NUCLEAR WEAPONS AND NATIONAL PRESTIGE

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February 2006

COWLES FOUNDATION DISCUSSION PAPER NO. 1560

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Nuclear Weapons and National Prestige

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ABSTRACT: Leaders and historians see prestige as important, but international relations theorists have neglected the concept, in part for lack of a clear definition. It is proposed that a party "holds prestige" when group members generally believe that they generally believe that the party has a certain desirable quality, and this situation gives the party perceived power in the group. The definition gains support from a survey of international affairs writings on the sources of prestige. Prestige is strategically important when a party wants support from others who would rather join the side that more of the others are joining. Some general ways of acquiring prestige are discussed. Compared to achieving social progress, building and testing nuclear weapons is better at bearing prestige because it has distinct borders separating success and failure, because it is salient and because it involves the symbolism of power. In some cases when prestige is a factor, one can better demonstrate one's ability to perform an accomplishment by refraining from doing it. The analysis yields suggestions for reducing nuclear proliferation.

Acknowledgments: I would like to thank Ken Binmore, David Edelstein, Lynn Eden, Virginia Foran-Cain, Roland Hain, Steve Morris, Greg Pollock, Robin Pope, Dov Samet, Frank Schuhmacher, Reinhard Selten, Avner Shaked, Judith Stacey, David Sylvan and Steve van Evera, for many helpful suggestions. Support is gratefully acknowledged from Hebrew University's Center for Rationality, the Deutsche Forschungsgemeinschaft at Bonn University, the Center for International Security and Cooperation at Stanford, the Cowles Foundation and the Russell Sage Foundation.

1. Introduction

States often forgo their direct interests for the sake of prestige, investing in projects that display their modernity, engaging in conflicts over symbols of prestige, or building grand but impractical weapons. Especially in private or after leaving office, leaders admit that prestige is a motive but international relations scholars have generally ignored it as an explanatory concept. One reason may be that it requires a more subtle definition than is usually given. This paper attempts to construct a convincing definition of prestige, then validate it by comparing it to how the word is used in discourse about international interactions, noting the kinds of events that are said to confer prestige. Using formal games, it draws out the definition's consequences, assesses whether they are reasonable for prestige and discusses their testability. It aims to answer the basic questions: How do states acquire prestige, and why do they acquire it?

The definition suggested here is this: a party holds prestige in a group for a certain desirable quality if the group's members generally believe that *they themselves generally believe* that the party possesses that quality. The definition also stipulates that to count as prestige, these beliefs must give the party perceived power, but the special feature proposed here involves "higher-level beliefs." If the "zero'th level" of belief is the objective situation and the first level is beliefs about that situation, what could be termed "reputation," then prestige is at the second level. It involves beliefs about beliefs about the quality; it is reputation for having a reputation. In the ambiguities of ordinary language prestige overlaps reputation in meaning, but focusing on a connotation that is different gives the word a useful function. In the present usage, everyone in a group may think you are an expert, but if they do not realize that they all think this, then you have reputation but not prestige. Students may believe that their university is a poor one, but if each believes that the group overall thinks highly of it, the university has prestige without reputation. Second-level beliefs seem arcane, but the analysis here shows why policymakers have to worry about them.

Prestige-seeking can have the dangerous consequence of adding to states' motivation to build and test nuclear weapons. The analysis here suggests why states do this and how they can be induced to seek prestige in more constructive activities. In the nuclear context, the qualities associated with prestige are usually modernity and independence, meaning the power and

resolve to stand up to other states. The definition explains why prestige is conveyed more readily by displaying nuclear weapons than by societal progress such as improved social welfare, education or democratic governance: nuclear tests can be made "public events," in the technical sense that they generate not only knowledge that they have occurred but knowledge of others' knowledge of that fact, and so on up the ladder. It is easier to make an event public if there is a recognizable boundary separating its achievement from non-achievement, and a nuclear explosion has such a boundary -- for practical purposes there is no "semi-nuclear" one. It is shown that a boundary is important just because prestige involves the second level of beliefs. Even if everyone knew that the country possesses the weapons, a public nuclear test informs everyone that everyone else knows that fact, and so bolsters prestige. Since the end of the Cold War worries about nuclear proliferation have increased, and the problems with other approaches, like embargos, sanctions or military interventions have become apparent. To disconnect these weapons from prestige removes a major motive for proliferation.

Prestige is often regarded as a matter of emotion and attitude, but the focus here is its strategic importance. Early realist writers like Herz, Morgenthau, Nicholson and Niebuhr were right to emphasize it. It comes into play especially in bandwagoning situations, when a state wants support from other states whose actions are strategic complements -- the potential supporters find an alliance more attractive the more of them that are in it. If prestige-seeking is strategically sensible, it cannot be banished by sophisticated thinking. The hope is to channel it into constructive areas, and the paper suggests some measures the world community can take towards this end.

Prestige is often spoken of as if it were a tangible commodity: it is "acquired," "held" by a "bearer," "granted," "saved," or "squandered." The analysis here shows that the metaphor is only partly valid. Since prestige arises from the interaction of beliefs spread over the whole group, it is a social construction, different in this regard from bread or land, for example, but somewhat like money, which is largely social and reflexive in nature,[1] and is a common metaphor for prestige. By treating it strategically this paper bridges the rationalist and constructivist approaches. Because prestige is not literally a commodity, because it involves not

[1] Searle 1995, 42-45.

just what one does but how onlookers interpret why one does it and how they expect each other to interpret that, the world community has some non-obvious ways of inducing parties to choose nuclear restraint. A formal game will show that a state can sometimes increase its technological prestige by *not* building nuclear weapons. This result does not turn on one kind of prestige prevailing over another, e.g., it is not that good world citizenship overbalances technological skill. Instead proliferators lose prestige for technological skill itself, the same quality the weapons were meant to demonstrate. The idea of showing you can do something by not doing it is counterintuitive, but it arises in real contexts and it can be understood by following the logic of the game's equilibrium.

Section 2 documents the importance of prestige in the eyes of national leaders. Section 3 surveys historical studies to understand the perceived sources of prestige, then presents a definition consistent with this pattern and with other criteria as well, and discusses the relation of prestige and power. Next are two ways to acquire prestige: Section 4 deals with passively letting one's quality become known, Section 5 with actively choosing to demonstrate one's quality or not. The discussions suggest ways to reduce proliferation. Section 6 shows formally how prestige can be strategically desirable. Section 7 gives two more routes to prestige, symbols of prestige and symbolic precedents, and the final section discusses the possibility of empirical tests of the theory and draws some implications about methodology.

2. Leaders' perceptions of the importance of prestige

Several nuclear weapons programs have had prestige as a significant motive, one piece of the evidence being that their leaders have stated that. Saddam Hussein's interrogators found that he was ready to explain himself: he was interested in weapons of mass destruction for three reasons, their capability to deter or wage war, their cost relative to other kinds of weapons, and their benefits for his prestige among the Arab states. In the words of the CIA's Duelfer Report, he saw nuclear weapons as "both a symbol and a normal process of modernity."

> He aspired to the prestige associated with the advanced arts and sciences. In his view the most advanced and potent were nuclear 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.[2]

In the common view Saddam meant to challenge the West in the name of Arab nationalism, but the report suggested that he was more concerned with prestige: "To the extent that you assume some of the stature of your enemy, Saddam derived prestige by being an enemy of the United States. Conversely it would have been equally prestigious for him to be an ally of the United States and regular entreaties were made during the last decade to explore this alternative." If an opportunity to avoid war was lost, this provides evidence of importance of prestige and the need to appreciate its importance.

To Charles de Gaulle a French nuclear weapon was not just a matter of military strategy, but " Will France remain France?"[3] Mao stated that China built its bomb in part for international status.[4] Australia's little-known nuclear quest during the 1960s was motivated partly by worries about a Chinese weapon, but also by its military leaders' desire to stand equal with their colleagues in the United States and Britain.[5] In 1974 India expected that testing a weapon would enhance its prestige just as that had done for China and France.[6] According to Indian leaders their desire for prestige inside and outside the country prompted the 1998 tests, even though in the end India arguably became less secure. Many writers have seen the prestige motive as influencing Argentina, North Korea and Iran.

Some authors have dismissed prestige as explaining for proliferation because it does not account for all cases or because it is not the full story for any single one. This is too demanding. Certainly Israel's nuclear weapons were built for other purposes, to deter an attack and reassure its own population, and the same probably holds for those nations that halted their programs short of a test but kept the capacity to build and deploy weapons quickly. Levite terms this

[2] US Central Intelligence Agency 2004, transmittal letter, no pagination.

[3] Quoted by Sagan 1996/1997, 79. See also Kohl 1971, 127-129, 150, and Barbier 1993, and on the British program, Thayer 1995.

[4] Johnston 1995/1996, 8.

[5] Walsh 1997.

[6] Chandrasekhara Rao 1974.

"nuclear hedging" and cites Egypt, Sweden, Taiwan, Japan and South Korea.[7] A state that forgoes a public demonstration is not primarily seeking prestige, but those states that do try for a nuclear test are good candidates for a prestige explanation. Acquisition-with-testing behavior is especially worth studying it is more dangerous -- it generates a greater risk of an arms race, crisis instability, accidental war or unauthorized use.

This behavior, gaining prestige by building a visible and imposing weapon, repeats an old pattern. During the 1400s a prominent device was the artillery bombard, a wide-mouthed cannon that fired stones against castle walls. Some powers built one of awe-inspiring size: France had the *Dule Grillet* and Scotland the *Mons Meg*, which could hurl a 330-pound ball for two miles, but their bulk made them impractical, hard to move and vulnerable to capture in a retreat.[8] A century later each large sea power wanted at least one immense warship -- Scotland built the *Great Michael*, England the *Harry Grâce à Dieu*, France the *Grand François*, Sweden the *Elefanten*, and Portugal the *São João.* Prestige insisted on size, one military historian commented, but he judged that the money would have been better spent on several smaller ships.[9] Visitors to Stockholm still marvel at the *Vasa*, built in 1628 and so top-heavy with cannonry, rigging and decoration that it sank in the harbor as soon as it was launched. According to Art, Germany built its late 19th century dreadnaughts in order to be seen as the equal of Britain.[10] The current "aircraft carrier club" has nine members: Brazil, Britain, France, India, Italy, Russia, Spain, Thailand and the United States, but some of these have only one carrier, which addresses no real security concern and is not kept on operational status.[11]

Historians have identified prestige as a reason that European states acquired colonies and foreign bases,[12] that France declared war on Prussia in 1870,[13] and that Mussolini invaded

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[7] 2002.

[8] Smith and Brown 1989.

[9] Hale 1975, 504.

[10] Art 1973, 36-39.

[11] Gilady 2002 relates aircraft carriers and prestige.

[12] Cohen 1978, Bell 1996.

[13] Howard 1961.

Ethiopia.[14] Paul Nitze, an architect of American Cold War strategy, wrote, "[t]oday it would appear that the most important tool of foreign policy is prestige," and went on to expand on this idea.[15] Internal American documents used it to justify pressing on in Korea and Vietnam,[16] and Henry Kissinger asserted that "[n]o serious policymaker could allow himself to succumb to the fashionable debunking of 'prestige,' or 'honor' or 'credibility'."[17] In recent years members of the US Congress have cited prestige as a reason for or against intervening in Haiti, Somalia, Bosnia and Kosovo. One cannot be sure exactly what the various parties meant since the word needs clarification, but these examples provide a reason to analyze it.

3. What is prestige?

With leaders declaring that prestige matters, one would expect that scholars would have dissected it thoroughly or at least explained their omission. In the 1940s and 1950s Morgenthau and others emphasized it[18] and some recent authors have seen it as a missing element in current theory[19] or discussed related concepts like status and reputation,[20] but considering the size of the whole literature it has been ignored. Morgenthau's explanation for this was that prestige was intangible and that it had become linked to an outmoded, pompous style of diplomacy. Another reason may be that it needs a clear definition. Lavoy notes that a nuclear program that cannot be explained by military or technological motives often goes into the bin of prestige.[21] Applied so widely, the concept becomes theoretically useless. The definition suggested here does not try to reveal what the word "really means," since terms in a natural language often acquire many

[14] Mori 1978.

[15] Nitze 1960, 15.

[16] Kim 1996, Milliken 1996.

[17] Kissinger 1979, 228.

[18] Examples are Nicholson 1937, Morgenthau 1948, Herz 1951, and Niebuhr 1959.

[19] See McGinn 1972, Gilpin 1981, Kim 1996, Lavoy 1993, 1997, Thayer 1995, Sylvan, Graff and Pugliese 1998, Markey 1999, O'Neill 1999, Mutimer 2000, Gilady 2002, and Busby 2005.

[20] Examples are Luard 1986, Eyre and Suchman 1996, Mercer 1996 and Sagan 1996/1997.

[21] 1997, 71.

senses, all of them fuzzy. It is a proposal, to be judged on its clarity, helpfulness in leading to productive theories, and general fit with a current usage of the word.

The sources of prestige as perceived by historians

A guide to the definition's fit with a current usage is how "prestige" has been used in international affairs discourse. Of special interest are the writings of historians, who know about particular conflicts but have no extensive theoretical framework to shift them away from the most straightforward way of speaking. *Historical Abstracts* was searched from its start in 1955 up to 2004 for instances of the word, applied to a state or other actor on the international scene, with the source of prestige identified. Both gains and losses in prestige were included, as were instances when a party only expected a gain or loss. The survey was not meant to determine accurate frequencies or test statistical hypotheses – it involved too many judgments and selection biases for that – but to note the kinds of events conferring prestige in their very rough proportions, as an empirical basis for the definition.

There were 267 causes identified and they fell into several categories.[22] In about 70 cases prestige came from *military possessions and actions*. Constant themes were success in war, large forces, or a modern weapon, especially one built indigenously, like Israel's Lavi fighter aircraft. A large navy appeared especially often, with an emphasis on its public visibility from foreign naval bases and foreign naval visits. About 25 more involved *possessing foreign territory* such as colonies or the sections of Antarctica claimed by South American states. About 40 determinants involved *moral responsible actions* -- a state giving foreign aid, acting as a mediator, or Russia protecting Christendom beyond its borders, parallel to the Duelfer Report's view of Saddam seeking prestige as a defender of the Palestinians.[23] About 40 sources involved *being deferred to, not defied or being supported* -- having one's citizens treated well, extracting compensation for an injury, or simply having allies. About 15 cases cited *acting independently*

[22] The list is available from the author.

[23] When moral behavior leads to power on that particular moral issue this is a kind of prestige which can be called *moral authority* (O'Neill 1999).

or assertively, like insisting on one's sovereignty or sending forces to a military engagement. About 20 cases involved *recognition by other countries,* such as being accepted into international organizations, hosting important meetings, or signing treaties implicitly recognizing one's importance. In 15 cases what counted was *foreign involvement* – being included or simply on the scene. *Scientific, technological, cultural and sports achievements* yielded prestige in about 35 cases -- airlines, airships or supersonic airliners, nuclear power, space exploration programs, or as a negative, the Chernobyl disaster. Examples in culture and science were the founding of the Hebrew University, exploratory expeditions, and successes in worldwide sports competitions. Finally, about 20 cases involved *economic strength, internal order, civil liberties and the rule of law.* France lost prestige for the Dreyfus Affair, as did the United States for Watergate.

The recurrent themes, then, were autonomy, recognized importance, moral uprightness, technological prowess, power and power symbolism. Prestigious accomplishments were typically discrete and clear, and conducted visibly in the international domain. Domestic accomplishments appeared relatively seldom; for example, navies, which are internationally visible, were mentioned often but armies barely at all. The definition will be consistent with these generalizations.

The definition

Prestige will be defined as involving an identifiable quality (in the sense of a party's characteristic, trait or attribute), and as depending on the group's belief about its belief about the party's possession of that quality. The definition also requires a belief that the quality is seen as desirable and that the situation confers power on the party. These beliefs do not have to be held uniformly across the group, just held "generally," in that the average of the assessed probabilities is high.

> **Definition**: A party has *prestige* with a group for a certain quality if
> (a) the members generally believe that they generally believe that the party has the quality,

(b) they generally believe that they see the quality as desirable, and

(c) they generally believe on account of the considerations in (a) and (b) that the party holds power with the group.

The definition's elements

What is the rationale for putting prestige at the second level of beliefs? Reputation was defined earlier as the average estimate of quality, and locating prestige one level above that gives the word its own function.[24] It also means that prestige needs three or more parties (at least two observers plus the prestige-holder) to avoid triviality, and this fits our way of talking. If two people are interacting by themselves, one might tell the other, "you've fallen in my esteem," but would not say, "you've lost prestige." The three-person minimum separates prestige from other related concepts like social face or social norms such as politeness or reciprocity, which can apply to two interactors.[25] Also, putting prestige two steps away from the objective truth fits with the word's origins. Before the early 1800's, it meant a magic trick, an illusion for a crowd.[26] Like Hans Christian Andersen's tale of the emperor's new clothes, there may be nothing there but as long as everyone believes that everyone else sees the quality, the prestige-holder can get away with it.

The definition requires that the parties' power come from these second-order beliefs rather than the first-order ones, and this conforms to our usual notions. Imagine a large state that intimidates its small neighbors, and assume that when each small state submits to the large one, it is not considering the other small ones' perceptions, but simply its own power resources relative to the large one. If prestige involved their first-order beliefs about the large state, the large state would be exploiting its prestige, but that sounds odd. The definition implies that prestige is not involved here since second-order beliefs have no role. (This example is an

[24] Keeping prestige separate from reputation is one reason why it is not defined here as simply common knowledge of quality.

[25] For distinctions with face, norm, honor, legitimacy and status, see O'Neill 1999.

[26] Kjellmer 1973, Schalk 1971.

argument against most definitions in sociology,[27] as well as against Morgenthau's definition as reputation for power over people.[28])

The desirable quality of condition (b) may be a normatively positive one, like wisdom or leadership, or be one that the members simply want, like military strength. A state can hold prestige for its democratic values or the skill of its athletes, but when it displays nuclear weapons the quality is often for technical prowess, or, more broadly, the modernity that entitles nations to full-fledged membership in the world system. In 1963 Chinese Foreign Minister Chen Yi told Japanese journalists, "A-bombs, missiles, supersonic aircraft -- all these are reflective of the technical level of a nation's industry. China will have to resolve this issue within the next several years; otherwise, it will degenerate into a second-class or third-class nation."[29] According to A.P.J. Abdul Kalam, head of India's defense research department, the 1998 tests showed that "India has got the size and weight to do it," and Dr. Rajagopala Chidambaram, who ran the Atomic Energy Commission, pointed out that the fissile material used was completely indigenous.[30] Other traits of prestige from nuclear weapons are resolution and independence. A systematic survey of Indian news reports, editorials, and government pronouncements appearing in the World News Connection database for three weeks after the 1998 tests revealed a constant theme of India standing up to the big powers. Hymans has detailed this motive for Argentina's activities.[31]

Some writers have argued that nuclear weapons could not be a coherent source of prestige since they would both raise and lower it. The respect one gets for following international anti-proliferation norms, for example, is at odds with that for holding military strength. The resolution is that the definition makes prestige specific to a particular quality, so one kind may rise while the other falls. One reaction to India's tests was that a country with

[27] E.g., Goode 1979.

[28] His term "reputation" also needs clarification since its usual meaning as first-level belief about quality is inadequate, as argued below.

[29] Quoted by Burr 2000.

[30] *Bangalore Deccan Herald*, May 18 1998.

[31] 2006.

such a rich culture had no need to seek prestige, but India wanted to be recognized for technical advancement and its cultural tradition did not contribute to that. The definition also makes prestige specific to a particular audience. In the early 1960s Canadians debated whether to place US nuclear weapons on their aircraft and missiles, which would have raised Canadian prestige in NATO military circles but lowered it among non-aligned countries. For India different reputations were at issue while Canada faced different reference groups.[32] The situations presented dilemmas but not contradictions.

What kind of power does prestige confer?

Point (c), that prestige yields power, fits with the constant linking of the concepts in dictionaries and the historical literature, and with some thought experiments. A person can have a reputation for being happy, and the group can be aware of that and admire the trait, but this would not constitute prestige for happiness since second-order beliefs about happiness do not confer power. (The reason, elaborated in Section 7, is that the typical link from prestige to power, that actions of support are strategic complements, does not apply.) Linking prestige to power also accords with our regular usage of applying it only to the living. A soldier who dies in war gains "glory" but not "prestige."[33] To hold power one must be able to pursue goals.

The definition might have said "influence" or "authority," but the best word seems to be "power." It is meant in a specific sense, characterized by these properties:[34] (1) Power is a dispositional concept, the ability to intentionally bring outcomes about. (2) The ability to effect outcomes that one does not want to happen still counts as power. (3) The power associated with prestige operates non-formally and intangibly, as opposed to through material resources or

[32] O'Neill 1999.

[33] Prestige is sometimes attributed to inanimate entities, like neighborhoods, occupations, automobiles or languages, but there is always an understood group of people -- those living in the neighborhood, speaking the language, etc., -- that can be seen holders of the prestige. The object is a mediator. A linguistic signal is that a car can be called "prestigious" but a person cannot.

[34] This discussion owes much to Morriss 2002. See also Guzzini 1993.

explicit rules of authority. (4) The ability to increase an outcome's likelihood even without guaranteeing it still counts as power.

Regarding (1), some writers have claimed that treating power as unobservable is unscientific, that it should be defined instead as resources held. However power-as-an-ability is a species of disposition, a respectable kind of entity that arises across the sciences. To say that a sugar cube is "soluble" means that *if* it *were* placed in water under certain understood conditions, it *would* dissolve. This conditional claim can be confirmed indirectly, e.g., by applying what is known about the sugar's chemical makeup and solubility, so the cube does not have to be in water for its solubility to be meaningful or confirmable. In the case of power the conditional involves the holder's intention: "if A were to adopt an intention to do something, A would (under certain understood conditions) succeed in doing it."[35]

Regarding property (2), "power" has a double meaning in English depending on whether it includes actions that are not in the holder's interests. Harsanyi's explication of Dahl's theory, for example, includes only outcomes that a party wants.[36] Does an airline pilot have the power of life and death over the passengers? One would say no if the pilot does not want their deaths or his own, but one could treat power as including whatever the pilot can do, wanted or not. Here the second sense is used.

Property (3) allows that the *source* of prestige might be tangible, like an aircraft carrier, but requires that the *linking* of prestige to power must be immaterial and informal. Sometimes this is distinguished as "influence": a president holds "influence" over legislators based on a high approval rating, but has the "power" to veto a piece of legislation, due to the Constitution. Here, however, "power" involves the first case, as in Nye's concept of "soft power."[37]

These specifications accord with the definition here and with the natural usage of "prestige." We commonly attribute prestige even to a person who has no interest in exploiting it.

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[35] Insisting on observability typically leads to defining power as material resources, but this is inadequate since one's power must depend on the whole constellation of resources across the group.

[36] 1962.

[37] Nye 2005.

Since prestige operates through other people's opinions and judgments, it does not guarantee an outcome -- it does not give the power we think of as pulling levers.

4. Acquiring prestige through displaying quality, the importance of public events

So far prestige has been treated as all or nothing, but to deal with its acquisition the definition must be extended to a matter of degree. One could make a continuum out of different elements, like the quality's desirability or the power it confers, then combine these according to some formula, but here the focus will be on the strength of the members' second-order belief. A party's *degree of prestige* in a group is the average of all the members' estimates of the average of all the members' estimates of the party's quality. Consider a group comprising two observers O_1 and O_2 who judge a subject S.[38] Assume the subject holds the quality to degree 5 but the observers estimate it (inaccurately) at 7 and 4 respectively, so the subject's reputation is the average, 5.5. For the second level of beliefs, assume each observer (inaccurately) estimates the other's estimate, O_1 believing that O_2 holds an estimate of 3 for the quality, and O_2 believing that O_1's estimate is 5. The degree of prestige includes these values in the average, and also each O's "estimate" of its own estimate. Following the principle that each person knows what he or she believes, the latter are simply the observers' first-order estimates, 7 and 4. Prestige is then the average of the two estimates of S's reputation: $[(7 + 3)/2 + (4 + 5)/2]/2 = 4.75$. (To count as prestige, S must also gain power from these beliefs, but that is not the focus here and is simply assumed to hold.)

Scenario 1: Gaining prestige from private and public evidence of one's quality

Central to prestige is the idea of a *public event*, one whose occurrence causes it to become common knowledge in the group. By the event itself each group member knows it has happened *and* knows the others know that, and so on, up the levels of belief. The first scenario combines the definition of degree of prestige with a coherent account of where the observers' estimates come from, and shows that evidence being a public event can be irrelevant to reputation but important for prestige.

[38] The prestige-holder may or may not be a member of the group.

Scenario 1 (private evidence followed by public evidence): A subject S has an urn with two tokens, either red/red, red/blue or blue/blue. Blue tokens are seen as desirable, so the possible types of subjects are called *weak*, *medium* or *strong*, respectively. Each O first believes the situations are equally likely, then randomly draws a token from the urn and views it. It re-estimates the number of blues in the urn and also the other's estimate of that. Next an all-seeing eye awards a prize to S if it has at least one blue token, and the observers again revise their estimates of the urn and of each other's estimate. Neither observer sees the other's draw (it will not matter whether S sees them), but the award or non-award is a public event -- each observer knows it and knows that the other knows it, etc.

Suppose that both observers draw blue. Standard probability calculations (Appendix) give the subject's reputation and prestige as shown in Table 1.

	Each O's probability of urn being:			Each O's estimate of other O's probability of urn being:			S's reputation	S's prestige
	rr	rb	bb	rr	rb	bb		
before the draw	.333	.333	.333	.333	.333	.333	1.00	1.00
both draw blue	0	.333	.667	.222	.333	.444	1.67	1.56
after the award	0	.333	.667	0	.428	.572	1.67	1.61

Table 1. Reputation and prestige at each stage of Scenario 1.

After the private blue draw each observer raises its estimate of the number of blues and also its likelihood that the other drew b, so S gains in both reputation and prestige. Prestige increases less than reputation since to judge reputation an observer infers only from its draw to the urn, but prestige requires one more inference, from the urn to the other observer's draw. This

extra step adds uncertainty, which prompts the observer to be more cautious in extrapolating from its own draw to the other's, i.e., to put more weight on its pre-draw estimate of 1 blue. This is the phenomenon of regression to the prior mean, well-known in statistical inference. In scenarios like this, when quality and others' beliefs are inferred from private evidence, prestige is less responsive to the evidence compared to reputation, just because the draws are private.

Under the case assumed here, the subject has at least one blue so it will get the award. This does not affect reputation but raises prestige from 1.56 to 1.61. The first result seems intuitive -- reputation is constant because each observer knows that S has a blue having just seen one -- but why does the award increase the subject's prestige? Before the award each O allowed the possibility that the other was allowing the possibility that S was red/red, but now each knows that the other knows that S is better than that, either red/blue or blue/blue. Prestige rises just because it involves beliefs about beliefs and the award is a public event.[39]

Nuclear weapons, public events and prestige

It is argued here that nuclear weapons confer prestige more readily because a nuclear test generates a public event that produces stronger higher-order beliefs. Achievements of social progress, on the other hand, tend towards private events. A country can lower its infant mortality or manufacture a technologically impressive product, but even if these facts become known abroad they might be known to be known. The goal is to identify the abstract properties that make an achievement publicly known. First, it should *be commonly known to be of interest or concern* to other countries, so that each of them not only pays attention but expects that the others are paying attention. Second, it helps mutual awareness if the news of the development is *sudden and simultaneous*. Also, achievement and non-achievement should be *separated by a clear border*. This is important because information about one's deeds is typically conveyed through language. Linguistic communication can be seen as a coordination game where the sender and receiver try to match what the first means with what the second understands. Usually culture and learning assure coordination over the general meaning -- a driver and a navigator

[39] Geanakoplos 1994 and Chwe 2001 give other examples of this phenomenon.

know that "right" means right rather than left -- but there remains the problem of communicating the exact boundaries of one's meaning, as when there are several right turns and the navigator says to take the "broad" one. Just as in Scenario 1, where prestige suffered more than reputation from an extra step in inference, here with communication the receiver of a message must infer back to the intended meaning of the sender's words, and, to judge prestige, infer what other listeners took from those words. It helps if a possible boundary of meaning is focal in Schelling's sense.[40] This occurs if some property of the boundary, like its prominence or cultural associations, makes it commonly obvious to be the boundary the sender intends.

In the prestige context, focality might arise from various mechanisms. One would be an *objective gap* on the scale of success, that renders it focal to interpret the boundary of the intended meaning there. Putting an earth satellite into orbit, sending a person to the moon, or building a supersonic fighter or airliner involve physical gaps: the laws of physics generate a hurdle for attaining orbit or reaching the moon and also make it unlikely that an aircraft's maximum speed would lie just at the speed of sound. Accordingly these feats have special potential to bear prestige. Focality in meaning can arise through *achievement of the highest value on a measurable scale*. The meaning of "highest value" is commonly clear since the scale is commonly clear, in contrast to one where the achievement is multidimensional and/or the scale is subjective. France is currently known for the fastest train, and Malaysia for the tallest building. Amount of foreign aid provided is a measurable scale and Japan has sought prestige as the greatest giver. In high-energy physics research, accelerators can be scaled by the energy in electron volts transferred to a particle, and critics have argued that countries have pursued these devices for prestige, beyond their scientific function.[41] The area has sometimes accounted for 40% or more of states' expenditures on basic natural science, even though it was clear by the 1960s that it had limited promise for nuclear energy. The Soviet Union's Serpukhov accelerator, meant to surpass all others, was completed in 1967 in time for the fiftieth anniversary of the Revolution, a goal unrelated to science. Similarly, concerning the Aswan Dam, Rycroft and Szyliowicz write that for President Nasser its "monumental size and scope were as much an

[40] O'Neill 1999.

[41] Irvine and Martin 1985.

attraction as was its technical performance."[42] These two routes to focality, a measurable scale and a physical gap, can be combined by being the first in time to achieve a clearly-bordered success. Canada was known for the first jet airliner, the Soviet Union for the first earth satellite, the U.S. for the first moon landing, and Britain and France jointly for the first supersonic airliner.

A fourth characteristic promoting higher-order beliefs is *evident visibility*, people knowing not just of the achievement but of each other's knowledge of it. Skolnikoff refers to countries' attraction to "visible technological feats"[43] and Gilady states that aircraft carriers count more for prestige than submarines because they are more conspicuous.[44] These statements should be refined to emphasize higher order beliefs: it is not just the feat that is visible -- its visibility is visible. The historical survey of examples produced many events conducted in an international setting; Olympic victories counted more than national competitions, and naval visits to other countries were constantly cited as prestige sources.[45]

Nuclear weapons tests fulfill these criteria, since the world is known to worry about them, the news breaks suddenly, they are clearly bordered and have evident visibility. The same does not apply to most developmental achievements. A dovish Indian editorialist wrote that his country had already conducted nuclear explosions and now it was time for a "developmental explosion." However social development events generally do not explode; they proceed gradually. A 5% decrease in infant mortality does not make headlines, so does not ensure that everyone knows that everyone else knows it. A reported increase in a country's "quality of life" or "literacy rate" is hard to exploit for prestige because these have many facets, and a hearer is uncertain what these phrases constitute or what others will take from the report of them.

Developmental advances that are already measurable or bordered should be exploited and publicized: some countries advertise the year they eradicated small pox. A prestige-bearing feature can sometimes be added artificially by a recognized ranking system,[46] or by announcing

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[42] Rycroft and Szyliowicz 1980, 57.

[43] Skolnikoff 1967, 212.

[44] Gilady 2002.

[45] Chwe 2001 discusses higher order visibility in ceremonies.

[46] Rotberg 2004/2005.

a public challenge or set up a contest with judges. A challenge singles out one measurable dimension of achievement and makes it salient. In 1957, probably in a bluff, Khrushchev challenged the United States to a missile accuracy competition to be held at some deserted range;[47] he also claimed that Soviet GNP would overtake America's by 1980.

When a quality is subjective and multiattributed, the notion of winning can become commonly understood through setting up legitimate judges. Prestige comes from winning a Nobel prize or an Olympic medal, not just for those competitions that are measurable like shotput, but because of judges, for figure-skating and synchronized swimming. The triennial Aga Khan Award is given for architecture in the Islamic world; the 2004 winners included the new library in Alexandria and a primary school in Burkina Faso. These techniques can be applied more widely to attach prestige to social progress.

5. Gaining prestige through refraining from a display of quality: countersignaling

In Scenario 1 evidence of quality came from the observers sampling the urn and from the external award. The subject stayed passive. However a state that tests nuclear weapons is choosing to make its display, and the next scenario, suggested by a model of Feltovich, Harbaugh and To,[48] shows how this makes a difference for others' estimates. It shows that even if a state could prove that its quality is above a certain minimum, doing that might harm its reputation and prestige.

> **Scenario 2:** As in Scenario 1, the subject's urn is red/red, red/blue or blue/blue with equal likelihood, and each of two observers privately draws a token. Each O sees only its own draw but S sees both of them. Then if S has a blue token it can either publicly show it to the O's or not show it. The subject tries to maximize either reputation or prestige for holding blues (here either goal gives the same result.)

The subject's ability to choose introduces a circularity into the parties' thinking: S's

[47] US White House 1957.

[48] Feltovich, Harbaugh and To 2002.

decision depends on how it expects the two O's to interpret its move, and their interpretation depends on their view of S's logic in choosing that move. This scenario is formal game and is analyzed by looking for a pure strategy perfect Bayesian equilibrium, which roughly is a set of conditional beliefs and determinate plans for action for all parties for all stages of play, such that each player's beliefs are consistent and no player would modify its plan if it knew the others'.[49] Exactly two such equilibria arise (Appendix):

1. *The simple signaling equilibrium:* S publicly shows a blue whenever it has one.

2. *The countersignaling equilibrium:* S publicly shows a blue if it has one and either observer drew a red. If both observers drew blue, S does not show a blue.

The first equilibrium seems natural: if S can demonstrate its quality, it should do so. The second seems to go against past formal models as well as common sense, where refusing to reveal whatever strength one has is interpreted in the worst way. If a policeman stops me, should I say that my license is in my pocket and to better convince him of this, I will decline to produce it? The countersignaling equilibrium reverses the normal logic (hence its name) and in fact it can be proven that when it is in effect if S showed a blue, its reputation and prestige would fall. Each observer can make this soliloquy, "I drew a blue. If S hadn't shown a blue to us I would have concluded that S was possibly red/blue, but more likely blue/blue. But S showed a blue, fully aware that this would not be news to me, so that must have been done for the sake of the other observer, who therefore must have drawn red. So S must be red/blue." Each observer concludes that S is red/blue, so S receives lower prestige and reputation than if it had not shown. The logic of countersignaling has S considering what each observer thinks about what the other thinks, so it involves considerations of prestige.[50]

A good formal theory should reflect some worldly phenomenon and countersignaling seems to occur. Suppose you are a politician with a good record, but are accused of corruption. You possess significant evidence that the charge is false. Should you present this publicly? Instead it is common to declare that the accusation "does not dignify a response." This can be

[49] Van Damme 2002.

[50] Orzach, Overgaard and Tauman (2002) reach a somewhat similar conclusion for a marketer choosing a restrained advertising campaign.

rationalized by the logic of countersignaling, since publicly presenting evidence implies to someone already on your side that the others have reasons to doubt you.

What is countersignaling not saying? It is not saying that a Strong subject has already impressed the audience, so a further show of quality is not worth the trouble. The subject pays no cost to show the blue, and the equilibrium would still be there even if S got a small positive payoff from doing that. Morgenthau warned against the "policy of bluff," which is seeking more prestige than one deserves, but that is not the point here either since a Strong subject who inappropriately shows a blue in violation of the equilibrium really is Strong, so is not bluffing. Perhaps the closest idea is Nicholson's "prestige through self-restraint," his example being Britain's policy of being generous to its colonies, relative to other European imperialist states.[51]

Those worried about proliferation would prefer that the countersignaling equilibrium be in place, since it involves less nuclear testing than the signaling equilibrium. A conjecture is that after World War II signaling prevailed, the assumption being that a technically advanced country would get these weapons, but after two decades the advanced countries used more forbearance than expected. If this was an equilibrium shift it may have been helped by the growing norm against nuclear use.[52] Relevant evidence would come from case studies examining the discourse of decision makers who chose not to go nuclear.

A crucial factor in determining which equilibrium holds is how a potential acquirer expects the international community to interpret why it built nuclear weapons, and this suggests certain measures to promote the countersignaling one. Through its speech and behavior the community can project that it is disposed to interpret acquisition in the worse way. During the 1960s anti-proliferation efforts were directed more to reducing positive motives, whereas recent approaches tend to involve deterrent threats and technological barriers, and some ways to promote countersignaling come from that period. A 1965 State Department telegram lamented that the phrase "nuclear power" referred only to weaponry, as if civilian reactors did not count. This usage promotes support simple signaling, since "powerful" countries are expected to acquire. The composition of the UN Security Council has also implicitly equated nuclear

[51] Nicholson 1937, 32.

[52] See Tannenwald 1999.

weapons with power, since for decades its five permanent members were just the five nuclear weapons states.[53] Adding non-nuclear states would help. How a country's diplomats are treated face-to-face may suggest which equilibrium is in effect. Underneath India's stated rationales for its tests, one finds a resentment of its lower diplomatic status.[54] Nuclear weapons should not be a condition of access or respect. Other anti-proliferation measures would involve promoting the expectation that manifestations other than weaponry prove one's technological skill. In the model's terms they would reduce the perceived evidentiary link between nuclear tests and overall technological development. A 1961 State Department memo proposed a covert campaign to promote the view that developing nuclear weapons is unimpressive.[55] US policymakers encouraged substitute programs to gain prestige, such as scientific exchanges and sponsorship of conferences on nuclear power for India,[56] and scientific help on space programs and the peaceful uses of nuclear energy.[57] For this purpose one document suggested encouraging Japan to build a nuclear-powered merchant fleet.[58] To counter Chinese prestige gains over India from its nuclear tests, the United States considered sending India secret intelligence so it could be the one to announce the details of a test.[59]

6. The strategic importance of prestige

Why does prestige matter? One answer is that it yields power, but this is a tautology, a consequence of the definition, so a better question is why power comes from second-order beliefs. There are two typical mechanisms. First, observers may be interested in the subject's quality and they look to others' beliefs about it rather than the direct evidence. This mechanism would arise when knowledge is diffused among many observers, as when students want to know

[53] Rostow 1964.

[54] Amitav Ghosh, *New Yorker*. 187-197, November 1998.

[55] McGhee 1961.

[56] Lavoy 1993.

[57] US Department of State 1965.

[58] US Department of State 1964.

[59] Lavoy 1997.

the quality of universities. They turn to media "rankings," which are, to a large extent, reports of others' views. A university will seek prestige, in that it will want the outside world to think that group holds it in high esteem. The second mechanism, which treats prestige as important in itself, involves bandwagoning.[60] Consider a situation with a few rivals and many other states that will choose one or the other to support, and suppose that each chooser wants to support someone with high quality but also wants to have many others on its side. It will consider both each rival's strength and others' opinions of that strength, so the rivals will seek prestige among the choosers. One can imagine students consulting rankings for a different reason than before, not looking for a university that is good per se, but one with a select group of fellow students. In this market universities will still want prestige.

The following scenario elaborates the second mechanism. The players are small states, and their choice is which of two large states to join. The issue could be bestowing their support on a matter before the Security Council or forming a military alliance. Each contributes its own strength to the group it joins and it benefits from that group's total strength. Compared to the previous scenarios the players are infinite in number and the quality varies continuously, but these differences are only to simplify the solution and similar results would arise with the earlier setup.[61]

> **Scenario 3.** The players are an infinity of small states with a total "strength" r divided equally among them. Two large states, S and T, have strengths s and t, respectively, but make no choices. The small states have common knowledge of the value of r and start with beliefs about s and t that follow identical independent normal distributions. The whole group then receives a public signal $y = s + u$ about state S's strength, and each small state i receives its own private signal $z_i = t + v_i$ about state T's strength, where u and v_i are "noise" sampled from normal distributions with mean zero, independent of

[60] Walt 1987.

[61] Normal distributions imply "negative strength." This seems odd but it can either be interpreted as burdening on one's partners or it can be made as negligible as desired by adding a constant to s and t.

each other and of the prior distributions. Each small state updates its probability distributions for strengths *s* and *t* and joins either state S or T. If it joins an alliance with greater strength than the other alliance, its payoff is 1, otherwise 0.

This is a *global game*, so-called because everyone has the same payoff function but no one is sure what it is and each has a different opinion about it.[62] The game has a symmetrical perfect Bayesian equilibrium, which for a range of parameter values is essentially unique in the sense that for a given player, the equilibrium assigns a unique move with probability 1 (Appendix). Each small state's equilibrium strategy involves going with S or T depending on whether its private signal about T is lower or higher than a certain cutoff value that depends on the public signal about S.

The point of the model is that a party with higher prestige may beat a party with higher reputation. In some cases T's signal induces a general belief that T is stronger than S, but most states join with S because they think that most of the others believe that S is stronger. For example, assuming that the small states' total strength *r* is .3, S's signal y is 1, T's strength t is 1.1 and that all variances are 1, it can be calculated that most states (56%) will believe that T is stronger. However their equilibrium cutoff will be 1.2, and since this is above T's average signal of 1.1, most (again 56%) will go with S. The mechanism behind the result is that players are trying to infer what each other believe and consequently will do. They are acting on the large states' prestige. The public nature of S's signal keeps its prestige equal to its reputation while T's private signals cause its prestige to regress toward the prior mean of 0, to its disadvantage.

The mechanism suggests why the past decades have seen less talk about prestige among policymakers as well as academics, but also why the idea might resurface. During the early Cold War the United States took the confrontation as an ideological battle between capitalism and communism. The competition was waged in Europe and the Third World, and was like vying for the sea of observers in Scenario 3. Policymakers were explicitly concerned with prestige, the CIA, for example, issuing a thick report on US prestige country by country.[63] When the

[62] See Carlsson and van Damme 1993, Morris and Shin 2004.

[63] US Central Intelligence Agency 1953.

situation solidified, with allies staying allies and neutrals staying neutrals, prestige became less relevant and the U.S. shifted to building forces to deter a surprise attack or an invasion of Europe, and providing aid to anti-communist governments and rebels. Since the Cold War ended the United States has continued a unilateralist approach, but with the world now more fluid, there are reasons to change and concern for prestige should increase. This post-Cold War pattern applies to other states. The end of Saddam's alliance with the Soviet Union would be expected to make prestige more strategically more important to him, with consequences as noted in the CIA report.

7. Symbols of prestige and symbolic precedents

This section deals with certain attributions of prestige that do not seem to fit comfortably with the account given so far. Morgenthau's discusses an example in which Napoleon forced Pope Pius VII into symbolic shows of deference by seeing to it that the pope walked across the dirt to his carriage and sat at his left on the ride to Paris.[64] A contemporary court official claimed that this set the pattern for their later interactions. The linking seems more based on symbolism than on evidence or beliefs about others' beliefs in evidence. In another example, in 1914 an Austrian government minister announced that if his country remained passive after the assassination at Sarajevo, its "prestige would come to an end."[65] The claim here is Austria will be treated poorly if it lets the precedent stand. In contrast to the examples so far, it is not that Austria will be treated poorly unless it ensures others' second-order belief in a certain quality. Trying to interpret the quality at issue here as Austrian "resolution" or "self-respect" will not work, since that begs the question of why the assassination would reasonably put those in doubt. Restraint shows irresolution only because other states will take it that way for this situation, and they take it that way because they expect others to take it that way. This kind of symbolic precedent arises in the proliferation context: a 1994 CIA analysis suggested that North Korea's

[64] Morgenthau 1948, 73.

[65] Quoted by Sylvan, Pugliese and Graff 1998.

leader Kim Jong Il was taking a hard line for the sake of a ”symbolic victory” over his country’s enemies.[66]

This section discusses two further ways to acquire prestige and shows their fit with definition. Both are based more on social conventions than on evidence or beliefs about others’ possession of it. Observers respond to the symbolism of quality even though it may have little inductive weight. However they may a good reason to do so. They hold a stronger belief in the party’s power because they have a common expectation that others will hold that too, and such a set of beliefs is self-consistent. Their common expectation is mediated by higher order knowledge of the symbolism based on the observers’ shared culture and experience.

The symbolic mechanism works in two ways: by symbolic precedents and by the possession of symbols of prestige. Both depend on a particular kind of symbolism, focal symbolism, whose operation is outlined first, then applied to the mechanisms.[67] In a bandwagoning situation, when potential supporters want to join the same side, coordination is helped by a *focal point*. This is an outcome that players believe to be more likely because of extra-game theoretic factors, in particular because of their beliefs about other players’ beliefs about these factors. Schelling’s noted example had two parties planning to meet in Manhattan but forgetting to arrange where. The focal point, determined by a survey of his colleagues, had both going to the clock in Grand Central Station.[68] This illustrates the definition’s conditions: it involves the extra-game theoretic factor of the clock, whose role is based on cultural experience rather than any feature of the abstract game, and it involves higher-order beliefs about the clock, since A does not expect B to go there from instinct but because B is considering what A would do, and vice versa.

A subtype of focal point is a *focal symbol.* The parties facing the game have higher-order knowledge of some event (the symbol) and commonly know that its occurrence symbolically evokes for them a larger class of events (its meaning), a class that includes the symbol as a member. The larger class in turn evokes the game’s outcome. The symbol connects to the

[66] Anonymous 1993.

[67] O’Neill 1999.

[68] 1960.

outcome through the focal point mechanism. The notion of the symbol "evoking" its meaning must be filled in, and this happens in two typical ways, by an analogy (where the symbol maps to the larger class), and by a prototype (the symbol being representative of the larger class). These correspond to precedents and symbols of prestige, respectively, as now described.

Symbolic precedents based on part/whole analogies

An example of symbolism by part/whole analogy (though not necessarily prestige) arose in April 2003 when a group in Baghdad publicly pulled over Saddam's statue and dragged it through the streets. The symbolic analogy was to his overall fall from power and toppling of stature was itself part of that fall. The wide publicity generated extensive knowledge of others' knowledge of the event, which helped solve a coordination game by emboldening Iraqis to oppose Saddam since they could be more confident that others would do the same.

Applying this mechanism to the context of prestige through symbolic precedent, the "part" is some specific precedent involving a party's power and the "whole" is the party's overall power in the group. The assassination at Sarajevo was symbolic in that it could be mapped into demeaning treatment of Austria and the Austria response mapped into its general foreign policy. The observers could understand the connection more readily since it used a typical pattern of the national leader, the archduke, mapping into his entire country.[69]

Symbols of prestige based on ideal prototype

The second mechanism involves symbols of prestige. These are almost always specific objects as opposed to events or activities.[70] A flagship airline or a large national sports stadium would qualify, but attending an international conference would not. They are typically

[69] A part/whole structure for analogies is not as common in general as a sideways structure, e.g., comparing electricity to water flow or the Iraq War to Vietnam, but is typical for symbolic precedents.

[70] The generalizations were validated using 156 occurrences of this phrase (or "prestige symbols", an expression common outside the United States) in the Major Newspapers section of the *Lexis-Nexis* database.

expensive or difficult to obtain. These are symbolic in the sense that they yield prestige by a part/whole relationship, and the linking of the part and the whole is by social convention rather than by evidence. One does not say that smoke from a gun "symbolizes" that it has been fired -- the smoke is *evidence* of that. An office with a thick carpet on the top floor is a symbol of prestige, but one could imagine a social rule where prestige came from hardwood floors on the bottom story. Symbols of prestige are often *ideals* for their larger class; they have its distinguishing properties to the greatest degree. Nuclear weapons fit the symbolism-by-ideal pattern: guns are much more prototypical as weapons, but the essence of weaponry is to destroy and nuclear weapons are at the extreme.

The quality required by the earlier definition seems to have dropped away in these examples, so one might conclude that symbolic prestige calls for a separate treatment. In fact, the quality is the party's power within the group, the very power produced by the group's higher-level knowledge of the symbolic event.[71]

The symbolic mechanisms for prestige seem to be almost as common as the earlier non-symbolic mechanisms ones. In the historical database very roughly 30% of the usages seemed to operate primarily through them and the same approximate rate came from surveying 100 US government documents attributing "prestige" in the computerized *Declassified Documents Index*. Many cases are hybrids, with both a general belief that others are evaluating evidence of a quality, as well as symbolism. An example of a hybrid was possessing air routes to one's colonies, since it combined the technological skill motif, plus the symbolic extending of one's power over territory.[72] Mountaineering, especially the British ascent of Mount Everest in 1953, was said to bear prestige and it operated by symbolic and non-symbolic mechanisms. As well as symbolically exploiting the control-of-territory analogy, it was seen as revealing evidence of the values by which Britain gained imperial power -- boldness, perseverance, and ability to gain the trust and cooperation of indigenous peoples. It was often called the "conquest" of Everest, and a

[71] Power is self-referential here, which may seem tricky, but there are many other examples of self-reference in concepts of social interaction, such as Boorstin's 1961 definition of a celebrity as someone "known for his well-knownness."

[72] Dierikx 1991.

London Times editorial associated it with Francis Drake's voyage in the *Golden Hind*.[73] Examples like these provide some grounded public evidence of a state's qualities but their symbolic nature gives them special weight in observers' estimates of how other observers are taking them.

8. Conclusions

The specific aim of the paper is to identify why nuclear weapons are attractive bearers of prestige and what can be done about that. A broader goal is to develop a conceptual system for prestige, so that any reasonably precise conceptual question about it will get a reasonably precise answer. The system has empirical implications in that it leads to a theory of when prestige is strategically useful and sought after, and how it is acquired. The theory's predictions can be tested systematically, either by coded data or case studies, but the best tests are not based on policymakers' use of the particular word or its cognates, since there is no guarantee that they use the words according to the meaning presented here. The criterion should be whether certain contexts lead to certain patterns of behavior. The major prediction applies to contexts where a state wants the support from others whose actions of support are strategic complements (in contrast to bipolar situations where the support of others is unimportant or to situations where supporters are not motivated to act together.) The prediction is that if a state appears mediocre in the quality relevant to the struggle, it will take actions that give evidence of the quality, possibly even actions with negative direct value. The actions will be those whose visibility is visible, ones that generate second-level knowledge, e.g., ones with clear boundaries of success as discussed in Section 4, or with symbolic precedents or holdings according to the principles of symbolism discussed in Section 7.

Beyond prestige, the analysis here has implications for theorizing about international relations. For one, it indicates that higher-order beliefs are important. The methodology used here to model these, global games, is a natural choice. The common alternative approach is usually termed asymmetric information since one player full knows its own payoff function or

[73] Hansen 1996, Stewart 1998, 170.

about some objective variable that determines it, but the other lacks that information. However, full knowledge, even of one's payoff function, is not a compelling claim.[74] Also the asymmetric information notion is a roundabout way of stating the parties' real problem: the conflict arises not because their opinions differ from the truth, but because they differ from each other. Global games focus more directly on the issue of what each believes about the other's beliefs by allowing especially simple representations of that. The emphases on beliefs about beliefs rather than on comparisons of beliefs with the objective facts, plus the social determination of equilibria, constitute an affinity of this analysis with constructivism. If the methods are different, the viewpoint is the same, that behavior flows from interacting social beliefs.[75]

[74] Iida (1993) and Koremenos (2005) discuss the common uncertainty assumption in such models.

[75] Johnson 1993, O'Neill 1999.

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Appendix.

Scenario 1, calculation of prestige and reputation

Let Q be the number of blue tokens in S's urn ("Q" for "quality"), so $2 - Q$ is the number of red tokens, where $Q = 0$, 1 or 2 with equal likelihood. The two observers' draws have four possible joint outcomes whose likelihoods depend on Q. Calculations for drawing two blues will show how to handle the other cases. Letting b_1 be the event that Observer 1 draws blue, Bayes' formula gives Observer 1's updated probabilities:
$Pr(Q = 2|b_1) = Pr(b_1|Q = 2)\ Pr(Q = 2)/Pr(b_1)$
$= Pr(b_1|Q = 2)Pr(Q = 2)/[Pr(b_1|Q = 2)\ Pr(Q = 2) + Pr(b_1|Q = 1)Pr(Q = 1)]$
$= 1\ (1/3)/[1\ (1/3) + 1/2\ (1/3)] = 2/3,$
and so $Pr(Q = 1|b_1) = 1/3$.
After both draw blues, both estimate Q at 1 (1/3) + 2 (2/3) + = 1.667, so that is S's reputation.

To calculate S's prestige, note that observer 1 knows that 2's estimate is either 1.667 or .333, and so knows that S's reputation is either (1.667 + 1.667)/2 = 1.667 or (1.667 + .333)/2 = 1. These possibilities are weighted by 1's respective probabilities for b_2 and r_2:
$Pr(b_2|b_1) = Pr(b_2|Q = 2\ \&\ b_1)\ Pr(Q = 2|\ b_1) + Pr(b_2|Q = 1\ \&\ b_1)\ Pr(Q = 1|b_1) =$
$1\ (2/3) + 1/2\ (1/3) = 5/6,$
and $Pr(r_2|b_1) = 1/6$.
Thus both observers' estimate of S's reputation, and thus prestige, is (5/6) 1.667 + (1/6) 1 = 1.555.

Scenario 2, derivation of the equilibria

The solution of Scenario 2 will be detailed for S maximizing reputation. Calculations for maximizing prestige are parallel so are only outlined. The O's have no moves, but the perfect Bayesian equilibrium concept can still be applied, strictly following its definition, since all players think strategically about what the other is thinking.

An equilibrium takes the form of a strategy and set of beliefs for S, and sets of beliefs for the O's. The equilibria are determined by constructing a table whose rows are S's possible moves, calculating the payoff of each row and eliminating rows that are suboptimal choices. The subject has essentially 16 pure strategies as shown in Table 2. The observers'

draws are abbreviated "r,r", etc., (in contrast to the urn's contents, which elsewhere are written "rr", etc.) After observing the draws, S will be at one of the information sets in the headings of columns I to VI, and at each with probabilities as shown. The subject S chooses between s and n conditional on its information set, and S's strategies are the 24 assignments of "s" or "n" to the six information sets. (Note that S has no choice with zero blues, and only equilibria will be sought where S makes the same move after draw pairs r,b or b,r, i.e., S treats the opinions of the two observers equally.) Strategy E, for example, tells S to always show, except when it has no blues or has one blue and both drew red.

TABLE 2 HERE

To evaluate a strategy, S considers its influence on each O's estimate. An O will be at an information set defined by its draw and its observation of S's move. The last four columns show the possible information sets, r:n, r:s, b:n, b:s, labeling them 1 to 4. The O's consequent estimate of the number of blues appears in the cells underneath. In B3, for example, the O drew a blue and saw that S did not show a blue, so deduces that S is at either 1:b,r or 2:b,b. Since these information sets have prior probability weights 1/12 and 1/3, the estimate is (1/12 x 1 + 1/3 x 2)/(1/12 + 1/3) = 1.80 blues. When an information set cannot be reached in equilibrium - when O knows S has a blue and is supposed to show it, but S does not – O cannot use Bayesian updating and an indeterminate estimate x appears.

The cells in columns I to VI show the average of the O's estimates, S's payoffs. In AIII, for example, after draws r and b and move n, the O's will be at information sets 1 and 3 (r:n and b:n) respectively. Their estimates, in A1 and A3, are 1/3 and 1, so S's receives .667. At every S-information set, S will maximize this average, so if at any cell S could do better by switching, the strategy is not part of an equilibrium. Strategies A, B, C and E are suboptimal and the suboptimal cells are asterisked. For example at CIII S chooses n, the O's information sets are 1 and 3, and based on C1 and C3, S receives .60. Had S shown, the O's would have been at 2 and 4 and cells C2 and C4 indicate that S would receive an average estimate 1.50, so C is not part of an equilibrium

Of the sixteen rows in the full table, only D and F survive. The first is countersignaling and the second is simple signaling. The simple signaling is an equilibrium

only for certain values of x; S must be willing to show its blue at 1:bb and 2:bb, which implies that $x \leq 5/3$. Therefore S must believe that an O will judge that its off-the-path s move was sufficiently more likely to have come from a 1-blue S than a 2-blue S.

This treats the reputation-seeking case. For prestige, the entries in columns 1 to 4 are modified. Cell EV, for example, becomes 1.555, based on calculations like those given at the start of this appendix, but the subsequent elimination is identical. For this game's parameters the same pair of equilibria arise.

Scenario 3, derivation of the equilibrium

The players, the small states, are represented by the points in $[0,\ 1]$. All receive the public signal $y = s + u$, where s is S's strength and u is distributed $N[0,\ \sigma_S]$. Each player i receives a private signal $z_i = t + v_i$ where t is T's strength and v_i is distributed $N[0,\ \sigma_T]$, with s, t, u and all v_i mutually independent. Players in a stronger alliance receive 1, otherwise 0. The theorem shows that the game has a symmetrical equilibrium in pure strategies, and if the private signals about T are precise enough relative to the prior uncertainty about T and the total strength of the small players is large enough, then an equilibrium is "essentially unique," in the sense that moves in the different equilibria differ only when a player's signal takes a certain precise value, which has probability zero for any player. (In this case we will loosely speak of "the equilibrium" of the game.) Further arguments of the kind used by Morris and Shin (2003, 2004) show that when the equilibrium is essentially unique, it follows from the iterated elimination of dominated strategies and there are no assymetrical equilibria.

Theorem: After the signals S holds reputation and prestige both $y\ (1 + \sigma_S^2)^{-1}$, and T's values are $t(1 + \sigma_T^2)^{-1}$ and $t\ (1 + \sigma_T^2)^{-2}$. The game possesses pure strategy and symmetrical Nash equilibria, and iff $r\ \sigma_T \leq \sqrt{\pi/2}\ \sim\ 1.25$ all are consistent with a cutoff function $c^*(y)$ such that player i chooses S if $z_i < c^*(y)$ and chooses T if $z_i > c^*(y)$. Under this condition if a player holds the same post-signal distribution for S and T's strength and the mean of the distribution is positive, then the player chooses S.

Proof: The proof roughly follows Morris and Shin (2004). The standard normal density

and distribution are designated $\phi(\cdot)$ and $\Phi(\cdot)$ and a distribution's precision $\alpha = 1/\sigma^2$ is used instead of its variance. The public signal y produces an estimate for s of $y\prime = y\ \alpha_S/(\alpha_S + 1)$, by Bayes' formula. Since $y\prime$ is commonly known, it is both S's reputation and prestige. To calculate T's values, note that any player whose private signal about T is exactly the average, i.e., who receives $z = t$, estimates T's strength at $t\ \rho$, where $\rho = \alpha_T/(\alpha_T + 1)$. Such a player then estimates others' signals at $t\ \rho$, and so estimates others' estimates at $t\ \rho^2$. Since the expectation of an average is the average of the expectations, these values are T's reputation and prestige, as the theorem states.

The value $y\prime$ is sufficient information about s for the players' decisions, so in their reasoning following the public signal it can be taken as riskless. Although the cutoff $c^*$is a function of y in the full game, given y, it will be treated as a number. A given private signal z alters that player's distribution for t from $\Phi(t)$ to

$$\Phi\left[\sqrt{\alpha_T}(t\ -\ \rho z)\right] \tag{1}$$

Assuming that all players use some common cutoff c, the proportion joining S is the probability that $v \leq\ c\ -\ t$, which is $\Phi\left[\sqrt{\alpha_T}(c-t)\right]$. Define $t(c)$ as the value of t for which the small players split into equal parts (the function understood as defined only when that value is unique.) It is the value that solves:

$$y\prime\ +\ r\ \Phi[\sqrt{\alpha_T}(c-t)] = t + r\ [1 - \Phi(\sqrt{\alpha_T}(c-t))],$$

which is equivalent to

$$c = t +\ \Phi^{-1}\left(\frac{t\ +\ r\ -\ y'}{2r}\right)\sqrt{\alpha_T}. \tag{2}$$

For $t \in [y\prime - r,\ y\prime + r]$, the right side goes continuously and monotonically from $+\infty$ to $-\infty$, implying that $t(c)$ is defined for any c.

At an equilibrium cutoff c^* a player whose signal is exactly c^* holds the same

expectation for either choice. Letting $t^* = t(c^*)$, by (1),

$$Pr[t < t^* |\ z = c^*] = \Phi[\sqrt{\alpha_T}\ (t^* - \rho c^*)]\ =\ 1/2. \tag{3}$$

(Note that (2) and (3) follow from different arguments: the former involves the true t and the latter is a player's expectations.) From (3),

$$t^* - \rho c^* = 0. \tag{4}$$

Substituting (2) in (4) yields

$$t^* - \sqrt{\alpha_T}\ \Phi^{-1}\left(\frac{t^*\ +\ r\ -\ y'}{2r}\right) = 0. \tag{5}$$

As t^* increases over its range, the left side goes continuously from $+\infty$ to $-\infty$, so (5) has a solution and (2) gives a corresponding equilibrium signal threshold c^*. This establishes the equilibrium existence claim.

Differentiating the left side of (5) with respect to $t*$,

$$1 -\ \sqrt{\alpha_T}\ \left[2r\ \phi\ \Phi^{-1}\left(\tfrac{t^*\ +\ r\ -\ y'}{2r}\right)\right]^{-1}.$$

Since ϕ has unique maximum $1/\sqrt{2\pi}$, iff $r\ \sigma_T\ \leq \sqrt{\pi/2}$ this derivative is negative for all t^* except possibly zero at a single point. Therefore (5) is monotonically decreasing with t^* and the inequality guarantees a unique equilibrium. (Conversely if the inequality does not hold, for some values of y there are multiple equilibria.)

Finally, an argument similar to the one leading to (4) shows that for other players using an equilibrium c^*, a sufficient condition for a player choosing T is that $\rho z > t^*$, or, following the derivation of (5), that

$$\rho z - \sqrt{\alpha_T}\ \Phi^{-1}\left(\frac{\rho z\ +\ r\ -\ y'}{2r}\right) > 0. \tag{6}$$

The assumption of equal distributions implies $\rho z = y'$, and with (6) this yields the equivalent condition $z > 0$. Since the player's mean for t was assumed to be positive, the player will choose S. $\square$

Columns: S's info sets and their prior likelihoods

Cells: S's move (n or s), each O's consequent info sets (1 to 4), and their average estimate of Q.

Columns: an O's info set

Cells: the O's consequent estimate of Q

	I 0:r,r 4/12	II 1:r,r 1/12	III 1:r,b 1/12	IV 1:b,r 1/12	V 1:b,b 1/12	VI 2:b,b 4/12	1 r:n	2 r:s	3 b:n	4 b:s
A	n,11 .33	n,11 .33*	n,13 1	n,31 1	n,33 1.67	n,33 1.67	.33	1	1.67	y
B	n,11 .33	n,11 .33*	n,13 .67*	n,31 .67*	n,33 1*	s,44 2	.33	1	1	2
C	n,11 .33	n,11 .33*	n,13 1.07	n,31 1.07	s,44 1*	n,33 1.80	.33	1	1.80	1
D	n,11 .20	n,11 .20*	s,24 1	s,42 1	n,33 1.80	n,33 1.80	.20	1	1.80	1
E	n,11 .20	s,22 1	n,13 .93*	n,31 .93*	n,33 1.67	n,33 1.67	.20	1	1.67	y
F	n,11 .33	n,11 .33*	n,13 .67	n,31 .67	s,44 1.80	s,44 1.80	.33	1	1	1.80
G	n,11 .20	n,11 .20*	s,24 1.40	s,42 1.40	n,33 1*	s,44 1.80	.20	1	1	1.80
H	n,11 .20	s,22 1	n,13 .60*	n,31 .60*	n,33 1*	s,44 2	.20	1	1	2
I	n,11 .20	n,11 .20*	s,24 1*	s,42 1*	s,44 1*	n,33 2	.20	1	2	1
J	n,11 .20	s,22 1	n,13 1	n,31 1	s,44 1*	n,33 1.80	.20	1	1.80	1
K	n,11 0	s,22 1	s,24 1	s,42 1	n,33 1.80	n,33 1.80	0	1	1.80	1
L	n,11 .20	n,11 .20*	s,24 1.33	s,42 1.33	s,44 1.67	s,44 1.67	.20	1	x	1.67
M	n,11 .20	s,22 1	n,13 .60*	n,31 .60*	s,44 1.80	s,44 1.80	.20	1	1	1.80
N	n,11 0	s,22 1	s,24 1.40	s,42 1.40	n,33 1*	s,44 1.80	0	1	1	1.80
O	n,11 0	s,22 1	s,24 1	s,42 1	s,44 1*	n,33 2	0	1	2	1
P	n,11 0	s,22 1	s,24 1.33	s,42 1.33	s,44 1.67	s,44 1.67	0	1	x	1.67

Table 2. S's sixteen strategies. An asterisk marks a suboptimal payoff in the row, and the K and P rows represent equilibria.