# 1AC

### Plan

#### I affirm: The appropriation of outer space by private entities via Large Satellite Constellations in Lower Earth Orbit is unjust.

Takaya et al 18 “The Principle of Non-Appropriation and the Exclusive Uses of LEO by Large Satellite Constellations” Yuri Takaya-Umehara [Visiting researcher at the University of Tokyo since April 2017. She was affiliated to the Kobe University to provide a course on space law to post-graduate students (2011-2017). She chairs a working group on the formulation of global norms in space law organized by the Keio University since 2018. She obtained her Ph.D. degree at the IDEST of Paris XI University in France, LL.M. at the Leiden University in the Netherlands.] Quentin Verspieren [Ph.D. in public policy @ The University of Tokyo, Assistant Professor of Space Policy @UTokyo, General Manager, Global Strategy @ArkEdge Space Inc., Associate Research Fellow @ESPI] Goutham Karthikeyan [The University of Tokyo & Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency (ISAS-JAXA)] 2018 https://www.researchgate.net/publication/328094878\_The\_Principle\_of\_Non-Appropriation\_and\_the\_Exclusive\_Use\_of\_LEO\_by\_Large\_Satellite\_Constellations SM

* LSC = large satellite constellations
* Outlines “L”SC thresholds

By investigating expected large satellite constellation projects and by reviewing existing interpretations of international space law, this paper argues that the exclusive use of specific LEO orbits by a large constellation of satellite could constitute a violation of the non-appropriation principle by means of occupation and by means of use, drawing a parallel between orbits as resources and the exploitation of tangible mineral resources in space. Based on this, the important question to be raised is what constitutes an exclusive use of a specific orbit. In other words, an important hurdle in the concrete evaluation of whether a planned or established constellation potentially violates the non-appropriation principle through an exclusive use of LEO resides in the lack of clear definition on what can be considered an exclusive use. While the authors claim that legal issue can be clearly solved in abstracto, it naturally shifts towards a regulatory challenge.

This regulatory challenge consists in first defining qualitatively what is the exclusive use of an orbit before translating this definition into measurable, technical rules. In this paper, the authors define an exclusive use of an orbit by a state40 as any use that would prevent/hinder the usage of the same orbit by any other state. Translating this definition into an applicable regulation could consist in defining a threshold of orbital collision risk or a threshold of density of satellites along an orbit based on its altitude, shape, relative velocity of neighbouring objects, etc. It is however not the purpose of this space law paper. What is more appropriate here is to think about which organization or forum would be in charge of elaborating this technical definition. Serious candidates could be the ITU, with excellent track-record in dealing with the use of the GEO region but which would have to review its “first come, first served” principle, or the UNCOPUOS, aiming for the widespread adoption of a new piece of international law. Moreover, even if its rules suffer from a low implementation rates, the IADC would be an appropriate discussion platform thanks to its very deep technical focus.

6. Conclusion

The various announced projects of LSC, also called mega-constellations, push existing regulations and practices to their limit, forcing researchers and practitioners around the world to rethink the applicability of existing space law principles to this new trend. In this paper, the authors, after providing background information on current LSC plans as well as recalling the legal status of the LEO region, investigate whether the deployment of an LSC having an exclusive use of an orbit constitutes a violation of the nonappropriation principle as stated in OST Article II. This paper concludes that:

♣ The exclusive use of an orbit by an LSC constitutes a violation of the non-appropriation principle by means of occupation due to the innate nature of orbit being a specific location in space that can be occupied, but most notably by means of use, considering orbits as “limited natural resources” and invoking parallels with the exploitation of natural resources in outer space;

♣ ITU’s “first come, first served” principle is reaching its limits with current LSC projects and should be re-evaluated;

♣ The main challenge ahead is not legal but technical and regulatory and consists in defining precisely what can constitute an exclusive use of an orbit and in translating such definition into a clear regulation or code of conduct.

#### Privatization is driving uncontrolled satellite internet constellations that profit at the expense of cooperation and sustainability – perpetuates internet inequality.

Song and Bloom 20 “Big Tech is leading the new space race. Here's why that's a problem” Steve Song is a Fellow with the Mozilla Foundation where he works to promote policy and regulation that will increase equitable and affordable access to communication in rural and underserved regions of the world. Peter Bloom is a community digital defense activist and the founder and General Coordinator of Rhizomatica, an international non-profit that helps communities build their own communications infrastructure. He is a former Shuttleworth Foundation fellow and was named an Innovator under 35 by MIT Technology Review and appeared on Foreign Policy's 100 Leading Global Thinkers list in 2015. November 14, 2020 <https://www.salon.com/2020/11/14/big-tech-is-leading-the-new-space-race-heres-why-thats-a-problem/> SM

Big Tech is leading the new space race. Here's why that's a problem

New satellite tech could bring billions more online. But will Big Tech bring their extractive ethos into space?

The coronavirus pandemic has made having a stable and reliable internet connection a matter of extreme urgency, as people all over the world struggle to work, access education, and participate in society while staying safe. Yet universal affordable access is far from being achieved; indeed, half of the world still lacks access to the Internet, despite sustained efforts from governments and corporations.

One popular proposal for ubiquitous connectivity comes from Low Earth Orbit (LEO) satellite constellations. LEO boosters claims that such satellites will have the ability to deliver high-speed broadband anywhere on the planet. These satellites provide internet access from space, and require placing thousands of satellites into orbit at a much closer proximity to Earth than traditional satellites.

The prospect of a globe-encircling mesh of broadband communication satellites has attracted the interest and investment of billionaires ranging from Bill Gates in the 1990s to Elon Musk and Jeff Bezos today. Currently there are at least four major LEO initiatives from the US and Europe, including Starlink (SpaceX), Project Kuiper (Amazon), OneWeb, and Telesat. China has announced at least three LEO constellations, and Russia one. The size and scope of these projects are massive. To put current LEO satellite ambitions in context: the current total number of satellites of any kind orbiting Earth is just over 2,500. Starlink, who already have nearly 900 satellites in orbit, recently petitioned the US communications regulator for permission to launch a total of 12,000 satellites. Not to be outdone, OneWeb recently applied for permission to launch 48,000 satellites.

So what's not to love?

While the goal of these companies to ensure broadband anywhere and everywhere is laudable, the technology and the approach to connectivity are not free from concerns. Recent history, especially the development of the Internet itself, has shown us that simply having the capability to build something doesn't necessarily make it a good idea. The Silicon Valley ethos of "move fast and break things," perhaps valid in developing small applications, becomes irresponsible when the consequences of failure may be catastrophic and irreversible. Criticism of LEO constellations to date have focused on practical concerns around a variety of issues, including: the economic viability of the constellations, the occlusion of the night sky from astronomers, wireless interference between different constellations, and the potential chain reaction of collisions from a single error in satellite trajectory, leaving near-space an inaccessible junkyard of debris.

Beyond that, LEO constellations have deeper and longer-term implications that have yet to find their way into mainstream public debate. For one, LEO constellations are part of a larger process in which space exploration is being redefined and reframed in military and commercial terms. Closer to Earth, LEO constellations raise important concerns around the potential for the further entrenchment of a global internet oligopoly that increases inequality and disempowers citizens.

The scramble for space

Over the past seven decades, as our ability to explore beyond our planet has evolved, national security interests in space have aligned with commercial ones to an extent that they are nearly indistinguishable today. In the United States, private space launch companies like SpaceX and United Launch Alliance are major recipients of government contracts and now provide the bulk of US launch capacity for both scientific and military missions. While close ties between the defense and aerospace industries is nothing new, we are in a decidedly new phase of this relationship due to technological advancement, new policy priorities and the rise of private actors.

As commercial launch capacity has increased and space exploration technologies have advanced, the decades-old agreements around how we treat space and recognize our solar system as a commons for the benefit of all humanity are beginning to unravel. One clear example of this is the White House's recent "Executive Order on Encouraging International Support for the Recovery and Use of Space Resources," which emphasizes that "the United States does not view outer space as a 'global commons'" and refers to the Moon Agreement as "a failed attempt at constraining free enterprise."

It is necessary to better understand the deep ties of LEO companies to the hegemonic designs of national governments on near space. Recently, in exchange for $28 million USD, Starlink provided the services of its satellites for live-fire demos with the US Air Force to test its Advanced Battle Management System and lay the groundwork for a military Internet of Things. Speaking after the latest live-fire demo, William Roper, Air Force acquisition chief, opined that "the military needs to be ready to play a strategic role because we need communications in many areas of the world that there are no commercial providers . . . we can be the stability case for companies like SpaceX and others who want to sell communications worldwide."

SpaceX's connections to the military-industrial complex were made clear in comments by SpaceX president Gwynne Shotwell in 2018, who stated that her company would be willing to launch a space weapon to protect the US, in contravention of established space norms. Only weeks ago, SpaceX signed a contract with the Pentagon to jointly develop a rocket that can deliver up to 80 tons of cargo and weaponry anywhere in the world in just one hour.

The Internet, too, from its very inception until today, has proven to be a useful tool for pursuing military and security objectives. Of these, surveillance remains at the heart of Silicon Valley's highly profitable business model of manipulating our attention and preferences for the sake of profit. This profit model facilitates the designs of space-obsessed billionaires like Jeff Bezos who make it no secret that their ultimate goal and passion is the human colonization of other planets in our solar system. In general terms, with material and economic support from taxpayers through defense spending, the profits from the colonization of our data-bodies are being invested in the militarization, privatization and colonization of space.

Telecommunications: driving inequality or empowering citizens?

The telecommunications sector has always been a battleground for regulation. While the early days of the Internet seemingly teemed with competition and diversity, power and control has ultimately become concentrated with the growth of giant internet companies that now dominate our online life. The consequences of unregulated, technology-fueled expansion of globalization and inequality can now be seen in almost every aspect of life.

Digital technology plays a critical role in amplifying inequality, highlighting the need to reframe how we approach network technology development. Some governments and citizen groups understand the connection between economic mobility and tech skills development.

One great example of this comes from Broadband for the Rural North (B4RN), a cooperative in Northern England, that delivers 1 gigabit-per-second fiber-optic capacity to homes in a region deemed economically unviable by the incumbent telecommunications giant. B4RN's ability to build and sustain an affordable internet service at speeds many times that of commercial offerings is based upon the investment they make in both community engagement and the development of local capacity. Contrast this with the prospect of a broadband service from a LEO constellation, in which the role of the citizen is that of a consumer only. It is also worth noting that B4RN's profits are reinvested locally, while revenues from LEO constellations are beamed straight out of the country.

The failure to invest in alternatives that build local capacity replicates itself at the national level as well. LEO constellations have the potential to further abstract Internet service to a supra-national level in a manner that disempowers not just individuals but nation-states themselves in terms of domestic expertise and infrastructure. Investment and deployment costs for LEO constellations are so "astronomical," and in many cases so tied to national/military investment and subsidies, that only a small handful of corporations/countries will be capable of owning and managing their own constellation. This is likely to open up a new front in the ongoing wrangling by geo-political power blocs over the future of the Internet.

Furthermore, it is far from clear that LEO constellations have either the capacity or the economic model to deliver on their claims of providing affordable connectivity to the unserved in most parts of the world. Consider that the half of the world's population that remains unconnected to the Internet are the most economically disadvantaged. As such, most people will not be direct consumers of LEO services but will instead need to rely on a telco building infrastructure and using LEO as backhaul—a scenario which already exists with conventional satellite services. A further concern is that LEO constellations may ultimately create a disincentive to investment in rural connectivity, based on the assumption by service providers and governments that LEO constellations will address that gap.

It is troubling that companies like Amazon and Google (the third largest shareholder in SpaceX), which already wield tremendous power and influence over society, are vying to expand their dominance by becoming global internet service providers with support from taxpayers via subsidies and military spending. With their hands in essentially every layer of the communication stack, it will prove challenging to regulate or even know about the data they harvest and how those are used to competitive advantage in other areas of their businesses.

At the time of their emergence, both space exploration and the Internet served as beacons of hope and of potential transcendence for humanity—one of shared imagination and resources, and of cooperation in human development. In both cases, that hope has been dimmed in a quest for profit and geo-political power. If we want to recover a sense of shared purpose as a species, the question as to "who gets to put their satellites into low earth orbit?" is more important than we might think. Is space for everyone, or just a few huge corporations and global superpowers? This is the question we ask when we ask who gets to park their satellites in orbit.

There is an opportunity to return to the spirit of internationalism that infused the early days of space exploration in which space was held as a shared resource to be protected and guarded from exploitation. Similarly, here on Earth, we see successful efforts to manage Internet infrastructure as a commons in contrast to Silicon Valley's model of surveillance capitalism. Recognizing that individual and collective empowerment and agency are as important as the actual infrastructure itself is the key to a more egalitarian Internet. LEO satellite networks may deliver connectivity (although many doubts remain), but they are less likely to empower people and move us toward a more equitable world. The development of a healthy Internet that actually benefits humanity involves not just the end result of affordable access, but also the process through which people gain that access.

### Adv – Collisions

#### Satellite internet constellations accelerate collision risks – more close encounters and less transparency means bad decisions are inevitable.

Pultarova 21 “SpaceX Starlink satellites responsible for over half of close encounters in orbit, scientist says” Tereza Pultarova [Master's in Science from the International Space University, France, to her Bachelor's in Journalism and Master's in Cultural Anthropology from Prague's Charles University. She worked as a reporter at the Engineering and Technology magazine, freelanced for a range of publications including Live Science, Space.com, Professional Engineering, Via Satellite and Space News and served as a maternity cover science editor at the European Space Agency.], August 18, 2021 <https://www.space.com/spacex-starlink-satellite-collision-alerts-on-the-rise> SM

SpaceX Starlink satellites responsible for over half of close encounters in orbit, scientist says

Starlink satellites might soon be involved in 90% of close encounters between two spacecraft in low Earth orbit.

Operators of satellite constellations are constantly forced to move their satellites because of encounters with other spacecraft and pieces of space junk. And, thanks to SpaceX's Starlink satellites, the number of such dangerous approaches will continue to grow, according to estimates based on available data.

SpaceX's Starlink satellites alone are involved in about 1,600 close encounters between two spacecraft every week, that's about 50 % of all such incidents, according to Hugh Lewis, the head of the Astronautics Research Group at the University of Southampton, U.K. These encounters include situations when two spacecraft pass within a distance of 0.6 miles (1 kilometer) from each other.

Lewis, Europe's leading expert on space debris, makes regular estimates of the situation in orbit based on data from the Socrates (Satellite Orbital Conjunction Reports Assessing Threatening Encounters in Space ) database. This tool, managed by Celestrack, provides information about satellite orbits and models their trajectories into the future to assess collision risk.

Lewis publishes regular updates on Twitter and has seen a worrying trend in the data that reflects the fast deployment of the Starlink constellation.

"I have looked at the data going back to May 2019 when Starlink was first launched to understand the burden of these megaconstellations," Lewis told Space.com. "Since then, the number of encounters picked up by the Socrates database has more than doubled and now we are in a situation where Starlink accounts for half of all encounters."

The current 1,600 close passes include those between two Starlink satellites. Excluding these encounters, Starlink satellites approach other operators’ spacecraft 500 times every week.

In comparison, Starlink's competitor OneWeb, currently flying over 250 satellites, is involved in 80 close passes with other operators' satellites every week, according to Lewis' data.

And the situation is bound to get worse. Only 1,700 satellites of an expected constellation of tens of thousands have been placed into orbit so far. Once SpaceX launches all 12,000 satellites of its first generation constellation, Starlink satellites of all close approaches, Lewis’ calculations suggest.will be involved in 90%

**Chart, line chart

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A graph showing the number of close encounters between Starlink satellites and spacecraft of other operators plotted by Professor Hugh Lewis based on data from the Socrates database.A graph showing the number of close encounters between Starlink satellites and spacecraft of other operators plotted by Professor Hugh Lewis based on data from the Socrates database. (Image credit: Hugh Lewis)

The risk of collision

Siemak Hesar, CEO and co-founder of Boulder, Colorado, based Kayhan Space, confirms the trend. His company, which develops a commercial autonomous space traffic management system, estimates that on average, an operator managing about 50 satellites will receive up to 300 official conjunction alerts a week. These alerts include encounters with other satellites as well as pieces of debris. Out of these 300 alerts, up to ten might require operators to perform avoidance maneuvers, Hesar told Space.com.

Kayhan Space bases their estimates on data provided by the U.S. Space Surveillance Network. This network of radars and telescopes, managed by the U.S. Space Force, closely monitors about 30,000 live and defunct satellites and pieces of debris down to the size of 4 inches (10 centimeters) and provides the most accurate location data of the orbiting objects.

The size of this catalog is expected to increase ten times in the near future, Hesar added, partly due to the growth of megaconstellations, such as Starlink, and partly as sensors improve and enable detection of even smaller objects. The more objects in the catalog mean more dangerously close encounters.

"This problem is really getting out of control," Hesar said. "The processes that are currently in place are very manual, not scalable, and there is not enough information sharing between parties that might be affected if a collision happens."

Hesar compared the problem to driving on a highway and not knowing that there has been an accident a few miles ahead of you. If two spacecraft collide in orbit, the cloud of debris the crash generates would threaten other satellites travelling through the same area.

"You want to have that situational awareness for the other actors that are flying in the neighbourhood," Hesar said.

Bad decisions

Despite the concerns, only three confirmed orbital collisions have happened so far. Earlier this week, astrophysicist and satellite tracker Jonathan McDowell, who's based at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, found evidence in Space-Track data that the Chinese meteorological satellite Yunhai 1-02, which disintegrated in March this year, was actually hit by a piece of space debris.

The worst known space collision in history took place in February 2009 when the U.S. telecommunication satellite Iridium 33 and Russia's defunct military satellite Kosmos-2251 crashed at the altitude of 490 miles (789 kilometres). The incident spawned over 1,000 pieces of debris larger than 4 inches (10 cm). Many of these fragments were then involved in further orbital incidents.

Lewis is concerned that with the number of close passes growing, the risk of operators at some point making a wrong decision will grow as well. Avoidance maneuvers cost fuel, time and effort. Operators, therefore, always carefully evaluate such risks. A decision not to make an avoidance maneuver following an alert, such as that made by Iridium in 2009, could, however, clutter the orbital environment for years and decades.

"In a situation when you are receiving alerts on a daily basis, you can't maneuver for everything," Lewis said. "The maneuvers use propellant, the satellite cannot provide service. So there must be some threshold. But that means you are accepting a certain amount of risk. The problem is that at some point, you are likely to make a wrong decision."

Hesar said that uncertainties in the positions of satellites and pieces of debris are still considerable. In case of operational satellites, the error could be up to 330 feet (100 meters) large. When it comes to a piece of debris, the uncertainty about its exact position might be in the order of a mile or more.

"This object can be anywhere in this bubble of multiple kilometres," Hesar said. "At this point, and for the foreseeable future, avoidance is our best recourse. People that say 'I'm going to take the risk', in my humble opinion, that's an irresponsible thing to do."

Starlink monopoly

Lewis is concerned about the growing influence of a single actor — Starlink — on the safety of orbital operations. Especially, he says, as the spaceflight company has entered the satellite operations world only recently.

"We place trust in a single company, to do the right thing," Lewis said. "We are in a situation where most of the maneuvers we see will involve Starlink. They were a launch provider before, now they are the world's biggest satellite operator, but they have only been doing that for two years so there is a certain amount of inexperience."

SpaceX relies on an autonomous collision avoidance system to keep its fleet away from other spacecraft. That, however, could sometimes introduce further problems. The automatic orbital adjustments change the forecasted trajectory and therefore make collision predictions more complicated, according to Lewis.

"Starlink doesn't publicize all the maneuvers that they're making, but it is believed that they are making a lot of small corrections and adjustments all the time," Lewis said. "But that causes problems for everybody else because no one knows where the satellite is going to be and what it is going to do in the next few days."

#### LEO collisions due to constellations take out ISR and other military assets – debris cascades into different altitudes and triggers Kessler Syndrome.

Wong 19 “Congested Outer Space: Increased Deployment of Small Satellite Constellations Could Hamper Military Space Operations” 2019 Arthur Wong [Strategic Development of Forces Division, SHAPE. Prior to working at SHAPE he has worked at NATO HQ, within the Defence Investment Division on interoperability for NATO’s multinational battlegroups.] <https://www.japcc.org/congested-outer-space/> SM

Since the production of a large number of small satellites in a factory environment will lower the cost of the overall programme, companies such as SpaceX, Amazon and OneWeb have been creating a satellite constellation within the LEO and Medium Earth Orbit (MEO).8, 9 OneWeb is a new company which plans to create an initial constellation of 648 satellites to provide global satellite internet broadband services. Each satellite weighs approximately 150 kg and will be programmed to operate in 20 different orbital planes at an altitude of 1,200 km.10 Creating a large constellation within the LEO could mitigate transmission delays and latency due to their closer range to ground stations while allowing users to send and receive data in a timely manner. The first six of the 648 satellites were launched in early 2019 with more launches scheduled to occur throughout this year.

Both SpaceX and Amazon have also announced their intention of creating a separate constellation for internet communication systems. SpaceX satellite constellations, named Starlink, will be the largest constellation ever built when it is completed. The constellations consist of nearly 12,000 satellites in more than 20 different orbital planes.11 The altitude of Starlink will range between 550 km to 1,150 km. SpaceX aims to have a minimum of 2,200 satellites in the next five years and achieve initial commercial operation by 2020.12 Amazon’s version of constellation, named Kuiper, has also been seeking approval from the Federal Communications Commission (FCC) to launch more than 3,200 satellites between 590 km to 630 km in the LEO.13

Space Debris Threat Increases in the LEO

The usage of cube satellite has provided positive impacts in various fields, ranging from environmental studies to offering worldwide internet access in rural areas through communication constellations. However, the current space environment is becoming congested. Hundreds of satellites have already been scheduled to launch each year before the construction of the constellation programme by OneWeb, SpaceX and Amazon. To further worsen the space debris situation in the LEO, direct-ascent Anti-Satellite Testing (ASAT) was conducted in recent years and more debris will be created through such testing. During the Chinese ASAT in 2007, some debris from the collision was blasted outward away from the Earth, causing a potential threat to satellites above the altitude where the ASAT testing occurred.14 Nine years after the incident happened, there are still more than 3,000 traceable pieces in orbit.

In 2009, two satellites collided at a speed of 10 km/s at an altitude of 800 km. This was the first time a collision had happened between two satellites. The incident created more than 1,000 pieces of debris larger than 10 cm. Such activity could initiate a chain reaction, creating more collisions from the initial impact. This phenomenon is known as the Kessler Syndrome.15

From early 2019, there were approximately 34,000 pieces of debris larger than 10 cm (similar to the size of a cube satellite) and more than 900,000 pieces of debris ranging from one cm to 10 cm in size. Objects that are smaller than one cm in size are expected to be more than 100 million within the LEO.16 Despite the small size of the space debris, they are travelling at a speed of more than seven km/s. At this speed, tiny objects could harm any large satellite orbiting in the LEO. While satellites can increase their physical hardening to protect the on-board instruments from impact, some satellites cannot be hardened due to the size and dimensional constraints. Furthermore, hardened materials would also increase the overall cost of the satellite.

Constellation in the Making Could Impact Space-Based Military Assets

The previous examples revealed the congestion of the LEO. With companies continuing to launch thousands of small satellites, the chances of a collision in space will continue to increase. This will hinder space-based Intelligence, Surveillance and Reconnaissance (ISR) support to provide valuable information to military operations. A majority of the ISR assets are orbiting in the LEO. NATO relies on space-based assets to assist its operations. Increasing the number of spacecraft in the LEO could raise problems and threats to military assets as well as access to space assets to support operations. If the orbital path of these smaller objects were not tracked by the Space Operation Centre regularly, larger satellites or manned-space stations could be penetrated by the non-propulsion satellites, making them a potential kinetic kill vehicle.

Most satellites within the 600 km region of the LEO are affected by the atmospheric drag, which is helping to bring down some of the obsolete satellites. However, satellites orbiting above 800 km are less likely to be affected by the atmospheric drag, making cube satellites or small satellites without propulsion systems difficult to deorbit once they have reached the EOL.17, 18 The altitude for some of the OneWeb, Starlink and Kuiper constellations is planned to be above the atmospheric drag region. Despite this, Starlink satellites will have propulsion system for orbital manoeuvre and EOL deorbiting, tracking the full constellation with 12,000 satellites could be challenging for the company and the Combined Space Operations Center (CSpOC).19 Additionally, there is the possibility of losing contact with satellites before they reach their EOL. Envisat, an 8,210 kg satellite that is currently drifting at an altitude of 785 km, poses a collision threat with other satellites. Envisat was expected to decommission in 2014 but the European Space Agency (ESA) lost contact with the satellite in 2012.20 If no interaction will be made with the Envisat, it is expected to stay in orbit for the next 150 years.21

#### Collisions with early warning satellites causes miscalc and goes nuclear – magnified by the Kessler effect

Blatt 20 [Talia, joint concentration in Social Studies and Integrative Biology at Harvard, specialization in East Asian geopolitics and security issues] “Anti-Satellite Weapons and the Emerging Space Arms Race,” Harvard International Review, May 26, 2020, <https://hir.harvard.edu/anti-satellite-weapons-and-the-emerging-space-arms-race/> TG

Despite their deterrent functions, ASATs are more likely to provoke or exacerbate conflicts than dampen them, especially given the risk they [pose](https://thebulletin.org/2019/06/arms-control-in-outer-space-the-russian-angle-and-a-possible-way-forward/) to early warning satellites. These satellites are a crucial element of US ballistic missile defense, capable of [detecting missiles](https://www.globalsecurity.org/space/world/japan/warning.htm) immediately after launch and tracking their paths.

Suppose a US early warning satellite goes dark, or is shut down. Going dark could signal a glitch, but in a world in which other countries have ASATs, it could also signal the beginning of an attack. Without early warning satellites, the United States is much more susceptible to nuclear missiles. Given the strategy of counterforcing—[targeting](https://www.belfercenter.org/sites/default/files/files/publication/isec_a_00273_LieberPress.pdf) nuclear silos rather than populous cities to prevent a nuclear counterattack—the Americans might believe their nuclear weapons are imminently at risk. It could be [twelve hours](https://books.google.com/books?id=ET8lDwAAQBAJ&pg=PA1&lpg=PA1&dq=%22Protecting+Space+Assets%22+johnson-freese&source=bl&ots=6Oq0IdeBjw&sig=ACfU3U1G6Hj8QdP4JlCRNxA6i5XplZwHyg&hl=en&sa=X&ved=2ahUKEwj1n-jT2YzpAhUugnIEHUuMCu4Q6AEwA3oECAkQAQ#v=onepage&q=%22Protecting%20Space%20Assets%22%20johnson-freese&f=false) before the United States regains satellite function, which is too long to wait to put together a nuclear counterattack. The United States, therefore, might move to mobilize a nuclear attack against Russia or China over what might just be a piece of debris shutting off a satellite.

Additionally, accidental warfare, or strategic miscalculation, is uniquely likely in space. It is [much easier](https://books.google.com/books?id=VyXTDwAAQBAJ&pg=PA339&lpg=PA339&dq=space+offense+dominant&source=bl&ots=Mw0bgJ51qf&sig=ACfU3U3DeZiEHpr9nfszlCbJZIoyyssIpg&hl=en&sa=X&ved=2ahUKEwjrs-WD3IzpAhVulHIEHbL0AE4Q6AEwCXoECAoQAQ#v=onepage&q=space%20offense%20dominant&f=false) to hold an adversary’s space systems in jeopardy with destructive ASATs than it is to [sustainably defend](https://www.cnas.org/publications/commentary/the-us-military-should-not-be-doubling-down-on-space) a system, which is expensive and in some cases not technologically feasible because of limitations on satellite movement. Space is therefore [considered](https://books.google.com/books?id=VyXTDwAAQBAJ&pg=PA339&lpg=PA339&dq=space+offense+dominant&source=bl&ots=Mw0bgJ51qf&sig=ACfU3U3DeZiEHpr9nfszlCbJZIoyyssIpg&hl=en&sa=X&ved=2ahUKEwjrs-WD3IzpAhVulHIEHbL0AE4Q6AEwCXoECAoQAQ#v=onepage&q=space%20offense%20dominant&f=false) offense-dominant; offensive tactics like weapons development are prioritized over defensive measures, such as [improving GPS](https://www.politico.com/story/2018/04/06/outer-space-war-defense-russia-china-463067) or making satellites more resistant to jamming.

As a result, countries are left with poorly defended space systems and rely on offensive posturing, which increases the risk that their actions are perceived as aggressive and incentivizes rapid, risky counterattacks because militaries cannot rely on their spaced-based systems after first strikes.

There are several hotspots in which ASATs and offensive-dominant systems are particularly relevant. Early warning satellites [play](https://www.politico.com/story/2018/04/06/outer-space-war-defense-russia-china-463067) a central role in US readiness in the event of a conflict involving North Korea. News of North Korean missile launches comes from these satellites. Given North Korea’s [history](https://www.bbc.com/news/world-asia-pacific-11813699) of nuclear provocations, unflinchingly hostile rhetoric towards the United States and South Korea, and diplomatic opacity, North Korea is always a threatening, unknowable adversary, but recent developments have magnified the risk. With the health of Kim Jong-un [potentially in jeopardy](https://apnews.com/f5d302ae65b03838173e40848223b771), a succession battle or even civil war on the peninsula [raises the chances](https://www.express.co.uk/news/world/1273890/Kim-Jong-un-dead-North-Korea-nuclear-weapon-news-latest-death-US) of loose nukes. If the regime is terminal, traditional MAD risk calculus will become moot; with nothing to lose, North Korea would have no reason to hold back its nuclear arsenal. Or China [might decide](https://foreignpolicy.com/2020/04/28/kim-jong-un-china-north-korea/) to seize military assets and infrastructure of the regime. If the US does not have its early warning satellites because they have been taken out in an ASAT attack, the US, South Korea, and Japan are all in imminent nuclear peril, while China could be in a position to fundamentally reshape East Asian geopolitics.

The South China Sea is another hotspot in which ASATs could risk escalation. China [is developing](https://missiledefenseadvocacy.org/missile-threat-and-proliferation/todays-missile-threat/china-anti-access-area-denial-coming-soon/) Anti-Access Area Denial (A2/AD) in the South China Sea, a combination of long range radar with air and maritime defense meant to deny US freedom of navigation in the region. Given the disputed nature of territory in the South China Sea, the United States and its allies do not want China to successfully close off the region.

#### Independently causes cyberwar and satellite hacking which escalates.

Falco 19 “Opinion: Our satellites are prime targets for a cyberattack. And things could get worse.” Gregory Falco [Gregory Falco is a cyber research fellow at Harvard University’s Belfer Center and a postdoctoral security researcher at the Massachusetts Institute of Technology’s Computer Science and Artificial Intelligence Laboratory. He is the founder and chief executive of NeuroMesh, a tech security company.] May 7, 2019 <https://www.washingtonpost.com/opinions/our-satellites-are-prime-targets-for-a-cyberattack-and-things-could-get-worse/2019/05/07/31c85438-7041-11e9-8be0-ca575670e91c_story.html> SM

One minute. That’s how long it took me last month to demonstrate to a major broadcasting company and production team how to access and restart a leading satellite Internet provider’s control system. Five minutes is how long it took me to demonstrate how to gain full control of it.

Hackers are always improving their ability to break into our digital infrastructure. Yet the computer systems running our satellites haven’t kept up, making them prime targets for an attack. This makes our space assets a massive vulnerability — and it could get much worse if we’re not careful.

This past weekend, SpaceX won approval from the Federal Communications Commission to increase the number of low-flying satellites as part of its Starlink project so that they can provide faster Internet access to the world. Unfortunately, access will be faster for both legitimate users and hackers alike. The FCC does not require applicants to publicly demonstrate how they will secure these satellites or the Internet they plan to provide. SpaceX, like other private space companies, has shared virtually no information about its cybersecurity efforts or plans.

This is extremely disconcerting, considering the potential ramifications of a satellite being hacked. The most mundane outcome is that the satellite will no longer function, but the other extreme is for an attacker to break into a satellite and take over any thrusters (which SpaceX has insisted its satellites will have) and then propel the satellite into critical infrastructure and military satellites in other orbits. In other words, attackers could possibly use the hacked satellite as a kinetic weapon.

There has long been a void of attention to securing space infrastructure, ranging from space-faring rovers to satellite ground-control systems that manage all the space-based assets. Virtually no policy or oversight agency exists concerning securing space assets — something I’ve discussed with government leadership to little avail. While the FCC regulates communications, it should not necessarily be responsible for all things space security. Perhaps the new Space Development Agency could be.

This leaves space security in the hands of the private sector, which is exploiting the recent ease of access to space. The advent of small satellites known as CubeSats offers the chance to launch a satellite into orbit for as little as $30,000 . And because the government wants to encourage economic activity in this area, requirements to do so are extremely light. This leaves those who are creating the satellites responsible for the cybersecurity of their assets, which is not usually part of the rocket scientist’s traditional skill set.

As a space cybersecurity researcher, I am excited about the renewed interest in space from both the commercial and exploratory perspectives. But we need to be strategic about the security of these space systems. Unlike “Internet of things” devices such as baby monitors, which we purchase for less than $100 and discard or sell once a new model comes out, satellites often remain in orbit for much longer and are less dispensable. So if we don’t consider the cybersecurity of the space asset now, we’ll likely be dealing with the ramifications of that for several years to come. The lack of government intervention in satellite security does not mean that we can ignore cybersecurity as an issue.

Private space companies such as SpaceX, OneWeb and Blue Origin need to join the conversation about cybersecurity and help consumers understand that they are taking it seriously (if they are). (Blue Origin’s founder and owner, Jeff Bezos, also owns The Post.) Right now, there are several job openings for information security analysts at private space companies, indicating that they are likely hurting for talent and are behind in figuring out their security. This isn’t surprising given that space is hard, and traditional IT experts don’t have the right skill sets for a space cybersecurity job. Space systems have unique requirements that are more akin to an industrial control system, such as an energy smart meter, than to an email server.

Private space companies need to start a dialogue with the security research community about their particular challenges so that we can help. They should also be transparent with the FCC that they need help in securing their infrastructure. The last thing we need is for China or Russia to take over SpaceX’s satellites and wreak havoc on our space assets.

#### Empirics prove it’s possible and likely by state and nonstate actors – especially true given private sector cost cutting.

Akoto 20 “Hackers could shut down satellites -- or turn them into weapons” February 13, 2020 William Akoto [a postdoctoral research fellow at the University of Denver.] <https://www.upi.com/Top_News/Voices/2020/02/13/Hackers-could-shut-down-satellites-or-turn-them-into-weapons/4091581597502/> SM

Feb. 13 (UPI) -- Last month, SpaceX became the operator of the world's largest active satellite constellation. As of the end of January, the company had 242 satellites orbiting the planet with plans to launch 42,000 over the next decade. This is part of its ambitious project to provide Internet access across the globe. The race to put satellites in space is on, with Amazon, U.K.-based OneWeb and other companies chomping at the bit to place thousands of satellites in orbit in the coming months.

These new satellites have the potential to revolutionize many aspects of everyday life -- from bringing Internet access to remote corners of the globe to monitoring the environment and improving global navigation systems. Amid all the fanfare, a critical danger has flown under the radar: the lack of cybersecurity standards and regulations for commercial satellites, in the United States and internationally. As a scholar who studies cyber conflict, I'm keenly aware that this, coupled with satellites' complex supply chains and layers of stakeholders, leaves them highly vulnerable to cyberattacks.

If hackers were to take control of these satellites, the consequences could be dire. On the mundane end of scale, hackers could simply shut down satellites, denying access to their services. Hackers could also jam or spoof the signals from satellites, creating havoc for critical infrastructure. This includes electric grids, water networks and transportation systems.

Some of these new satellites have thrusters that allow them to speed up, slow down and change direction in space. If hackers took control of these steerable satellites, the consequences could be catastrophic. Hackers could alter the satellites' orbits and crash them into other satellites or even the International Space Station.

Commodity parts

Makers of these satellites, particularly small CubeSats, use off-the-shelf technology to keep costs low. The wide availability of these components means hackers can analyze them for vulnerabilities. In addition, many of the components draw on open-source technology. The danger here is that hackers could insert back doors and other vulnerabilities into satellites' software.

The highly technical nature of these satellites also means multiple manufacturers are involved in building the various components. The process of getting these satellites into space is also complicated, involving multiple companies. Even once they are in space, the organizations that own the satellites often outsource their day-to-day management to other companies. With each additional vendor, the vulnerabilities increase as hackers have multiple opportunities to infiltrate the system.

Hacking some of these CubeSats may be as simple as waiting for one of them to pass overhead and then sending malicious commands using specialized ground antennas. Hacking more sophisticated satellites might not be that hard either.

Satellites are typically controlled from ground stations. These stations run computers with software vulnerabilities that can be exploited by hackers. If hackers were to infiltrate these computers, they could send malicious commands to the satellites.

History of hacks

This scenario played out in 1998 when hackers took control of the U.S.-German ROSAT X-Ray satellite. They did it by hacking into computers at the Goddard Space Flight Center in Maryland. The hackers then instructed the satellite to aim its solar panels directly at the sun. This effectively fried its batteries and rendered the satellite useless. The defunct satellite eventually crashed back to Earth in 2011. Hackers could also hold satellites for ransom, as happened in 1999 when hackers took control of the U.K.'s SkyNet satellites.

Over the years, the threat of cyberattacks on satellites has gotten more dire. In 2008, hackers, possibly from China, reportedly took full control of two NASA satellites, one for about two minutes and the other for about nine minutes. In 2018, another group of Chinese state-backed hackers reportedly launched a sophisticated hacking campaign aimed at satellite operators and defense contractors. Iranian hacking groups have also attempted similar attacks.

Although the U.S. Department of Defense and National Security Agency have made some efforts to address space cybersecurity, the pace has been slow. There are no cybersecurity standards for satellites and no governing body to regulate and ensure their cybersecurity. Even if common standards could be developed, there are no mechanisms in place to enforce them. This means responsibility for satellite cybersecurity falls to the individual companies that build and operate them.

As they compete to be the dominant satellite operator, SpaceX and rival companies are under increasing pressure to cut costs. There is also pressure to speed up development and production. This makes it tempting for the companies to cut corners in areas like cybersecurity that are secondary to actually getting these satellites in space.

#### Nuke war causes extinction – Ice Age, famines, and war won’t stay limited

Edwards 17 [Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky. How nuclear war would affect Earth’s climate. September 8, 2017. earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] Note, we are only reading parts of the interview that are directly from Paul Edwards -- MMG

In the nuclear conversation, what are we not talking about that we should be?

We are not talking enough about the climatic effects of nuclear war. The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges. The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide. What about a larger-scale conflict? A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences would be catastrophic: global average temperatures would drop as much as 12 degrees Fahrenheit (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, smoke and dust circulating in the stratosphere would darken the atmosphere enough to inhibit photosynthesis, causing disastrous crop failures, widespread famine and massive ecological disruption. The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs. Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion? At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in. North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S. It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today? To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but it’s quite unlikely that any exchange between two nuclear powers would stay limited to these smaller, less destructive bombs.

### Adv – Ozone

#### Mega-constellations destroy the ozone layer.

Pultarova 21 “Air pollution from reentering megaconstellation satellites could cause ozone hole 2.0” Tereza Pultarova [Master's in Science from the International Space University, France, to her Bachelor's in Journalism and Master's in Cultural Anthropology from Prague's Charles University. She worked as a reporter at the Engineering and Technology magazine, freelanced for a range of publications including Live Science, Space.com, Professional Engineering, Via Satellite and Space News and served as a maternity cover science editor at the European Space Agency.], June 7, 2021 <https://www.space.com/starlink-satellite-reentry-ozone-depletion-atmosphere> SM

* Aaron Boley -- an associate professor of astronomy and astrophysics at the University of British Columbia, Canada

The aluminum from re-entering satellites also has a potential to damage the ozone layer, a problem well known to humanity, which has been successfully solved by widespread bans on the use of chlorofluorocarbons, chemicals used in the past in aerosol sprays and refrigerators.

In their paper, Boley and his colleague Michael Byers cite research by their counterparts from the Aerospace Corporation, a U.S. non-profit research organization, which identified local damage to the planet's ozone layer triggered by the passage of polluting rockets through the atmosphere.

"We know that alumina does deplete ozone just from rocket launches themselves because a lot of solid-fuel rockets use, or have, alumina as a byproduct," Boley said. "That creates these little temporary holes in the stratospheric ozone layer. That's one of the biggest concerns about compositional changes to the atmosphere that spaceflight can cause."

The ozone layer protects life on Earth from harmful UV radiation. The depletion of ozone in the stratosphere, the second lowest layer of the atmosphere extending between altitudes of approximately 7 to 40 miles (10 to 60 kilometers), led to an increased risk of cancer and eye damage for humans on Earth.

Gerhard Drolshagen, of the University of Oldenburg, Germany, who has published papers about the effects of meteoroid material on Earth, told Space.com that reentering satellites usually evaporate at altitudes between 55 and 30 miles (90 and 50 km), just above the ozone-rich stratosphere. However, he added, the particles created as a result of the satellites' burning will eventually sink to the lower layers.

Boley said that as the alumina sinks into the stratosphere, it will cause chemical reactions, which, based on existing knowledge, will likely trigger ozone destruction.

Drolshagen, who wasn't involved in the recent study, agreed that because "satellites are mostly made of aluminum, the amount of aluminum deposited in the atmosphere will certainly increase."

Concerns about the effects of aluminium oxides on the atmosphere have been cited by U.S. telecommunications operator Viasat in its request to the US Federal Communications Commision to suspend launches of SpaceX's Starlink megaconstellation until a proper environmental review of its possible impacts is conducted.

Learning from past mistakes

In their study, Boley and his colleagues looked only at the effects of the first generation of the Starlink megaconstellation, which is expected to consist of 12,000 satellites. More than 1,700 of these have already been launched. As a result of SpaceX's activities (and to a lesser extent those of other constellation operators), the number of active and defunct satellites in low Earth orbit, the region of space below the altitude of 620 miles (1,000 km), has increased by 50% over the past two years, according to the paper.

"The problem is that there are now plans to launch about 55,000 satellites," Boley said. "Starlink second generation could consist of up to 30,000 satellites, then you have Starnet, which is China's response to Starlink, Amazon's Kuiper, OneWeb. That could lead to unprecedented changes to the Earth’s upper atmosphere."

Megaconstellation operators, inspired by the consumer technology model, expect fast development of new satellites and frequent replacement, thus the high amount of satellites expected to be burning in the atmosphere on a daily basis.

"Humans are exceptionally good at underestimating our ability to change the environment," said Boley. "There is this perception that there is no way that we can dump enough plastic into the ocean to make a difference. There is no way we can dump enough carbon into the atmosphere to make a difference. But here we are. We have a plastic pollution problem with the ocean, we have climate change ongoing as a result of our actions and our changing of the composition of the atmosphere and we are poised to make the same type of mistake by our use of space."

#### Ozone hole recovering now but depletion causes extinction.

Browne 20 “Scientists warn erosion of ozone layer could lead to a modern mass extinction event” EDWARD BROWNE May 28, 2020 <https://www.express.co.uk/news/science/1287983/ozone-layer-global-warming-mass-extinction-dinosaurs-Southampton> SM

Scientists warn erosion of ozone layer could lead to a modern mass extinction event

AN unexplained mass extinction event that occurred 359 million years ago may have been caused by erosion of the ozone layer, a UK study has found.

It could have alarming implications for the way our current world is headed, regarding rising global temperatures. Researchers from the University of Southampton have been investigating an extinction event that occurred at the end of the Devonian geological period.

During their study, they found evidence that plant spores from around the time had been damaged by UV radiation, suggesting that the Earth’s ozone layer was not providing sufficient protection from the sun’s deadly rays.

While it is already known that ozone depletion could lead to an extinction event, the scientists were alarmed by the reason behind why the ozone depletion seemed to have occurred.

The researchers discovered that this particular ozone erasure could have been linked to global warming, which the scientists described as a “new mechanism for mass extinctions.”

Mass extinction events have occurred a number of times in Earth’s past, with known causes being asteroid impacts and large-scale volcanic eruptions, Phys.org reports.

Many will associate the asteroid impact event as the one that led to the extinction of the dinosaurs.

The extinction event that the Southampton scientists were studying came after a period of rapid global warming after an ice age, Phys.org continues.

As part of their study, the researchers collected rocks from sites in Greenland as well as Bolivia in order to study any clues about what Earth conditions may have been like way back 360 million years ago.

Indeed, these rocks held some clues as to what had been happening around the time of the Devonian period.

The researchers found that the rocks contained plant spores – which plants use to reproduce – that had been preserved within them for hundreds of millions of years.

They discovered that some of these spores appeared to have been damaged by something, noting that they had “malformed sculpture and pigmented walls”.

This sort of damage is similar to what would occur if the spores had been hit by high levels of ultraviolet light – also called UV rays – that are given off by the sun.

The researchers explained: “This indicates the temporary loss of the global protective ozone layer.”

This is because the ozone layer absorbs some of the UV light – a particular type called UBV – that travels from the sun to the Earth.

The US Environmental Protection Agency (EPA) notes that UVB light has been linked to skin cancer and can cause harm to crops and marine life.

The ozone layer is a part of Earth’s atmosphere located in the stratosphere between 9 and 18 miles up.

Professor Marshall, lead researcher for the team, said that “current estimates suggest we will reach similar global temperatures to those of 360 million years ago,” according to phys.org.

He added that this raises the possibility of another collapse in the ozone layer, which could have disastrous consequences for all life on Earth, including us.

In the study’s abstract, the team said: “ozone loss during rapid warming is an inherent Earth system process with the unavoidable conclusion that we should be alert for such an eventuality in the future warming world.”

As well as global warming, human activity is associated with the depletion of the Earth’s vital ozone layer.

Scientists have reported that a large ozone hole over the Antarctic is slowly beginning to recover amid international efforts to limit the amount of ozone-depleting substances belched out by mankind.

### FW

#### This connection between pain and pleasure and phenomenal conceptions of intrinsic value and disvalue is irrefutable – everything else regresses – robust neuroscience proves.

Blum et al. 18 Kenneth Blum, 1Department of Psychiatry, Boonshoft School of Medicine, Dayton VA Medical Center, Wright State University, Dayton, OH, USA 2Department of Psychiatry, McKnight Brain Institute, University of Florida College of Medicine, Gainesville, FL, USA 3Department of Psychiatry and Behavioral Sciences, Keck Medicine University of Southern California, Los Angeles, CA, USA 4Division of Applied Clinical Research & Education, Dominion Diagnostics, LLC, North Kingstown, RI, USA 5Department of Precision Medicine, Geneus Health LLC, San Antonio, TX, USA 6Department of Addiction Research & Therapy, Nupathways Inc., Innsbrook, MO, USA 7Department of Clinical Neurology, Path Foundation, New York, NY, USA 8Division of Neuroscience-Based Addiction Therapy, The Shores Treatment & Recovery Center, Port Saint Lucie, FL, USA 9Institute of Psychology, Eötvös Loránd University, Budapest, Hungary 10Division of Addiction Research, Dominion Diagnostics, LLC. North Kingston, RI, USA 11Victory Nutrition International, Lederach, PA., USA 12National Human Genome Center at Howard University, Washington, DC., USA, Marjorie Gondré-Lewis, 12National Human Genome Center at Howard University, Washington, DC., USA 13Departments of Anatomy and Psychiatry, Howard University College of Medicine, Washington, DC US, Bruce Steinberg, 4Division of Applied Clinical Research & Education, Dominion Diagnostics, LLC, North Kingstown, RI, USA, Igor Elman, 15Department Psychiatry, Cooper University School of Medicine, Camden, NJ, USA, David Baron, 3Department of Psychiatry and Behavioral Sciences, Keck Medicine University of Southern California, Los Angeles, CA, USA, Edward J Modestino, 14Department of Psychology, Curry College, Milton, MA, USA, Rajendra D Badgaiyan, 15Department Psychiatry, Cooper University School of Medicine, Camden, NJ, USA, Mark S Gold 16Department of Psychiatry, Washington University, St. Louis, MO, USA, “Our evolved unique pleasure circuit makes humans different from apes: Reconsideration of data derived from animal studies”, U.S. Department of Veterans Affairs, 28 February 2018, accessed: 19 August 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6446569/>, R.S.

**Pleasure** is not only one of the three primary reward functions but it also **defines reward.** As homeostasis explains the functions of only a limited number of rewards, the principal reason why particular stimuli, objects, events, situations, and activities are rewarding may be due to pleasure. This applies first of all to sex and to the primary homeostatic rewards of food and liquid and extends to money, taste, beauty, social encounters and nonmaterial, internally set, and intrinsic rewards. Pleasure, as the primary effect of rewards, drives the prime reward functions of learning, approach behavior, and decision making and provides the **basis for hedonic theories** of reward function. We are attracted by most rewards and exert intense efforts to obtain them, just because they are enjoyable [10].

Pleasure is a passive reaction that derives from the experience or prediction of reward and may lead to a long-lasting state of happiness. The word happiness is difficult to define. In fact, just obtaining physical pleasure may not be enough. One key to happiness involves a network of good friends. However, it is not obvious how the higher forms of satisfaction and pleasure are related to an ice cream cone, or to your team winning a sporting event. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure [14].

Pleasure as a hallmark of reward is sufficient for defining a reward, but it may not be necessary. A reward may generate positive learning and approach behavior simply because it contains substances that are essential for body function. When we are hungry, we may eat bad and unpleasant meals. A monkey who receives hundreds of small drops of water every morning in the laboratory is unlikely to feel a rush of pleasure every time it gets the 0.1 ml. Nevertheless, with these precautions in mind, we may define any stimulus, object, event, activity, or situation that has the potential to produce pleasure as a reward. In the context of reward deficiency or for disorders of addiction, homeostasis pursues pharmacological treatments: drugs to treat drug addiction, obesity, and other compulsive behaviors. The theory of allostasis suggests broader approaches - such as re-expanding the range of possible pleasures and providing opportunities to expend effort in their pursuit. [15]. It is noteworthy, the first animal studies eliciting approach behavior by electrical brain stimulation interpreted their findings as a discovery of the brain’s pleasure centers [16] which were later partly associated with midbrain dopamine neurons [17–19] despite the notorious difficulties of identifying emotions in animals.

Evolutionary theories of pleasure: The love connection BO:D

Charles Darwin and other biological scientists that have examined the biological evolution and its basic principles found various mechanisms that steer behavior and biological development. Besides their theory on natural selection, it was particularly the sexual selection process that gained significance in the latter context over the last century, especially when it comes to the question of what makes us “what we are,” i.e., human. However, the capacity to sexually select and evolve is not at all a human accomplishment alone or a sign of our uniqueness; yet, we humans, as it seems, are ingenious in fooling ourselves and others–when we are in love or desperately search for it.

It is well established that modern biological theory conjectures that **organisms are** the **result of evolutionary competition.** In fact, Richard Dawkins stresses gene survival and propagation as the basic mechanism of life [20]. Only genes that lead to the fittest phenotype will make it. It is noteworthy that the phenotype is selected based on behavior that maximizes gene propagation. To do so, the phenotype must survive and generate offspring, and be better at it than its competitors. Thus, the ultimate, distal function of rewards is to increase evolutionary fitness by ensuring the survival of the organism and reproduction. It is agreed that learning, approach, economic decisions, and positive emotions are the proximal functions through which phenotypes obtain other necessary nutrients for survival, mating, and care for offspring.

Behavioral reward functions have evolved to help individuals to survive and propagate their genes. Apparently, people need to live well and long enough to reproduce. Most would agree that homo-sapiens do so by ingesting the substances that make their bodies function properly. For this reason, foods and drinks are rewards. Additional rewards, including those used for economic exchanges, ensure sufficient palatable food and drink supply. Mating and gene propagation is supported by powerful sexual attraction. Additional properties, like body form, augment the chance to mate and nourish and defend offspring and are therefore also rewards. Care for offspring until they can reproduce themselves helps gene propagation and is rewarding; otherwise, many believe mating is useless. According to David E Comings, as any small edge will ultimately result in evolutionary advantage [21], additional reward mechanisms like novelty seeking and exploration widen the spectrum of available rewards and thus enhance the chance for survival, reproduction, and ultimate gene propagation. These functions may help us to obtain the benefits of distant rewards that are determined by our own interests and not immediately available in the environment. Thus the distal reward function in gene propagation and evolutionary fitness defines the proximal reward functions that we see in everyday behavior. That is why foods, drinks, mates, and offspring are rewarding.

There have been theories linking pleasure as a required component of health benefits salutogenesis, (salugenesis). In essence, under these terms, pleasure is described as a state or feeling of happiness and satisfaction resulting from an experience that one enjoys. Regarding pleasure, it is a double-edged sword, on the one hand, it promotes positive feelings (like mindfulness) and even better cognition, possibly through the release of dopamine [22]. But on the other hand, pleasure simultaneously encourages addiction and other negative behaviors, i.e., motivational toxicity. It is a complex neurobiological phenomenon, relying on reward circuitry or limbic activity. It is important to realize that through the “Brain Reward Cascade” (BRC) endorphin and endogenous morphinergic mechanisms may play a role [23]. While natural rewards are essential for survival and appetitive motivation leading to beneficial biological behaviors like eating, sex, and reproduction, crucial social interactions seem to further facilitate the positive effects exerted by pleasurable experiences. Indeed, experimentation with addictive drugs is capable of directly acting on reward pathways and causing deterioration of these systems promoting hypodopaminergia [24]. Most would agree that pleasurable activities can stimulate personal growth and may help to induce healthy behavioral changes, including stress management [25]. The work of Esch and Stefano [26] concerning the link between compassion and love implicate the brain reward system, and pleasure induction suggests that social contact in general, i.e., love, attachment, and compassion, can be highly effective in stress reduction, survival, and overall health.

Understanding the role of neurotransmission and pleasurable states both positive and negative have been adequately studied over many decades [26–37], but comparative anatomical and neurobiological function between animals and homo sapiens appear to be required and seem to be in an infancy stage.

Finding happiness is different between apes and humans

As stated earlier in this expert opinion one key to happiness involves a network of good friends [38]. However, it is not entirely clear exactly how the higher forms of satisfaction and pleasure are related to a sugar rush, winning a sports event or even sky diving, all of which augment dopamine release at the reward brain site. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure.

Remarkably, there are pathways for ordinary liking and pleasure, which are limited in scope as described above in this commentary. However, there are **many brain regions**, often termed hot and cold spots, that significantly **modulate** (increase or decrease) our **pleasure or** even produce **the opposite** of pleasure— that is disgust and fear [39]. One specific region of the nucleus accumbens is organized like a computer keyboard, with particular stimulus triggers in rows— producing an increase and decrease of pleasure and disgust. Moreover, the cortex has unique roles in the cognitive evaluation of our feelings of pleasure [40]. Importantly, the interplay of these multiple triggers and the higher brain centers in the prefrontal cortex are very intricate and are just being uncovered.

Desire and reward centers

It is surprising that many different sources of pleasure activate the same circuits between the mesocorticolimbic regions (Figure 1). Reward and desire are two aspects pleasure induction and have a very widespread, large circuit. Some part of this circuit distinguishes between desire and dread. The so-called pleasure circuitry called “REWARD” involves a well-known dopamine pathway in the mesolimbic system that can influence both pleasure and motivation.

In simplest terms, the well-established mesolimbic system is a dopamine circuit for reward. It starts in the ventral tegmental area (VTA) of the midbrain and travels to the nucleus accumbens (Figure 2). It is the cornerstone target to all addictions. The VTA is encompassed with neurons using glutamate, GABA, and dopamine. The nucleus accumbens (NAc) is located within the ventral striatum and is divided into two sub-regions—the motor and limbic regions associated with its core and shell, respectively. The NAc has spiny neurons that receive dopamine from the VTA and glutamate (a dopamine driver) from the hippocampus, amygdala and medial prefrontal cortex. Subsequently, the NAc projects GABA signals to an area termed the ventral pallidum (VP). The region is a relay station in the limbic loop of the basal ganglia, critical for motivation, behavior, emotions and the “Feel Good” response. This defined system of the brain is involved in all addictions –substance, and non –substance related. In 1995, our laboratory coined the term “Reward Deficiency Syndrome” (RDS) to describe genetic and epigenetic induced hypodopaminergia in the “Brain Reward Cascade” that contribute to addiction and compulsive behaviors [3,6,41].

Furthermore, ordinary “liking” of something, or pure pleasure, is represented by small regions mainly in the limbic system (old reptilian part of the brain). These may be part of larger neural circuits. In Latin, hedus is the term for “sweet”; and in Greek, hodone is the term for “pleasure.” Thus, the word Hedonic is now referring to various subcomponents of pleasure: some associated with purely sensory and others with more complex emotions involving morals, aesthetics, and social interactions. The capacity to have pleasure is part of being healthy and may even extend life, especially if linked to optimism as a dopaminergic response [42].

Psychiatric illness often includes symptoms of an abnormal inability to experience pleasure, referred to as anhedonia. A negative feeling state is called dysphoria, which can consist of many emotions such as pain, depression, anxiety, fear, and disgust. Previously many scientists used animal research to uncover the complex mechanisms of pleasure, liking, motivation and even emotions like panic and fear, as discussed above [43]. However, as a significant amount of related research about the specific brain regions of pleasure/reward circuitry has been derived from invasive studies of animals, these cannot be directly compared with subjective states experienced by humans.

In an attempt to resolve the controversy regarding the causal contributions of mesolimbic dopamine systems to reward, we have previously evaluated the three-main competing explanatory categories: “liking,” “learning,” and “wanting” [3]. That is, dopamine may mediate (a) liking: the hedonic impact of reward, (b) learning: learned predictions about rewarding effects, or (c) wanting: the pursuit of rewards by attributing incentive salience to reward-related stimuli [44]. We have evaluated these hypotheses, especially as they relate to the RDS, and we find that the incentive salience or “wanting” hypothesis of dopaminergic functioning is supported by a majority of the scientific evidence. Various neuroimaging studies have shown that anticipated behaviors such as sex and gaming, delicious foods and drugs of abuse all affect brain regions associated with reward networks, and may not be unidirectional. Drugs of abuse enhance dopamine signaling which sensitizes mesolimbic brain mechanisms that apparently evolved explicitly to attribute incentive salience to various rewards [45].

Addictive substances are voluntarily self-administered, and they enhance (directly or indirectly) dopaminergic synaptic function in the NAc. This activation of the brain reward networks (producing the ecstatic “high” that users seek). Although these circuits were initially thought to encode a set point of hedonic tone, it is now being considered to be far more complicated in function, also encoding attention, reward expectancy, disconfirmation of reward expectancy, and incentive motivation [46]. The argument about addiction as a disease may be confused with a predisposition to substance and nonsubstance rewards relative to the extreme effect of drugs of abuse on brain neurochemistry. The former sets up an individual to be at high risk through both genetic polymorphisms in reward genes as well as harmful epigenetic insult. Some Psychologists, even with all the data, still infer that addiction is not a disease [47]. Elevated stress levels, together with polymorphisms (genetic variations) of various dopaminergic genes and the genes related to other neurotransmitters (and their genetic variants), and may have an additive effect on vulnerability to various addictions [48]. In this regard, Vanyukov, et al. [48] suggested based on review that whereas the gateway hypothesis does not specify mechanistic connections between “stages,” and does not extend to the risks for addictions the concept of common liability to addictions may be more parsimonious. The latter theory is grounded in genetic theory and supported by data identifying common sources of variation in the risk for specific addictions (e.g., RDS). This commonality has identifiable neurobiological substrate and plausible evolutionary explanations.

Over many years the controversy of dopamine involvement in especially “pleasure” has led to confusion concerning separating motivation from actual pleasure (wanting versus liking) [49]. We take the position that animal studies cannot provide real clinical information as described by self-reports in humans. As mentioned earlier and in the abstract, on November 23rd, 2017, evidence for our concerns was discovered [50]

In essence, although nonhuman primate brains are similar to our own, the disparity between other primates and those of human cognitive abilities tells us that surface similarity is not the whole story. Sousa et al. [50] small case found various differentially expressed genes, to associate with pleasure related systems. Furthermore, the dopaminergic interneurons located in the human neocortex were absent from the neocortex of nonhuman African apes. Such differences in neuronal transcriptional programs may underlie a variety of neurodevelopmental disorders.

In simpler terms, the system controls the production of dopamine, a chemical messenger that plays a significant role in pleasure and rewards. The senior author, Dr. Nenad Sestan from Yale, stated: “Humans have evolved a dopamine system that is different than the one in chimpanzees.” This may explain why the behavior of humans is so unique from that of non-human primates, even though our brains are so surprisingly similar, Sestan said: “It might also shed light on why people are vulnerable to mental disorders such as autism (possibly even addiction).” Remarkably, this research finding emerged from an extensive, multicenter collaboration to compare the brains across several species. These researchers examined 247 specimens of neural tissue from six humans, five chimpanzees, and five macaque monkeys. Moreover, these investigators analyzed which genes were turned on or off in 16 regions of the brain. While the differences among species were subtle, **there was** a **remarkable contrast in** the **neocortices**, specifically in an area of the brain that is much more developed in humans than in chimpanzees. In fact, these researchers found that a gene called tyrosine hydroxylase (TH) for the enzyme, responsible for the production of dopamine, was expressed in the neocortex of humans, but not chimpanzees. As discussed earlier, dopamine is best known for its essential role within the brain’s reward system; the very system that responds to everything from sex, to gambling, to food, and to addictive drugs. However, dopamine also assists in regulating emotional responses, memory, and movement. Notably, abnormal dopamine levels have been linked to disorders including Parkinson’s, schizophrenia and spectrum disorders such as autism and addiction or RDS.

Nora Volkow, the director of NIDA, pointed out that one alluring possibility is that the neurotransmitter dopamine plays a substantial role in humans’ ability to pursue various rewards that are perhaps months or even years away in the future. This same idea has been suggested by Dr. Robert Sapolsky, a professor of biology and neurology at Stanford University. Dr. Sapolsky cited evidence that dopamine levels rise dramatically in humans when we anticipate potential rewards that are uncertain and even far off in our futures, such as retirement or even the possible alterlife. This may explain what often motivates people to work for things that have no apparent short-term benefit [51]. In similar work, Volkow and Bale [52] proposed a model in which dopamine can favor NOW processes through phasic signaling in reward circuits or LATER processes through tonic signaling in control circuits. Specifically, they suggest that through its modulation of the orbitofrontal cortex, which processes salience attribution, dopamine also enables shilting from NOW to LATER, while its modulation of the insula, which processes interoceptive information, influences the probability of selecting NOW versus LATER actions based on an individual’s physiological state. This hypothesis further supports the concept that disruptions along these circuits contribute to diverse pathologies, including obesity and addiction or RDS.

#### The standard is consistency with hedonic act utilitarianism

#### Prefer additionally:

#### 1] Actor specificity –

#### A] Aggregation – every policy benefits some and harms others, which also means side constraints freeze action.

#### B] No intent-foresight distinction – If we foresee a consequence, then it becomes part of our deliberation which makes it intrinsic to our action since we intend it to happen.

### **Method**

#### Psychoanalysis pathologizes oppression. There is no single symbolic order. Engaging in politics can create fissures in libidinal investment.

Nancy FRASER 13. Louise Loeb Professor of Political and Social Science and Professor of Philosophy, The New School. *Fortunes of Feminism*. Verso Books. 140-9. Modified for ableist language.

Let me begin by posing two questions: What might a theory of discourse contribute to feminism? And what, therefore, should feminists look for in a theory of discourse? I suggest that a conception of discourse can help us understand at least four things, all of which are interrelated. First, it can help us understand how people’s social identities are fashioned and altered over time. Second, it can help us understand how, under conditions of inequality, social groups in the sense of collective agents are formed and unformed. Third, a conception of discourse can illuminate how the cultural hegemony of dominant groups in society is secured and contested. Fourth and finally, it can shed light on the prospects for emancipatory social change and political practice. Let me elaborate.

First, consider the uses of a conception of discourse for understanding social identities. The basic idea here is that people’s social identities are complexes of meanings, networks of interpretation. To have a social identity, to be a woman or a man, for example, just is to live and to act under a set of descriptions. These descriptions, of course, are not simply secreted by peoples’s bodies; nor are they simply exuded by people’s psyches. Rather, they are drawn from the fund of interpretive possibilities available to agents in specific societies. It follows that, in order to understand the gender dimension of social identity, it does not suffice to study biology or psychology. Instead, one must study the historically specific social practices through which cultural descriptions of gender are produced and circulated.3

Moreover, social identities are exceedingly complex. They are knitted together from a plurality of different descriptions arising from a plurality of different signifying practices. Thus, no one is simply a woman; one is rather, for example, a white, Jewish, middle-class woman, a philosopher, a lesbian, a socialist, and a mother.4 Because everyone acts in a plurality of social contexts, moreover, the different descriptions comprising any individual’s social identity fade in and out of focus. Thus, one is not always a woman in the same degree; in some contexts, one’s womanhood figures centrally in the set of descriptions under which one acts; in others, it is peripheral or latent.5 Finally, it is not the case that people’s social identities are constructed once and for all and definitively fixed. Rather, they alter over time, shifting with shifts in agents’ practices and affiliations. Even the way in which one is a woman will shift— as it does, to take a dramatic example-, when one becomes a feminist. In short, social identities are discursively constructed in historically specific social contexts; they are complex and plural; and they shift over time. One use of a conception of discourse for feminist theorizing, then, is in understanding social identities in their full socio-cultural complexity, thus in demystifying static, single variable, essentialist views of gender identity.

A second use of a conception of discourse for feminist theorizing is in understanding the formation of social groups. How does it happen, under conditions of domination, that people come together, arrange themselves under the banner of collective identities, and constitute themselves as collective social agents? How do class formation and, by analogy, gender formation occur?

Clearly, group formation involves shifts in people’s social identities and therefore also in their relation to social discourse. One thing that happens here is that pre-existing strands of identities acquire a new sort of salience and centrality. These strands, previously submerged among many others, are reinscribed as the nub of new self-definitions and affiliations.6 For example, in the current wave of feminist ferment, many of us who had previously been “women” in some taken-for-granted way have now become “ women” in the very different sense of a discursively self-constituted political collectivity. In the process, we have remade entire regions of social discourse. We have invented new terms for describing social reality— for example, “sexism,” “ sexual harassment,” “ marital, date, and acquaintance rape,” “ labor force sex-segregation,” “ the double shift,” and “ wife-battery.” We have also invented new language games such as consciousness raising and new, institutionalized public spheres such as the Society for Women in Philosophy.7 The point is that the formation of social groups proceeds by struggles over social discourse. Thus, a conception of discourse is useful here, both for understanding group formation and for coming to grips with the closely related issue of socio-cultural hegemony.

“Hegemony” is the Italian Marxist Antonio Gramsci’s term for the discursive face of power. It is the power to establish the “common sense” or “doxa” of a society, the fund of self-evident descriptions of social reality that normally go without saying.8 This includes the power to establish authoritative definitions of social situations and social needs, the power to define the universe of legitimate disagreement, and the power to shape the political agenda. Hegemony, then, expresses the advantaged position of dominant social groups with respect to discourse. It is a concept that allows us to recast the issues of social identity and social groups in the light of societal inequality. How do pervasive axes of dominance and subordination affect the production and circulation of social meanings? How does stratification along lines of gender, “race,” and class affect the discursive construction of social identities and the formation of social groups? The notion of hegemony points to the intersection of power, inequality, and discourse. However, it does not entail that the ensemble of descriptions that circulate in society comprise a monolithic and seamless web, nor that dominant groups exercise an absolute, topdown control of meaning. On the contrary, “hegemony” designates a process wherein cultural authority is negotiated and contested. It presupposes that societies contain a plurality of discourses and discursive sites, a plurality of positions and perspectives from which to speak. Of course, not all of these have equal authority. Yet conflict and contestation are part of the story. Thus, one use of a conception of discourse for feminist theorizing is to shed light on the processes by which the socio-cultural hegemony of dominant groups is achieved and contested. What are the processes by which definitions and interpretations inimical to women’s interests acquire cultural authority? What are the prospects for mobilizing counter-hegemonic feminist definitions and interpretations to create broad oppositional groups and alliances?

The link between these questions and emancipatory political practice is, I believe, fairly obvious. A conception of discourse that lets us examine identities, groups, and hegemony in the ways I have been describing would be of considerable use to feminist practice. It would valorize the empowering dimensions of discursive struggles without leading to “culturalist” retreats from political engagement.9 In addition, the right kind of conception would counter the disabling assumption that women are just passive victims of male dominance. That assumption over-totalizes male dominance, treating men as the only social agents- and rendering inconceivable our own existence as feminist theorists and activists. In contrast, the sort of conception I have been proposing would help us understand how, even under conditions of subordination, women participate in the making of culture.

2. LACANIANISM AND THE LIMITS OF STRUCTURALISM

In light of the foregoing, what sort of conception of discourse will be useful for feminist theorizing? What sort of conception best illuminates social identities, group formation, hegemony, and emancipatory practice?

In the postwar period, two approaches to theorizing language became influential among political theorists. The first is the structuralist model, which studies language as a symbolic system or code. Derived from Saussure, this model is presupposed in the version of Lacanian theory I shall be concerned with here; in addition, it is abstractly negated but not entirely superseded in deconstruction and in related forms of French “women’s writing.” The second influential approach to theorizing language may be called the pragmatics model, which studies language at the level of discourses, as historically specific social practices of communication. Espoused by such thinkers as Mikhail Bakhtin, Michel Foucault, and Pierre Bourdieu, this model is operative in some but not all dimensions of the work of Julia Kristeva and Luce Irigaray. In the present section of this chapter, I shall argue that the first, structuralist model is of only limited usefulness for feminist theorizing.

Let me begin by noting that there are good prima facie reasons for feminists to be suspicious of the structuralist model. This model constructs its object of study by abstracting from exactly what we need to focus on, namely, the social practice and social context of communication. Indeed, the abstraction from practice and context are among the founding gestures of Saussurean linguistics. Saussure began by splitting signification into langue, the symbolic system or code, and parole, speakers’ uses of language in communicative practice or speech. He then made the first of these, langue, the proper object of the new science of linguistics, and relegated the second, parole, to the status of a devalued remainder.10 At the same time, Saussure insisted that the study of langue be synchronic rather than diachronic; he thereby posited his object of study as static and atemporal, abstracting it from historical change. Finally, the founder of structuralist linguistics posited that langue was indeed a single system; he made its unity and systematicity consist in the putative fact that every signifier, every material, signifying element of the code, derives its meaning positionally through its difference from all of the others.

Together, these founding operations render the structuralist approach of limited utility for feminist purposes." Because it abstracts from parole, the structuralist model brackets questions of practice, agency, and the speaking subject. Thus, it cannot shed light on the discursive practices through which social identities and social groups are formed. Because this approach brackets the diachronic, moreover, it will not tell us anything about shifts in identities and affiliations over time. Similarly, because it abstracts from the social context of communication, the model brackets issues of power and inequality. Thus, it cannot illuminate the processes by which cultural hegemony is secured and contested. Finally, because the model theorizes the fund of available linguistic meanings as a single symbolic system, it lends itself to a monolithic view of signification that denies tensions and contradictions among social meanings. In short, by reducing discourse to a “symbolic system," the structuralist model evacuates social agency, social conflict, and social practice.12

Let me now try to illustrate these problems by means of a brief discussion of Lacanianism. By “Lacanianism," I do not mean the actual thought of Jacques Lacan, which is far too complex to tackle here. I mean, rather, an ideal-typical neo-structuralist reading of Lacan that is widely credited among English-speaking feminists.'5 In discussing “ Lacanianism,” I shall bracket the question of the fidelity of this reading, which could be faulted for overemphasizing the influence of Saussure at the expense of other, countervailing influences, such as Hegel.'4 For my purposes, however, this ideal-typical, Saussurean reading of Lacan is useful precisely because it evinces with unusual clarity the difficulties that beset many conceptions of discourse that are widely considered “ poststructuralist” but that remain wedded in important respects to structuralism. Because their attempts to break free of structuralism remain abstract, such conceptions tend finally to recycle it. Lacanianism, as discussed here, is a paradigm case of “neostructuralism.” '5

At first sight, neo-structuralist Lacanianism seems to promise some advantages for feminist theorizing. By conjoining the Freudian problematic of the construction of gendered subjectivity to the Saussurean model of structural linguistics, it seems to provide each with its needed corrective. The introduction of the Freudian problematic promises to supply the speaking subject that is missing in Saussure and thereby to reopen the excluded questions about identity, speech, and social practice. Conversely, the use of the Saussurean model promises to remedy some of Freuds deficiencies. By insisting that gender identity is discursively constructed, Lacanianism appears to eliminate lingering vestiges of biologism in Freud, to treat gender as sociocultural all the way down, and to render it in principle more open to change.

Upon closer inspection, however, the promised advantages fail to materialize. Instead, Lacanianism begins to look viciously circular. On the one hand, it purports to describe the process by which individuals acquire gendered subjectivity through their painful conscription as young children into a pre-existing phallocentric symbolic order. Here the structure of the symbolic order is presumed to determine the character of individual subjectivity. But, on the other hand, the theory also purports to show that the symbolic order must necessarily be phallocentric since the attainment of subjectivity requires submission to “the Father s Law.” Here, conversely, the nature of individual subjectivity, as dictated by an autonomous psychology, is presumed to determine the character of the symbolic order.

One result of this circularity is an apparently ironclad determinism. As Dorothy Leland has noted, the theory casts the developments it describes as necessary, invariant, and unalterable.16 Phallocentrism, womans disadvantaged place in the symbolic order, the encoding of cultural authority as masculine, the impossibility of describing a nonphallic sexuality— in short, any number of historically contingent trappings of male dominance— now appear as invariable features of the human condition. Womens subordination, then, is inscribed as the inevitable destiny of civilization.

I can spot several spurious steps in this reasoning, some of which have their roots in the presupposition of the structuralist model. First, to the degree Lacanianism has succeeded in eliminating biologism— and that is dubious for reasons I shall not go into here17 — it has replaced it with psychologism, the untenable view that autonomous psychological imperatives given independently of culture and history can dictate the way they are interpreted and acted on within culture and history.

[INSERT FOOTNOTE 17]

17 Here I believe one can properly speak of Lacan. Lacan’s claim to have overcome biologism rests on his insistence that the phallus is not the penis. However, many feminist critics have shown that he fails to prevent the collapse of the symbolic signifier into the organ. The clearest indication of this failure is his claim, in The Meaning of the Phallus,” that the phallus becomes the master signifier because of its “turgidity” which suggests “ the transmission of vital flow” in copulation. See Jacques Lacan, “ T h e Meaning of the Phallus,” in Feminine Sexuality: Jacques Lacan and the ecole freudienne, eds. Juliet Mitchell and Jacqueline Rose, New York: W.W. Norton & Company, 1982.

[END FOOTNOTE 17]

Lacanianism falls prey to psychologism to the extent that it claims that the phallocentricity of the symbolic order is required by the demands of an enculturation process that is itself independent of culture.18

If one half of Lacanianism’s circular argument is vitiated by psychologism, then the other half is vitiated by what I shall call symbolicism. By symbolicism I mean, first, the homogenizing reification of diverse signifying practices into a monolithic and all-pervasive “symbolic order,” and second, the endowing of that order with an exclusive and unlimited causal power to fix people’s subjectivities once and for all. Symbolicism, then, is an operation whereby the structuralist abstraction langue is troped into a quasi-divinity, a normative “symbolic order” whose power to shape identities dwarfs [stunts] to the point of extinction that of mere historical institutions and practices.

Actually, as Deborah Cameron has noted, Lacan himself equivocates on the expression “the symbolic order.” '9 Sometimes he uses this expression relatively narrowly to refer to Saussurean langue, the structure of language as a system of signs. In this narrow usage, Lacanianism would be committed to the implausible view that the sign system itself determines individuals’ subjectivities independently of the social context and social practice of its uses. At other times, Lacan uses the expression “ the symbolic order” far more broadly to refer to an amalgam that includes not only linguistic structures, but also cultural traditions and kinship structures, the latter mistakenly equated with social structure in general.20 In this broad usage, Lacanianism would conflate the ahistorical structural abstraction langue with variable historical phenomena like family forms and childrearing practices; cultural representations of love and authority in art, literature, and philosophy; the gender division of labor; forms of political organization and of other institutional sources of power and status. The result would be a conception of “the symbolic order” that essentializes and homogenizes contingent historical practices and traditions, erasing tensions, contradictions, and possibilities for change. This would be a conception, moreover, that is so broad that the claim that it determines the structure of subjectivity risks collapsing into an empty tautology.21

The combination of psychologism and symbolicism in Lacanianism results in a conception of discourse that is of limited usefulness for feminist theorizing. To be sure, this conception offers an account of the discursive construction of social identity. However, it is not an account that can make sense of the complexity and multiplicity of social identities, the ways they are woven from a plurality of discursive strands. Granted, Lacanianism stresses that the apparent unity and simplicity of ego identity is imaginary, that the subject is irreparably split both by language and drives. But this insistence on fracture does not lead to an appreciation of the diversity of the socio-cultural discursive practices from which identities are woven. It leads, rather, to a unitary view of the human condition as inherently tragic. In fact, Lacanianism differentiates identities only in binary terms, along the single axis of having or lacking the phallus. As Luce Irigaray has shown, this phallic conception of sexual difference is not an adequate basis for understanding femininity22— nor, I would add, masculinity. Still less, then, is it able to shed light on other dimensions of social identities, including ethnicity, color, and social class. Nor could the theory be emended to incorporate these manifestly historical phenomena, given its postulation of an ahistorical, tension-free “symbolic order” equated with kinship.23

Moreover, Lacanianism’s account of identity construction cannot account for identity shifts over time. It is committed to the general psychoanalytic proposition that gender identity (the only kind of identity it considers) is basically fixed once and for all with the resolution of the Oedipus complex. Lacanianism equates this resolution with the child’s entry into a fixed, monolithic, and all-powerful symbolic order. Thus, it actually increases the degree of identity fixity found in classical Freudian theory. It is true, as Jacqueline Rose points out, that the theory stresses that gender identity is always precarious, that its apparent unity and stability are always threatened by repressed libidinal drives.24 But this emphasis on precariousness is not an opening onto genuine historical thinking about shifts in peoples social identities. On the contrary, it is an insistence on a permanent, ahistorical condition, since for Lacanianism the only alternative to fixed gender identity is psychosis.

If Lacanianism cannot provide an account of social identity that is useful for feminist theorizing, then it is unlikely to help us understand the formation of social groups. For Lacanianism, affiliation falls under the rubric of the imaginary. To affiliate with others, to align oneself with others in a social movement, would be to fall prey to the illusions of the imaginary ego. It would be to deny loss and lack, to seek an impossible unification and fulfillment. Thus, from the perspective of Lacanianism, collective movements would by definition be vehicles of delusion; they could not even in principle be emancipatory.25

Moreover, insofar as group formation depends on linguistic innovation, it is untheorizable from the perspective of Lacanianism. Because Lacanianism posits a fixed, monolithic symbolic system and a speaker who is wholly subjected to it, it is inconceivable that there could ever be any linguistic innovation. Speaking subjects could only ever reproduce the existing symbolic order; they could not possibly alter it. From this perspective, the question of cultural hegemony is blocked from view. There can be no question as to how the cultural authority of dominant groups in society is established and contested, no question of unequal negotiations between different social groups occupying different discursive positions. For Lacanianism, on the contrary, there is simply “ f/ie symbolic order,” a single universe of discourse that is so systematic, so all-pervasive, so monolithic that one cannot even conceive of such things as alternative perspectives, multiple discursive sites, struggles over social meanings, contests between hegemonic and counterhegemonic definitions of social situations, conflicts of interpretation of social needs. One cannot even conceive, really, of a plurality of different speakers.

With the way blocked to a political understanding of identities, groups, and cultural hegemony, the way is also blocked to an understanding of political practice. For one thing, there is no conceivable agent of such practice. Lacanianism posits a view of the person as a non-sutured congeries of three moments, none of which can qualify as a political agent. The speaking subject is simply the grammatical “I,” a shifter wholly subjected to the symbolic order; it can only and forever reproduce that order. The ego is an imaginary projection, deluded about its own stability and self-possession, hooked on an impossible narcissistic desire for unity and self-completion; it therefore can only and forever tilt at windmills. Finally, there is the ambiguous unconscious, sometimes an ensemble of repressed libidinal drives, sometimes the face of language as Other, but never anything that could count as a social agent.

#### Evaluate the plan before discourse-

#### --focusing on their theory and requiring the Aff to defend every assumption collapses global progress

David A. Lake 14. University of California, San Diego, USA. “Theory is dead, long live theory: The end of the Great Debates and the rise of eclecticism in International Relations.” European Journal of International Relations 19(3) 567–587

More important, as Kuhn (1970) first argued, progress is only possible within paradigms. OEP and democratic peace theory, described above, made progress only through sets of shared assumptions and common epistemologies and ontologies that allowed theory to be extended to new topics, additional hypotheses to be deduced, and propositions confronted with evidence according to agreed-upon standards. Were researchers in each area forced to defend their methodological, epistemological, and ontological assumptions at every turn, progress within the approach would have been severely hampered. As these research programs have developed, they have been increasingly challenged by accumulated anomalies, as expected, and will either be revised or superseded by some future theory. Although I have not reviewed research in the postpositivist approach in similar detail in this article, and others are undoubtedly better qualified to address this question, I see similar progress in the feminist security studies program from the early works of Enloe (1990) that opened the political space to include women, to Tickner’s (1992) agenda-setting work, to more recent and substantive applications that reveal and highlight the ways in which gender deeply structures world politics (see Sjoberg, 2010; Sjoberg and Via, 2010; Towns, 2010). This too would have been even more difficult if researchers were forced to debate first principles at every turn. Within both positivist and post-positivist approaches, progress occurs within paradigms according to their own criteria for evaluating that progress. This suggests letting each paradigm develop on its own in its own fashion.

In the end, I prefer progress within paradigms rather than war between paradigms, especially as the latter would be inconclusive. The human condition is precarious. This is still the age of thermonuclear weapons. Globalization continues to disrupt lives as countries realign their economies on the basis of comparative advantage, production chains are disaggregated and wrapped around the globe, and financial crises in one country reverberate around the planet in minutes. Transnational terrorism threatens to turn otherwise local disputes into global conflicts, and leave everyone everywhere feeling unsafe. And all the while, anthropomorphic change transforms the global climate with potentially catastrophic consequences. Under these circumstances, we as a society need all the help we can get. There is no monopoly on knowledge. And there is no guarantee that any one kind of knowledge generated and understood within any one epistemology or ontology is always and everywhere more useful than another. To assert otherwise is an act of supreme intellectual hubris.

This is not a plea to let a hundred, a thousand, or ten thousand intellectual flowers bloom. Scholars working in cloistered isolation are not likely to produce great insights, especially when the social problems besetting us today are of such magnitude. All knowledge must be disciplined. That is, knowledge must be shared by and with others if it is to count as knowledge. Positivists and post-positivists are each working hard to improve and clarify the standards of knowledge within their respective paradigms. This is an important turn for both, as it will facilitate progress within each even as it raises barriers to exchange across approaches. So, if not a thousand flowers, it is perhaps better for teams of scholars to tend a small number of separate gardens, grow what they can best, and share when possible with the others and, especially, the broader societies of which they are part.

Do not mourn the end of theory, if by theory we mean the Great Debates in International Relations. Too often, the Great Debates and especially the paradigm wars became contests over the truth status of assumptions. Declarations that ‘I am a realist’ or pronouncements that ‘As a liberal, I predict …’ were statements of a near quasi-religious faith, not conclusions that followed from a falsifiable theory with stronger empirical support. Likewise, assertions that positivism or post-positivism is a better approach to understanding world politics are similarly blinding. The Great Debates were too often academic in the worst sense of that term. Mid-level theory flourished in the interstices of these debates for decades and now, with the waning of the paradigm wars, is coming into its own within the field. I regard this as an entirely positive development. We may be witnessing the demise of a particular kind of grand theory, but theory — in the plural — lives. Long may they reign.

#### Scenario planning is pedagogically valuable---analyzing how policies might be otherwise and imagining the consequences is vital to critical reflexivity---deconstructs cognitive biases and flawed ontological assumptions, and empowers creativity and flexibility in thinking and advocacy.

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Over the past decade, the “cult of irrelevance” in political science scholarship has been lamented by a growing chorus (Putnam 2003; Nye 2009; Walt 2009). Prominent scholars of international affairs have diagnosed the roots of the gap between academia and policymaking, made the case for why political science research is valuable for policymaking, and offered a number of ideas for enhancing the policy relevance of scholarship in international relations and comparative politics (Walt 2005,2011; Mead 2010; Van Evera 2010; Jentleson and Ratner 2011; Gallucci 2012; Avey and Desch 2014). Building on these insights, several initiatives have been formed in the attempt to “bridge the gap.”2 Many of the specific efforts put in place by these projects focus on providing scholars with the skills, platforms, and networks to better communicate the findings and implications of their research to the policymaking community, a necessary and worthwhile objective for a field in which theoretical debates, methodological training, and publishing norms tend more and more toward the abstract and esoteric. Yet enhancing communication between scholars and policymakers is only one component of bridging the gap between international affairs theory and practice. Another crucial component of this bridge is the generation of substantive research programs that are actually policy relevant—a challenge to which less concerted attention has been paid. The dual challenges of bridging the gap are especially acute for graduate students, a particular irony since many enter the discipline with the explicit hope of informing policy. In a field that has an admirable devotion to pedagogical self-reflection, strikingly little attention is paid to techniques for generating policy-relevant ideas for dissertation and other research topics. Although numerous articles and conference workshops are devoted to the importance of experiential and problem-based learning, especially through techniques of simulation that emulate policymaking processes (Loggins 2009; Butcher 2012; Glasgow 2012; Rothman 2012; DiCicco 2014), little has been written about the use of such techniques for generating and developing innovative research ideas. This article outlines an experiential and problem-based approach to developing a political science research program using scenario analysis. It focuses especially on illuminating the research generation and pedagogical benefits of this technique by describing the use of scenarios in the annual New Era Foreign Policy Conference (NEFPC), which brings together doctoral students of international and comparative affairs who share a demonstrated interest in policy-relevant scholarship.3 In the introductory section, the article outlines the practice of scenario analysis and considers the utility of the technique in political science. We argue that scenario analysis should be viewed as a tool to stimulate problem-based learning for doctoral students and discuss the broader scholarly benefits of using scenarios to help generate research ideas. The second section details the manner in which NEFPC deploys scenario analysis. The third section reflects upon some of the concrete scholarly benefits that have been realized from the scenario format. The fourth section offers insights on the pedagogical potential associated with using scenarios in the classroom across levels of study. A brief conclusion reflects on the importance of developing specific techniques to aid those who wish to generate political science scholarship of relevance to the policy world. What Are Scenarios and Why Use Them in Political Science? Scenario analysis is perceived most commonly as a technique for examining the robustness of strategy. It can immerse decision makers in future states that go beyond conventional extrapolations of current trends, preparing them to take advantage of unexpected opportunities and to protect themselves from adverse exogenous shocks. The global petroleum company Shell, a pioneer of the technique, characterizes scenario analysis as the art of considering “what if” questions about possible future worlds. Scenario analysis is thus typically seen as serving the purposes of corporate planning or as a policy tool to be used in combination with simulations of decision making. Yet scenario analysis is not inherently limited to these uses. This section provides a brief overview of the practice of scenario analysis and the motivations underpinning its uses. It then makes a case for the utility of the technique for political science scholarship and describes how the scenarios deployed at NEFPC were created. The Art of Scenario Analysis We characterize scenario analysis as the art of juxtaposing current trends in unexpected combinations in order to articulate surprising and yet plausible futures, often referred to as “alternative worlds.” Scenarios are thus explicitly not forecasts or projections based on linear extrapolations of contemporary patterns, and they are not hypothesis-based expert predictions. Nor should they be equated with simulations, which are best characterized as functional representations of real institutions or decision-making processes (Asal 2005). Instead, they are depictions of possible future states of the world, offered together with a narrative of the driving causal forces and potential exogenous shocks that could lead to those futures. Good scenarios thus rely on explicit causal propositions that, independent of one another, are plausible—yet, when combined, suggest surprising and sometimes controversial future worlds. For example, few predicted the dramatic fall in oil prices toward the end of 2014. Yet independent driving forces, such as the shale gas revolution in the United States, China’s slowing economic growth, and declining conflict in major Middle Eastern oil producers such as Libya, were all recognized secular trends that—combined with OPEC’s decision not to take concerted action as prices began to decline—came together in an unexpected way. While scenario analysis played a role in war gaming and strategic planning during the Cold War, the real antecedents of the contemporary practice are found in corporate futures studies of the late 1960s and early 1970s (Raskin et al. 2005). Scenario analysis was essentially initiated at Royal Dutch Shell in 1965, with the realization that the usual forecasting techniques and models were not capturing the rapidly changing environment in which the company operated (Wack 1985; Schwartz 1991). In particular, it had become evident that straight-line extrapolations of past global trends were inadequate for anticipating the evolving business environment. Shell-style scenario planning “helped break the habit, ingrained in most corporate planning, of assuming that the future will look much like the present” (Wilkinson and Kupers 2013, 4). Using scenario thinking, Shell anticipated the possibility of two Arab-induced oil shocks in the 1970s and hence was able to position itself for major disruptions in the global petroleum sector. Building on its corporate roots, scenario analysis has become a standard policymaking tool. For example, the Project on Forward Engagement advocates linking systematic foresight, which it defines as the disciplined analysis of alternative futures, to planning and feedback loops to better equip the United States to meet contemporary governance challenges (Fuerth 2011). Another prominent application of scenario thinking is found in the National Intelligence Council’s series of Global Trends reports, issued every four years to aid policymakers in anticipating and planning for future challenges. These reports present a handful of “alternative worlds” approximately twenty years into the future, carefully constructed on the basis of emerging global trends, risks, and opportunities, and intended to stimulate thinking about geopolitical change and its effects.4 As with corporate scenario analysis, the technique can be used in foreign policymaking for long-range general planning purposes as well as for anticipating and coping with more narrow and immediate challenges. An example of the latter is the German Marshall Fund’s EuroFutures project, which uses four scenarios to map the potential consequences of the Euro-area financial crisis (German Marshall Fund 2013). Several features make scenario analysis particularly useful for policymaking.5 Long-term global trends across a number of different realms—social, technological, environmental, economic, and political—combine in often-unexpected ways to produce unforeseen challenges. Yet the ability of decision makers to imagine, let alone prepare for, discontinuities in the policy realm is constrained by their existing mental models and maps. This limitation is exacerbated by well-known cognitive bias tendencies such as groupthink and confirmation bias (Jervis 1976; Janis 1982; Tetlock 2005). The power of scenarios lies in their ability to help individuals break out of conventional modes of thinking and analysis by introducing unusual combinations of trends and deliberate discontinuities in narratives about the future. Imagining alternative future worlds through a structured analytical process enables policymakers to envision and thereby adapt to something altogether different from the known present. Designing Scenarios for Political Science Inquiry The characteristics of scenario analysis that commend its use to policymakers also make it well suited to helping political scientists generate and develop policy-relevant research programs. Scenarios are essentially textured, plausible, and relevant stories that help us imagine how the future political-economic world could be different from the past in a manner that highlights policy challenges and opportunities. For example, terrorist organizations are a known threat that have captured the attention of the policy community, yet our responses to them tend to be linear and reactive. Scenarios that explore how seemingly unrelated vectors of change—the rise of a new peer competitor in the East that diverts strategic attention, volatile commodity prices that empower and disempower various state and nonstate actors in surprising ways, and the destabilizing effects of climate change or infectious disease pandemics—can be useful for illuminating the nature and limits of the terrorist threat in ways that may be missed by a narrower focus on recognized states and groups. By illuminating the potential strategic significance of specific and yet poorly understood opportunities and threats, scenario analysis helps to identify crucial gaps in our collective understanding of global politicaleconomic trends and dynamics. The notion of “exogeneity”—so prevalent in social science scholarship—applies to models of reality, not to reality itself. Very simply, scenario analysis can throw into sharp relief often-overlooked yet pressing questions in international affairs that demand focused investigation. Scenarios thus offer, in principle, an innovative tool for developing a political science research agenda. In practice, achieving this objective requires careful tailoring of the approach. The specific scenario analysis technique we outline below was designed and refined to provide a structured experiential process for generating problem-based research questions with contemporary international policy relevance.6 The first step in the process of creating the scenario set described here was to identify important causal forces in contemporary global affairs. Consensus was not the goal; on the contrary, some of these causal statements represented competing theories about global change (e.g., a resurgence of the nation-state vs. border-evading globalizing forces). A major principle underpinning the transformation of these causal drivers into possible future worlds was to “simplify, then exaggerate” them, before fleshing out the emerging story with more details.7 Thus, the contours of the future world were drawn first in the scenario, with details about the possible pathways to that point filled in second. It is entirely possible, indeed probable, that some of the causal claims that turned into parts of scenarios were exaggerated so much as to be implausible, and that an unavoidable degree of bias or our own form of groupthink went into construction of the scenarios. One of the great strengths of scenario analysis, however, is that the scenario discussions themselves, as described below, lay bare these especially implausible claims and systematic biases.8 An explicit methodological approach underlies the written scenarios themselves as well as the analytical process around them—that of case-centered, structured, focused comparison, intended especially to shed light on new causal mechanisms (George and Bennett 2005). The use of scenarios is similar to counterfactual analysis in that it modifies certain variables in a given situation in order to analyze the resulting effects (Fearon 1991). Whereas counterfactuals are traditionally retrospective in nature and explore events that did not actually occur in the context of known history, our scenarios are deliberately forward-looking and are designed to explore potential futures that could unfold. As such, counterfactual analysis is especially well suited to identifying how individual events might expand or shift the “funnel of choices” available to political actors and thus lead to different historical outcomes (Nye 2005, 68–69), while forward-looking scenario analysis can better illuminate surprising intersections and sociopolitical dynamics without the perceptual constraints imposed by fine-grained historical knowledge. We see scenarios as a complementary resource for exploring these dynamics in international affairs, rather than as a replacement for counterfactual analysis, historical case studies, or other methodological tools. In the scenario process developed for NEFPC, three distinct scenarios are employed, acting as cases for analytical comparison. Each scenario, as detailed below, includes a set of explicit “driving forces” which represent hypotheses about causal mechanisms worth investigating in evolving international affairs. The scenario analysis process itself employs templates (discussed further below) to serve as a graphical representation of a structured, focused investigation and thereby as the research tool for conducting case-centered comparative analysis (George and Bennett 2005). In essence, these templates articulate key observable implications within the alternative worlds of the scenarios and serve as a framework for capturing the data that emerge (King, Keohane, and Verba 1994). Finally, this structured, focused comparison serves as the basis for the cross-case session emerging from the scenario analysis that leads directly to the articulation of new research agendas. The scenario process described here has thus been carefully designed to offer some guidance to policy-oriented graduate students who are otherwise left to the relatively unstructured norms by which political science dissertation ideas are typically developed. The initial articulation of a dissertation project is generally an idiosyncratic and personal undertaking (Useem 1997; Rothman 2008), whereby students might choose topics based on their coursework, their own previous policy exposure, or the topics studied by their advisors. Research agendas are thus typically developed by looking for “puzzles” in existing research programs (Kuhn 1996). Doctoral students also, understandably, often choose topics that are particularly amenable to garnering research funding. Conventional grant programs typically base their funding priorities on extrapolations from what has been important in the recent past—leading to, for example, the prevalence of Japan and Soviet studies in the mid-1980s or terrorism studies in the 2000s—in the absence of any alternative method for identifying questions of likely future significance. The scenario approach to generating research ideas is grounded in the belief that these traditional approaches can be complemented by identifying questions likely to be of great empirical importance in the real world, even if these do not appear as puzzles in existing research programs or as clear extrapolations from past events. The scenarios analyzed at NEFPC envision alternative worlds that could develop in the medium (five to seven year) term and are designed to tease out issues scholars and policymakers may encounter in the relatively near future so that they can begin thinking critically about them now. This timeframe offers a period distant enough from the present as to avoid falling into current events analysis, but not so far into the future as to seem like science fiction. In imagining the worlds in which these scenarios might come to pass, participants learn strategies for avoiding failures of creativity and for overturning the assumptions that prevent scholars and analysts from anticipating and understanding the pivotal junctures that arise in international affairs.