# 1NC R3 Colley

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#### Space Tourism makes low-gravity research accessible which results in critical physiological science innovation.

Caplan and Lindsay 17 Nick Caplan and Kirsty Lindsay 7-29-2017 "Space Tourism Could Help Boost Science and Health Research — Here's How" <https://www.space.com/37503-space-tourism-could-help-boost-science-health-research.html> (Nick graduated from the University of Birmingham with a PhD in Biomechanics)//Elmer

Perhaps one day we will see research teams launching groups of participants to spend a few weeks or months aboard a space hotel in order to study medical interventions that would slow the ageing process on Earth, and to help the human species colonise the Moon or even Mars. Research dating back to the early years of the space race has led to technologies that benefit us all. Many scientific discoveries have come since the arrival of inhabitable space stations that act as orbital laboratories. NASA’s first space station Skylab helped understand the effects on the human body of spending months in space and paved the way for the International Space Station. A huge number of research studies have been completed on the ISS since the year 2000 in the areas of human physiology, biology, biotechnology, physical science and earth and space science. These studies have led to discoveries such as enhanced protein crystal growth for drug development, efficient combustion of fuel droplets, and an understanding of the effects of long duration exposure to microgravity on the human body, revealing that spaceflight has effects similar to ageing on Earth. Despite much human physiological research being carried out in space, it has one major limitation – there are simply not enough humans currently going to space to act as research participants, leading to difficulties in research design. In fact, only 550 or so humans have ever been into space since Russian cosmonaut Yuri Gagarin first orbited the Earth in 1961. Human physiological experiments in space tend to have very small participant numbers (for example, the NASA twins study) or they have to take place over many years. Could the boom in commercial human spaceflight accelerate the speed of human physiological discoveries in space? We certainly think so.

#### Physiology key to manage new Diseases.

APS 20 5-21-2020 "How Physiologists Are Helping Patients Recover from COVID-19" <https://ispyphysiology.com/2020/05/21/how-physiologists-are-helping-patients-recover-from-covid-19/> (American Physiology Society)//Elmer

Understanding Physiology Is Critical to Fighting COVID-19 For each of the new treatments and devices created to combat COVID-19, it is critical to make sure they are safe to use in people. This is where understanding of human physiology is very important. For instance, treatment with remdesivir can reduce the amount of the virus in your body and has helped people who are severely ill with COVID-19 recover faster. But the drug is known to damage the liver and the immune system, so it is very important to know how well a patient’s liver and immune system are functioning before using it as a treatment. Even as I write this, there are new findings that COVID-19 directly affects not only the lungs but also the brain, kidneys, blood vessels and blood cells. This makes treatment of COVID-19 very difficult. Scientists and bioengineers need to take into consideration how the different organs of the body coordinate to keep you alive and healthy—the knowledge of how all the organs, tissues and cell work together in health and disease is the basis of physiological study. The trouble with finding the best treatment for COVID-19 is that the symptoms are so different from one person to the next. Children seem to be less vulnerable to COVID-19, older people are more vulnerable and some young adults are dying from strokes caused by the coronavirus rather than respiratory issues. As we find out more about how COVID-19 affects the body, it is clear that there will be more than one best way to fight it. In my eyes, the COVID-19 pandemic has highlighted the value of scientific research, especially research that helps us understand human physiology. In a few short months, scientists have sequenced the genome of the virus, discovered how SARS-CoV-2 infects cells by attaching its “spikes” to a protein on cells and developed new potential treatments. It will be the research physiologist’s job to study and understand how to best use these medicines and devices to treat COVID-19 patients.

#### Disease causes Extinction.

Bar-Yam 16 Yaneer Bar-Yam 7-3-2016 “Transition to extinction: Pandemics in a connected world” <http://necsi.edu/research/social/pandemics/transition> (Professor and President, New England Complex System Institute; PhD in Physics, MIT)//Elmer

Watch as one of the more aggressive—brighter red — strains rapidly expands. After a time it goes extinct leaving a black region. Why does it go extinct? The answer is that it spreads so rapidly that it kills the hosts around it. Without new hosts to infect it then dies out itself. That the rapidly spreading pathogens die out has important implications for evolutionary research which we have talked about elsewhere [1–7]. In the research I want to discuss here, what we were interested in is the effect of adding long range transportation [8]. This includes natural means of dispersal as well as unintentional dispersal by humans, like adding airplane routes, which is being done by real world airlines (Figure 2). When we introduce long range transportation into the model, the success of more aggressive strains changes. They can use the long range transportation to find new hosts and escape local extinction. Figure 3 shows that the more transportation routes introduced into the model, the more higher aggressive pathogens are able to survive and spread. As we add more long range transportation, there is a critical point at which pathogens become so aggressive that the entire host population dies. The pathogens die at the same time, but that is not exactly a consolation to the hosts. We call this the phase transition to extinction (Figure 4). With increasing levels of global transportation, human civilization may be approaching such a critical threshold. In the paper we wrote in 2006 about the dangers of global transportation for pathogen evolution and pandemics [8], we mentioned the risk from Ebola. Ebola is a horrendous disease that was present only in isolated villages in Africa. It was far away from the rest of the world only because of that isolation. Since Africa was developing, it was only a matter of time before it reached population centers and airports. While the model is about evolution, it is really about which pathogens will be found in a system that is highly connected, and Ebola can spread in a highly connected world. The traditional approach to public health uses historical evidence analyzed statistically to assess the potential impacts of a disease. As a result, many were surprised by the spread of Ebola through West Africa in 2014. As the connectivity of the world increases, past experience is not a good guide to future events. A key point about the phase transition to extinction is its suddenness. Even a system that seems stable, can be destabilized by a few more long-range connections, and connectivity is continuing to increase. So how close are we to the tipping point? We don’t know but it would be good to find out before it happens. While Ebola ravaged three countries in West Africa, it only resulted in a handful of cases outside that region. One possible reason is that many of the airlines that fly to west Africa stopped or reduced flights during the epidemic [9]. In the absence of a clear connection, public health authorities who downplayed the dangers of the epidemic spreading to the West might seem to be vindicated. As with the choice of airlines to stop flying to west Africa, our analysis didn’t take into consideration how people respond to epidemics. It does tell us what the outcome will be unless we respond fast enough and well enough to stop the spread of future diseases, which may not be the same as the ones we saw in the past. As the world becomes more connected, the dangers increase. Are people in western countries safe because of higher quality health systems? Countries like the U.S. have highly skewed networks of social interactions with some very highly connected individuals that can be “superspreaders.” The chances of such an individual becoming infected may be low but events like a mass outbreak pose a much greater risk if they do happen. If a sick food service worker in an airport infects 100 passengers, or a contagion event happens in mass transportation, an outbreak could very well prove unstoppable.

## Case

### ADV

### Retrenchment

#### Revisionist states are only dangerous and conflict-prone when they’ve just had their ambitions denied---the plan creates the only scenario for great power war

Hal Brands 18, the Henry Kissinger Distinguished Professor at Johns Hopkins-SAIS, senior fellow at the Center for Strategic and Budgetary Assessments, 10/24/18, “Danger: Falling Powers,” <https://www.the-american-interest.com/2018/10/24/danger-falling-powers/>

There is, then, no disputing that rising powers can have profoundly disruptive effects. Yet such powers might not actually be the most aggressive or risk-prone type of revisionist state. After all, if a country’s position is steadily improving over time, why risk messing it all up through reckless policies that precipitate a premature showdown? Why not lay low until the geopolitical balance has become still more favorable? Why not wait until one has surpassed the reigning hegemon altogether and other countries defer to one’s wishes without a shot being fired? So while a rising revisionist power may be tempted to assert itself, it should also have good reason to avoid going for broke.

Now imagine an alternative scenario. A revisionist power—perhaps an authoritarian power—has been gaining influence and ratcheting its ambitions upward. Its leaders have cultivated intense nationalism as a pillar of their domestic legitimacy; they have promised the populace that past insults will be avenged and sacrifices will be rewarded with geopolitical greatness and global prestige. Yet then the country’s potential peaks, either because it has reached its natural limit or because of some unforeseen development, and the balance of power starts to shift in unfavorable ways. It becomes clear to the country’s leadership that it may not be able to accomplish the goals it has set and fulfill the promises it has made, and that the situation will only further worsen with time. A roll of the iron dice now seems more attractive: It may be the only chance the nation has to claim geopolitical spoils before it is too late.

In this scenario, it is not rising power that makes the revisionist state so dangerous, but the temptation to act before decline sets in. In this sense, the dynamic bears a resemblance to the famous Davies J-Curve theory of revolution, wherein a populace is held to be more inclined to revolt not when it is maximally oppressed but rather when raised expectations are shown to be in vain.

Obviously, rational analysis does not always prevail in world politics. Rising states can become intoxicated with their own strength; they may simply get tired of waiting to attain the status they desire; or some domestic pressure may impel leaders to act dangerously. But revisionists whose power has begun to decline, or who have hit a rogue bump in the road, may not feel that they even have the option of waiting.

#### Leadership is unsustainable---retrenchment is gradual now, but recommitting makes it violent and forced.

Kupchan 20, professor of international affairs at Georgetown University and senior fellow at the Council on Foreign Relations. (Charles A., 10-21-2020, "America’s Pullback Must Continue No Matter Who Is President", *Foreign Policy*, https://foreignpolicy.com/2020/10/21/election-2020-smart-retrenchment/)

As the Trump era potentially comes to an end, many foreign-policy voices in the United States and abroad relish the prospect of the country’s roaring return to the global stage. But attempting a full-on comeback would be a mistake. If anything, the strategic pullback that President Donald Trump has initiated needs to continue—albeit in a more coherent and judicious manner.

Much of the debate surrounding the next administration’s foreign policy has focused on boldly reasserting U.S. leadership in the world. And it’s true: Global interdependence and upheaval do require steady U.S. leadership and engagement. What’s been largely missing from this debate, however, are the challenges facing the next president when it comes to right-sizing U.S. engagement abroad—especially military involvement—and bringing the nation’s strategic commitments back into line with it means and purposes.

The American electorate has turned sharply inward in response to military overreach in the Middle East, the economic dislocations brought about by innovation and globalization, and the national calamity caused by COVID-19. The nation’s next president would be wise to take note—and craft a brand of global statecraft that is effective but also politically sustainable. Otherwise, the strategic pullback that needs to take place will occur by default rather than by design, risking that U.S. overreach could turn into even more dangerous underreach. Indeed, that’s what’s been happening during Trump’s presidency. He seems to have understood the need to retrench. But his troop withdrawals from Afghanistan, Iraq, Syria, and Germany have been haphazard, making a hash of the effort. Retrenchment cannot be done by tweet, in unpredictable fits and starts, and couched in an abrasive “America first” unilateralism that has alienated allies and set the world on edge.

Democratic candidate Joe Biden is far better suited to restore an equilibrium between the nation’s foreign policy and its political will. Throughout his career, he has been a pragmatic and prudent internationalist; looking forward, pragmatism and prudence will require a more selective and discriminating internationalism, not restoration of the status quo ante. Three-quarters of the American public want U.S. troops to leave Afghanistan and Iraq—it is time to downsize the U.S. footprint in the Middle East. U.S. foreign policy has become over-militarized—the next administration should reallocate priorities and resources, putting more emphasis on diplomacy, cybersecurity, global public health, and climate change. Washington should also return to being a team player if it is to lighten its load; retrenchment and multilateral engagement go hand in hand. Meeting the threat posed by China, managing international trade and finance, preventing nuclear proliferation, addressing pandemics—these and other urgent challenges all require broad international cooperation. And as the United States pulls back from its role as global policeman, it will want like-minded partners to help fill the gap. These partnerships become stronger through diplomacy and teamwork.

The top priorities of the next president will be at home: taming the pandemic, repairing the economy, and reviving democratic institutions and norms. Only if the country’s democratic lights come back on can it effectively deal with the rest of the world. In the meantime, the next administration needs to continue Trump’s effort to downsize the nation’s foreign entanglements—but in a smart and measured way. The United States needs to step back without stepping away. “Build back better” applies abroad just as much as it does at home.

#### US competitive decline causes peaceful retrenchment- no transition wars

Paul K. MacDonald 11, Assistant Professor of Political Science at Wellesley College, with Joseph M. Parent, Assistant Professor of Political Science at the University of Miami. May 2011 “Resurrecting Retrenchment: The Grand Strategic Consequences of U.S. Decline” http://www.belfercenter.org/publication/resurrecting-retrenchment-grand-strategic-consequences-us-decline

CURRENT U.S. DECLINE AND THE UNPOPULARITY OF RETRENCHMENT

Many policymakers and pundits contend that U.S. relative power is declining and that this decline will have negative consequences for international politics. They justify this pessimism on the belief that great powers have few options for dealing with acute relative decline. Critics say that retrenchment, a policy of retracting grand strategic commitments in response to a decline in relative power, is a contemptible policy that demoralizes allies and emboldens potential adversaries. Furthermore, domestic interest groups and lobbies look like immovable obstacles with regard to policies designed to harmonize ends with means.

There is little evidence, however, to justify the pervasive pessimism about retrenchment. The historical record suggests that not only is great power retrenchment common; it is also effective. Retrenching states shift burdens to allies, constrain military budgets, and avoid militarized disputes to preserve their position in the hierarchy of nations. In contrast, states that fail to retrench never recover their rank among the great powers.

The competitive nature of the international system explains the success of retrenchment. If states shoulder disproportionate burdens, pamper private interests, become bogged down in costly conflicts, and generally masquerade as more powerful than they are, they will tend to be exploited by more disciplined and realistic adversaries. Great powers have a considerable incentive, therefore, to moderate their ambitions in the face of sustained declines in relative power.

KEY FINDINGS

To date, there has been no comprehensive study of great power retrenchment and no study that defends retrenchment as a probable or practical policy. Using historical data on gross domestic product, we identify eighteen cases of "acute relative decline" since 1870. Acute relative decline happens when a great power loses an ordinal ranking in global share of economic production, and this shift endures for five or more years. A comparison of these periods yields the following findings:

Retrenchment is the most common response to decline. Great powers suffering from acute decline, such as the United Kingdom, used retrenchment to shore up their fading power in eleven to fifteen of the eighteen cases that we studied (61–83 percent).

The rate of decline is the most important factor for explaining and predicting the magnitude of retrenchment. The faster a state falls, the more drastic the retrenchment policy it is likely to employ.

The rate of decline is also the most important factor for explaining and predicting the forms that retrenchment takes. The faster a state falls, the more likely it is to renounce risky commitments, increase reliance on other states, cut military spending, and avoid starting or escalating international disputes.

In more detail, secondary findings include the following:

Democracy does not appear to inhibit retrenchment. Declining states are approximately equally likely to retrench regardless of regime type.

Wars are infrequent during ordinal transitions. War broke out close to the transition point in between one and four of the eighteen cases (6–22 percent).

Retrenching states rebound with some regularity. Six of the fifteen retrenching states (40 percent) managed to recapture their former rank. No state that failed to retrench can boast similar results.

Declining great powers cut their military personnel and budgets significantly faster than other great powers. Over a five-year period, the average nondeclining state increased military personnel 2.1 percent—as compared with a 0.8 percent decrease in declining states. Likewise, the average nondeclining state increased military spending 8.4 percent—compared with 2.2 percent among declining states.

Swift declines cause greater alliance agreements. Over a five-year period, the average great power signs 1.75 new alliance agreements—great powers undergoing large declines sign an average of 3.6 such agreements.

Declining great powers are less likely to enter or escalate disputes. Compared to average great powers, they are 26 percent less likely to initiate an interstate dispute, 25 percent less likely to be embroiled in a dispute, and markedly less likely to escalate those disputes to high levels.

IMPLICATIONS FOR POLICYMAKERS

From the analysis above, three main implications follow for U.S. policy. First, we are likely to see retrenchment in U.S. foreign policy. With a declining share of relative power, the United States is ripe to shift burdens to allies, cut military expenditures, and stay out of international disputes. This will not be without risks and costs, but retrenchment is likely to be peaceful and is preferable to nonretrenchment. In short, U.S. policymakers should resist calls to maintain a sizable overseas posture because they fear that a more moderate policy might harm U.S. prestige or credibility with American allies. A humble foreign policy and more modest overseas presence can be as (if not more) effective in restoring U.S. credibility and reassuring allies.

Second, any potential U.S.-Sino power transition is likely to be easier on the United States than pessimists have advertised. If the United States acts like a typical retrenching state, the future looks promising. Several regional allies—foremost India and Japan—appear capable of assuming responsibilities formerly shouldered by the United States, and a forward defense is no longer as valuable as it once was. There remains ample room for cuts in U.S. defense spending. And as China grows it will find, as the United States did, that increased relative power brings with it widening divisions at home and fewer friends overseas. In brief, policymakers should reject arguments that a reduction in U.S. overseas deployments will embolden a hostile and expansionist China. Sizable forward deployments in Asia are just as likely to trap the United States in unnecessary clashes as they are to deter potential aggression.

Third, the United States must reconsider when, where, and how it will use its more modest resources in the future. A sensible policy of retrenchment must be properly prepared for—policymakers should not hastily slash budgets and renounce commitments. A gradual and controlled policy of reprioritizing goals, renouncing commitments, and shifting burdens will bring greater returns than an improvised or imposed retreat. To this end, policymakers need to engage in a frank and serious debate about the purposes of U.S. overseas assets.

Our position is that the primary role of the U.S. military should be to deter and fight conventional wars against potential great power adversaries, rather than engage in limited operations against insurgents and other nonstate threats. This suggests that U.S. deployments in Iraq and Afghanistan should be pared down; that the United States should resist calls to involve itself in internal conflicts or civil wars, such as those in Libya and elsewhere in North Africa; and that the Asia-Pacific region should have strategic priority over Europe and the greater Middle East. Regardless of whether one accepts these particular proposals, the United States must make tough choices about which regions and threats should have claim to increasingly scarce resources.

CONCLUSION

Retrenchment is probable and pragmatic. Great powers may not be prudent, but they tend to become so when their power ebbs. Regardless of regime type, declining states routinely renounce risky commitments, redistribute alliance burdens, pare back military outlays, and avoid ensnarement in and escalation of costly conflicts.

Husbanding resources is simply sensible. In the competitive game of power politics, states must unsentimentally realign means with ends or be punished for their profligacy. Attempts to maintain policies advanced when U.S. relative power was greater are outdated, unfounded, and imprudent. Retrenchment policies—greater burden sharing with allies, less military spending, and less involvement in militarized disputes—hold the most promise for arresting and reversing decline.

#### Retrenchment solves prolif, allied entrapment, and blowback terrorism

Glaser, 17 - associate director of foreign policy studies at the Cato Institute, Master of Arts in International Security at the Schar School of Policy and Government at George Mason University (John, "Withdrawing from Overseas Bases: Why a Forward-Deployed Military Posture Is Unnecessary, Outdated, and Dangerous," *Cato Institute*, 7-18-2017, https://www.cato.org/publications/policy-analysis/withdrawing-overseas-bases-why-forward-deployed-military-posture)

Even beyond airstrikes, U.S. troops can deploy to virtually any region fast enough that they can be based in the continental United States. In emergency situations, according to Rand, “lighter ground forces can deploy by air from the United States almost as quickly as they can from within a region.” 53 An armored brigade combat team can get from Germany to Kuwait in approximately 18 days, only about 4 days more quickly than if it deployed from the East Coast of the United States. 54 U.S.-based forces could handicap contingency responsiveness in certain smaller missions. The transit time to the Taiwan Strait, for example, for a carrier strike group deployed from Yokosuka, Japan, would d take 3 to 5 days, whereas deployment from the West Coast would take up to 16 days. However, basing capacity in Hawaii or Guam can cut those transit times considerably. 55

Admittedly, deploying heavy forces by air in bulk is not plausible for contingencies requiring massive ground troops. But contingencies that truly depend on extremely rapid deployment are rare. The United States tends to have the luxury of intervening at its own pace. And, given America’s relative insulation from external threats, it’s not clear that speedy intervention is even desirable. For one thing, reducing the emphasis on rapid response would likely signal to allies the need to cut back on free riding (that is, spending less on the military in the expectation that the United States will carry their defense burden).

Moreover, robbing the executive branch of the ability to rapidly insert the United States into a military conflict abroad may indeed be a good thing. Since World War II, constitutional restrictions on the president’s war-making powers have eroded. But the Framers of the Constitution were wise to constrain the president’s war-making powers. Affording the executive a speedy response with in-place forces, therefore, not only undermines the rule of law but also can intensify war proneness. As Bernard Brodie once wrote, “the notion that it is incontestably good to expand the chief executive’s options is rather peculiar” because “it runs directly counter to the basic tenets of constitutional government” and because “one way of keeping people out of trouble is to deny them the means for getting into it.” 56

Vulnerability, Counterbalancing, and Entanglement

Keeping U.S. troops permanently stationed abroad presents several strategic problems. First, such forces are more vulnerable to attack than forces stationed at home. Even though the preponderance of U.S. power and the general decline in international war probably mean that U.S. overseas bases are not at risk of bombardment in the immediate future, certain plausible contingencies could make them priority targets. If conflict breaks out over Taiwan or maritime-territorial disputes in the East China Sea or the South China Sea, the United States would be obligated to intervene against China to fulfill its security guarantee to Taiwan, Japan, or the Philippines, which would then trigger Chinese actions against U.S. assets. 57 To take another example that is now more remote, thanks to the recently negotiated nuclear deal with Iran, if Israel were to preventively strike one of Iran’s nuclear facilities, the United States would be implicated immediately because of its promises to fight to defend Israel. 58 According to a 2012 report, U.S. bases in Bahrain would be a priority target in Iranian retaliatory strikes. 59

For facilities based in certain countries, particularly in the Middle East, the risk of terrorist attacks on military bases has increased in recent years. Not only are homemade explosives and car bombs easier to access and produce, but also—especially after the damage done by the post-9/11 wars in Iraq and Afghanistan—an anti-American narrative has become even more popular, making U.S. bases desirable targets for terrorist attacks.

Overseas bases can inspire blowback in the form of terrorism. According to Robert Pape, “the principal cause of suicide terrorism is resistance to foreign occupation.” 60 Infamous examples, like the 1983 bombings of the Marine barracks in Beirut, Lebanon, that killed 241 Americans, and the al Qaeda attack in 2000 on the USS Cole off the coast of Yemen, are illustrative. 61 But bases can also motivate attacks on U.S. soil. The presence of U.S. military bases in Saudi Arabia was one of the most prominent grievances cited by al Qaeda in the lead-up to the 9/11 attacks. 62 And the post-9/11 surge in the U.S. military presence in the Middle East coincided with a massive increase in the rate of terrorist attacks inspired by anti-Americanism. 63

In addition to terrorism, the development of extremely accurate intermediate- and long-range ballistic missiles and modern satellite-based sensors, among other innovations, makes overseas bases susceptible to asymmetric attacks that are very difficult to defend against. China, in particular, has invested heavily in these capabilities, meaning that a large percentage of U.S. facilities—more than 90 percent of U.S. air facilities in northeast Asia—are in high-threat areas. China’s conventional theater-strike system, the DF-21, “can hit all military facilities along the entire Japanese archipelago,” says Toshi Yoshihara, the chair of Asia-Pacific Studies at the U.S. Naval War College. 64 Michael J. Lostumbo and others write that these weapons and others like them “could cripple an airbase, incapacitate an aircraft carrier, and devastate concentrated ground forces.” 65Granted, the tripwire effect of U.S. forward bases, along with the fact that U.S. allies benefit from these capabilities as well, means that deterrence remains robust in Asia. Still, Chinese strategic planners have discussed striking U.S. bases in the unlikely scenario that inadvertent escalation results in an outbreak of conflict. 66 In other words, bases offer only a marginal increase in deterrence at added risk to forward-deployed troops.

Another major strategic problem with a forward-deployed military posture is that it can sometimes have the opposite of its intended effect. Stationing military bases near an adversary can cause fear that generates counteraction instead of scaring an adversary into submission. 67 The most intense crisis of the Cold War period may have had its origins in such a dilemma. In June 1961, the Kennedy administration placed Jupiter ballistic missiles in Turkey, bordering the Soviet Union. It was partly in response to that decision that the Soviet Union decided to place its own missiles in Cuba, precipitating a dangerous crisis between the nuclear powers in October of that year. 68 Soviet leader Nikita Khrushchev reportedly called the deployment of Jupiter missiles “an intolerable provocation” and told his ambassador to Cuba, “Inasmuch as the Americans already have surrounded the Soviet Union with a circle of their military bases and missile installations of various designations, we should repay them in kind, let them try their own medicine.” 69

Today, the U.S. military presence in Europe is tasked, in part, with deterring Russian military aggression. And on those recent occasions in which Russia has acted out militarily, as it did against Georgia in 2008 on the side of separatists in South Ossetia and Abkhazia and in Ukraine in 2014, advocates of a forward posture blame the incursions on a lack of deterrence or diminished American credibility. But Russia’s interventions in Georgia and Ukraine derive more from Moscow’s insecurities about the expansion of U.S.-led Western economic and military institutions into former Soviet republics, and even up to the Russian border, than from insufficient U.S. military presence in Eastern Europe. 70 Post-Cold War NATO expansion is the source of profound anxiety and lingering resentment in Moscow. 71 Following Vladimir Putin’s annexation of Crimea, the Russian leader decried NATO expansion as an attempt at containment, and, when in 2015 NATO invited Montenegro to be the newest member of the alliance, the Kremlin warned that further expansion eastward “cannot but result in retaliatory actions.” 72 One could say that forward deployment contributes to the insecurity it purports to prevent.

Bases can also motivate nearby adversaries to pursue nuclear weapons. Iran’s expansion of nuclear enrichment in the run-up to the recent nuclear deal between Iran, the United States, the United Kingdom, France, Russia, China, and Germany, for example, was likely understood by many in Tehran as a measure of protection from the United States. After all, the United States habitually intervenes in the region, is allied with Iran’s two most vociferous enemies (Israel and Saudi Arabia), and has carried out regime change and years of military occupation in the countries on Iran’s immediate east and west flanks. In addition, while bases in Japan and South Korea have arguably helped dissuade these countries from developing nuclear weapons, the U.S. presence creates pressure for North Korea to do so. Pyongyang’s efforts to secure a deliverable nuclear weapon may be partly motivated by a desire for the prestige associated with such capabilities, but fear of U.S. military power in South Korea, and a desire to deter an attack by either or both countries, are also significant motivators. Proximate U.S. military forces and an adversarial relationship with Washington helped motivate China’s 1964 acquisition of nuclear weapons. 73 And, in recent years, U.S. actions in Iraq and Libya have signaled to potential rogue states the wisdom, rather than the danger, of obtaining a nuclear deterrent, or at least maintaining a threshold breakout capability. 74

Entanglement is another risk exacerbated by the attempt to reassure allies with overseas bases. 75 If U.S. troops are stationed abroad to demonstrate credibility, and then the United States refuses to intervene in the event of conflict, U.S. policymakers will suffer political costs, even if the circumstances do not involve vital U.S. interests. Much academic literature has questioned the need to take military action solely for the sake of credibility. 76 But the presence of military bases in or near a conflict zone can intensify calls to intervene to satisfy credibility concerns, thus making entanglement more likely.

Allies can entrap a security patron into war with their rivals by pursuing high-risk strategies. U.S. military presence can encourage this moral hazard, sometimes called “reckless driving.” 77 Current U.S. posture is plagued by plausible scenarios of entrapment in its commitments to Taiwan, Japan, and the Philippines over territorial and maritime sovereignty disputes with China. In 2012, the Philippines engaged in an intense and potentially dangerous two-month naval standoff with China, a much more capable military power, over the disputed Scarborough Shoal in the South China Sea. Heightened nationalist sentiments certainly played a role in the quarrel, but the unequal power dynamics between the two states raises reasonable questions about whether the relatively weak Philippines was emboldened to challenge a much stronger China because of the United States’ security guarantee and nearby military bases. That kind of moral hazard is a liability that could pull the United States into conflicts unconnected to its direct security and economic interests. Fundamentally, moral hazard is a function of the commitment, but it is exacerbated by the physical presence of bases and troops.

#### China’s drive for regional hegemony is peaceful and not zero-sum with the U.S.---the only scenario for an aggressive rise to power is in response to signals that the U.S. could successfully deny China’s status claims

Paul Heer 19, National Intelligence Officer for East Asia in the Office of the Director of National Intelligence from 2007 to 2015, the Robert E. Wilhelm Research Fellow at the Massachusetts Institute of Technology’s Center for International Studies and an Adjunct Professor at George Washington University’s Elliott School of International Affairs, 1/8/19, “Rethinking U.S. Primacy in East Asia,” <https://nationalinterest.org/print/blog/skeptics/rethinking-us-primacy-east-asia-40972>

First, China is pursuing hegemony in East Asia, but not an exclusive hostile hegemony. It is not trying to extrude the United States from the region or deny American access there. The Chinese have long recognized the utility—and the benefits to China itself—of U.S. engagement with the region, and they have indicated receptivity to peaceful coexistence and overlapping spheres of influence with the United States there. Moreover, China is not trying to impose its political or economic system on its neighbors, and it does not seek to obstruct commercial freedom of navigation in the region (because no country is more dependent on freedom of the seas than China itself). In short, Beijing wants to extend its power and influence within East Asia, but not as part of a “winner-take-all” contest.

China does have unsettled and vexing sovereignty claims over Taiwan, most of the islands and other features in the East and South China Seas, and their adjacent waters. Although Beijing has demonstrated a willingness to use force in defense or pursuit of these claims, it is not looking for excuses to do so. Whether these disputes can be managed or resolved in a way that is mutually acceptable to the relevant parties and consistent with U.S. interests in the region is an open, long-term question. But that possibility should not be ruled out on the basis of—or made more difficult by—false assumptions of irreconcilable interests. On the contrary, it should be pursued on the basis of a recognition that all the parties want to avoid conflict—and that the sovereignty disputes in the region ultimately are not military problems requiring military solutions. And since Washington has never been opposed in principle to reunification between China and Taiwan as long as it is peaceful, and similarly takes no position on the ultimate sovereignty of the other disputed features, their long-term disposition need not be the litmus test of either U.S. or Chinese hegemony in the region.

Of course, China would prefer not to have forward-deployed U.S. military forces in the Western Pacific that could be used against it, but Beijing has long tolerated and arguably could indefinitely tolerate an American military presence in the region—unless that presence is clearly and exclusively aimed at coercing or containing China. It is also true that Beijing disagrees with American principles of military freedom of navigation in the region; and this constitutes a significant challenge in waters where China claims territorial jurisdiction in violation of the UN Commission on the Law of the Sea. But this should not be conflated with a Chinese desire or intention to exclusively “control” all the waters within the first island chain in the Western Pacific. The Chinese almost certainly recognize that exclusive control or “domination” of the neighborhood is not achievable at any reasonable cost, and that pursuing it would be counterproductive by inviting pushback and challenges that would negate the objective.

So what would Chinese “hegemony” in East Asia mean or look like? Beijing probably thinks in terms of something much like American primacy in the Western Hemisphere: a model in which China is generally recognized and acknowledged as the de facto central or primary power in the region, but has little need or incentive for militarily adventurism because the mutual benefits of economic interdependence prevail and the neighbors have no reason—and inherent disincentives—to challenge China’s vital interests or security. And as a parallel to China’s economic and diplomatic engagement in Latin America, Beijing would neither exclude nor be hostile to continued U.S. engagement in East Asia.

A standard counterargument to this relatively benign scenario is that Beijing would not be content with it for long because China’s strategic ambitions will expand as its capabilities grow. This is a valid hypothesis, but it usually overlooks the greater possibility that China’s external ambitions will expand not because its inherent capabilities have grown, but because Beijing sees the need to be more assertive in response to external challenges to Chinese interests or security. Indeed, much of China’s “assertiveness” within East Asia over the past decade—when Beijing probably would prefer to focus on domestic priorities—has been a reaction to such perceived challenges. Accordingly, Beijing’s willingness to settle for a narrowly-defined, peaceable version of regional preeminence will depend heavily on whether it perceives other countries—especially the United States—as trying to deny China this option and instead obstruct Chinese interests or security in the region.

#### China isn’t revisionist.

McKinney 19, \*Jared Morgan; PhD candidate at the S. Rajaratnam School of International Studies, Nanyang Technological University (Singapore); \*\*Nicholas Butts; Center for Strategic and International Studies Pacific Forum Young Leader. He holds an LL.M. from Peking University, an MSc from The London School of Economics and an MPA from Harvard University where he was also a Crown Prince Frederik Scholar and a Cheng Fellow. (Winter 2019, “Bringing Balance to the Strategic Discourse on China’s Rise”, *Journal of Indo-Pacific Affairs*, pg. 75-76, https://www.airuniversity.af.edu/Portals/10/JIPA/journals/Volume-02\_Issue-4/McKinney.pdf)

In the abstract, such claims are alarming—in context, and in balance, rather humdrum. In fact, the evidence of any Chinese intention to destroy, or even merely undermine and exploit, the current order is slight. China is certainly using its growing military power to defend its claims in the SCS and even—on occasion— to coerce its neighbors. It uses protectionist economic policies to boost the prospects of Chinese companies and reduce competition. It employs economic statecraft to serve its interests abroad. And it certainly is opposed to America’s policy of global democracy promotion. However, none of these positions fundamentally challenge the existing order, none of them radically depart from America’s own actions when it was a rising power in the nineteenth century, and none of them obviously surpass America’s own contemporary record of order subversion.

When the United States was a rising power, it took half of Mexico and considered taking the rest, it colonized the Philippines and Hawaii, and it unilaterally seized the maritime choke points of the Caribbean (Puerto Rico and Cuba).21 The United States used tariffs—which by 1857 averaged 20 percent22 and by the end of the nineteenth century were “the highest import duties in the industrial world”23—to protect its industries. It stole intellectual property,24 and it ideologically challenged the governments of the “Old World.” Today, despite no longer being a rising power, the United States has launched two disastrous invasions, tortured prisoners, and dispatches drone strikes at a whim with little international legal authority.25 The point is not that two wrongs make a right; it is that international order is much more resilient than critics seem to realize,26 and it is utopian to expect any rising Great Power to act in a way that uniformly satisfies one’s moral scruples, evolving, in Friedberg’s words, “into a mellow, satisfied, ‘responsible’ status quo power.”27

Friedberg or Harris might object that America’s rise took place in the context of a different order. This is perfectly true, but the more important point is that the long nineteenth century (1815–1914)—the era of America’s rise—was the first iteration of the New Peace.28 The implication is that relative peace can and has coexisted with limited wars, property and territorial thefts, acts of coercion, and aggressive assertions of status. This does not mean any of these are desirable— they are not—but it shows that they need not be fatal to the system. Insofar as there is a lesson from that first period of relative peace, it is that Great Power confrontation is the one thing that is fatal. Accepting this does not mean capitulating in every instance, as implied by some,29 but it does mean rediscovering the rules of Great Power competition30 alongside the art of strategy.31

Focusing only on areas that China’s rise violates the scruples of the established powers, moreover, downplays the extent to which China, has, in fact, conformed to the existing order. As a RAND Corporation report published in 2018 concludes, China has been a supporter—albeit a conditional one—of the international order: “Since China undertook a policy of international engagement in the 1980s … the level and quality of its participation in the order rivals that of most other states.”32 The way in which Xi Jinping, following his 2017 Davos speech in defense of globalization, has been heralded as the most prominent champion of international order and defender of globalization underscores the fact that there are different elements of this order, and that China supports many, if not most, of them. Even in places where China is supposedly “altering” the current order, Beijing tends to simultaneously affirm that order. China’s Asian Infrastructure Investment Bank, for instance, actually mirrors existing structures, and China has intentionally copied elements and “best practices” of the World Bank and Asian Development Bank. China is playing the same game, even if it is seeking a bigger role

### Global Governence

#### Retrenchment key to a concert strategy---that unlocks global governance.

Pampinella 19, Assistant Professor of Political Science and International Relations at the State University of New York (SUNY) at New Paltz. He is on leave from SUNY New Paltz during Spring 2019 and is conducting research on the practice of diplomacy in the Ecuadorian Foreign Ministry in Quito, Ecuador. (Stephen, 1-23-2019, "The Internationalist Disposition and US Grand Strategy", *Disorder of Things*, https://thedisorderofthings.com/2019/01/23/the-internationalist-disposition-and-us-grand-strategy/)

I think there is a strategy consistent with the international disposition: great power concert. A concert strategy requires that all great powers pursue mutual accommodation and recognize each other’s interests as part of a larger commitment to maintain international stability. Patrick Porter and Amitav Acharya argue that a great power concert strategy is the best suited to adapt to the transfer of wealth and power to Asia along with the “multiplex” nature of world politics (not to mention a global perspective on international relations). The emergence of a diverse range of state and non-state actors bound together by extreme interdependence makes it impossible for any one actor, such as the United States, to establish rules for global governance which can mobilize all others. On this basis, a concert strategy would lead the United States to collaborate with others on the basis of mutual co-existence and embrace joint decision-making at the global level for coping with macrostructural processes that threaten all peoples around the world. In this way, a concert strategy is firmly grounded the international disposition and can serve as the realization of progressive internationalism.

Security and The Balance of Power

A concert strategy can do what establishment foreign policy cannot, namely de-escalate great power competition by giving up US hegemony. If adopted, the United States would treat other great powers, like Russia, China, and Iran, as equal partners in the maintenance of global stability and incorporate their interests into regional security agreements. The United States would give up its self-assumed role as an unrivaled global hegemon and seek a balance of power based on mutual respect with other great powers as partners rather than enemies. This kind of international posture would result in a more horizontal great power system, one that Stacie Goddard as identified as being productive of status quo rather than revisionist intentions. It would be compatible with recognition of the great power identities of other states and provide them with ontological security.

Transitioning from a hegemonic security strategy to a balance of power one will require that the United States engage in some degree of retrenchment from its already expansive commitments. But supporters of hegemony are wrong when they claim that retrenchment will encourage great power aggression and lead to the abandonment of our allies. The United States can engage in moderate forms of retrenchment consistent with great power recognition while still maintaining commitments to allies that strive to uphold human dignity. For example, were the United States to support a moratorium on NATO expansion, as Michael O’Hanlon suggests, it would signal that the United States is no longer interested in moving the frontiers of its influence to the gates of Moscow and remove the sense of threat experienced by Russian leaders. By recognizing the validity of Russian security interests as well as its great power identity, the equal relationship made possible by a concert strategy will better deal with the threat of interstate conflict compared to US hegemony.

Reviving Global Governance

A concert strategy informed by the internationalist disposition can further enable more robust forms of global governance. Rather than attempt international cooperation based on a priori liberal normative templates, the United States would accept the validity of all claims made by collective actors in world politics in an open-ended and inclusive process of deliberation. The result would be less of a hegemonic order and more of a constitutionalist one, in which the United States binds itself to a truly democratic process of decision-making at the global level. The emergence of global governance norms would be a function less of hegemonic socialization and more of a right held by all actors to contest the validity of standards of expected behavior. In other words, a concert strategy would enable the United States to accept processes of norm contestation as the motor of transnational cooperation and generate more legitimate rules for regulating global governance. It would expand the US order building project initially identified by Ikenberry on the basis of restraint and institutional self-binding, but without retaining its own hierarchical position in world politics or engaging in hypocritical forms of dominance.

The implications for economic governance are profound: the United States would no longer exclude from consideration the notion of social democratic regulation of global capitalism and instead promote non-capitalist perspectives on the economy. Todd Tucker provides one great example of this approach when he argues that ISDS arbitration should include labor leaders and social justice advocates rather than international lawyers chosen by multinational firms which initiate legal action against sovereign states. It would also enable the United States to seriously consider Piketty’s call for a global wealth tax, Palley and Chow’s call for minimum wage floors, and a binding multilateral treaty that regulates global business activities on the basis of human rights. And finally, it would enable the drastic shift away from fossil fuels necessary to avoid climate apocalypse.

In Search of a Global Public

Naysayers might argue that all this degree of international cooperation sounds idealist, but all are possible in a context of declining great power competition. Once the United States recognizes the equal membership of all others in world politics on the basis of our extreme interdependencies, it can make possible what Mitzen has referred to as collective intentionality, or the emergence of a plural subject composed of several individuals who make and uphold joint commitments to each other and demand adherence as members of a global public. This kind of action is what the internationalist disposition can help us conceptualize, and even realize, through a concert strategy.

If progressive internationalists want to realize their objectives, they should be willing to turn away from the US establishment and embrace a concert strategy. By prioritizing cooperation on non-state issues and resolving great power competition through equal recognition, they can realize security for their own citizens as well as others. However, IR constructivists remind us that no foreign policy can be enacted by policymakers without a legitimating national security narrative. Progressive internationalists must continue to develop a new story about the United States that rationalizes a concert strategy and renders US national identity compatible with the pluralism we find in both world politics and US domestic politics. To develop this narrative, progressive internationalists should engage radical critiques of democracy, like those offered by Chantal Mouffe, which seek maximal inclusion of others and accept difference and conflict as irreducible elements of political life. A pluralist strategic narrative can thereby serve as the basis for mutual respect of others and enable the democratization of world politics.

#### Global governance checks emerging tech, pandemics, and war---extinction.

Bailey 18, Professional technologist and strategic manager. Robert earned his Master of Science Degree in Computer science in 2009, and has worked since then has a product engineer developing Microsoft stack technologies. (Robert, 9-5-201, "Why do we need global governance?" *Global Governance*, https://www.visionofearth.org/social-change/global-governance/)

Global governance is necessary because humanity increasingly faces both problems and opportunities that are global in scale. Today, transnational problems such as violence and pandemics routinely reach across borders, affecting us all. At the same time, the increasingly integrated global system has also laid the necessary foundations for peace and spectacular prosperity. Effective global governance will allow us to end armed conflict, deal with new and emerging problems such as technological risks and automation, and to achieve levels of prosperity and progress never before seen.

The most important challenge for humanity to overcome is that of existential risks. One way to look at the danger of an existential risk is to quantify the level of global coordination needed to deal with it. While best-shot risks, at one end of the spectrum only require that a single nation, organization or even individual (i.e., superhero) has the means and the will to save everyone, weakest-link risks, at the other end of the spectrum, are dangers that might require literally every country to take appropriate action to prevent catastrophe, with no room for failure.2 3

We’ve always been at risk of natural disaster, but with advances in our level of technology the risk we pose to ourselves as a species becomes ever greater. Nuclear weapons are a well-known risk that we still live with to this day. The progress of technological research exposes us to new dangers such as bioengineered superbugs, nanotechnological menaces, and the risk of an out-of-control artificial intelligence with ill-intent. Increased levels of global coordination are needed to combat many of these risks, as described in our article on the cooperation possibilities frontier.

There are other problems that don’t necessarily threaten the species or even civilization as we know it, but which are holding back the development of prosperity and progress. Armed conflict, around since the dawn of history, still haunts us today. Even though wars between great powers appear to be a thing of the past, regional conflicts still account for tremendous human suffering and loss of life in parts of the world without stable governance.4

Other problems have emerged precisely because of our successes in the past. The unprecedented advancement of human wellbeing and prosperity over the past century has been based in large part on the use of fossil fuels, thus exposing us to climate change. Widespread automation, already a stressor on society, will put increased pressure on the social and economic fabric of our societies over the next few decades. Global governance can help alleviate these issues in various ways - we refer the interested reader to the very detailed work in Ruling Ourselves.

Finally, global governance will increasingly be judged not only by the extent to which it prevents harm, but also by its demonstrated ability to improve human wellbeing.5 Progress has let us set our sights higher as a species, both for what we consider to be the right trajectory for humanity and for our own conduct.6 Major advances in human wellbeing can be accomplished with existing technology and modest improvements in global coordination.

Effective global governance is global governance that tackles these issues better than the regional governments of the world can independently. Global governance is key to solving global problems. Without it, we may not be able to avoid weakest-link existential risks or regulate new and dangerous technologies. With it, we may be able to prosper as we never have before. The next step is to determine how effective global governance can be achieved.

### Sino Russia

#### Pursing heg locks in overstretch and a Russia-China axis.

Porter 19, Professor of International Security and Strategy at the University of Birmingham. He is also Senior Associate Fellow at the Royal United Services Institute, London and a Fellow of the Quincy Institute for Responsible Statecraft. (Patrick Porter (2019) “Advice for a Dark Age: Managing Great Power Competition”, The Washington Quarterly, 42:1, 7-25, <https://doi.org/10.1080/0163660X.2019.1590079>)

There is little sign of active “splitting” currently, however. (A notable exception is recent collaboration with Beijing over North Korea’s nuclear program, even if it is marred by tension and distrust.) Rather, the United States is encouraging the perception of a common enemy. By militarily positioning itself within striking distance of Russia and China through a semi-encircling presence in eastern Europe and north-east Asia, expanding alliances, entertaining further expansion, ramping up freedom-of-navigation operations (FONOP) in the South China Sea, reviving the pursuit of an antiballistic missile shield, establishing a reputation as a sponsor of “color revolutions” and as an overthrower of regimes, Washington helps draw Beijing and Moscow closer together into a balancing coalition. A nascent Russia-China alliance is suggested by Russia’s own interagency inquiry into the possibility, the frequency of Putin-Xi contact, deliberate tightening of economic interaction, and overt displays and declarations of close military ties through joint exercises and arms sales.24

It does not have to be this way. The United States has a geopolitical advantage—its distant location. Most powers, most of the time, are more concerned by the potential threat of other nearby land powers than distant sea powers.25Based in the Western hemisphere, the United States has less of a compelling security interest in adversaries ’backyards, allowing Washington the choice of adopting a more distant pose. Russia and China, by contrast, are neighbors so cannot withdraw, both are primarily continental land-based military powers, and historically such proximity can exacerbate rivalries and mutual fears. Sino-Russian antagonism remains a built-in possibility. Only under the right conditions, though, can the rivalries again grow. This is not a plea for a trilateral realignment whereby one state agrees to be the United States’ “geopolitical hammer” and teams up with Washington to contain the other. Rather, it is to suggest that more American restraint in one theater could make space for Russia-China frictions to take effect in another.

This geopolitical principle will prove controversial. The bipartisan consensus among security experts in Washington is to assume that only a state of preponderance over all rivals will suffice. Policymakers assume that the problem lies in Washington’s failure to apply enough power, or to apply enough power efficiently enough. They then call for the allocation of more resources and their smarter use in order to sustain U.S. dominance. The congressionally-mandated2018National Defense Strategy Commission report, appointed to make recommendations, is a case in point. It takes dominance as the obvious U.S. national interest. It complains that as rivals challenge American power, U.S. military superiority and its capacity to wage concurrent wars has eroded, due tor-educed defense expenditure, and advises that it spend more while cutting entitlements.26On this logic, a defense budget that is already10 times the size of Russia’s and four times the size of China’s is not enough, for U.S. grand strategy must go beyond defense and deterrence to achieve unchallengeable strength. That the pursuit of dominance could be the source of the problem, not the answer, is not considered.

Even the United States cannot prudently take on every adversary on multiple fronts. The costs of military campaigns against these adversaries in their backyards, whether in the Baltic States or Taiwan, would outstrip the losses that the U.S. military has sustained in decades. Short of all-out conflict, to mobilize for dominance and risk escalation on multiple such fronts would court several dangers. It would overstretch the country. The U.S. defense budget now approaches $800 billion annually, not including deficit-financed military operations. This is a time of ballooning deficits, where the Congressional Budget Office warns that “the prospect of large and growing debt poses substantial risks for the nation.”27 If in such conditions, current expenditure is not enough to buy unchallengeable military preponderance—and it may not be—then the failure lies not in the failure to spend even more.

Neither is the answer to sacrifice the quality of civic life at home to service the cause of preponderance abroad. The old “two war standard,” a planning construct whereby the United States configures its forces to conduct two regional conflicts at once, would be unsustainably demanding against more than one peer competitor, or potentially with a roster of major and minor adversaries all at once.28After all, the purpose of American military power is ultimately to secure a way of life as a constitutional republic. To impose ever-greater debts on civil society and strip back collective provision at home, on the basis that the quality of life is expend-able for the cause of hegemony, is perversely to set up power-projection abroad as the end, when it should be the means. The problem lies, rather, in the inflexible pursuit of hegemony itself, and the failure to balance commitments with scarce resources.

To attempt to suppress every adversary simultaneously would drive adversaries together, creating hostile coalitions. It also may not succeed. Counterproliferation in North Korea is difficult enough, for instance, but the task becomes more difficult still if U.S. enmity with China drives Beijing to refuse cooperation over enforcing sanctions on Pyongyang. Concurrent competitions would also split American resources, attention and time. Exacerbating the strain on scarce resources between defense, consumption and investment raises the polarizing question of whether preponderance is even worth it, which then undermines the domestic consensus needed to support it. At the same time, reduced investment in infrastructure and education would damage the economic foundations for conducting competition abroad in the first place.

Taken together, indiscriminate competition risks creating the thing most feared in traditional U.S. grand strategy: a hostile Eurasian alliance leading to continuous U.S. mobilization against hostile coalitions, turning the U.S. republic into an illiberal garrison state. If the prospect for the United States as a great power faces a problem, it is not the size of the defense budget, or the material weight of resources at the U.S. disposal, or popular reluctance to exercise leadership. Rather, the problem lies in the scope of the policy that those capabilities are designed to serve. To make the problem smaller, Washington should take steps to make the pool of adversaries smaller.

#### Russia-China coordination triggers global war.

Kendall-Taylor & Shullman 19, \*PhD in Political Science from Yale, Senior Fellow in and Director of the Transatlantic Security Program at the Center for a New American Security an Adjunct Professor in Georgetown University’s School of Foreign Service. \*\*PhD, Senior Adviser at the International Republican Institute and an Adjunct Senior Fellow in the Transatlantic Security Program at the Center for a New American Security. (Andrea, David, 5/14/19, "A Russian-Chinese Partnership Is a Threat to U.S. Interests", *Foreign Affairs*, https://www.foreignaffairs.com/articles/china/2019-05-14/russian-chinese-partnership-threat-us-interests)

While Washington takes a wait-and-see approach, Moscow and Beijing could be coordinating to significantly thwart U.S. interests over the next 15 to 25 years. The two powers may never forge a formal military alliance, but they could still work together in ways that cause major headaches for the United States. Imagine, for example, that Russia and China coordinate the timing of hostile actions on their peripheries. If China made aggressive moves in support of its sovereignty claim in the South China Sea at the same time that Russia made further incursions into Ukraine, U.S. forces would struggle to respond effectively to either gambit.

Nonmilitary collaboration between Russia and China could weaken the United States and even threaten its way of life. Both countries are likely to use their cyber and disinformation capabilities to, as the director of national intelligence put it in January, “steal information, to influence our citizens, or to disrupt critical infrastructure.” China currently does not exhibit Russia’s zeal for using such measures, particularly against the United States; but if U.S.-Chinese relations darken, Beijing could plausibly take a page from Russia’s playbook and mount coordinated, deniable cyberattacks or interference campaigns against the United States.

China and Russia behave very differently in pursuit of their foreign policy objectives, but the combined effect of their actions is often greater than the sum of its parts. In Europe, for example, China has amassed economic influence through growing trade relationships and Belt and Road-related infrastructure investments not contingent on standards for democratic governance and human rights, particularly in eastern Europe, Greece, and Italy. This engagement will ultimately translate into political leverage, as it already has in many countries in Asia. Russia, for its part, appears intent on pursuing hybrid tactics that disrupt democratic processes. On their own, each of these activities is already worrisome for the United States and Europe. But a scenario in which each country’s actions amplify the other’s is not hard to imagine. China, for example, could eventually use its growing ownership of European ports and rail lines to slow a NATO response to Russian aggression. Likewise, Beijing could use the economic leverage it has accrued to quietly dissuade an already reluctant NATO member state such as Hungary or Turkey from responding to Russia’s hybrid tactics, which could ultimately serve to discredit NATO’s commitment to collective defense.

### Mining

#### No space mining – it’s just not profitable.

**Fickling 20** [David Fickling, David Fickling is a Bloomberg columnist covering commodities, as well as industrial and consumer companies. He has been a reporter for Bloomberg News, Dow Jones, the Wall Street Journal, the Financial Times and the Guardian. 12-21-2020, "We’re Never Going to Mine the Asteroid Belt," Bloomberg, [https://www.bloomberg.com/opinion/articles/2020-12-21/space-mining-on-asteroids-is-never-going-to-happen accessed 12/10/21](https://www.bloomberg.com/opinion/articles/2020-12-21/space-mining-on-asteroids-is-never-going-to-happen%20accessed%2012/10/21)] Adam

It’s wonderful that people are shooting for the stars — but those who declined to fund the expansive plans of the nascent space mining industry were right about the fundamentals. Space mining won’t get off the ground in any foreseeable future — and you only have to look at the history of civilization to see why.

One factor rules out most space mining at the outset: gravity. On one hand, it guarantees that most of the solar system’s best mineral resources are to be found under our feet. Earth is the largest rocky planet orbiting the sun. As a result, the cornucopia of minerals the globe attracted as it coalesced is as rich as will be found this side of Alpha Centauri.

Gravity poses a more technical problem, too. Escaping Earth’s gravitational field makes transporting the volumes of material needed in a mining operation hugely expensive. On Falcon Heavy, the large rocket being developed by Elon Musk’s SpaceX, transporting a payload to the orbit of Mars comes to as little as [$5,357 per kilogram](https://www.spacex.com/media/Capabilities&Services.pdf) — a drastic reduction in normal launch costs. Still, at those prices just lofting a single half-ton drilling rig to the asteroid belt would use up the annual exploration budget of a small mining company.

Power is another issue. The international space station, with 35,000 square feet of solar arrays, generates up to 120 kilowatts of electricity. That drill would need a [similar-sized power plant](https://www.rocktechnology.sandvik/en/products/exploration-drill-rigs-and-tools/compact-core-drill-rigs/) — and most mining companies operate multiple rigs at a time. Power demands rise drastically once you move from exploration drilling to mining and processing. Bringing material back to Earth would raise the costs even more. Japan’s [Hayabusa2 satellite spent six years](https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=2014-076A#:~:text=Total%20cost%20of%20the%20mission,yen%20(roughly%20%24150%20million%20U.S.)) and 16.4 billion yen ($157 million) recovering a single gram of material from the asteroid Ryugu and returning it to Earth earlier this month.

#### China’s Asteroid Mining efforts are light-years ahead of everyone else – now is key for Asteroid Mining. Successful Mining solves Warming through Green Transition.

Cohen 21 Ariel Cohen 10-26-2021 "China’s Space Mining Industry Is Prepping For Launch – But What About The US?" <https://www.forbes.com/sites/arielcohen/2021/10/26/chinas-space-mining-industry-is-prepping-for-launch--but-what-about-the-us/?sh=6b8bea862ae0> (I am a Senior Fellow at the Atlantic Council and the Founding Principal of International Market Analysis, a Washington, D.C.-based global risk advisory boutique.)//Elmer

Exploration of space-based natural resources are on the Chinese policy makers’ mind. The question is, what Joe Biden thinks? In April of this year, China’s Shenzen Origin Space Technology Co. Ltd. launched the NEO-1, the first commercial spacecraft dedicated to the mining of space resources – from asteroids to the lunar surface. Falling costs of space launches and spacecraft technology alongside existing infrastructure provides a unique opportunity to explore extraterrestrial resource extraction. Current technologies are equipped to analyze and categorize asteroids within our solar system with a limited degree of certainty. One of the accompanying payloads to the NEO-1 was the Yuanwang-1, or “little hubble” satellite, which searches the stars for possible asteroid mining targets. The NEO-1 launch marks another milestone in private satellite development, adding a new player to space based companies which include Japan’s Astroscale. Private asteroid identification via the Sentinel Space Telescope was supported by NASA until 2015. As private investment in space grows, the end goal is to be capable of harvesting resources to bring to Earth. “Through the development and launch of the spacecraft, Origin Space is able to carry out low-Earth orbit space junk cleanup and prototype technology verification for space resource acquisition, and at the same time demonstrate future asteroid defense related technologies.” In the end, it will come down to progressively lowering the cost of launched unit of weight and booster rocket reliability – before fundamentally new engines may drive the launch costs even further down. The April launch demonstrates that China is already succeeding while the West is spinning its wheels. The much touted Planetary Resources and Deep Space Industries (DSI) DSI -1% were supposed to be the vanguard of extra-terrestrial resource acquisition with major backers including Google’s GOOG -1.4% Larry Page. But both have since been acquired, the former by block chain company ConsenSys and the latter by Bradford Space, neither of which are prioritizing asteroid mining. This is too bad, given that that supply chain crunches here on Earth – coupled with the global green energy transition – are spiking demand for strategic minerals that are increasingly hard to come by on our environmentally stressed planet. And here China currently holds a monopoly on rare earth element (REE) extraction and processing to the tune of 90%. REE’s 17 minerals essential for modern computing and manufacturing technologies for everything from solar panels to semi-conductors. Resource-hungry China also has major involvement in global critical mineral supply chains, which include cobalt, tungsten, and lithium. As I’ve written before, the Chinese hold of upstream and downstream markets is staggering. Possessing 30% of the global mined ore, 80% of the global processing facilities, and an ever increasing list of high dollar investments around the world, China boasts over $36 billion invested in mining projects in Africa alone. Beijing’s space program clearly indicates that the Chinese would also like to tighten their grip on space-based resources as well. According to research, it is estimated that a small asteroid roughly 200 meters in length that is rich in platinum could be worth up to $300 million. Merrill Lynch predicts the space industry — including extraterrestrial mining industry – to value $2.7 trillion in the next three decades. REEs are fairly common in the solar system, but to what degree remains unknown. The most sought after are M-type asteroids which are mostly metal and hundreds of cubic meters. While these are not the most common, the 27,115 Near Earth asteroids are bound to contain a few. This – and military applications – are no doubt a driving factor of China’s ever increasing space ambitions.