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## Repository Citation
Boryczka, Jocelyn M.; Mohanan, M. K.; Pearson, F. S.; and Weigand, J. D., "Cultural and Strategic Factors in South Asian Nuclear Arms Control" (1997). *Politics Faculty Publications*. 15.
https://digitalcommons.fairfield.edu/politics-facultypubs/15

## Published Citation
Boryczka, J.M., Mohanan, M.K., Pearson, F.S., Weigand, J.D. (Winter 1997) "Cultural and Strategic Factors in South Asian Nuclear Arms Control," Journal of Political and Military Sociology 25 (2) , pp. 279-303.

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# CULTURAL AND STRATEGIC FACTORS IN SOUTH ASIAN NUCLEAR ARMS CONTROL

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Journal of Political and Military Sociology 1997, Vol 25 (Winter): 279-303

*Future efforts at arms control are shifting to LDCs. We believe future agreements could look very different from their cold war predecessors because third world decision making processes are influenced by many unaddressed factors, ranging from culture to historical antagonism, in addition to strategic and technical concerns.*

*Utilizing game theory as well as historical and cultural analysis, we examine likely possibilities for arms control agreements in South Asia, as a case study, and then analyze the logic behind these possibilities. Our findings about the cultural mind set and political preferences of leaders and their constituents lead us toward a specific hypothesis about how these factors influence the decision making process, a direction for the future study of other regions.*

## INTRODUCTION

Ending the cold war has not eradicated concerns about the proliferation of weapons of mass destruction in world politics. Indeed, favorable global trends in nuclear policy are evidenced by the widespread support of 179 countries for the renewal of NPT in 1995, and the call of sixteen states, and over 700 NGOs to ban nuclear weapons. Certain LDCs, however, have held open the option of acquiring and deploying nuclear, chemical, or biological weapons, and India, a reputed nuclear power, staunchly opposed agreement on a comprehensive nuclear test ban treaty in 1996 pending major power moves toward nuclear disarmament. This situation creates an environment demanding greater attention to the

[1] The authors would like to thank Dr Stephen P. Cohen at the University of Illinois for his invaluable comments.

question of how arms control might play out in regional contexts and for countries with particular traditions regarding peace and security concerns.[2]

To explore such questions, we initially contrast expectations about regional nuclear rivalry, produced by strategic theory and defined in the West's realist traditions, on the one hand, with insights derived from cultural and historical analysis of regional contexts on the other. Synthesizing these two perspectives may contribute to producing a more refined theory of regional arms control, with implications for regional peace in the 21st century, than could be derived from either approach alone.

In this article, we take three cuts at understanding the trend of nuclear armament and the moves toward arms control in one of the most contentious and complex regional subsystems, South Asia. The cuts, somewhat in the tradition of Allison's Essence of Decision (1971), in this case represent: (1) strategic "rational" analysis-- expressed in the form of game theory; (2) historical analysis of the root causes and symptoms of Indian and Pakistani nuclear arms research and development; and (3) analysis of the politically relevant Indo-Pakistani cultures which condition approaches to the nuclear question. In the latter case, we look both at elite decision-making culture, which may indeed bear resemblance to generic "security management" seen in other parts of the world, and at subcontinental ethno-cultural traditions relevant to politics and the use of power.

The South Asian region is especially fascinating in this regard because of its doctrines of nuclear non-deployment, or "non-weaponized deterrence." Ever since its famous 1974 nuclear blast, which was justified for "mining purposes," India has pioneered the concept (adopted by others such as Israel and Pakistan) that one need not necessarily admit to possessing nuclear weapons despite the abundant evidence that possession is both feasible and likely. Implied in this approach is the notion that one gains many supposed advantages from such weaponry merely through the reputation of possession, while avoiding many of the costs, such as stigma and political or military opposition at home and abroad, by not formally deploying the arms.

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[2] Although some sporadic regional agreements, such as "nuclear free zone" commitments in South Africa, parts of Latin America, and the South Pacific have been achieved, and while most LDCs have effectively forsworn the development of nuclear weapons, most agreements reached by the most likely future nuclear powers do not yet formally restrict critical components of their nuclear programs. Such agreements will potentially become a focus for negotiation in the coming years; yet we lack extensive knowledge about the priorities and approaches that regional powers might take in such nuclear arms proliferation talks.

The "logic" of this stance, however, profoundly affects regional approaches to arms control itself, in that if formal agreements are reached, weapons possession is implied. South Asian arms control, therefore, at least as long as "non-weaponized deterrence" is the policy, is unlikely to take the form of treaties, unless they only vaguely refer to civilian or military "nuclear facilities" (Bellany, 1996). Vagueness, a flaw in arms control generally by western standards (although strategists such as Henry Kissinger were not above artful vagueness in some of their strategic arms control negotiations), may be a prerequisite in this regional context, and may correspond well to a cultural tolerance for less specific, more oblique forms of reference. In order to follow up on these initial suppositions, let us first judge the pattern of arms control we would expect by application of game theoretic/strategic analysis to the region, and then contrast these expectations with patterns deduced from history and culture.

## RATIONAL CHOICE, GAME THEORY, AND SOUTH ASIAN NUCLEAR STRATEGY

We utilize game theory and strategic analysis first as a descriptive tool, in modeling the past and current complexity of the relationships among the essential players in the South Asian strategic environment, and second, as a predictive tool, we explore the possibilities for regional nuclear arms control and disarmament. This "cut" is premised on "realist" presumptions that self-interest guides actors and that one may deduce their likely moves from their power and strategic positions, without much reference to domestic or cultural peculiarities, except as these might affect definitions of interest.

For analytical purposes, we assume that four separate but simultaneous games are being played by India, Pakistan, China, and extra-regional actors such as Russia, the US, and other nuclear powers (conceptualized as "the rest of the world").[3] The games are linked through the common players, India and China. For example, China plays a game with the US and Russia in terms of major power strategy, while also playing a separate game with India. In a similar fashion, India plays separate but related nuclear security games with China and Pakistan, and as demonstrated by the 1996 test ban struggle, politically with the rest of the

[3] We assume that Pakistan and China are separate players and do not constitute an alliance in any except the loosest sense of the term. They cooperate but only in as much as they have a perceived common security threat, India. China also appears to have a commercial interest in arms sales to Pakistan.

world. Armaments developed and designed against one opponent in one game can profoundly influence the security calculations of other opponents in other games, a fact perhaps not always appreciated fully by decision-makers.

Thus, each of the individual games becomes a component of a much larger "megagame." The relationship between each of the individual games and the megagame will become clear as we attempt to develop and combine the payoff matrices for each. For the sake of simplicity, each of the four games below are separate and distinct:

— China vs. the US and Russia in a security game
— India vs. the World in a prestige and influence game
— India vs. China in a regional security game
— India vs. Pakistan in a regional security game.[4]

The above games are characterized as "supergames" that are played repeatedly, as opposed to playing each game only once. According to Nicholson, governments typically regard any particular incident as part of a supergame with an adversary. Since play goes on, arms control supergames provide strong deterrence potential in that if one party "defects" to a position harmful to the other, it is in the direct and immediate self-interest of the other party to counter-defect (Nicholson, 1992).

Consider an arms control or disarmament game, or a supergame, in which each player always has three options: (1) to collaborate in reducing weapons; (2) to remain at the status quo; (3) to defect and increase weaponry or break the agreement. As a supergame, this situation would be modeled best on a GRIT payoff matrix (Osgood, 1962) where both players would proceed towards partial or complete disarmament incrementally in stages (see Figure 1). Once two opponents have chosen to collaborate at any given level, that point of collaboration becomes a new status quo; to remain at that point would be merely to maintain the status quo; to defect would require a reversal and a renewed arms race, effectively ending the game (Nicholson, 1992).[5]

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[4] Each of these games will be modeled in the format of 2x2 ordinal games (with the exception of the India-World game which is modeled in a 2x3 format). In each game, each of the players (US and Russia combined as one player vs. China) has been given a "preferred payoff ranking."

[5] In order to unify the above games as a megagame, we adopt a series of rules for play. The primary rule in our analysis is the "common moves" rule, i.e., whatever move the common players make in one game, they must and will always make in each of the other games in which

Figure 1 Generic GRIT Payoff Matrix

| | | State B: Defect | | | | | | | | | Collaborate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| State A | Defect | (0.0) | (1.0) | (2.0) | | | | | | | |
| | | (0.1) | (1.1) | (2.1) | | | | | | | |
| | | (0.2) | (1.2) | (2.2) | | | | | | | |
| | | | | | (3.3) | | | | | | |
| | | | | | | (4.4) | | | | | |
| | | | | | | | (5.5) | | | | |
| | | | | | | | | (6.6) | | | |
| | | | | | | | | | (7.7) | | |
| | Collaborate | | | | | | | | | (8.8) | |
| | | | | | | | | | | | (9.9) |
| | | | | | | | | | | | (10,10) |

In classical game theory, and particularly in the "prisoner's dilemma," the problem of arms control/disarmament is that while both parties presumably would like to move to lower armament levels, for one state to do so unilaterally risks putting itself at a major strategic disadvantage. Likewise, once State A has disarmed unilaterally, State B has no incentive to disarm because that would remove its supposed advantage. An inherent stability, therefore, is achieved by maintaining the status-quo, even if the price is higher than could be achieved by mutual arms agreement. In one sense, disarmament negotiations are designed to overcome this dilemma by allowing all parties to reduce simultaneously through steps such as mutual reassurance.

This game structure would be modified somewhat, however, in a situation where one party was militarily more powerful than the other (presumably with a larger set of security concerns), as is arguably the case in all four games (India stronger than Pakistan, China stronger than India, the US and Russia stronger than China, and the World stronger than India).

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they are involved. Thus, moves in one place have profound implications on associated games. If India were to defect from arms control in its game with Pakistan, it is assumed that India will effectively defect in its game with China and the World, despite any intent to confine moves to the Pakistani front.

A few additional rules concerning payoffs are taken from Brams' Theory of Moves (TOM) (Brams, 1995): play starts at an outcome, called the **initial state**, the intersection of the row and column in a payoff matrix; either player can unilaterally switch strategy, and thereby change the initial state into a new state, in the same row or column as the initial state. The second player can respond, thereby moving the game to a new state. Brams posits that the game terminates in a **final state**, which is the outcome when the player with the move option chooses not to switch strategy. Modifying this assumption somewhat here, we assume that the arms control game does not terminate unless both players elect to play the defect strategy, thus negating arms control at least for a time. We further modify Brams' rules by assuming that payoffs accrue at all states in the game and not simply at the final state.

For the more powerful actor, the relative security gains in possession or acquisition of nuclear weapons are theoretically not as great as they would be for the smaller power (let us say Pakistan vis-a-vis India, though for India the effect is reversed in relation to China). Thus, the strategic value of unilaterally acquiring, developing, improving, or dismantling nuclear weapons can be seen as greater for the disadvantaged military power.[6]

Figure 2 presents the hypothetical game structure for both the India-Pakistan and India-China games; India plays the stronger side (state A) vs. Pakistan (state B), and the weaker side (state B) vs. China (state A) with the same relative payoffs in each instance for the stronger or weaker party. Despite the assumption of power disparity (and the distinction between gains through mere deterrence as opposed to strategic advantage), the India-Pakistan and India-China games depict the classical prisoner's dilemma (each cell in the Figure 2 matrix is labeled with the order of each player's preference for that outcome, with 1 most preferred and 4 least preferred). If both players are rational and follow the strategy that will benefit them most regardless of their opponent's choice, such as following their dominant strategy, they will both end up worse off than they might have been if they had risked choosing a non-dominant strategy, seeking higher gain but risking higher initial loss. If both follow the rules of TOM and Brams' theory of "backwards induction,"[7] either player could unilaterally initiate their non-dominant strategy with confidence that the opposing player would follow by counter-initiating the non-dominant strategy, in this case

[6] In our conceptualization of these games, we determine hypothetical values of arms development or "proliferation" as compared to arms control or disarmament in order to determine the ordinal rankings in each game. These values depend on certain factors, including gains for basic deterrent purposes (set at 50 points for the stronger power and 60 points for the weaker power), for strategic domination (set at 100 points for a stronger power and 120 for a weaker power), and for economic costs in producing and maintaining weapons (set at 20 points). In the China-US/Russia and India-World games, additional calculations are posed for the dynamic of gains or losses involved in the smaller power catching up with the larger powers.

[7] Brams states that "backwards induction" and TOM allow for two things which add a dynamic dimension to game theory and thereby create a more realistic game. First, TOM combines the normal and extensive forms of classical game theory thus allowing the game to be modeled on a payoff matrix and also preserving the sequential moves of an extensive form game. Second, TOM and "backwards induction" allow players to look ahead before making moves, thereby allowing players to look past immediate payoffs and plan for long term gains.

moving play from cell A to cell D.[8] If the second player did not follow, the first could simply return play to the suboptimal payoffs of cell A, switching back to their dominant strategy. Once cell D was reached, both players would possess a deterrent bargaining threat, whereby they could force their opponents' two worst outcomes on them; thus a stable cooperative position is possible for both India-Pakistan and India-China. However, given the interconnected megagame structure, incentives fail to exist for Pakistan to collaborate in this way until India-China sort out their strategic situation, since India will premise its armament levels to a great extent on China's levels.

Figure 2

| | | State B | |
|---|---|---|---|
| | | Proliferation | Arms Control |
| State A | Proliferation | A (30,40) (3,3) | B (130,-60) (1,4) |
| | Arms Control | C (-50,160) (4,1) | D (50,60) (2,2) |

Complications for successful arms control also arise from the China-US/Russia game (Figure 3). This game's options are conceived somewhat differently, as proliferation vs. arms control for China and as arms control vs. arms reduction responses for the US and Russia. The latter change is due to the fact that the US and Russia have entered into serious arms control (and some initial arms reduction) already in their own mutual START game; therefore, they have two choices -- to maintain the current status quo of arms control or to move to a point of further reduction. China, in the meantime, is increasing nuclear production with a relatively slow gain on the leaders, conceivably attempting to reach a point of relative parity with them. China appears unlikely to move to a position of arms reduction or even arms control until that relative parity with the major powers is closer, either by China catching up or by the US and Russia reducing nuclear arms levels. (As expressed in its comprehensive test ban position, India too seems keen on forcing the latter reduction.)

[8] To not counter-initiate would guarantee player 1's return to dominant strategy, thus returning player 2 to its original less preferred payoff in comparison to the more preferred payoff in cell D, a strategy that appears to be clearly irrational.

Figure 3

| | | China | |
|---|---|---|---|
| | | Proliferation | Arms Control |
| The US & Russia | Arms Control | A (0,100) (2,3) | B (50,60) (1,4) |
| | Arms Reduction | C (-50,160) (4,1) | D (0,120) (2,2) |

In the previous games, payoff cells A and D both represented static strategic positions, i.e., the adversaries' relative strategic positions remained constant, while cells B and C represented changing strategic positions where one side gains advantage over the other. In the China-US/Russia game, though, cell B is the only one where relative strategic positions are not changing.[9] In cell C, strategic positions change rapidly as the US/Russia move to reduce arms levels and China continues to increase. In cells A and D, relative strategic positions change at a slower rate because only one player moves toward strategic parity as opposed to both players moving in that direction. As premised in the game structure, the US and Russia would probably prefer maintaining the arms control, rather than reduction strategy, since they would want to avoid the loss in cell C. Assuming that they could not offer China sufficient inducements to reach the gains of cell B, the game would be likely result in perpetuating the current situation of China's slow, strategic gains (cell A).[10]

Conceivably in the future, as China draws closer to current major power levels, the logic of mutual three-way reduction could become more compelling. The game structure would, therefore, appear to predict a

[9] Unfortunately, this is the least desired position for China, though one in which she still gains. It is the outcome she is specifically attempting to avoid, that of becoming stuck at a strategic disadvantage relative to other major powers.

[10] With China's dominant proliferation (own weapons, not necessarily assisting others) strategy and the US/Russian dominant arms control strategy, under rules of TOM, and unlike the previous games, neither side has an incentive unilaterally to initiate their non-dominant strategy; only China has that incentive. China could unilaterally initiate an arms control strategy, temporarily receiving her worst payoff in hopes that the US/Russia would respond by counter-initiating (reducing arms), thus moving play from cell B to D; however, there would be no payoff incentive for the major powers to risk their worst payoff should China defect. For these reasons, the game appears to break down if players initiate non-dominant strategies. In real terms, there appears to be insufficient incentives to encourage the major powers to accept arms parity with China at reduced armament levels.

continuation of China's current arms developments and the US-Russia arms control position (cell A), despite its suboptimality for the major powers (interestingly only in the cell B condition of mutual arms control at current levels would the major powers gain relatively more than China). China would gain economically by moving toward cell D, but only if the major powers move further toward arms reduction. There appears, therefore, to be an impediment standing in the way of a move in this direction, and this impediment also thereby reduces the prospects for an India-China arms control outcome.

In the fourth game (Figure 4), India vs. the World, another impediment for nuclear arms control or disarmament in South Asia is evident.[11] As other nuclear aspirants (such as France in her time), India presumably sees nuclear arms as a potential tool to help achieve desired global status and influence. For this reason, the game options are modified to assume that the World powers have the option of maintaining the current arms control regime or moving toward significant arms reductions as India requests. India, in turn, now has three options: acceding to the NPT, which implies either disarming or openly admitting to having nuclear weapons and accepting safeguards, or not acceding (retaining ambiguous non-weaponization).[12] Accession with weapons would boost India to the level of the "nuclear club" and increase her status, though she might suffer politically at home and regionally for officially acquiring nuclear weapons. Accession as a non-nuclear state presumably would not entail status increase. Non-accession and continued non-weaponization would maintain the irritant of not attaining formal nuclear status recognition and not attaining desired global status and influence, but offers political benefits in "having it both ways."

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[11] To determine ordinal rankings, we calculate the values in this game under the following assumptions: as before let the economic cost of producing weapons be 20 units (offset of course by savings in not producing them); let the deterrent value of nuclear weapons for India be 60 units and for the world 50 units, the equivalent of the deterrent value in the other games; let the security gain or loss of nuclear domination over the opponent be 100 units for the world and 120 for India; let the reassurance gained by India's accession to NPT and submission to international monitoring and safeguards be 40 units; for India, let condemnation for acquiring weapons against prevailing norms be 40 units.

[12] Because the NPT classifies nation-states that were not NWS before a certain date, India could not join the NPT as a weaponized state. India, however, could join as a *de facto* signatory, perhaps through a regional agreement, which is allowed under the NPT.

Figure 4 (actual)

| | | The World: Arms Control | The World: Disarmament |
|---|---|---|---|
| | No NPT/Non-Weaponized | A (-80,150) (6,2) | B (40,0) (4,5) |
| India | NPT/Weaponized | C (60,90) (2,3) | D (180,-60) (1,6) |
| | NPT/Disarmament | E (-70,190) (5,1) | F (50,40) (3,4) |

With this structure, the highest joint ranked outcome would be in cell C, with weaponized NPT status for India (which would only be possible as a *de facto* signatory, or as part of a regional agreement) and continued arms control for the powers. Whether India would adhere to such a regime without major power disarmament remains to be seen; New Delhi's test ban treaty opposition is a negative indication. Interestingly, though, the payoffs to India seem greater in weaponized entry into NPT than into signing NPT as a non-nuclear state.[13]

These models suggest that while complete disarmament is unlikely, arms control on most levels is desirable if not achievable. While mutual arms control is possible in all games, it seems especially unlikely to occur in

[13] In a number of these games, situations can improve if players respond to incentives to attempt non-dominant strategies as ways out of the prisoner's dilemma. One such motivation for arms control agreements can be through "side payments," i.e., the offer of extra inducements. To be generally effective, such payments require: salience (i.e., they must relate to security concerns), deniability (must be available only to the agreement's members), and durability (there must be a demand for the side payments by the parties involved). The balance between the risks or costs incurred by arms control initiatives can be tipped by side payments, and could attract the support of additional states as "free riders" to an agreement.

In this sense, Pakistan represents a potential free rider in China-India talks, and side payments might solidify their participation in an agreement; a series of other guarantees or aid programs might also convince India to move toward NPT status, though the challenge would appear to be more difficult in this case than for Pakistan (Bellany, 1991). It must be noted that Pakistan wants and needs nuclear weapons because they cannot stand up to India through conventional means. The Pakistanis, therefore, will be unlikely to relinquish the nuclear option as long as no nation is willing to provide a credible security guarantee.

the pivotal US/Russia vs. China game. China sees her position as manifestly unjust, and while arms control with India might be desirable (depending upon the relative balance at the time), Beijing stands to lose more in her game with the major powers than she could gain back in her dealings with India. The games also indicate that if arms control were achieved between India and China, and India and Pakistan, and if Pakistan decided to play the defect strategy, it would be in India's interest to counter-defect despite its game with China. The nested chain reaction relationships in these games thereby generally obstruct arms control efforts in the region.

## HISTORICAL FACTORS IN SOUTH ASIAN NUCLEAR ARMS POLICY

To enhance an understanding of the motivations beneath a nation's rational choices, an historical review of the region's nuclear arms development (concentrating specifically on India and Pakistan) will cast more light on these motivations and potential solutions. At the same time, evolving traditions of security policy thinking in each state can indicate the persistent preferences underlying each party's approach to arms control and such issues as relative parity.

India's nuclear research program began in 1944 with the establishment of the Tata Institute of Fundamental Research, as part of an endeavor to gain self reliance in the economic and scientific spheres. India entered the "peaceful" atom club as its first experimental research reactor (named APSARA -- the first indigenous Asian research reactor) became operational in August 1956.[14]

Prime Minister Jawaharlal Nehru also was the chief architect of India's foreign and security policies. The country's nuclear policy, therefore, was greatly influenced by his views of India's role in the international system which he characterized as essentially unfair and even hostile to less developed states. Nehru advocated that all available technologies be utilized by LDCs in pursuit of self-reliance; he saw nuclear power as useful to meet energy needs in this regard, though he was not quick to authorize any weapons programs that would destabilize international relations.

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[14] While Gandhi favored rural economic development through "cottage industries," Nehru characterized large industrial establishments, such as steel mills, as the "temples of modern India." It may be worth noting that Jawaharlal Nehru, India's first Prime Minister, stressed the importance of high technology industrial establishments for economic development, instead of completely relying on agro-based rural industries which had been preferred by Mahatma Gandhi.

Nehru strongly opposed President Eisenhower's "Atoms for Peace" proposals of the late 1950s. While he desired a peaceful world, he would not support any disarmament proposals that strengthened a superpower elitism in the security domain and that tied India's hands. His opposition to international control and safeguards on the nuclear programs of developing countries is echoed even in today's Indian nuclear policy stance. Nehru insisted that the system should be universal and non-discriminatory, and safeguards should be uniformly applied to the military but not peaceful uses of the atom. India's support for an international nuclear regime that provided security for all while respecting the principle of national sovereignty was reflected in New Delhi's willingness to sign the Partial Test Ban Treaty of 1963.

The evolution of a nuclear military option strategy "was, initially, a response to the Chinese test [of 1964] and subsequent weaponization" (Cohen, 1991, p. 7). Nehru was opposed to the idea of acquiring nuclear weapons, even though he fully understood the necessity of using technology that India possessed. His personal antipathy toward the possession of nuclear weapons remained India's nuclear policy until his death in 1964. He was also vehemently opposed to the superpower arms race, and wanted complete abolition of nuclear weapons, fearing that "if more countries possess nuclear weapons, it will be more difficult to control them than it is today. In fact, quite a new situation will arise, which might threaten humanity" (Nehru, 1961, p. 197). However, Nehru also opposed the international safeguards that would prevent India from developing a military option if one became necessary. As far back as 1946, he stated his hope that India would develop atomic power for peaceful uses but warned that, "so long as the world was constituted as it was, every country would have to develop and use the latest scientific devices for its protection" (Kavic, 1967, p. 28). [15]

Lal Bahadur Shastri, Nehru's successor, recognized the region's changing strategic situation. Under his leadership, India formulated a two-

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[15] He was not, however, advocating an intention to create a "nuclear India." While inaugurating the "swimming pool reactor," APSARA in January 1957, he stated "on behalf of my Government - and I think I can say with some assurance, on behalf of any future Government of India - that whatever might happen, whatever circumstances, we shall never use this atomic energy for evil purposes. There is no condition attached to this assurance, because once a condition is attached, the value of such an assurance does not go very far." (R.L.M. Patil, p. 49) After India endured a crushing defeat in the 1962 war with China, influential members of the Indian Parliament made strong suggestions to review the nuclear policy in 1963. Nehru not only rejected their suggestions, but also prepared to sign the Partial Test Ban Treaty in October 1963.

edged policy: first, emphasizing the question of security and seeking to link the disarmament of nuclear powers with the attempts of non-nuclear states to acquire or manufacture nuclear weapons; and second, expecting states with nuclear weapons to provide some kind of security guarantees to non-nuclear states.

Ultimately India's efforts to obtain guarantees did not succeed.[16] Reasons for the failure included the Indian government's reluctance to request such guarantees explicitly from the nuclear powers (represented by Shastri's avoidance of this issue while visiting Moscow in May 1965)-- a reluctance perhaps premised on neutralism--along with the fact that the powers were unwilling to make guarantees unless shown to relate closely their national security interests. The final outcome of the UN Disarmament Commission in May 1965 and the Eighteen Nation Disarmament Committee of February 1966, furthermore, failed to produce any guarantees to non-nuclear states.

In December 1965, therefore, Shastri approved proposals from the highly influential Indian Atomic Energy Commission for a subterranean nuclear explosion (SNEP) project. The project was suspended temporarily in 1967, as Prime Minister Indira Gandhi sent delegations to Moscow, Paris, London, and Washington seeking nuclear guarantees. The failure to obtain these commitments, coupled with superpower unity in restricting LDC nuclear development programs, led to India's refusal to support NPT.[17] After considering India's security options, Prime Minister Gandhi decided in late 1971 to proceed with a "peaceful nuclear explosion" (PNE) in May 1974.[18]

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[16] Foreign Affairs Record, 1964, Lok Sabha Debates, 1967.

[17] The team of scientists, diplomats, and bureaucrats close to the Prime Minister were instrumental in convincing her of the adverse effects of joining the treaty, a stance further substantiated by China's announced hydrogen bomb test in June 1967, even as NPT negotiations were in their final stages.

[18] Mrs. Gandhi felt enormous pressure from the Parliament to weaponize India's nuclear program, due to reported Pakistani plans to test its first bomb. Her reply was both ambiguous and clear: "I do not think that I can discuss matters of policy at this moment, but I do not think that our having one bomb is going to guarantee the safety of this country in such a contingency" (Patil, 1969, p. 54). This approach reflected Indira Gandhi's belief that weaponizing India's nuclear program would not guarantee its security due to the much larger nuclear arsenals of other powers. In light of this view, it may be inferred that the decision to conduct an explosion was mainly a demonstration of India's capabilities and its displeasure with the NPT regime, considering the enormous external pressure on India to cap its nuclear program while China and the superpowers continued to develop theirs. In practice, India accepted U.S. safeguards

Mrs. Gandhi's successors retained the nuclear option strategy while expanding India's security related technological base. Especially during the prime ministership of Rajiv Gandhi, in one year between 1987-88 and 1988-89, the Department of Atomic Energy's scientific and technical personnel were increased tenfold, from 2,181 to 20,109 (Chellany, 1991, p. 229). Prime Minister Narasimha Rao told a parliamentary committee in 1992 that there was a national consensus that the country needed to keep its nuclear weapons option open and that foreign pressure would not force a change in this posture (Chellany, 1994, p. 176). As of 1995, India was believed capable of assembling between sixty and ninety nuclear weapons (SIPRI, 1995, p. 657).

While strategic game theoretic analysis highlighted the pivotal importance of China's nuclear agreements with other major powers in predicting India's course, the historical analysis also shows the traditional importance of nuclear symbolism in Indian sovereignty, at least until other world powers disarm. The lingering importance of India's standing with those powers, was expressed in the India-World game. Indeed, India's eventual accession to NPT and a comprehensive test ban, either as a nuclear or ambiguous nuclear power, would appear to depend on the play of these two interrelated games.

Pakistan established its first nuclear research facility, the High Tension and Nuclear Research Laboratory, at the Physics Department of the Government College at Lahore in 1954. The laboratory was intended to train atomic scientists, engineers, and technicians. Formally, the Pakistan Atomic Energy Commission (PAEC) was established in March 1956 under the chairmanship of Dr. Nazir Ahmad (ironically a textile scientist, rather than a nuclear physicist). Initially, as with the Indian initiative, the program was intended to generate power, and to use the atom for agricultural, medical, and industrial purposes. Military uses were not then on the agenda.[19]

The peaceful research pattern continued through the 1960s, with concrete progress under the chairmanship of Dr. I.H. Usmani and a

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on the Tarapur (near Bombay) reactor in 1963. In 1963 and 1968, it accepted safeguards on the Canadian supplied reactors called RAPP I AND II. Subsequently, those bilateral safeguards agreements were converted into trilateral agreements between the supplier, India, and the International Atomic Energy Agency (IAEA).

[19] The PAEC was successful in the discovery of Pakistani uranium deposits, and in recruiting a core of specialists and technical personnel for training in world class scientific institutions. However, from the beginning, Dr. Ahmad failed to mobilize adequate political and financial support from the government (Ahmad, 1958, p. 50).

coalition of policy makers, including Dr. Abdus Salam, a Nobel laureate, and Z.A. Bhutto, then minister in charge of atomic energy and later foreign minister and president (Johal, 1989, p. 132). Mr. Bhutto, the influential and rising power in the Pakistani government, was the first and probably the only one during this period to call for an effort to acquire the weapons technology. He was primarily motivated by two developments: first, the news that India had acquired reprocessing technology in 1964; and secondly, the negative outcome of the 1965 Indo-Pakistani war. Bhutto presumably was convinced that only through acquisition of nuclear weapons could India's overwhelming conventional superiority be offset. It was against this background that he issued his famous "eating grass and making the bomb" statement, which promised weapons even in the midst of economic hardship.[20] However, neither President Ayub Khan nor the PAEC was interested in pursuing the nuclear option, and Bhutto's advocacy for the weapons program was not put into practice until he became head of government in December 1971.

Bhutto's ascendancy changed the long standing Pakistani nuclear policy. For the first time the program was given an explicitly anti-Indian and military focus, although formal military influence in nuclear decision making remained, as in India, quite limited until later in the decade (Kapur, 1987, p. 137). From 1972, the Pakistani nuclear program was shifted to a military mode; Bhutto's resolve was strengthened after India exploded its first nuclear device.

Nevertheless, Bhutto's efforts to weaponize his country's nuclear program faced several obstacles, not the least of which was enormous pressure from U.S. Secretary of State Henry Kissinger to roll back reprocessing and weapons plans. Secondly, such a program was costly both politically and economically (as we attempted to model in the game analysis). Thirdly, even though Munir Khan, who replaced Dr. Usmani as Chairman of PAEC in December 1972, was initially in favor of a weapons program, he changed his position subsequently because of his alignment with the West and his long experience in PAEC (Khan, 1982, p. 65). With high dependence on reprocessing, Pakistan's nuclear program was more subject to needs for additional reactors and more sophisticated technologies than India's approach, and therefore more vulnerable to outside restraints. An important agreement with France for the supply of a reprocessing facility at CHASMA was suspended in 1979 due to intense American pressure. As a

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[20] Stephen Cohen indicates that "from the beginning Bhutto wanted a nuclear weapon" (Cohen, 1991, p.9).

result, Bhutto was never successful in realizing his ambition to assemble a bomb.

Considerable progress in this endeavor, however, was achieved by his successor, Mohammad Ziaul-Haq, who came to power in a 1977 military coup. He too was subjected to non-proliferation pressure, but was more successful in avoiding it and gaining U.S. support particularly after the 1979 Soviet intervention in Afghanistan. Moreover, Zia was able to gain a degree of Chinese help in designing a Pakistani bomb (Vas, 1987, p. 96).

Thus, while India and Pakistan began their nuclear programs as catalysts for economic development, the combined influences of regional threat perception, personal and national ambition, and major power politics all strongly conditioned both India's and Pakistan's moves toward nuclear weaponization. Despite pressures from the nuclear weapon countries, and especially the U.S., both states continue to pursue their nuclear programs. At best, international pressure has slowed their progress, but both countries' nuclear facilities remain, by and large, outside the international inspection regime.

While both India and Pakistan agree in principle to the need for nuclear disarmament, the former's approach is to deal with the nuclear threat globally, while Pakistan's attention is focused much more narrowly on denuclearizing South Asia. They agree that NPT remains discriminatory and biased against LDCs, but they have quite different historical and geopolitical outlooks.

## CULTURAL INFLUENCES IN STRATEGIC CALCULATIONS

Until now we have discussed South Asian arms control in a strategic perspective, whether dealing with "rational" calculus or historic policy formation. There were hints that Indian and Pakistani nuclear policy reflected a unique perspective of newly independent states, focusing on equity. The question remains as to whether there is something quintessentially characteristic of these states' approaches to weaponry, power, negotiations, and trust which can be traced as well to their prevailing cultural outlooks.

Culture will be examined here in two arenas: South Asian socio-political cultures, and the cultural beliefs of individual decision-making elites. Broadly speaking, "cultural patterns refer to 'the systematic and often repetitive nature of human behavior, interaction, and organization....human behavior is channeled and constrained by underlying systems that impose regularity and rules on what otherwise might be random activity'" (Samovar, p. 95). More narrowly, political culture is defined as the patterns of meaning

developed by a group or society that enable them to interpret or evaluate themselves in a given situation; it creates a sense of tradition that enables a social group to interpret the present through the past and use both to predict the future (Abbott, 1996). Some tools for analyzing political culture include: rhetoric, symbols, elements of popular culture, various politically relevant myths, and conceptions of martyrdom, heroism, scapegoats, sacred places, texts, and icons.[21]

Within the South Asian context, India, China, and Pakistan broadly share a collectivist culture that is distinguished from the Western individualist tradition. The collectivist perspective, together with "high context" communication style (Ting-Toomey, et. al., 1991, p. 276) may provide a cornerstone for developing a common ground from which the three nations may enter their arms control dialogue with reasonably good chances of at least understanding each other's frames of reference and rhetorical nuances, if not necessarily agreeing substantively. As noted below, though, these commonalties also become diminished and complicated in light of diverse cultural traditions that each nation-state's negotiators bring to the table. For example, Indian negotiators seem to bring unique traits to bargaining situations, traits which emanate in part from the traditions that informed Gandhi's non-violent approach to political change, called satyagraha or "Truth-force." Satyagraha is premised on a position of strength, as opposed to the Western notion of passive resistance.[22]

In applying cultural considerations to nuclear strategy and arms control, elite diplomatic corps and governmental/bureaucratic leaders

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[21] In this context, symbols provide a framework for an initial analysis of political culture as related to nuclear policy. A symbol is "a word or a phrase, a gesture or an event, a person, a place or a thing. An object becomes a symbol when people endow it with meaning, value, or significance" (Elder, 1983, p.29). Nuclear weapons and delivery systems (e.g., missiles) themselves have sometimes been characterized as symbols of power or prestige. To capture the emotional and behavioral preferences that individuals derive from their political culture, however, condensational symbols are especially pertinent, since they "condense into one symbolic event, sign or act of patriotic pride, anxieties, remembrances of past glories or humiliations, promises of future greatness: some one of these or all of them" (Edelman, 1985, p. 6). Symbols, therefore, can generally indicate a panoply of diverse factors that make up a political culture.

[22] This general philosophy has helped to create the portrait of the ideal Indian negotiator, one who looks for and says the truth, is not afraid of speaking up and has no fears, exercises self control, seeks solutions that will please all the parties involved, respects the other party, does not use or threaten violence or insults, and appeals to the other party's spiritual identity (Casse and Deol, 1985, pp. 149-50). In some respects, this Indian approach offers similarities and differences when compared with an ideal Pakistani negotiator.

ultimately are the critical players. While dealing with common concepts such as security and deterrence, elites also reflect the cultures they represent; they do not conceive or carry out negotiations in a diplomatic vacuum, since the durability and acceptability of agreements will also depend on domestic acceptance.

International negotiators often are depicted as diplomats speaking a neutral, common language, instructed by strategically and technically minded ministries and bureaucracies. Yet while a certain similarity undeniably exists across nations in diplomatic style, distinct cultures appear to condition the articulation and even the choice of demands and tactics; "people from different cultures appear to negotiate differently. In addition to behavioral differences in negotiation across borders, different cultures may also interpret the fundamental process of negotiations differently (such as what factors are negotiable and the purpose of the negotiations)" (Lewicki, 1994, p. 412). In cross cultural studies of how people from diverse historical traditions, languages, and religions can reach mutually beneficial agreements, Ting-Toomey et. al. observe that, "Cross-cultural conflict style differences are critical to the effective management of intercultural conflict misunderstanding. For often times, it is not the content conflict that creates tensions or friction, rather, it is the cultural style level that creates uncertainty and anxiety in the conflict encounter situation" (Ting-Toomey, et. al., 1991, p. 276).

One tradition that may significantly influence Indian action, for example, is the relative importance of the means used to achieve valued ends (Appadorai, 1969, pp. 116-17); this tradition would be difficult to model in game theoretic terms. During the Cold War, the balance of means and ends influenced India's decision (reflecting both Nehru's and Gandhi's principles) to remain non-aligned, thus preserving both independence of action and moral suasion (Appadorai, 1969, pp. 116-17 and 125-26). Non-weaponized deterrence is a doctrine corresponding to these precepts, although the thoroughly Hindu BJP party proposes to change this doctrine and opt for weaponization in the 1990s.

Another tenet of Indian diplomacy, deriving from the myth of Gandhian teachings, involves the ability to enter into peaceful negotiations; "in our circumstance, in light of our history and in the great traditions of the man who made our national independence possible, we think it is always necessary to talk to one's opponent and to seek the basis of reconciliation and negotiation" (Appadorai, 1969; quoting the leader of India's UN General Assembly delegation in October 1955, pp. 126-27. Remarkably, though, very little actual dialogue took place in certain of the India-Pakistan crises). Intertwined with these diplomatic imperatives is India's critical concern with world opinion, partially derived from a Mahabharata story

where a special envoy indicates the importance of showing the world the correctness of his position while emphasizing the incorrectness of his opponent (Appadorai, 1969, p. 117). Often, Indian strategies, even on nuclear matters, have involved similar appeals to world opinion (one classic case was Mrs. Gandhi's extensive worldwide diplomatic offensive to justify her position in undermining Pakistan's control of Bengal before intervening in the Bangla Desh war of independence).

Concepts of "peace" played a broad and influential role in both India's and Pakistan's approach to nuclear research. Nehru began India's nuclear program under the benign auspices of a civilian establishment that focused on generating power; electricity would benefit both industrial and agricultural (Gandhian) development strategies. Reflecting the maintenance of non-violence from a strong bargaining position, Nehru's "option strategy" involved acquisition of technological capability to create weapons if need be, while preserving India's "face" in the international community. Indira Gandhi's resistance to NPT reflected the same themes. Thus, India could step through the door of nuclear power and status much earlier than most Third World nations, while preserving a peaceful image.[23]

As the Cold War ended, global alignment patterns shifted, and transformed the nature of diplomacy and non-alignment in regions such as South Asia. To address the challenges of post-Cold War negotiations, Peter Lavoy suggests that India and Pakistan create a stable arms control regime similar to that developed by the US and USSR during the Cold War. Significant differences exist, however, between these South Asian nations and former superpowers: geographic proximity, a shared national past, and a lower hierarchical position in the international community power structure, as well as cultural similarities and differences.

In order to explore these differences, the role of "face" must be considered in relation to such factors as confidence-building measures and disarmament. India's position in favor of global nuclear disarmament

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[23] With this concern, the India-World game, a subtle game which proved too difficult to model in a mere 2x2 matrix, takes on characteristics of both demand and concession; in addition to seeking higher status and influence in decision-circles, New Delhi seeks to bring major powers to a more equitable or "just" arrangement of military capability in relation to lesser powers. Thus, it could be that we must incorporate a greater value for India attached to gaining great power arms reduction or disarmament; such an enhanced score would raise the value of each outcome in the B, D, and F cells of Figure 4, thereby making India-- though not the rest of the World, more favorable toward all outcomes on the right side of the matrix. This revaluation would also appear to lessen the prospect of joint agreement, as seen for example in India's holdout status against the comprehensive test ban, since the outcomes on the left side of the matrix would be preferred by the major powers and those on the right side would be preferred by India.

remains the major tenet of their negotiating stance; "every Indian prime minister. . .has viewed deterrence as immoral and as an irrational basis for national security in the nuclear age" (Lavoy, 1996, p. 275). This is a key orientation in their game with the World.

In the collectivist/high context culture of South Asia, the role of face helps to explain India's reluctance to desert or alter its long-standing position on global disarmament, and reflects the government's concern with maintaining respect and prestige in the world community. Thus, while game theory highlighted the pivotal role of Indian-Chinese negotiations, and historical analysis reminded us of the need for India and Pakistan to begin a gradual tension reduction process, cultural analysis seems to point to an even more central role for the India-World negotiations, and for the outside world to comprehend solutions allowing face to be saved on a long standing Indian policy priority.

Similarly, Pakistan's insecurities emanating from a series of traumas -- forced division from India, subsequent dismemberment, and the continuing frustration over Kashmir -- the role of face also becomes important in posing effective CBMs in Indo-Pakistani relations. In the 1980s, General Zia proposed to India six ways to pursue regional nuclear disarmament, but India rejected them in view of its larger regional and global concerns (Lavoy, 1996, p. 276). In addition to these concerns, India's nuclear advantage over Pakistan also probably lessened New Delhi's interest in such a bargain. The deep-seeded animosity between the two nations impedes the development of trust necessary to satisfy verification concerns and decrease the sense of threat, increase reassurance, and create a sense of security; "neither side is willing to initiate a relationship of reciprocated good gestures" (Lavoy, 1996, p. 280).

We have seen that there have been some CBM moves in the region, but no GRIT-like momentum. In pursuit of non-weaponized deterrence, these two states have adopted strategies of secrecy and "nuclear opacity" that involve covert diplomacy. Thus, while preserving face in relation to domestic and international opinion through such opacity, because "large portions of the region's informed populations see civilian and military nuclear programs as components of, and indeed symbols for, national sovereignty and security" (Lavoy, 1996, p. 278), the strategy also complicates efforts to reassure and inspire trust in the adversary. Therefore, in the long run, nuclear opacity may have to give way to more specific reporting and accounting for purposes of global and regional arms negotiations, especially if a quid pro quo in terms of more global disarmament, is actually to be reached.

## CONCLUSION

The three successive "cuts" through the South Asian arms control environment offer valuable insights into the region's nuclear policies. First, game theory demonstrated the critical importance of negotiations with China in freeing leaders to take greater risks for cooperation in the other games. Second, historical narrative highlighted common technical but divergent geopolitical Indian and Pakistani concerns as they confront each other's nuclear developments. Third, cultural analysis uncovered the lingering legacy of self-reliance and equity demanded by India's and Pakistan's heroes, a script most vividly played out in the India-World game.

The strategic, historical, and cultural modes of analysis converge on the questions of time and perception. Rational payoffs may vary according to long versus short term time projections. In the long term, for example, global nuclear powers may have to consider forms of global nuclear disarmament in order to stabilize specific regions; this may require risking much closer parities with regional powers such as China and India. In game theoretic terms, once a collaborative strategy is established, defecting may seem rational if one's opponent fails to regain their strategic parity for many years, but ultimately both players will lose for a much longer time period. Various cultures also have different perspectives on time, and as Mr. Bhutto's "grass and weapons" dictum indicates, may also have different tolerances for economic sacrifice in the interest of security or autonomy. Nevertheless, incremental economic savings in arms reduction can add up to vast long term economic incentives if leaders think in those terms.

Perceptions of time and value are crucial in supergames as depicted in the GRIT matrix (Figure 1). As the two parties move progressively away from the origin point, what is the effect on their estimate of and tolerance for benefits and risks of defecting at various points down the line? Payoffs for moves, and the potential to coerce opponents through threatened defections can increase as time goes on and accumulated values mount (as states gain a stake in the new *status quo*). At this point, culture provides some regularity and predictability to the decision-making calculus. As noted, a remarkable resiliency of the perspectives on nuclear power and weapons developed in India and Pakistan over 40 years ago. Heroic symbols and myths, at least in part, shaped these long lasting policy orientations that should encourage and reassure future leaders, despite their temptations or worries about the opponent breaking agreements, to risk preserving and enlarging nuclear arms control agreements.

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