

Emerging Technologies, Prestige Motivations and the Dynamics of International Competition

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Abstract: The study of international races has focused almost exclusively on security motivations for competitive arming. But international races may also be motivated by prestige. This article defines a “prestige race” and outlines the significant ways in which prestige motivates can shape state spending and drive dynamics that can deviate from those described in the traditional arms race literature. Races motivated by prestige can differ in the material objects states invest in, when they are most likely to occur and which states becomes involved. The article illustrates these dynamics in the important case of the Space Race between the United States and Soviet Union beginning in 1957. Often erroneously understood by political scientists as an extension of traditional security competition during the Cold War, the Space Race instead offers an ideal case for the study of how prestige affects the dynamics of international competition, dynamics which have important implications for our understanding of the rapidly emerging competitive environment of today. Understanding why US leaders chose to respond to Sputnik in the ways they did, for instance, can provide insight into the options likely to confront policymakers in contemporary contexts.

Why do states condition investments in their capabilities on the investments of others? Existing answers to this question focus almost exclusively on security rationales: rivals seek to match or surpass the increasing capabilities of others to avoid losing relative power and falling prey to aggression. This focus on defense and deterrence as motivation for arms races has, however, ignored an important motivation for race behavior: prestige. Like security races, prestige races involve at least one state conditioning investment decisions on the investment decisions of others. Unlike security races, which involve the quest for military parity or superiority as a means of defense, prestige races are aimed at shaping perceptions of superiority

in the eyes of others.

Scholars have long accepted prestige as a primary driver of state behavior.¹ Recent work has outlined the conditions under which concerns about prestige and status are most likely to affect international affairs, pointing to whether a state is granted the recognition it desires within its relevant status community and to whether the state performs on the world stage as would be expected of a state of its status.² But these explanations fail to account for how the prestige-seeking acts of one state raise the salience of prestige for others. Prestige-seeking acts do not occur in a vacuum. They can have broad systemic effects and, under the conditions defined below, can give rise to prestige races in which states feel pressed to engage in prestige-seeking acts they likely would not have otherwise.

This article examines the onset, dynamics and implications of such races. It argues that the conflation between security-motivated and prestige-motivated races in the existing literature has obscured key distinctions in the competitive behavior of states. These distinctions derive in large part from the prioritization of appearance over material reality in the pursuit of prestige and they relate to the object of competition, the conditions under which races are likely to emerge and the particular states who are likely to become involved. To demonstrate these dynamics, the article examines US space policy between 1957 and 1962. Historians of the “Space Race” widely agree that prestige drove Soviet space policy and pushed US policymakers to invest over 4% of the US federal budget on space and technology at its height.³

¹See, e.g., Gilpin (1981); Morgenthau et al. (1955).

²See, e.g., Gilady (2018); Mercer (2017); Larson and Shevchenko (2010); Renshon (2017); O’Neill (2006); Dafoe et al. (2014); Lebow (2010); Barnhart (2020); Ward (2017).

³Budget figures are available at: <https://www.govinfo.gov/content/pkg/BUDGET-2016-TAB/pdf/BUDGET-2016-TAB.pdf>. The defense budget in 1965 was, in comparison, 43.3% of the

But they have left the dynamics of this important case – and what they might mean for our understanding of material competition more broadly – largely unexplored. Detailed examination of the Cold War Space Race highlights limitations of the standard arms race model for understanding international race behavior.

The theoretical framework presented in this article has significant contemporary implications. Following a period of relative post-Cold War calm, contemporary signs of new international competitions abound. There are signs, for instance, of a new global arms races between the US and Russia, a new space race in East Asia and an emerging race over artificial intelligence between the US and China.⁴ Analysts have gone so far as to declare competition over AI to be the “space race” of the future.⁵ But what do such comparisons mean? And what are the implications of such comparisons for the trajectory of future technological development? A deeper assessment of the dynamics of the Space Race within the context of the theoretical framework of prestige races provides answers to these important questions. In an era of increasing international competition, understanding the potential trajectories of international races and how policymakers might shape them is of pressing political importance.

Identifying the unique features of prestige races also contributes more broadly to our understanding of two important international phenomena.⁶ First, it adds significant complexity

federal budget. On prestige motivations in US policy, see in particular Mieczkowski (2013); Erickson (2005) as well as McDougall (1985); Haefele (2001); Muir-Harmony (2020); Divine and Divine (1993). On prestige and Soviet space policy, see Siddiqi (2000a). Musgrave and Nexon (2018) discuss the Apollo program as an attempt to shore up social hierarchy, but does not discuss such investments in terms of a race.

⁴See Roff (2019) on the inapplicability of this framing.

⁵Singh, Katyani, “AI and the Space Race,” Medium, April 3, 2020. Bershidsky, Leonid, “AI Competition is the New Space Race,” Bloomberg Opinion, December 28, 2018. Allen, John R. and Amir Husain, “The Next Space Race is Artificial Intelligence,” Foreign Policy, November 11, 2017. The director at the China Development Institute agreed, declaring that a new “space race” was forming.

⁶The term ‘prestige race’ may have first been used by Mieczkowski (2013, p. 6) to describe the space race.

to our understanding of why states race and the decisions they make when engaged in international competition. It argues that security-motivated races should be understood as a subset of ‘international races’ which are defined as action-reaction phenomena involving two or more states who base significant improvements or increases in their capabilities on the past, current and future increases of others. The article identifies four primary characteristics of that distinguish international races: their primary motivation, the features of the capabilities states pursue, the conditions under which races are most likely to emerge and the types of states likely to become involved.

Second, parsing the defining features of prestige races sheds greater light on how symbols of status evolve and when status concerns motivate state behavior. Scholars have clearly established that a desire for prestige can motivate the acquisition of material goods which symbolize high status, such as nuclear weapons, aircraft carriers and space programs.⁷ But we know little about when prestige-driven acquisition motivates similar behaviors in others, giving rise to race dynamics.

The article proceeds by describing the traditional features of arms races as laid out in the existing literature, focusing on the material objects pursued in such races, the conditions under which they are most likely to occur and, finally, who becomes involved and when. The paper then defines “prestige races” and the ways in which they are alike and the many ways in which they differ from races motivated by spiral and security dilemma logics. It outlines four specific propositions that are then illustrated through a detailed analysis of defining points of American space policy between 1957 and 1962. Due to limitations of space, the article does

⁷E.g. Sagan (1996); O’Neill (2006); Murray (2010); Kinsella and Chima; Gilady (2018).

not provide an examination of Soviet motivations and investments.⁸ The article concludes by discussing the implications of these dynamics on how we understand contemporary investments in artificial intelligence and other emerging technologies, laying out policy possible trajectories and describing potential policy interventions.

Security-Motivated Arms Races

Though an arms race is notoriously difficult to define, the prevailing and classical definition is an action-reaction models in which states arm in response to the arming of rivals in order to defend against and deter aggressive behavior in a threatening anarchic world.⁹ This definition is identical to that of an international race, defined above, but is constrained in two important ways: first, it limits race behavior to states within an adversarial relationships. Second, it limits the domain of investment in the race to projects that promise military and strategic advantage.¹⁰ As Glaser (2000) notes, the logic of external threat at the heart of these models is consistent with the security dilemma, the spiral model and theories of structural realism. The goal of such conditional improvements may be parity with or superiority over another state.¹¹

Existing research on arming has pointed to numerous factors that affect which material capabilities nations pursue, including domestic political considerations, military and industrial

⁸For the Soviet side, see Siddiqi (2000a).

⁹See. eg., Gray (1971, p. 40). Also Buzan et al. (1998); Huntington (1958); Morgenthau et al. (1985); Rathjens (1969); Sample (1997). Glaser (2000) acknowledges greed as another important external driver of competitive arming.

¹⁰Glaser (2000). See Buzan et al. (1998, p. 75-79) for a discussion. cf Rider (2017).

¹¹Some definitions of arms races necessitate a desire for superiority (Schwarz and Hadik (1966) and Hammond (1993)) while others do not (Gibler et al. (2005); Gray (1971); Buzan et al. (1998)). See e.g. Evangelista (1988); Gray (1973); Buzan et al. (1998) and Glaser (2000) on how internal factors like domestic political incentives can push states to arm in suboptimal ways.

interest groups, the technological and economic capacity of the state and whether or not the weapon appears as offensive or defensive to others.¹² But when arming decisions are made in the context of a traditional arms race, the parameters of optimal investments logically narrow to include weapons that promise to balance or counteract rivals' strategic and military developments. A rival's new weapons create novel weaknesses that must then be defended against. ABM technology, for instance, threatens to undermine strategic balance and mutually assured destruction, giving rise to the need to devise weapons with the ability to penetrate such shields. Hypersonic weapons could be one approach to the strategic challenge presented by ABM capabilities; but hypersonic weapons would make far less sense in a non-ABM world.

States may not know with great accuracy which investments will provide the greatest relative advantage, given the abilities of the other side, but they should at least choose investments they believe capable of providing military advantage given a rival's capabilities. In some cases, such investments may be aimed at increasing the quantity of weapons, as is typically the case in conventional arms races and was often the case of delivery mechanisms and nuclear warheads during the Cold War. In other cases, states may aim at making qualitative advances which leapfrog or cancel out the abilities of others. Sophisticated satellite systems may, for instance, give rise to more advanced satellite systems or to novel anti-satellite technologies aimed at eradicating a rival's advantage.¹³

Regarding when exactly security-motivated races are most likely to emerge and the timing of state responses, the standard security dilemma model often used to depict race logic predicts

¹²See Evangelista (1988).

¹³Uncertainty over the potential capabilities of others can lead to overcorrection and large jumps. See Rathjens (1969).

races will emerge when either state within a dyad invests or plans to invest in improvements to its capabilities in order to bolster its security. States that view this investment as threatening are expected to respond rapidly with investments in their own capabilities in order to minimize the magnitude and longevity of vulnerability created by the shift in relative power. The more intense the shared perception of threat, the quicker the timing of responses.¹⁴ But most arms race models do not conceive of all states' arming as equally threatening. In his canonical definition, Gray (1971, p. 40) defines an arms race as between two or more parties in an "adversary relationship."¹⁵ Kennedy (1983, p. 174) perceives of arms races as mere reflections of preexisting and unresolvable political differences. Rivalry may be more common between states of equal or near equal military capabilities, but these models suggest that need not be the case, as the number of adversarial relationships between contiguous states with dramatically different capabilities suggests.¹⁶ An arms race within one rivalry can have repercussions throughout the international system as it triggers arming by their rivals which triggers investment by their rivals and so on.

In short, prominent models of security-motivated races suggest that races will emerge when either state within a rivalry, defined by ongoing political difference and antagonism, invests to expand their capabilities either quantitatively or qualitatively. The rival will then act quickly to minimize vulnerabilities posed by this arming by investing in capabilities which best promise to shore up novel military or strategic weaknesses. As the next section shows,

¹⁴Buzan et al. (1998, p. 95). Measuring the timing of races can be difficult since states are often responding to what they believe rivals will do in the future and not what they have already done.

¹⁵See also Buzan et al. (1998, p. 78 - 80) and Rider et al. (2011); Hammond (1993).

¹⁶See, e.g., Goertz and Diehl (1993); Huth (1996); Rasler and Thompson (2006); Tir and Diehl (2002). See Rider (2009).

prestige races can deviate from these dynamics in observable and meaningful ways.

Prestige Races

In addition to security concerns, competitive material investment may also be motivated by a desire for prestige.¹⁷ The unique characteristics of races in which prestige plays a primary role have been ignored. This section begins by describing prestige as a distinct motivation and then outlining the key dynamics and characteristics of prestige races.

Prestige exists at the level of second-order beliefs, or beliefs about others' beliefs.¹⁸ A state has prestige if everyone thinks that everyone thinks that the state possesses an admired quality. This implies that one need not actually possess the quality as long as others believe that others believe they do. Like status, international prestige is positional, hierarchical and zero-sum.¹⁹ The more actors who possess a given trait, the less likely the trait is to be considered prestigious. But status is associated with a social role related to rank while prestige relates to specific characteristics or traits.²⁰

Why would states bother to compete for prestige? First, self-identification as a member of a prestigious nation confers psychological benefits.²¹ A decline in the admiration shown to one's state can engender a decline in collective esteem and confidence, presenting an uncomfortable challenge to the self-image of the group and those who identify as its members.²²

¹⁷See Gray (1973, p. 215). Buzan et al. (1998) cites the acquisition of goods for "symbolic" reasons.

¹⁸See O'Neill (2006).

¹⁹Gilady (2018, p. 8).

²⁰Dafoe et al. (2014) argues that in weakly institutionalized settings, higher status is more likely ascribed to actors with greater prestige, but in strongly institutionalized settings, high status may be ascribed to those that rank lower on the possession of certain positive traits.

²¹Tajfel and Turner (1979).

²²Experimental evidence shows that individuals will pay costs for status. See Huberman et al. (2004); Pettit et al. (2010).

An increase in prestige can in turn be accompanied by the increase in collective esteem which accompanies a sense of superiority over other less admirable groups. Second, states may value the increased international influence bestowed upon prestigious states.²³ With influence comes the ability to shape international structures and outcomes in ways that provide increased access to strategic and material benefits. But prestige is not the same as power. Prestige implies communal approbation whereas power is not inherently social.²⁴

What then does it mean to “race” for prestige? Give the instrumental and psychological benefits of prestige, wouldn’t states seek prestige at all times? Existing work has outlined two primary conditions under which state behavior is most likely driven by prestige concerns: 1) when large gaps arise between the prestige or status states believe they should have and the amount conferred by their relevant community and 2) when the state’s rightful claim to status is undermined by its failure to perform as would be expected on the international stage.²⁵ But this list is clearly not exhaustive. Because status and prestige are zero-sum, one state’s novel admirable achievements can threaten the prestige of others and call their preeminence into question.²⁶ Under some conditions, outlined below, they will cause others to pursue prestigious achievements of their own in the hope of avoiding the material and / or psychological costs of lowered prestige. Superior capabilities may not necessarily be the goal of security-motivated arms races since deterrence and security may be achieved through

²³Dafoe et al. (2014) and Gilady (2018, p. 9).

²⁴Gilady (2018, p. 7). “Soft power” is, in contrast to military power, social; those with prestige arguably possess soft power. See Nye (1990).

²⁵See, e.g., Renshon (2017); Wallace (1971); Volgy et al. (2014); Ward (2017); Barnhart (2020).

²⁶Status can also be a club good, as illustrated by the club of nuclear powers, etc. Adding members to the club would marginally diminish individual status. See Lake (2011).

parity. But the maintenance of the perception of superiority is usually a goal in prestige races, at least for the preeminent state.

The Characteristics of Investments:

One of the primary points of distinction between security and prestige-motivated races relates to key differences in the features of material objects that racing states pursue. First, while security-motivated states seek investments that shore up military and strategic weaknesses, states involved in prestige races seek to persuade others of their distinctive capabilities along certain admirable dimensions. To achieve this goal, the objects they invest in must convey exclusivity.²⁷ The more easily others are able to achieve the same goal, the less prestige the achievement garners. While exclusivity may be valuable within a security-motivated race, it is not necessary to bolstering security.

Second, security-motivated races tend to exist along the dimension of military capacity. Prestige races, however, can arise along a broader number of dimensions.²⁸ Exceptional military strength has long been considered a basis of international prestige, largely because of what it signals about the unique skills of the state. The possession of a large standing army, for instance, long signaled exceptional economic and organizational capacity. The possession of nuclear arsenals and blue-water navies symbolizes a state's significant economic and organizational resources but also its distinctive technological capacity, all of which are thought to be worthy of admiration within contemporary international affairs. But achievements need not actually contribute to the overall power of the state in order to garner prestige. Techno-

²⁷As Gilady (2018) argues, exclusivity is a material measure of hierarchy.

²⁸O'Neill (2006).

logical achievements with zero military implications can, for instance, symbolize modernity and dynamism, both also highly admired traits in most eras.²⁹

Claims of preeminence can, therefore, reside in different types of exclusive accomplishments. Preeminence may be achieved through demonstrations that one is able to do something *first*.³⁰ Such is the case with technological innovation where second-place comes with few rewards for those who seek leadership positions.³¹ Preeminence and exclusivity may also be achieved by acquiring the *most* or *best* of some good or capacity that the international community already views as prestigious. Standing armies garner prestige only to the extent that they outsize all others. By the end of the 19th century, many states could claim to possess colonies abroad. But only ‘World States’ like Britain and France which had amassed continent-spanning empires, could make a rightful claim to international preeminence. Similarly, the Soviet Union and United States were mindful that perceptions of international preeminence were dependent in part of the relative size of nuclear arsenals in the 1960s and 70s.³²

Third, the ability of an achievement to draw attention is essential to the investments made in prestige races.³³ While an extremely admirable and exclusive achievement might bolster security even if kept secret, it would not garner the state prestige. Only achievements with the potential to shape second-order beliefs can affect prestige.³⁴ The more dramatic

²⁹See Gilady (2018) on other admirable traits. The nature of admirable traits may change over time as norms of how it is best for states to behave evolve. Acceptable symbols of admirable traits may also change, as was the case with imperialism in the post-World War II era.

³⁰Schweller (1999).

³¹For a high-status state to recreate the prestigious innovation of a lower-status state might serve to undermine its preeminence if it appears as a late-comer only capable of following others’ innovations.

³²Barnhart (2020).

³³Gilady (2018) emphasized the importance of conspicuousness, which symbolizes distinctive economic capacity. Also Musgrave and Nexon (2018).

³⁴See O’Neill (2006), which describes the utility of sudden, simultaneous awareness for the development of

the event, the more likely it is to garner widespread attention and generate the perception that everyone knows that everyone else knows that they have all witnessed an admirable and exclusive achievement worthy of prestige.

Finally, while there is little need for non-experts to comprehend the nature of achievements in security-motivated arms races, it is important for a prestige-seeking act to be easily understood by non-experts as symbolizing an admirable trait if it is to foster a shared perception of preeminence.³⁵ Highly technical, arcane achievements, even if representing the height of capability and sophistication, are unlikely to alter perceptions of preeminence if they do not have a shared meaning to provide a basis for understandings of relative capability. Expert reaction to and interpretation of an achievement may provide some basis for common knowledge, but the more readily individuals are able to assign a meaning of their own to an event, the more firmly established second-order beliefs about preeminence are likely to be.

In short, states involved in prestige races seek to demonstrate distinctiveness along a broader array of dimensions of international behavior, beyond those that contribute to military capacity. They aim to demonstrate exceptional skills either by being first at a dramatic, highly visible and easily understood technological achievement or by acquiring the best or most of some highly visible existing symbol of international prestige. States racing for preeminence may not have free rein in deciding how they will respond to the prestigious achievements of others. As we will see below, the first mover's investment tends to establish the particular skill over which the race for leadership will be conducted. But states may have significant

common knowledge.

³⁵O'Neill (2001, p. 241).

choice in how specifically they decide to demonstrate their leadership, along as the chosen achievement holds shared meaning within the international community and promises to draw high levels of international attention.

The Onset, Timing and Participants of Prestige Races

Security-motivated races arise when a state is perceived to make a military advance and threatened rivals respond quickly in order to minimize vulnerability and avoid falling further behind. Prestige races arise, however, under somewhat more restrictive conditions, beginning when a state engages in a high-profile demonstration of distinctive capacity along a particularly admirable dimension. The prestige-worthy accomplishment may be motivated by a desire for prestige or could also arise as a result of domestic political pressures or the natural progression of scientific progress.

Not all prestigious accomplishments, however, set off races for prestige. The emergence of prestige races is then best understood by again considering prestige as an objective. States are competing for achievements that convince others and themselves that they deserve greater prestige than the state they are competing with. But only states with proximate positions on the status hierarchy can reasonably compete for preeminence.³⁶ A prestige race is, in other words, unlikely to arise between states of vastly different rank, even if the lower state can demonstrate distinctive capacity along one admirable dimension, because the achievement is unlikely to alter broader perceptions of international leadership. Status communities assign rank within the hierarchy based loosely on composite prestige along multiple dimensions. But the distances between rungs on the status hierarchy are rarely uniform. Significant

³⁶Preeminence can be understood as leadership within a relevant status community. Renshon (2017).

distance might exist between two states at nearby rungs, eradicating ambiguity about who can rightfully claim leadership, or states may be clustered closely together if they accumulate near-equal shares of admirable traits, heightening status ambiguity. As Wohlforth (2009) notes, because rank within the international status hierarchy is partially dependent upon material conditions, such status ambiguity is most likely to arise when states are evenly matched in material capabilities.³⁷ This form of ‘status rivalry’ is distinct from standard notions of rivalry defined by mistrust and apprehension which can exist between states at dramatically different rungs on the status ladder, as rivalries between Pakistan and India or the United States and Iran suggest.

Prestige races are triggered, therefore, when a leading state views a prestigious accomplishment as a genuine challenge to its overall rank. This perception is heightened if the leading state views the accomplishment to have been made along a dimension in which its claims to leadership are thought to be based and if the two states possess many of the same admirable attributes, including material symbols of status. Prestigious accomplishments by a leading state may spark imitative behavior by lower status states who seek not to fall behind in their own relative status, but the investments made in imitation are unlikely to set off further reaction by the leading state unless they convey superiority.

This framework suggests that, though we would expect states to respond rapidly to potential or actual investments in security by rivals, we should expect preeminent states to favor

³⁷p. 38. Prestige races are different from Wohlforth’s concept of “status dilemmas” in that while uncertainty drives both security and status dilemmas, uncertainty over who can claim higher prestige might diminish the likelihood of prestige races. Certainty that one’s prestige has been diminished can lead to the highest levels of investment in prestige.

the status quo and to be disinclined to invest in their prestige if not forced to by a legitimate challenger. Prestigious achievements can be costly and can come at the expense of strategic and material interests. A sense of reluctance will often define a leading state's attitude until the threat to rank seems real. This often means that by the time that the leading state decides to compete, it is confronting a threat to its existence as the preeminent power, leading to excessive amounts of investment aimed at shoring up its status in the eyes of others and protecting self-conception as a preeminent state.³⁸

Exacerbating Conditions

While the primary conditions that foster prestige races relate to the relative status of the states and the dimension along which a prestigious achievement occurs, there may be additional factors that exacerbate the likelihood prestige races. Some individual leaders may, for instance, be far more predisposed to prioritize and perceive threats to status than others. Wilhelm II seemed particularly attuned to status concerns as did John F. Kennedy while Bismarck and Eisenhower were arguably less effected. Regime type may also play a role in that the threat of "falling behind" can be politicized within democracies in ways that heighten the salience of foreign policy events which thereby pressures leaders to respond with assertive investments of their own. Conversely, the exorbitant costs of prestige investments might also be politicized, creating a political liability for leaders inclined to shore up national prestige at any cost.

Observable Implications

The key distinctions between security-motivated and prestige-motivated races are sum-

³⁸Mitzen (2006).

FIGURE 1: KEY FEATURES OF INTERNATIONAL RACES.

	<i>Security-Motivated Race</i>	<i>Prestige-Motivated Race</i>
<i>Objective</i>	To shore up military or strategic weakness.	To shape international perceptions about preeminence.
<i>Nature of Investments</i>	Those best at shoring up military weaknesses posed by rivals.	Exclusive, High-profile, easily understood by a wide audience.
<i>Trigger</i>	Technological or military investment by rival.	Prestigious achievement by slightly lower status state on a key dimension of preeminence.
<i>Competitors</i>	Military or historical rivals.	Proximate states in status hierarchy.

marized in Table 1. As the table suggests, we should expect the following dynamics to define a race for prestige. A state with lower but proximate status is the first to achieve some highly visible innovation or to possess the most of some high-profile symbol of status. This achievement may or may not be motivated by a desire for higher prestige. This achievement will be perceived as a threat to the preeminence of the state with slightly-higher status if it is made in a domain which is thought to legitimate the state's claim to higher status. A failure to respond to such threats risks a painful challenge to national self-perception and a decline in international influence. The higher-status state therefore has an incentive to increase or redirect its spending to focus on a dramatic innovation or superlative acquisitions of its own in the hope of shoring up perceptions of its leadership in the eyes of others.

This framework implies that prestige races will be easily distinguished from security races

when the types of investments states pursue are along dimensions with little immediate security and military utility to a particular state.³⁹ Examples of such investments abound.⁴⁰ O’Neill (2006), for instance, describes the 15th century race to build the most powerful wide-mouthed cannon which resulted in cannons so large that could not be moved as armies advanced or retreated. Gilady (2018) highlights the acquisition by prestige-seeking states of a single highly visible and exclusive aircraft carrier. Though they may bolster prestige, single carriers fail to shore up security in meaningful ways, especially if they are left inoperable.⁴¹

In other cases, distinguishing prestige races from security races will be more difficult for two possible reasons. First, because physical power is viewed as an admirable trait of the international community, investments in highly visible, powerful new technologies such as nuclear weapons or newfangled battleships may promise to bolster both security and prestige; the desire for security may drive such investments. Second, motivations for race behavior are not mutually exclusive. Concerns for security and prestige often come hand in hand and can motivate states to greater and lesser degrees.⁴² We can expect, however, that the more prestige motives shape behavior, the more emphasis states will place on certain types of high profile investments intended to draw public attention and congeal perceptions of preeminence.

The article now turns to the important and understudied case of the Space Race, focusing on key US policymaking by Presidents Eisenhower and Kennedy between 1957 to 1962. As

³⁹Prestige investments may promise long-term benefits stemming from the heightened influence that conjoins prestige.

⁴⁰See, e.g., Gilady (2018).

⁴¹Murray (2010) demonstrates that large navies, which may have general security implications, can offer fewer advantages for particular states.

⁴²As Gray (1974, p. 227) argues, even when security is a driver, prestige is also “nearly always present to some degree.”

we will see, concerns about international prestige motivated both president's decisions to an almost extraordinary degree. The Space Race therefore provides an ideal opportunity to examine how prestige motives shape national policy and the path of technological progress. The evidence confirms key elements of the theory: Sputnik, an exclusive, highly visible and easily comprehended feat, represented distinctive capacity along a dimension at the heart of US preeminence – technological progress. As the theory predicts, US leaders felt compelled to respond or risk a decline in US influence and the permanent decline of US confidence. The likelihood of the US response was only heightened by increasing status ambiguity with the Soviet Union and by domestic political incentives in the lead up to the 1960 presidential election.

Sputnik I, The Trigger

On October 4, 1957, the Soviets launched Sputnik 1, a twenty-three inch satellite weighing 184 pounds. The impetus for the satellite's development came almost exclusively from lead Soviet rocket engineer Sergei Korolev and his team of scientists, who announced the launch of a satellite program in August 1955 before receiving official backing from the Soviet state.⁴³ Sputnik's launch would trigger significant changes in US priorities and spending. But what was it about Sputnik that caused this shift? The framework above clearly would have predicted the prestige effects of Sputnik to be incredibly high. With the launch, the Soviets became the first entrant in an exclusive new club of countries able to venture beyond the earth's orbit. While few non-experts understood the science behind Sputnik's launch, the general

⁴³Recently released documents suggest that the Soviet program had started in May 1954. See Gorin (2000). Though Khrushchev would quickly come to recognize Sputnik as a path to heightened Soviet prestige, in the days leading up to it, he had expected “just another Korolev rocket launch.” Harford (2000).

meaning of Sputnik was clear to all – the Soviets had become the first to achieve a technical feat that the US had not and they had done so within an era in which technological and scientific advances were generally seen as highly admirable symbols of national dynamism and capacity. The launch drew global media attention; people around the world could tune in to hear the satellite’s sounds through their radios and view its reflection through their binoculars, experiencing the achievement first hand.⁴⁴

Almost every relevant branch of the US government had foreseen that the launch of the first satellite would be a prestigious event. A 1953 report by national scientific advisors predicted that a significant “psychological effect” around the world, arguing that a Soviet satellite would represent a “serious blow to the technical and engineering prestige of America the world over.”⁴⁵ The CIA agreed, arguing in 1955 that “The nation that first accomplished this feat will gain incalculable prestige and recognition throughout the world.”⁴⁶ The contents of National Security Council Report 5520, released the same year, predicted that “considerable prestige and psychological benefits will accrue to the nation” which launches a satellite first. These reports built upon even an earlier assessment by RAND, then part of the Douglas Aircraft Company, in 1946 which predicted that a Soviet satellite “would inflame the imagination of mankind, and would produce repercussions comparable to the explosion of the atomic bomb.”⁴⁷

In light of these predictions and Sputnik’s effects, it is interesting to consider what features

⁴⁴Mieczkowski (2013, p. 187).

⁴⁵Quoted in McDougall (1985, p. 119).

⁴⁶See Osgood, p. 205.

⁴⁷https://www.rand.org/content/dam/rand/pubs/special_memoranda/2006/SM11827part1.pdf

Sputnik lacked. While the physical weight of Sputnik surprised some US scientists, all other technical elements of the satellite were crude compared to the American *Vanguard* satellite, scheduled to launch in 1958.⁴⁸ Sputnik lacked any scientific instrumentation and included only a simple radio transmitter powered by a crude battery which lasted only three weeks before dying.⁴⁹ Soviet scientists had had plans for more sophisticated satellites and instrumentation, but had knowingly chosen to launch what they called a “Simple Sputnik,” made in only one month, in effort to beat American scientists into space.⁵⁰

Regardless of instrumentation, the launch of the satellite was not perceived by those with technical knowledge as a sophisticated achievement beyond American capacities.⁵¹ The US “could easily have placed an object in orbit” before the Soviets using the old Jupiter missiles, top Eisenhower aide Arthur Larson reflected.⁵² Yet despite the repeated warnings of Sputnik’s likely effects on world psychology and the encouragement of those in his own administration, Eisenhower never prioritized the US *Vanguard* satellite program or allotted the funding needed to ensure that an American satellite would be first in space.⁵³ At times, Eisenhower expressed interest in the “prestige and psychological benefits” that would accrue to the nation launch a

⁴⁸The planned weight of the US satellite was 3.5 pounds in comparison with the 184-pound Sputnik. Divine and Divine (1993).

⁴⁹Mieczkowski (2013, p. 199).

⁵⁰Siddiqi (2000a, p. 55). Gorin (2000, p. 38) argues that the launch of Sputnik was a “purely political act” for the Soviet scientists. We have little insight into why lead Soviet scientists were so intent upon launching first. Historians have only been able to conjecture they wished to snub the American scientists for a change by accomplishing such a feat despite hailing from a supposedly technologically unsophisticated state. Bulkeley (2000, p. 150-152).

⁵¹As one Harvard astronomer commented at the time, the Soviets had simply employed well-known scientific principles. See Divine and Divine (1993, p. xvi).

⁵²Mieczkowski (2013, p. 59).

⁵³Erickson (2005, p. 16) notes that Secretary of State Christian Herter argued the satellite program should be prioritized “because of the prestige it would confer on the United States.” The CIA similarly argued that the satellite argued the “psychological warfare value” of a first launch would be worth the expense. See NSC 5522, Comments on the Report to the President by the Technological Capabilities Panel, 8 June 1955.

satellite first.⁵⁴ But this interest never outweighed his desire to prioritize matching the Soviet development of ICBMs, which, as the NSC declared, would have the “gravest repercussions on the national security” of the United States.⁵⁵ Nor did it outweigh his concerns that American prestige might take a hit if it appeared that the US was militarizing space.⁵⁶ For this and other reasons, Eisenhower ensured that the US satellite program would rely on Viking missile technology developed by the Navy for the scientific purpose of atmospheric research rather than on orbital launch missiles developed by the Army which would have been able to launch a satellite as early as 1956.⁵⁷ He also prioritized launching the American satellite during the International Geophysical Year, an international scientific project which coincided with maximum solar activity lasting from July 1957 to December 1958, so that the act would maintain the guise of a scientific program.⁵⁸

There is even evidence that Eisenhower perceived an upside to the Soviets launching a satellite first. A secret program, under the direction of the CIA, was developing highly sophisticated reconnaissance satellites they hoped would minimize the likelihood of surprise Soviet attack. A primary function of the US Vanguard satellite program was to serve as a “stalking horse” to establish the legal right of overflight before these more sophisticated

⁵⁴He, for instance, expressed dissatisfaction with the costs spent by the program for instrumentation, arguing that the “element of national prestige so strongly emphasized in NSC 5520” depended on launching a satellite first and not on the technological sophistication of the instrumentation. See *Foreign Relations of the United States, 1955-1957*, vol. 11, pp. 748 - 749.

⁵⁵National Security Council Action No. 1433, September 13, 1955. The DoD budget was funding multiple long-range missile programs in all three military branches by 1955.

⁵⁶McDougall (1985, p. 194).

⁵⁷Bulkeley (2000, p. 172). Erickson (2005, p. 15). Eisenhower also did not want to draw Soviet attention to the development of the reconnaissance satellites.

⁵⁸Bulkeley (2000, p. 172).

satellites were launched.⁵⁹ In launching Sputnik first, the Soviets set a helpful precedent that distinguished national airspace from open space above a certain orbit with free access to all, akin to the freedom of the seas.⁶⁰ Had national security concerns alone dictated American responses to Sputnik, there would arguably have been little reason to launch the first US Vanguard satellite at all given this logic.

Not only were American policymakers unimpressed by the relative technical competence of Sputnik, they were convinced that the satellite provided no new information about the relative military capacity of the Soviet Union. Thirty eight days before Sputnik, the Soviets had announced they could launch long-range missiles “into any region of the terrestrial globe.”⁶¹ The timing of this achievement was slightly ahead of American expectations, but Sputnik did little to alter assessments that these new missiles were relatively unsophisticated and incapable of hitting exact targets.⁶² As Eisenhower noted to the press, the United States maintained its capacity, he argued, to “bring near annihilation” to the Soviets with its hundreds of bombers and missiles.⁶³ Sputnik involved “no new discovery to science” and therefore posed “no additional threat to the United States. . . We still can destroy Russia. We know it,” he concluded.⁶⁴

⁵⁹This approach was endorsed by the Air Force and Eisenhower’s Technological Capabilities Panel, tasked with assessing how the US could implement technological innovations for military and strategic purposes. See Erickson (2005).

⁶⁰See comments by Secretary of Air Force Quarles in Erickson (2005, Ch. 2) ftnt 28.

⁶¹Siddiqi (2000b, p. 58). See also Mieczkowski (2013). The effects of the ICBM announcement on the international press was relatively minimal.

⁶²The first US Atlas ICBM was fired on June 11, 1957. Curtis LeMay, head of Strategic Air Command, argued that the Soviet achievements in space “do not have great significance in regards to the present balance of power.” Chief scientists at the US Air Force Ballistic Missile Program also argued that Sputnik provided no additional information about the Soviet’s ability to launch an attack on the US. They remained confident in the US superior missile guidance system.

⁶³Erickson (2005, p. 40).

⁶⁴Eisenhower’s Chief of Staff put the question directly to the head of the NSF in the aftermath of Sputnik:

Was the Space Race Inevitable? The Role of International and Domestic Context

The theoretical framework laid out above predicts that the likelihood a race emerges following a state's prestigious achievement depends on two conditions: 1) the proximity of the state to those above on the status hierarchy and the resulting degree of status ambiguity and 2) the centrality of the domain of achievement to the preeminence of the higher status state. These factors are most likely to generate perceptions that the higher-status state faces a challenge to its position and influence and to engender a painful decline in domestic confidence. These factors, in possible conjunction with domestic political pressures, push policymakers to adopt prestige-seeking policies aimed at shoring up the status of the state.

The American response to Sputnik illustrates the importance of each of these factors in fostering a prestige race. First, Sputnik occurred at a particularly crucial period of the Cold War in which the Soviets appeared to be catching up with the US on a number of material dimensions. It had taken the Soviet Union four years to catch up to the atomic bomb and only nine months to match thermonuclear capabilities. To those in the media and the public who lacked access to the classified reality, it also appeared that the Soviets were surpassing the US in terms of missile capacity. Analysts in the US and beyond were convinced, moreover, that the Soviet economy was large and growing at rates that could threaten American economic dominance.⁶⁵ Status ambiguity had risen to the point that the Secretary of Defense McElroy saw it as necessary to “tote up” the assets of the two countries to obtain a sense of the balance

“Is there anything in the Soviet achievement to make us alter our research and development programs in the missile field.” The answer was no. “We can’t always go changing our program in reaction to everything the Russians do.” Eisenhower (1965, p. 211).

⁶⁵Such estimates later proved to be wrong. See Trachtenberg (2018). Also Bergson (1963).

sheet since “they have certain strengths in excess of ours and we have certain strengths in excess of theirs.”⁶⁶ Within this context, any new highly conspicuous prestigious achievement was bound to take on heightened meaning extending far beyond its implication on the material and strategic bottom line.

Second, the Soviets’ achievement with Sputnik was not in just any domain. American leadership since 1945 was in large part rooted in its preeminence within the scientific and technological realm. The US had been the first to test an atom bomb and a hydrogen bomb and to develop a nuclear submarine. Prior to Sputnik, Secretary of State Dulles predicted that because America’s preeminence was so significantly rooted in scientific research and development that losing this edge would present a “grave blow” to the country’s international leadership.⁶⁷ The most easily understood and highly visible technological achievements, like those in space, had the greatest potential to threaten perceptions of preeminence, becoming symbols of technological leadership more broadly.⁶⁸ With Sputnik, the President of Eisenhower’s Science Advisory Committee argued, the Soviets had managed to instill the idea “that achievements in space were an accurate overall measure of a country’s scientific and technological potential.”⁶⁹ A United States Information Agency report written in 1959 concurred: achievements in space had come to serve as “an index, or symbol, in judging national

⁶⁶Quoted in Erickson (2005, p. 47).

⁶⁷Mieczkowski (2013, p. 197).

⁶⁸National Security Council 5814/1 written in the summer of 1958 argued that space exploration had “an appeal to deep insights within man which transcend his earthbound concerns” which would lead to a tendency to “equate achievement in outer space with leadership in science, military capability, industrial technology and with leadership in general.”

⁶⁹National Security Council, 470th Meeting of the NSC, memorandum of discussion, 20 December 1960, 45.

achievement in all fields.”⁷⁰

The single launch of a satellite was not, therefore, simply an admirable advance within one particular scientific domain but, as one Democratic Senator argued, “a devastating blow to the prestige of the United States as the leader in the scientific and technical world,” and this scientific leadership was seen as key to America’s preeminent status.⁷¹ “We have been plunged into a race for the conquest of outer space,” the President’s Science Advisory Committee declared, motivated by “the international political situation which demands that we demonstrate our technological capabilities if we are to maintain our position of leadership.”⁷² The CIA concluded that because of the overall decline in US prestige, “we cannot afford to discuss whether or not to compete – we must compete.” The Secretary of State argued that if the US allowed itself to take a secondary position by not responding with space achievements of its own, “the repercussions throughout the world would be most unfortunate.”⁷³

The perception that a competitive response to Sputnik was essential to American prestige was plausibly motivated by both instrumental and psychological rationales. Solid evidence drawn from “prestige polls” conducted around the world suggested the perception of American decline in the aftermath of Sputnik was widespread.⁷⁴ Polls by the US Information Agency found that more than half of Europeans surveyed in 1960 believed that the Soviet Union

⁷⁰USIA Director Allen publicly stated that space had become “the primary symbol of world leadership in all areas of science and technology.”

⁷¹NSC 5814/1 concluded that “The USSR, if it maintains its present superiority in the exploitation of outer space, will be able to use the superiority as a means of undermining the prestige and leadership of the United States.”

⁷²<https://www.hq.nasa.gov/office/pao/History/report60.html>.

⁷³NSC, memorandum of discussion, 415th meeting of the NSC, 30 July 1959, 7?8.

⁷⁴Eisenhower wanted to keep such polling private. Kennedy made an issue out of the existence of these polls during the 1960 election, demanding that Eisenhower release the results which he assumed would underscore his argument about American status decline. See Haeefe (2001).

would overtake the United States in scientific achievement within a decade, a marked increase from the year before Sputnik.⁷⁵ A 1960 Gallup poll reported that perceptions of US prestige had fallen outside of Europe, including in New Delhi and Toronto. Iranian officials were said to have “considered the satellite such a blow to U.S. prestige that they displayed an uneasy embarrassment in discussing it with the Americans.”⁷⁶

US politicians expected perceptions of leadership to equate with levels of global influence. Countries will “tend to line up with the country they believe to be the leader,” Senator Lyndon Johnson argued.⁷⁷ Surveys again provided evidence that such shifts in foreign policy preferences might be under way. Support for neutral, less pro-Western policies, for instance, rose in the period following Sputnik, especially in countries like France that were already decidedly less pro-Western.⁷⁸ The Deputy Director of NASA also reported that American scientific instruments were on the decline in foreign laboratories, blaming the drop off on American scientific prestige.⁷⁹

US leaders also perceived a painful loss of national confidence engendered by the threat to the self-conception of the state as preeminent.⁸⁰ The *New York Post* put it succinctly:

⁷⁵In France, 59 percent thought the USSR would lead the world in science by 1970 and only 18 percent thought America would. In Great Britain, 48% expected Soviet leadership by 1970.

⁷⁶Mieczkowski (2013, p. 198).

⁷⁷McDougall (1985, p. 320).

⁷⁸Almond (1960). Support for neutrality in France increased to 57% in October 1958 from 39% the year before.

⁷⁹Mieczkowski (2013, p. 198).

⁸⁰Historians largely agree that Eisenhower and policymakers were largely misled about the extent of public hysteria following Sputnik, which evidence suggests was more of an elite phenomenon. See McDougall (1985); Michael (1960); Mieczkowski (2013, p. 6). Respected political analyst Samuel Lubell found “no evidence at all of any panic or hysteria in the public’s reaction” in the weeks after Sputnik. Almond (1960) similarly concluded in 1960 that the American public was neither indifferent to nor panicked by Sputnik I or the subsequent Sputniks that followed. A Gallup poll conducted between October 11 and 14 found only half of those surveyed expressed surprise that the Soviets had launched a satellite first. Sixty-one percent thought that the satellites were likely to be used for good purposes.

“For the first time, we know what it feels like to be a have-not nation.” James Killian, who became America’s first true Presidential Science Advisor in 1957, argued that a crisis of confidence was sweeping the country “like a windblown forest fire.”⁸¹ In response, Eisenhower launched “Operation Confidence,” intended to boost public morale, in which he repeatedly pledged that the Soviets’ “very spectacular achievements” were no reason “to bow our heads in shame.” The US was capable of similar if not superior technological feats and had, in fact, been achieving them, he argued. But such entreaties did little to stave off predictions by Eisenhower’s political opposition of “national extinction” if the US failed to successfully achieve impressive firsts in space, by which they could only have referred to the existence of the state’s identity as preeminent given that Sputnik did little to endanger the physical existence of the US.⁸²

The decline in international prestige and domestic confidence created pressure on American policy makers to engage in policies aimed at shoring up US prestige. But even given these pressures, some American policymakers, including Eisenhower himself, initially attempted to push against the tide and downplay Sputnik as a mere stunt which did not merit strong response by the US.⁸³ Sputnik did not raise his apprehensions “not one iota,” Eisenhower told the press. The Soviets had only managed, after all, to “put a small ball into the air.”⁸⁴

⁸¹Killian (1977, p. 7).

⁸²See Mieczkowski (2013, p. 185).

⁸³Eisenhower generally admitted the importance of perception and prestige in international affairs, arguing that “at times, appearance are as significant as the reality, if not more so.” Quoted in Mieczkowski (2013, p. 194).

⁸⁴Administration “sophisticates” regarded it more as a stunt for worldwide publicity purposes than as a matter of grave significance,” one official said. Charlie Wilson publicly labelled it a “nice scientific trick.” Divine and Divine (1993, p. xv). Senator Fulbright argued Sputnik was a “trick, a kind of gambit. So far as real prestige goes, it is nothing.” Curtis LeMay agreed, arguing “There is no doubt that, with the Sputniks, the Soviets did obtain a propaganda success far greater than the actual achievement warranted.”

Eisenhower admitted underestimating the ‘propaganda advantages’ of Sputnik, but thought these did little to merit a shift in American scientific development. “Under no circumstances did we want to make the thing a competition,” Eisenhower reflected, because a race over achievements in space would be “unnecessary, wasteful” and would violate “the basic tenets of common sense.”⁸⁵ He admitted being “a bit amazed about the business of catching up. . . A deterrent has no added power once it has become completely adequate.” These sentiments were not simply expressed for public consumption, though Eisenhower had clear political incentive to downplay the Soviet achievement and to counteract the notion that his administration had allowed the US to fall behind.⁸⁶

But the US domestic political context made it all the more difficult to hold back the tide. With Sputnik, Eisenhower’s political opponents, including prominent Democratic aspirants for President, perceived a winning angle.⁸⁷ Secretary of Defense Charlie Wilson equated the political opposition’s reaction to Sputnik with “heavy drinkers hearing a cork pop.” Senator Lyndon B. Johnson conducted highly public ‘Preparedness’ hearings in Congress, motivated in large part by his desire to appear presidential and visionary while harping on the administration’s failure to effectively prepare the US.⁸⁸ “There was no better opportunity for a

⁸⁵Quoted in Launius and McCurdy (1997, p. 29). Eisenhower and the NSC ordered those in government to “play down competitive aspects and implications of a ‘race’” within administrations communications, fearing that such rhetoric would amplify demands for competition. Erickson (2005, p. 32).

⁸⁶James Killian later summarized the internal position of the White House, saying that “a number of us took the view that it was silly to conclude from the Russian’s launch of Sputnik I. . . meant any really significant weakness.” Quoted in Erickson (2005, p. 33).

⁸⁷See McDougall (1985, p. 142).

⁸⁸Republicans owned the Democrats on the issue of racial integration everywhere but the South. As LBJ’s aide George Reedy said at the time, the only possibility for winning the White House in 1960 would be to “find another issue which is even more potent. Otherwise the Democratic future is bleak.” Sputnik and the status of the US space program would become that issue. Reedy argued that “if properly handled,” the issue would “blast the Republicans out of the water.” See Mieczkowski (2013, p. 138).

Democratic Congress to harass a Republican administration and everyone involved on either side knows it,” Republican officials admitted.⁸⁹ Johnson’s hearings only amplified the perception of public uncertainty and concern as, day after day, officials spoke, as Walter McDougall has described, of “American humiliation [which] flowed through the press and public mind together, weakening faith in the administration and its values.”⁹⁰

The US Response Under Eisenhower

Given the international and domestic pressure, it is not surprising that even the frugal and sensible Eisenhower failed to avoid responding to Sputnik with policies aimed at shoring up perceptions of US leadership, despite his strong belief that American technological superiority had never really been challenged and his perception of Sputnik as a propaganda stunt with little military or strategic meaning. Debate remained within the administration, however, about what form the American response to Sputnik should take. Given the theoretical framework, we would expect the most effective response to involve a high-profile, exclusive and understandable achievement.

Eisenhower’s first instinct was to avoid competing on achievements in space, where the US was already perceived to be behind. He desired to focus on “some other items in the prestige race” which improved the bottom line, like bolstering the power of the American dollar, expanding US trading networks or promoting the country’s unique industrial or agricultural capacity.⁹¹ “Let’s ask the world,” he quipped, “What has Soviet Russia or Red China got compared with these achievements?” He opined with *The Wall Street Journal* that a “thriving

⁸⁹Quoted in McDougall (1985, p. 149).

⁹⁰*Ibid.*, p.153-4.

⁹¹Mieczkowski (2013, p. 192).

American economy” promised to bolster US prestige far more “than any particular space exploit.”⁹² Ultimately, he sought to build on existing capacity. “If we must compete with Soviet Russia for world prestige,” he questioned, “why not channel the struggle more along the lines in which we excel” rather than spectacular achievements in space which the US had failed to prioritize?⁹³

But such arguments gained little traction within the wider media, which depicted Eisenhower as overly conservative, behind the times and enfeebled. Such achievements failed to shore up the US’ identity as the preeminent technological power. If the US was going to focus its attention on achievements in space, however, Eisenhower argued it should only pursue “space science” – projects that would “encourage and hearten” Americans while also making scientific advances – rather than costly high-profile “fluff projects” aimed solely at bolstering America’s image.⁹⁴ Eisenhower attempted to sell American achievements in developing photographic capabilities at 20,000 miles, discovering the Van Allen belts and devising long running solar-fueled satellites as the symbol of US technological leadership. He supported the development of SCORE, the world’s first purpose-built communications satellite, which would achieve a major scientific breakthrough by demonstrating that messages could be transmitted through the upper atmosphere from one place on earth to another while also playing a Christmas greeting recorded by Eisenhower which could be heard around the world for eight

⁹² *Wall Street Journal*, October. 7, 1959. The CIA proposed many other prestige projects, including an ‘International Medical Year’ aimed to eradicate diseases such as malaria or sponsoring events to demonstrate U.S. superiority over the Soviet Union in synthetic food research, the conversion of plankton into food, and other areas.

⁹³ According to the Director of Defense R and D, Eisenhower and his science advisors were loathe to accept prestige as a primary motivation. “With them, . . . prestige could be a fine dividend but there had to be a better reason than simply prestige alone.” Quoted in Erickson (2005, p. 40).

⁹⁴ Mieczkowski (2013, p. 186).

days.⁹⁵

But Eisenhower struggled to adhere to his principled stance against high-profile, exclusive acts of little scientific or strategic merit. In his decision to push for a timely launch of the first US Vanguard satellite in the wake of Sputnik, for instance, he clearly prioritized appearances over science. The launch of Vanguard I, whose entire function as a stalking horse had been undermined by Sputnik's launch, had already been set back by one delay, making the US "the laughing-stock of the whole free world." in Secretary of State Dulles' eyes. Another delay would not be tolerated, Eisenhower signaled, despite scientists' warnings of potential technical issues. "The psychological factors in this matter have obviously received a new emphasis," the Secretary of Defense noted of the timing of the launch. Vanguard Test-Vehicle 3 launched as planned on December 6, 1957, only to explode two seconds after liftoff. Pundits derided the effort as "Flopnik," "Kaputnik" and "Stayputnik" while Khrushchev offered the US technical assistance as part of a program intended to aid underdeveloped nations.⁹⁶

Considerations about prestige and confidence also shaped Eisenhower's military budget strategy in the months following Sputnik. Knowing full well that Congress would be willing to throw money at space endeavors after Sputnik, he requested \$1.3 billion in supplemental defense appropriations to accelerate existing missile programs, two-thirds of which he admitted was "more to stabilize public opinion than to meet the real need for acceleration." He instructed his administration to choose a "figure that will create confidence," while also ensuring that advances would be made so that "the US does not have to be ashamed no matter

⁹⁵With SCORE's launch, the US could also boast that it had launched a payload of over four tons into orbit, though most of the payload consisted of a 9,000 pound Atlas booster. See Erickson (2005, p. 39).

⁹⁶Murray and Cox (1989, p. 23-24).

what other countries do.”⁹⁷

The tension between the need to shape domestic and international perceptions of leadership and the need to protect the US’ bottom line also extended to considerations of who would administer the US space program. In early discussions in February 1958, Eisenhower favored housing the US space program solely within the Department of Defense, believing this arrangement would best ensure, as one aide summarized, that unlimited funds were not poured into costly projects “where there was nothing of early value of the Nation’s security” and that the government wouldn’t pursue “glamor [sic] performances without a full appreciation of their great cost.”⁹⁸ Ultimately, however, Eisenhower backed the creation of NASA, an entirely new civilian agency, to oversee non-military space initiatives, despite the redundant costs involved in running both a military and civilian programs committed to achievements in space.⁹⁹ He was seemingly swayed by the argument that a civilian agency would best produce “advances in general scientific knowledge and the protection of the international prestige of the United States.”¹⁰⁰ Both NASA’s first administrator and Eisenhower himself later admitted that NASA “was based on psychological values” borne solely out of the hysteria caused by Sputnik.¹⁰¹

The Saturn rocket program, authorized in 1958, was further evidence of Eisenhower’s increasing willingness to pursue projects as high-profile demonstrations of superior capabilities

⁹⁷Quoted in McDougall (1985, p. 202).

⁹⁸Quoted in Erickson (2005, p. 53).

⁹⁹The Department of Defense was to pursue space projects with military implications. While a Space Council was devised to minimize duplication of the two programs, eliminating redundant spending was difficult.

¹⁰⁰https://archive.org/stream/NASANTRSArchive19980236048/NASANTRSArchive19980236048_djvu.txt

¹⁰¹NSC, memorandum of discussion, 415th meeting of the NSC, 30 July 1959, 7-8. Discussion at this meeting included how officials were to assess the comparative psychological value when selecting between various space projects like, for instance, a soft landing on the moon and a trip to Venus.

over time. Sputnik had shown that the Soviets, If anything, were ahead in rocket booster capacity. The US Saturn program was intended to close the gap. The Saturn rocket would be several times more powerful than any Soviet rocket, able to throw 20-ton objects into space.¹⁰² While its military value was vague, laying mostly in delivering communication and navigation satellites which could be delivered with less powerful boosters, its prestige value was clear. Eisenhower's critics in Congress had publicly advocated the rocket's development as the key to a leading position in space activities. Eisenhower perceived that because the big booster was "the only thing that will have major psychological effect," it should be put on a crash course.¹⁰³ Not only would Saturn itself give the US bragging rights, it was seen as a necessary step if the US were to pursue other high profile projects in the future. "The political, scientific, and perhaps military, ramifications of the projects made possible by SATURN will greatly affect the strengthen the nation's role as the leader of the free world," the head of NASA declared.¹⁰⁴

By the end of his second term, Eisenhower had made what he viewed to be numerous concessions to the importance of prestige and the role of space achievements as symbols of global leadership. He reluctantly came to perceive a race for prestige in space as unavoidable, asking only if the race would be a "100-yard dash or a mile run," even as he continued to lament the costs. "I could use \$1 billion to better advantage on some other aspect of the cold war," he declared in a NSC meeting when discussing the prospective budget for manned-space

¹⁰²Mieczkowski (2013, p. 216).

¹⁰³Quoted in Erickson (2005, p. 96).

¹⁰⁴By 1959 estimates, the Saturn, which had no utility as a missile, cost at least half a billion dollars. Mieczkowski (2013, p. 217).

flight.¹⁰⁵ “The Sputnik complex impelled us to do everything yesterday,” he yelled. His job was to think about the country and the economy as a whole.

And yet, he publicly advocated statements by his science council which listed being “strong and bold in space technology” in order to “enhance the prestige of the United States among the peoples of the world” as an priority ahead of scientific exploration.¹⁰⁶ With one year left in office and 10 months to go before the 1960 presidential election, Eisenhower signed off on NSC-5918, which stated that failure to match Soviet achievements in space would give rise to the belief that the United States was “second best.” By the end of his term, the once-reluctant Eisenhower had accepted prestige as an explicit and primary objective of US space policy.¹⁰⁷

The US Response Under Kennedy

By the election of 1960, the US had more than caught up with the Soviets in the number and sophistication of launched satellites. The Saturn boosters would eventually put the US ahead of Soviet booster capability. US scientists were making repeated scientific advances in meteorology, navigation and communication, which, as Eisenhower said, provided “very real and useful results for all mankind.”¹⁰⁸ But there was still a sense that the results of these achievements had failed to meet one important objective. As the *New York Times* put it, the US had “forged a clear-cut scientific lead in the race for pace... In instrumentation, commu-

¹⁰⁵470th Meeting of the National Security Council, memorandum of discussion, 20 December 1960, 4?5. Eisenhower later declared that he was not willing to “hock his jewels” to finance a manned expedition to the Moon.

¹⁰⁶See *Introduction to Outer Space*, written by the Presidential Science Advisory Council.

¹⁰⁷NSC-5918’s stated objective was “To achieve and demonstrate an overall US superiority in outer space without necessarily requiring US superiority in every phase of space activities.”

¹⁰⁸<https://www.presidency.ucsb.edu/documents/statement-the-president-us-achievements-space>.

nications, electronics, reliability and guidance the United States... need fear no comparisons with Russia or any other nation.” But the US continued to lag in accruing political and psychological rewards for its efforts.¹⁰⁹ The *New York Post* argued that, though Eisenhower’s constantly emphasized US scientific achievements, he failed to “explain how [they] would impress the Indians, Indonesians and other uncommitted people who are currently awed by the Russian achievement. Do extra gadgets make up for being six months late?”¹¹⁰ The Democratic Advisory Council located fault for this drag in US prestige in the fact that the US’ space accomplishments “were not readily appreciated by the layman” nor was it easy to “translate them into readily understood form.”¹¹¹

That the issue of America’s threatened prestige had yet to be resolved by American advances in space under Eisenhower was nowhere more evident than in the 1960 presidential election. Kennedy placed the issue of declining American prestige and status at the very center of his political campaign, acknowledging he was riding “on the single assumption that the American people are uneasy at the present drift in our vitality and prestige.” Sputnik was evidence that Eisenhower had allowed the US to slip to the rank of a second-class state, ex-President Truman said on the campaign trail. Kennedy and the Democrats would “restore [America] to its place of preeminence in the world.” And they would do so by ensuring US preeminence and leadership in the development of space technologies, for, as the Democratic Advisory Council put it, “In the psycho-political space race, there is little pay-off for second

¹⁰⁹*New York Times*, May 3, 1960.

¹¹⁰Mieczkowski (2013, p. 67). *Time* agreed that the US was “still running a poor second in the two-entry race.”

¹¹¹Mieczkowski (2013, p. 193).

place.”¹¹²

Once in office, Kennedy and Lyndon Johnson confronted the need to follow through on their promises or risk falling prey to their own line of attack in future elections – that they had failed to adequately protect America’s stature. Kennedy surveyed his advisors on the best ways to demonstrate American superiority, a need made all the more severe after Yuri Gagarin became the first human to journey into outer space on April 12th, 1961 and the Bay of Pigs debacle on April 20th. Robert McNamara’s response echoed what the president already believed. “Major achievements in space contribute to national prestige. This is true even though the scientific, commercial or military value of the undertaking may...be marginal or economically unjustified,” McNamara wrote.¹¹³ Lyndon Johnson also strongly advocated for big moves in space, arguing that “Failure to master space means being second best in every aspect...In the eyes of the world, first in space means first, period; second in space is second in everything.”¹¹⁴ Intelligence analysts similarly argued that a “space race” was “neither rational nor desirable” but was necessary.

Tasked by Kennedy with identifying a “space program which promises dramatic results in which we could win,” LBJ suggested that a moon landing would provide the the most significant propaganda victory “in the psychological battlefield of the Cold War.” On May 25, 1961, Kennedy delivered a special State of the Union speech which he had requested to discuss “Urgent National Needs.” The speech called for a “great new American enterprise” – a manned trip to the Moon. “No single space project in this period will be more impressive

¹¹²*Ibid.*, p. 222.

¹¹³Robert McNamara, “Brief Analysis of Department of Defense Space Program Effects,” April 21, 1961.

¹¹⁴Quoted in McDougall (1982, p. 1025).

to mankind... none will be so difficult or expensive to accomplish,” he declared.

The NASA director tried to pull Kennedy towards a broader understanding of “preeminence” in space, suggesting that it could be gained through a broader range of accomplishments beyond the Apollo missions. Kennedy dismissed this in a White House meeting with his scientific advisers, saying that “we’ve been telling everybody we’re preeminent in space for five years and nobody believes us because they have the booster and the satellite. We know all about the number of satellites we put up – two or three times the number of the Soviet Union; we’re ahead scientifically. It’s like that instrument you’ve got at Stanford that is costing us \$125 million and everybody tells me that we’re the number one in the world, and what is it – I can’t even think what it is,” he said, referring to the sophisticated linear particle accelerator under development.¹¹⁵

Like Eisenhower, Kennedy had explored alternative paths to restored prestige after Sputnik, including nation building, the provision of the foreign aid to the third world and advancements in the medical industry aimed at highlighting the superiority of capitalism for social and physical welfare. Ultimately, however, these areas lacked the appeal and the drama of significant “first” in space. “If you had a scientific spectacular on this earth that would be more useful – say desalting the ocean – or something that is just as dramatic and convincing as space, then we would do it,” Kennedy begrudgingly declared.¹¹⁶ In his choice of space as his prestige venture, Kennedy was also affected by what he believed would receive financial support. “If I thought Congress would support increased expenditures for medical programs,

¹¹⁵Transcript of meeting available at <https://millercenter.org/the-presidency/educational-resources/fly-me-to-the-moon>.

¹¹⁶Mieczkowski (2013, p. 193).

for foreign aid – I would trade space for this, but they will not buy it.”

The sole ability to get to the Moon was not going to be enough, however, to satisfy Kennedy’s objectives. To bolster prestige, Kennedy believed the United States would need to demonstrate the ability *before* the Soviets or else it would not be worth the expense. “Everything that we do should be tied into getting on to the Moon ahead of the Russians,” Kennedy said in a contentious meeting in 1962 with the heads of NASA and the NSF, both of whom sought to balance the goal of the manned mission with other more scientifically beneficial programs.¹¹⁷ But Kennedy insisted that other developments, including the development of satellite technology, meteorological instruments to predict the weather and even those in rocketry, should be put on the back burner until the top priority, the manned Apollo mission, was achieved. “This is important for political reasons, international political reasons... this is, whether we like it or not, in a sense a race.” Kennedy concluded that if NASA was not fully committed to coming in first, “we shouldn’t be spending this kind of money because I am not that interested in space... We’ve wrecked our budget and all these other domestic programs and the only justification for it, in my opinion, is to do it in the time element I am asking.”

In his quest to shore up the prestige of the United States, Kennedy was staking his chances on a project that was not expected to come to fruition for at least eight years, long after he could have remained in office under any scenario. But committing the resources and organizational capacity of the United States to the long-term goal of putting a man on the Moon itself signaled confidence in American technical abilities, the resolve to remain dynamic and preeminent no matter the cost and the ability to channel resources into a large scientific en-

¹¹⁷Quoted in Launius (2003, p. 172).

deavor while also managing continued development in the area of national security.¹¹⁸ Costing over 4% of the federal budget at the height of their development, the Apollo missions would become the most expensive government-funded engineering program in history.

Discussion

This case has illustrated the unique features of a prestige race, including the importance of visibility and comprehensibility of triggers and responses and the predictable pattern in which the preeminent state, favoring the status quo, fails to preempt prestige challenges by states with viable claims to leadership, but then feels forced to make excessive investments to shore up the basis of its legitimacy or else confront an existential threat to its identity. But why should we consider the Space Race representative of broader patterns? For one thing, as described, these key features extend logically and directly from the nature of prestige itself, the prioritization of appearance over reality and the attachment of identity to rank. States involved in security-motivated arms races may have incentive to publicize increases in capabilities to deter rivals' aggression. But this does not require pursuing capabilities that are inherently likely to draw attention, the significance of which is readily understood. Moreover, states have a strong incentive to quickly and preemptively match the security improvements of others. But preeminent states have less incentive to act quickly in the face other's prestigious achievements unless overall status is threatened, especially when prestige investments come with significant costs.

Second, there are stark similarities between the features of the Space Race and other historical competitions in which prestige and status played primary motivating roles, features

¹¹⁸See Gilady (2018).

that are largely absent in cases when it did not. Though competition between Britain and France at the height of the Scramble for Africa in the 1890s, for instance, focused on the accumulation of territory rather than on impressive technological feats, many of the key features of the race for territory during this time are familiar. Just as highly visible achievements in space came not only to distinguish the Soviet Union and US from others but also to symbolize the relative preeminence of two closely matched powers in the late 1950s, highly visible transcontinental Empires distinguished Britain and France from colonial states with smaller territorial holdings. ‘World Statehood’ came to symbolize national capacity and preeminence at the end of the 19th century.¹¹⁹ “The tendency of the time is to throw all power into the hands of the greater empires, and the minor kingdoms... seem destined to fall into a secondary and subordinate place,” British Secretary of State for the Colonies Joseph Chamberlain observed in 1897.

The British, as the preeminent naval and colonial power, had remained reluctant to compete for colonies throughout the 1870s and 80s, despite the entrance of Germany into the colonial fray and the slow expansion of France in Africa. Content with the status quo, future Prime Minister Salisbury perceived that any changes to world affairs could only be for the worse for England. “It is our interest that as little should happen as possible,” he declared in 1879.¹²⁰ Only once French expansion picked up pace in the mid 1890s, fully challenging the British in the scale and vigour of its Empire, a key dimension of its preeminence, did British

¹¹⁹Sanderson (1965); Barnhart (2016).

¹²⁰Prime Minister Gladstone wrote of territorial acquisition in 1884 just before the Berlin Conference, “I see great objection to [the scramble for colonies; and generally considering what we have got I am against entering into a scramble for the remainder.” Quoted in Knäplund (1970, p. 91).

leaders feel they had no choice but to expand Britain's already immense footprint to maintain perceptions of preeminence. As with Sputnik, French territorial gains in Africa presented little threat to British livelihood or physical existence. But they did threaten Britain's standing at the top of the global hierarchy. With France nearly doubling its African holdings between 1890 and 1894, competition in Africa had come to threaten the "very greatness of England," a threat that led by 1895 to the whole-hearted embrace of a forward policy of Imperialism by both political parties in England and by an increasingly jingoistic public. By the end of the decade, Britain's act of "pegging out claims for the future" had become, as one prominent British historian put it, like a "cock-bird blowing up his feathers to assert his dominance over rivals."¹²¹

The dynamics witnessed in the Space Race and Scramble for Africa are far from unique. The massive Soviet buildup of nuclear arms in the late 1960s, for instance, triggered prestige concerns among US leaders who feared that the balance of nuclear arms would be perceived by third-party observers around the world as an indication of preeminence. To forestall a resulting decline in US prestige, US defense elites tailored the US nuclear arsenal to "guard against any danger that the Soviets might be seen as superior – *even if the perception is not technically justified.*"¹²² There are plausible arguments that similar dynamics have played a role in other cases, including the South American dreadnought race and the Anglo-German naval race of the early 20th century, though the exact impact of these motives in these cases

¹²¹Porter (2004, p. 119).

¹²²Quote by Secretary of Defense Harold Brown. Emphasis added. See Brown (1978) and Barnhart (2020, Ch. 6) for further description of the case.

and others remains to be fully explored.¹²³

Implications for the Future

In addition to numerous historical cases, there are signs that prestige concerns are already shaping contemporary material competitions in important ways. Contemporary Chinese investments in space may be setting off a Space Race redux. Beijing's heightened interest in space is seen by US intelligence analysts as motivated in part by the desire to exceed the US to gain the "prestige benefits" that Washington has accrued from space leadership.¹²⁴ NASA is now planning manned missions to the moon for the first time since the 1970s and has announced intention to land the first woman and person of color on the moon by 2024.

In July 2017, the Chinese government also released a national strategy for developing artificial intelligence that aims at achieving a 'major breakthrough' in basic AI theory by 2025 and at surpassing the US to become the world leader in AI innovation by 2030 with an AI industry worth \$150 billion. The United States government has been slow to enact an equivalent top-down national policy in an area of achievement that has been central to the perception of the US as a dynamic world leader, despite calls from both the US tech and defense communities.¹²⁵ Developments in artificial intelligence may not fit the features of prestigious achievements as neatly as Cold War efforts in space. Though highly exclusive, major breakthroughs have often been difficult to see and have not been easily understood

¹²³See, e.g., Murray (2010); Sondhaus (2012).

¹²⁴"The Space Race is Back On – But Who will Win?," *The Guardian*, July 16, 2021.

¹²⁵<https://warontherocks.com/2019/07/in-search-of-ideas-the-national-security-commission-on-artificial-intelligence-wants-you/>. In 2020, the US government did announce a \$1 billion investment in AI and quantum computing hubs, though this amount is dramatically less than what many experts think will be needed to maintain leadership. See <https://venturebeat.com/2020/08/26/white-house-announces-creation-of-ai-and-quantum-research-institutes/>.

by non experts. As status ambiguity grows, however, between China and the US, one can imagine that achievements in AI will become a focal point of an international prestige race, leading politicians in both countries to apply pressure on national scientists to create more visible and high profile applications of AI that promise to shape perceptions of technological leadership in the 21st century.

The model of prestige races above sheds light on elements of these dynamics that might be difficult to explain from a security perspective. First, the importance of prestige may explain why China would announce its intentions to wrest control of global leadership from the US through AI development. While such a public declaration may be useful for domestic purposes of mobilizing collective efforts around a joint national project, it could also serve to spawn reciprocal investments by the US which could minimize any strategic or military advantage the Chinese might hope to gain from their investment. Such declarations can, however, contribute to national confidence and pride in the direction of the country and to global perceptions of China as a confident and viable challenger for global leadership, just as Kennedy's announcement of the Apollo missions were intended to do in 1961.

Second, the importance of prestige might explain why a top-down national race over AI innovation has yet to emerge. Advances in AI promise to symbolize global leadership in the 21st century just as Empire and space flight did in prior eras.¹²⁶ China is investing billions of dollars to achieve its stated aim of outdoing the US in a domain that has been central to perceptions of US global dominance and which promises to provide significant economic

¹²⁶ "Americans don't want to grow old wondering what happened to their country's place in the world," Eric Schmidt and Robert Work, the former CEO of Alphabet and the former Deputy of Secretary of Defense wrote recently.

and security benefits. The US has nevertheless failed to engage in comparable investments at the national level. Many factors might explain this reluctance, including a reliance by the US government on private industry and capital to continue its unparalleled record of technological innovation. But among these factors may be the absence of a “Sputnik moment,” a high-profile and easily understood achievement by China that threatens to generate common knowledge internationally that the US is being replaced by China as the leader in AI innovation and thereby as the global leader more broadly.¹²⁷ Such an event may involve a technological advance with national security implications but, as was true with the actual Sputnik, it may not. A threat to America’s identity as the preeminent technological power could, however, be sufficient to prompt the US to accept a race with China, as the case of the Space Race shows. The potential threat to identity would only grow if China continues to match other capabilities which symbolize US international preeminence, including a large blue water navy and manned space flight.

This is not to argue that prestige concerns will overshadow security concerns in any emerging AI race. It is hard to imagine, however, that the US will not prioritize managing perceptions of international leadership in the long run. The more prominent these concerns, the more we should expect US policymakers to support projects that promise to generate common knowledge of US preeminence. If and when an AI ‘Sputnik Moment’ does occur for the US, policymakers will confront the incentive to select high-profile, easily understood, dramatic projects. Such projects might have military and strategic implications which would

¹²⁷<https://breakingdefense.com/2017/11/our-artificial-intelligence-sputnik-moment-is-now-eric-schmidt-bob-work/>.

amplify any existing the perception of security threats. But this need not be the case. AI technology could potentially be utilized to solve a wide-range of seemingly intractable social problems, garnering high praise and prestige for the innovator. Epistemic communities and experts may play a valuable role in helping shape where American investments are focused and ensuring that such initiatives are in the public's interest.

Conclusion

The dynamics and implications of arms races were once the subject of intense scholarly attention. But since the end of the Cold War, the topic has received far less consideration, leaving many significant questions unanswered.¹²⁸ Recent signs of increased geopolitical competition strongly suggest that important questions about the motivations, dynamics and implications of race behavior should promptly receive renewed attention. Understanding why leaders chose to respond to Sputnik in the ways they did can provide insight into the options likely to confront policymakers in future races.

This article has advanced our understanding of race behavior by distinguishing prestige as a motivating force for material competition. In races motivated by prestige, states will prioritize achievements with the potential to generate common knowledge about preeminence. Such achievements will be highly visible, easily comprehensible and symbolic of broader material capacity. Competitive behavior may be, and often is, motivated by concerns about both the security and prestige of the state. But the more influential prestige concerns as a motive, the more high profile state achievements will become. Races for prestige will become more likely as status ambiguity grows, especially if one or both states involved are democratic and

¹²⁸For contemporary exceptions, see Rider et al. (2011); Rider (2013).

prestige concerns can be weaponized within a partisan political environment.

The evidence and theory in this article have touched upon numerous topics that are deserving of future investigation. The success of the Apollo missions, for instance, begs the question of how influential such prestigious acts ultimately are on national status and how long their effects might persist in shaping international perceptions.¹²⁹ Additionally, the articles' model of prestige races provided allows for such competition at all rungs of the status hierarchy, but further work should be done to assess any differential dynamics of competition among lower status states.

Perhaps the most important outstanding question, however, regards the relationship between prestige races and the likelihood of conflict. On the one hand, it is possible that competitions for prestige heighten mistrust in ways that amplify the possibility of misjudgment or intentional conflict.¹³⁰ On the other hand, it is possible to conceive of prestige races as relatively peaceful alternatives to direct conflict aimed at establishing states' rightful place within the international hierarchy of capabilities. Competitive investments in symbols of international preeminence may provide prestige-seeking states an opportunity to gain standing and confidence without directly or immediately threatening the security of others. Prestige-seeking acts ideally attract significant attention from a public that readily understands them as significant feats. But, beyond these requirements, policymakers involved in prestige races may have more leeway in determining which projects to pursue than those involved in security-motivated

¹²⁹Mercer (2017) argues that prestige is an illusion with little effects on the balance of international influence. Further study of the Space Race and its implications on international perceptions of leadership might possibly provide an alternative model.

¹³⁰While there is a general assumption that spiral models raise the risk of conflict, there remains debate about the issue. See Glaser (2000, 2004); Sample (1997).

ances, choosing normatively acceptable policies with few direct military implications. Further work should be done to assess the role of epistemic communities in advising policymakers about the appropriate direction of technological development.

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