold’ PM,” *Outlook India Magazine*, May 25, 1998.

¹⁶⁷ Manoj Joshi, “Nuclear Shock Waves,” *India Today*, May 25, 1998. Others put the decision on May 10. See Raj Chengappa, “The Bomb Makers,” *India Today*, June 22, 1998.

¹⁶⁸ Raj Chengappa, *Weapons of Peace*, pg. 51.

in 1993-1996¹⁶⁹. India did not sign the CTBT when the time came on June 20, 1998, but New Delhi's concern over the requirements of the "entry into force" clause indicates that had India signed the treaty, it would have abided by its terms.

Prestige and international importance, as in 1974, seem to have been directed primarily towards the Indian public than the international stage. India still held tightly to its ideal of anti-colonialism, nuclear parity, and maintaining a strong independent streak. One of the primary reasons that India did not sign the CTBT was the "nuclear second-class," or "nuclear apartheid" that the treaty would create, similar to the reasons it declined to sign the NPT¹⁷⁰. In 1983, no mention was made of prestige. The scientists presented their case for nuclear weapons tests, likely lacking in national strategic thought, and Indira Gandhi's advisors probably dissuaded her from completing the test. This dissuasion probably occurred because of the economic impact tests would have. If prestige was an important issue, India would have been willing to brave the economic impact of the tests in exchange for higher standing in the international community.

This is also true of the near-tests of 1995 and 1996. India lost its chance to gain the Asian seat on the UN Security Council in 1996, most likely because of lasting antagonism from India's rejection of the CTBT¹⁷¹. India must have realized that a nuclear test would not improve its international status. In fact, in the fall of 1996, the Indian prime minister promised the American government that India had "no plans to build nuclear weapons or to test."¹⁷² If India believed that its prestige would be enhanced by a nuclear test, the time would have been right for a test *after* losing the Asian seat to Japan.

The situation had changed a bit in 1998. Only two years earlier, India had learned a hard lesson by opposing the CTBT and losing the Asian seat on the UN Security Council. However, Indian nationalistic fervor was still intense and the election of the nationalistic BJP amplified those feelings. Prime Minister Vajpayee and many in his

¹⁶⁹ India has still not acceded to the NPT as of this writing. For India's participatory role in the CTBT, see Arundhati Ghose, "Negotiating the CTBT: India's Security Concerns and Nuclear Disarmament," *Journal of International Affairs*, Vol. 51, no. 1 (Summer, 1997).

¹⁷⁰ The treaty allowed for simulations and "cold" tests, allowing nuclear states to proliferate vertically but restraining non-nuclear states from proliferating.

¹⁷¹ Report to Congress: Update on Progress Toward Regional Nonproliferation in South Asia, Bureau of South Asian Affairs, June 15, 1997

¹⁷² *Ibid.*

cabinet believed that India had been denied her rightful place in the world. He reportedly told Raja Ramanna that nuclear tests were necessary because “I [Vajpayee] want to see India a strong country and not a soft one.”¹⁷³ In an interview, Vajpayee stated that “The greatest meaning of these tests is that they have given India *shakti*, they have given India strength and they have given India self-confidence.”¹⁷⁴ Vajpayee’s colleagues also found nuclear weapons to be beneficial for India’s prestige: a Cabinet member often pointed out that “one-sixth of humanity took its rightful place under the sun” after the 1998 tests¹⁷⁵.

However, Prime Minister Vajpayee and his advisors knew that a nuclear test would not garner them instead respect in the world: an article written directly following the 1998 test began, “For the BJP establishment, the underground nuclear tests are part of an overall strategy to tap the nationalist sentiment, and, in its calculations, the country can be prepared to face up to sanctions imposed by the West.”¹⁷⁶ This indicates that the Indians understood that the result of a nuclear test would not be a positive international reaction, but rather the imposition of sanctions. The domestic gains, however, were large, as the Indian populace saw the nuclear tests in an overwhelmingly positive light¹⁷⁷. It is possible that Vajpayee and his advisors believed that the economic hardships would be transient, and therefore worth it for the benefits of restoring India to her “rightful” place in the international community¹⁷⁸.

Summary

Twenty-four years after the first Indian nuclear test, five more devices were exploded in the Pokhran desert. Less well-known, however are the aborted tests of 1983, 1995, and 1996. As in 1974, domestic politics combined with security concerns seems to

¹⁷³ Chengappa, *Weapons of Peace*, pg. 52.

¹⁷⁴ *Ibid.*, pg. 36. The term *shakti* refers to the belief that every person (and by extension, country) has an internal energy that must be released in order to find the true purpose of existence. According to this belief, India must find its *shakti* if it was going to become a great country.

¹⁷⁵ *Ibid.*, pg. 18.

¹⁷⁶ Harish Khare, “A repudiation of Nuclear Apartheid Policy,” *The Hindu*, May 12, 1998, pg. 11.

¹⁷⁷ In a poll taken less than 24 hours after the nuclear tests, 91% of respondents approved of the tests, while the same percentage felt “proud of the country’s achievement”. See “Most Indians Hail N-Test: Opinion Poll,” *The Hindu*, May 13, 1998.

¹⁷⁸ Chengappa writes of the assessments made regarding international responses to a nuclear test. See Chengappa, *Weapons of Peace*, pg. 48.

have played the largest role in all the tests or near-tests outlined in this section. All the test decisions, 1983, 1995, 1996, and 1998, were made when the prime minister at the time was vulnerable or seeking to bolster support for a sagging regime. Given the primary responsibility of the prime minister in the nuclear hierarchy, it is not surprising that in all these cases, the prime minister was personally under attack by opposition parties. In addition to electoral politics, organizational politics also played a large role. The nuclear community had fairly ready access to the prime minister throughout this period. The nuclear community both wanted to test new designs and was also concerned over monetary flow, the impression of the public due to the disappointment of the civilian energy program, and the retention of scientists in the absence of nuclear testing. The heavy advocacy on the behalf of the nuclear establishment likely led to the decisions in 1983 and 1995, while great political pressure probably was the foundation for the 1996 and 1998 test decisions. The ability of those advisors with opposing opinions to dissuade the prime minister from testing seems to have played quite a strong role in 1983, 1995, and 1996.

National security, as in 1974, combines with political pressure to influence testing decisions. In 1983, US-Pakistan military cooperation and information on Chinese support to Pakistan's missile and nuclear programs led to concern in the Indian security apparatus. A shift in the military balance on the subcontinent could have led to Indira Gandhi's personal calculations for the 1983 nuclear test; it is not known what her defense minister said after her initial approval but he was likely not in favor of a nuclear test¹⁷⁹. In 1995 and 1996, presumably, if the threat to Indian security had been strong enough to warrant a nuclear test, neither of these events would have been cancelled. Instead, the 1995 test was never authorized over the fear of US sanctions, while the 1996 test was postponed due to domestic political unrest. According to realist thought, national security is paramount; if the security situation were such that it was driving the decision-

¹⁷⁹ As Mrs. Gandhi had already approved a nuclear test, if the military was concerned over the security situation with Pakistan and China and thought nuclear tests could improve India's position, he may have been able to override the domestic economic concerns that Mrs. Gandhi's other advisors warned of. In addition, the military was not enthusiastic about nuclear weapons: "...there is little evidence of any enthusiasm for nuclear weapons in the Indian Army, or even in the Indian Air Force, on the simple fear that a nuclear weapons program would mushroom into something very costly, drawing funds from conventional weapons which for the moment seem more urgent." Quoted in Ashok Kapur, *India's Nuclear Option: Atomic Diplomacy and Decision Making* (New York: Praeger Publishers, Inc, 1976), pg. 145.

making, these tests would have been completed. In 1998, as in 1971, the Pakistani test of the Ghauri missile in April probably encouraged Vajpayee to authorize a nuclear test, but again, he had previously authorized a nuclear test during a time of relative unrest. Security threats were probably not the primary factor in Vajpayee's decisions. However, the genuine security impact of nuclear-capable countries with missiles capable of reaching most urban centers, combined with domestic unrest and an impression of ineffective leadership, creates a synergistic effect that makes nuclear tests more likely.

Technical factors seem to have played a role only in that they gave the nuclear establishment a plausible excuse to advocate for nuclear testing. Weaponers had developed advanced new warhead designs and had even produced the warhead components a decade before the 1998 tests. While the scientists argued their case convincingly to Indira Gandhi in 1983, she apparently did not think that their technical concerns outweighed the economic risk. Similarly, in 1995, 1996, and 1998 the technical factors seem to have been secondary in importance to economic and domestic concerns.

Finally, nuclear weapon testing seems to be directed more towards a domestic audience than designed to increase international standing and prestige. While the Indian public was "proud" of the weapon, India gained little international standing. In fact, India lost quite a bit of status when it opposed the CTBT so it was well known that a nuclear test would not advance India's interests in the international community. However, nationalistic feelings run strong in India, leading prime ministers to assume (correctly) that a nuclear test would both boost Indian pride and make their public approval ratings stronger. This is, however, more of a domestic politics angle than an argument that India believed that nuclear weapons testing would enhance its international prestige. Ideas matter, and the personal beliefs held by key decision makers and their advisors have a strong impact on nuclear testing. These ideas, however, are not the driving force in nuclear testing, but rather make the decision more likely when other factors such as security concerns and domestic political distress are also present.

V CONCLUSION

The reasons that states test nuclear weapons are similar to the reasons states develop nuclear weapons in the first place: a combination of security concerns, domestic politics, and power and prestige. In the case of nuclear testing, we can add another category, technical considerations, which is the basis for arms control agreements such as the CTBT. This thesis has used India as a model to test these theories, using the nuclear tests of 1974 and 1998 as well as aborted tests in 1983, 1995, and 1996 to evaluate the role that each theory played in nuclear decision-making.

The results provide some interesting trends (see Table 1 below). First of all, technical reasons to test seem to play little or no role in nuclear decisions. The organizations involved in preparing the nuclear explosives, BARC and the AEC generally, together with the military who would deliver the weapon, advocated heavily for nuclear tests, both in 1974 and throughout the 1980s and 1990s. Their arguments centered on concerns of feasibility and deliverability, but did not seem to have a significant impact on decision makers. If they had, we would expect to see nuclear tests conducted as soon as delivery systems were available and when new warheads were designed, regardless of other considerations or leadership. Instead, we find that throughout the 1980s and 1990s when new weapon designs were conceived of and missiles developed, scientists may have worried about validity of their designs but were unable to convince leaders of the *need* to test.

Hypotheses related to national security and power can do much to explain nuclear weapons testing. In most of the cases, the two instances when nuclear tests actually occurred, security and regional power issues do seem to have played a role. The first hypothesis related to security is that a state will test if it feels its security is threatened by another state. This would provide a rationale for Indian nuclear tests during the 1990 Indo-Pakistani crisis or the 1987 Brasstacks exercises, when India was concerned about

Table 1: Summary of political situation in India when nuclear test decisions were made

Test/ Decision Date	Technical Imperatives	Security Environment	Domestic Situation	Normative Arguments
1971/1972	<ul style="list-style-type: none"> • Feasibility 	<ul style="list-style-type: none"> • 1971 Indo-Pak Crisis • Chinese support for Pakistan • <i>USS Enterprise</i> • USSR Peace and Friendship Treaty 	<ul style="list-style-type: none"> • High approval ratings • Congress Party enjoys large majority • Few political advisors allowed in nuclear talks 	<ul style="list-style-type: none"> • NPT debates “segregate” developing countries • Intense national pride in technology
1974	----	<ul style="list-style-type: none"> • India pre-eminent power • Improving relations with China/US • Improving relations with Pakistan • China deploys DF-3 	<ul style="list-style-type: none"> • Low point for Indira Gandhi • Significant domestic unrest • Economic turmoil • Few political advisors allowed in nuclear talks 	----
1983	<ul style="list-style-type: none"> • Validity of new designs 	<ul style="list-style-type: none"> • Strengthening US-Pak relations (esp. military) • Pakistan gains military parity • Evidence of Chinese support to Pak missile and nuclear programs 	<ul style="list-style-type: none"> • Political and military advisors allowed in discussions • Joining of nuclear/military industrial complex • Indira Gandhi and party weakening 	----
1995	<ul style="list-style-type: none"> • New designs/new delivery systems 	<ul style="list-style-type: none"> • Loss of Soviet support • Military pact between US and Pakistan • Chinese support to Pakistan missile program • Tension over Kashmir • CTBT negotiations seen as a constraint 	<ul style="list-style-type: none"> • Prime Minister Rao under fire • Party has loss of popular support • High % of public approves of nuclear weapons • Pressure from nuclear establishment 	----
1996	----	<ul style="list-style-type: none"> • Virtually same as 1995 	<ul style="list-style-type: none"> • New PM has long history of pro-nuclear stance 	<ul style="list-style-type: none"> • Nationalistic BJP gains power
1998	----	<ul style="list-style-type: none"> • Pakistan tests Ghauri missile • India believes China support for Pak missile program 	<ul style="list-style-type: none"> • BJP says will “induct nuclear weapons” • Political advisors excluded from talks • Vajpayee seen as “tired,” weak, ineffective 	----

Pakistani military moves¹⁸⁰. However, there is no evidence that discussions regarding nuclear tests occurred at these times. Instead, decisions made regarding nuclear tests occurred when India's security was not overtly threatened, but when the possibility of a shift in the balance of power in the region occurred. For example, in 1971, India decisively won a war with Pakistan, which would imply that no tests should be authorized, as India's security *vis-à-vis* Pakistan was decisively in India's favor. Pakistan, however, has never been India's primary threat, and the greater threat at that time was China's deployment of intermediate range missiles. India may have been feeling safer with respect to Pakistan, but the ability of China to hold all Indian cities at risk regardless of their intent influence Indian nuclear decisions.

Similarly, in 1998, the Pakistani test of the Ghauri missile likely prompted Vajpayee to authorize nuclear tests¹⁸¹. This missile allowed Pakistan to threaten Indian urban centers with nuclear weapons. While overt threatening moves were not made, the *ability* was present for the first time. This shift, both in 1974 and in 1998, in Indian security likely led in part to the nuclear tests.

Finally, although the 1983 and 1995 near-tests came at a time when Pakistan was renewing military ties with the United States and threatening to shift the military balance between India and Pakistan, this threat was not as significant as the threats facing India in 1974 and 1998. A picture emerges from these cases: States are loathe to escalate crises such as those that occurred in 1987 and 1990, but are not hesitant to swing the security balance in their favor at times when new threats emerge that could hold a state's existence at risk. This sets a fairly high bar for nuclear testing due to security, as it implies that states will not test if minor threats to security arise, only if significant changes in the balance of power occur. We find that in 1983, 1995, and 1996, when tests were contemplated but ultimately not permitted, the security situation looks much less threatening than in 1974 and 1998.

¹⁸⁰ See Devin T. Hagerty, "Nuclear Deterrence in South Asia: The 1990 Indo-Pakistani Crisis," *International Security*, Vo. 20, No. 3 (Winter, 1995-1996), pg. 70-114 and Kanti P. Bajpai, P.R. Chari, Pervaiz Iqbal Cheema, Stephen P. Cohen, and Sumit Ganguly, *Brasstacks and Beyond: Perception and Management of Crisis in South Asia* (Urbana-Champaign, IL: ACDIS, June 1995). These two crises were marked by military buildups on the Pakistani and Indian borders, a rapid threat escalation, and the fear of nuclear exchange, especially in 1990.

¹⁸¹ Vajpayee was most likely already considering nuclear tests, as he had previously approved them in 1996 and had advocated for inducting nuclear weapons into the Indian military for years.

The second security hypothesis, that countries will test in response to others, seems to have not applied to India but probably did apply to Pakistan's 1998 response to Indian nuclear tests. This suggests two things: that rivals, or those that engage in a form of nuclear one-upmanship, *will* detonate nuclear weapons, if they are able to do so, in response to an adversary's test. However, rather than for purely security needs, these tests may just be a form of equalizing the power situation in an almost symbolic way. For example, Pakistan claimed to have tested five nuclear devices two weeks after India, and then waited two more days before detonating a sixth. This not only parallels the Indian nuclear tests, but also evens the number of nuclear tests between the two countries (counting India's 1974 test). Additionally, Pakistan's claim that the total yield was quite similar to the total yield from India's tests symbolizes the importance that nuclear equivalence, rather than true security needs, played in Pakistan's 1998 tests.

The relative security of individual states likely plays a role in how those states respond to shifts in the security environment. India, for example, is a relatively secure country. Bordered on one side by a vast geologic boundary, the Himalayas, India knows that China can threaten but has to overcome huge difficulties in order to actually invade. Water provides another geologic defensive benefit, while Pakistan since 1971 has been much smaller and much weaker compared to India. India thus exists in a relatively secure position; changes in this security environment shift within comparative stability and do not threaten India's existence. Pakistan, on the other hand, has no such boundaries: Afghanistan, on one side, is a perpetually unstable country prone to invasion by countries that may continue on to invade Pakistan (as was the fear with the Soviet invasion in 1979). India, on the other side, is large, overpowering, and has a military advantage. Thus, Pakistan exists in a relatively unstable region, and shifts in the balance of power convey more sincere threats than for states whose status quo is relative security. This relative insecurity is also evident from polling data that shows that 85% of respondents believed that Pakistan should resort to nuclear weapons if India conducted a nuclear test, while only 48% of Indians believed that India should go nuclear as a

response to a nuclear Pakistan and 52% supported a nuclear test as a reaction to a Chinese test¹⁸².

The last two security hypotheses relate to coercion, either coercion from another or the belief that a nuclear test will allow a state to coerce others. With respect to both cases, it seems as though coercion is a small, if nonexistent, factor in testing decisions. There is no evidence of the latter – no indication that India tested nuclear weapons in order to coerce others. This is not to say that coercion is not a goal of other states that might test: As mentioned previously in this paper, North Korea, for instance, has shown no reticence in making demands in exchange for ending its nuclear program. However, they have not tested nuclear weapons, perhaps signifying that they believe that testing would reduce their ability to blackmail other states. This suggests that only states that stand to gain a significant amount from coercion or blackmail will test; states that pride themselves on independence and self-sufficiency will not.

Evidence for the hypothesis that countries will test to remove a coercive or threatening force is also thin. India made decisions to test in 1974 after negotiations over the NPT placed India in a position of feeling as though its actions would be constrained. The same rationale is likely behind the near tests of 1995 and 1996 – negotiations over the CTBT meant that India was in a position of needing to test before the treaty took effect. Some scholars have indicated that India may have tested in 1974 to clarify its independence, non-aligned status, and to demonstrate to the Soviet Union that India could not be regarded as a client state. These arguments do not stand up to scrutiny, however. India did not need to sign a peace and friendship treaty with the Soviet Union and was not pressured into it by the USSR. If coercion was a reason to detonate a nuclear explosive, than we would expect Prime Minister Rao to have authorized a test in 1995 following pressure from the United States in order to demonstrate that India could not be threatened. Instead, we see the opposite – Rao backed down from nuclear tests in the face of US economic pressure. This suggests that coercive pressure by others does not highly impact nuclear tests decisions, except possibly in cases where national security or independence is at risk.

¹⁸² Samina Ahmed, David Cortwright, and Amitabh Mattoo, "Public Opinion and Nuclear Options for South Asia," *Asian Survey*, Vol. 38, No. 8 (August 1998), pg. 727-744.

Domestic politics also seems to play a role in nuclear testing. Both bureaucratic politics and electoral or domestic pressures factor into nuclear decision making. Bureaucratic politics in the form of advisory relationships likely played a large role in India's decision making: when advisors with differing opinions on nuclear testing were able to voice these opinions (as happened in 1983), the outcome was different than in 1974 when the weak opposition was overruled. It seems fairly obvious that in situations where the only input comes from the nuclear establishment, the leaders will ultimately make the decision to test. This is where the argument that tests are "necessary" for technical reasons seems to have an effect: weaponeers are able to use this argument to justify their desire to test and others, such as military planners or foreign ministers, are not available to provide an alternative point of view. A second important finding also follows from this analysis: economic considerations are a significant factor in nuclear decision making. In all situations when economic concerns were voiced (1983, 1995, and 1996), the decision to test a nuclear weapon was either cancelled or not authorized to begin with. In 1974, economic consequences were downplayed, and in 1998, they were minimized.

Electoral concerns also seem to matter. The timing of nuclear tests coincides nicely with periods in which the prime minister's approval was low, serious domestic troubles were mounting, or coalitions were failing. In all cases, politicians stated that electoral politics was not the reason for the nuclear tests, but the timing is certainly suspect. While prime ministers may not have been relying on nuclear tests alone to boost approval ratings (polls show that approval ratings receive only a short-lived increase after a test and subsequently drop), the ability to refocus public attention is beneficial. In all cases of nuclear testing in India, the prime minister's approval rating was low, and in most cases, he or she was seen as "ineffective" or "weak". A synergy exists between threat and electoral politics: when external threats increase and domestic problems increase, nuclear weapon testing becomes a viable option to address both problems. This could be the case in 1974, when the Chinese nuclear threat was growing and Indira Gandhi's domestic approval was low, and in 1983 when Pakistan's military was strengthening. Some authors have written of the "fallacy of domestic politics" in explaining India's nuclear tests, but to disregard the impact of public opinion and

especially the role of organizational politics is a mistake¹⁸³. Public opinion matters to political leaders, and the advice that they receive from their advisors is important.

Finally, an individual's ideas regarding nuclear weapons seem to play a fairly large role in decisions to test nuclear weapons. The status that individual leaders and their advisors place on nuclear weapons seems to make the largest impact. Vajpayee, a staunch believer in nuclear weapons for many years, took the first opportunity he had to authorize nuclear weapon tests. His (and his advisors') belief that nuclear weapons would bestow upon India the prestige and status that it had been lacking is well documented. Indira Gandhi, on the other hand, was able to be swayed in her decisions because she did not possess a firm opinion of the status that nuclear weapons impart to states¹⁸⁴.

What especially matters is the extent to which leaders and their advisors believe that testing a nuclear weapon will convey a sense of prestige and status upon a state. Vajpayee and his advisors all believed this to be the case, and combined with security threats and domestic problems, a nuclear test was predictable. Prime Minister Gowda, who took over power in 1996 following the failed confidence vote on Vajpayee's government, cancelled the nuclear test that Vajpayee had ordered two weeks previously, partly because of his belief that nuclear weapons would not lift India's status in the world community¹⁸⁵. One can easily believe, however, that only beliefs of status and prestige are not sufficient to test nuclear weapons. In 1998, had the previous government signed non-aggression treaties with Pakistan and China, had China agreed to reduce its nuclear arsenal, and had Vajpayee's political fortunes seemed rosier, it is not difficult to assume that nuclear tests would not have occurred.

Of the four sets of hypotheses that were tested in this thesis, one seems not to play a role at all, while the other three are factors in nuclear test decisions to greater or lesser

¹⁸³ Sumit Ganguly, "India's Pathway to Pokhran II: The Prospects and Sources of New Delhi's Nuclear Weapons Program," *International Security*, Vol. 23, No. 4 (Spring 1999), pg. 168 (Footnote 89).

¹⁸⁴ Her family's history of nuclear abolition and peaceful resolution of conflicts no doubt contributed to her feelings towards nuclear weapons. By all indications, she was neither for nor against nuclear weapons, but was swayed by her advisors. Vajpayee, on the other hand, was an ardent supporter of nuclear weapons and believed strongly in the status that nuclear weapons bestow upon their owner.

¹⁸⁵ "Gowda said no to N-test in 1996," *The Statesman*, May 19, 1998.

extents. Above all, what this thesis has shown is that nuclear tests must pass a high bar to be allowed. Real, existential security threats are necessary, combined with leaders facing low public approval or domestic strife. The individual beliefs of the leaders and their principle advisors make a difference by making leaders inclined to lean towards nuclear weapons tests in the face of security and domestic troubles.

These findings suggest a formula that future conflicts may follow, for example, Japan and North Korea, or Iran and Israel. For instance, consider what Israel's response may be to an Iranian nuclear test. Israel would be faced with a significant change in their security, a nuclear threat from a country which calls for Israel's destruction. If the leader at the time is strong and not facing domestic problems, it is probable that Israel would not test. On the other hand, if Israel's leader was under domestic pressure, it is much more likely that Israel would follow Iran's lead with a nuclear test of its own. If Israel tests first, however, Iran is much more likely to follow suit. Iran would be faced with incontrovertible evidence of Israel's nuclear ability, a significant security threat that is real and a useful excuse to test. Iranian leaders have long used nationalistic rhetoric to shore up their domestic base; in the event of a nuclear test, Iran's public would likely demand an Iranian response. The same arguments can be made for the North Korea-Japan relationship, or Japan and China.

Nuclear weapon testing is unique in that the decision to test is made by a relatively few number of people but has major international and domestic consequences. Unlike a decision to start a nuclear *development* program, a nuclear test, especially the first one, is a single event rather than an ongoing policy. Thus, the theories that have been discussed in this thesis apply to the decision-making, but have the added complication of the beliefs and preferences of the primary decision-maker and his or her advisors. That said, the theories presented here help to outline a clear picture of the factors that influence nuclear testing. Technical concerns are a minor aspect of the final decision, although likely factor into the desires of nuclear scientists. Security concerns, while important, also do not seem to be the driving factor behind nuclear tests. Domestic politics and individual ideas regarding status and prestige appear to matter greatly, specifically with regard to whom is able to influence the primary decision-maker. In the future, understanding of *why* states test nuclear weapons will help to determine *when*

states will test, leading to fewer surprises such as occurred in 1998, and may help to address the concerns of the growing number of states with latent nuclear weapon capabilities.