### 1AC – Plan

#### Plan – The appropriation of outer space through the production of space debris by private entities is unjust.

#### Revising the Outer Space Treaty clarifies legal loopholes and ambiguities in space debris.

* Private entities: Non-governmental
* Space debris: Non-functional Space Objects

Shah 20. Sachin Shah is a write for Cornell Undergraduate Law and Society Review. 8/30/20 [CORNELL UNDERGRADUATE LAW & SOCIETY REVIEW “The International Legal Regulation of Space Debris,” <https://www.culsr.org/articles/the-international-legal-regulation-of-space-debris>] Justin

While many scholars agree that the Outer Space Treaty provides rudimentary regulation of the problem of space debris, therein lies the problem: it is only rudimentary. One of the most often cited problems with the Outer Space Treaty is that it was signed in 1967 (53 years ago) and that the technological climate of the space travel industry was not as advanced as it is today, reflected in a marked lack of specificity in the writing of these laws. [7] This lack of specificity highlights another issue: the imprecise language of the Treaty leaves unclear the definition of space debris, which leaves the regulation open to interpretation. Rather than agree with most scholars that space debris constitute “space objects,” scholar Chelsea Muñoz-Patchen uses the UN Space Debris Mitigation Guidelines’ definition of space debris along with the fact that space debris is non-functional and its ownership often untraceable in order to argue that space debris should be classified as “abandoned property” instead. [8] Furthermore, non-governmental private enterprises may be inclined to legally define space debris as something other than “space objects” in order to avoid the Outer Space Treaty’s aforementioned financial penalties, as will be explained below. The Outer Space Treaty also does not account for the fact that the space debris problem, especially as of late, has been becoming worse over time. As collisions between debris and satellites continue to occur, more debris is strewn across Earth’s orbit, endangering future spacecraft from safely orbiting Earth, supporting the theory of the Kessler Syndrome. [9] Thus, the Outer Space Treaty is not a very effective legal instrument with regards to mitigating the amount of space debris in orbit around Earth.

Due to the Treaty’s weakness, many of the aforementioned scholars support revising the Outer Space Treaty by clearly defining space debris, increasing its technology-specific language to combat space debris issues, and outlining specific punishments to negate the complete lack of enforcement built into the current Treaty. While nations do recognize the danger that space debris pose to orbital operations, stronger laws must be enacted in order to de-escalate an imminent arms race and incentivize them to mitigate their debris. [10] Believing that one convention or treaty would be insufficient, N. Jasentuliyana recommends the creation of a regulatory regime to solve the growing problem of space debris. Such a regime would “effectively deal with these technical problems and establish international legal rules, standards and procedures on a continuing basis.” [11] Thus, one potential solution to the legal lack of space debris mitigation is establishing a lawmaking agency which specifically focuses on the issue of space debris. In addition to the creation of a legal agency which could hold actors accountable for the amount of space debris produced, international laws guiding the actions of private companies’ activities may also provide an answer, as will be discussed in greater detail below.

Although there do exist international laws and regulations governing the use of space for states and governmental entities (albeit weak ones), the private enterprises sending objects into space are subject to even less stringent regulations than states are. SpaceX, for example, to authorize their sending of 42,000 Starlink satellites into orbit, only had to submit paperwork to the U.S. Federal Communications Commission (FCC) and the International Telecommunication Union (ITU). [12] Paul Larsen posits that, in the face of less stringent regulations, nongovernmental satellite companies send many satellites into orbit in order to maximize their profit, which is their primary objective. Unlike the vagueness and lack of enforcement that came with written law (which is apparent in the Outer Space Treaty), the unwritten market-oriented incentives for profit by large-scale satellite providers and operators provide a reason for actors to mitigate space debris in orbit around Earth. Larsen states that “They have huge sums of money invested in each satellite, perhaps as much as a half-billion dollars, when all costs are included. Loss of one satellite is a major event. They want their assets to be safe.” [13] Thus, these satellite companies have a major stake in space traffic management and their market incentives do a better job of mitigating space debris than the existing legal regulation does. The company SpaceX, as mentioned above, plans to send 42,000 satellites into space. While doing so would likely result in significant profits for the company, many believe this will diminish astronomical visibility as well as increase the chance of collisions with space debris. [14] Due to these effects, scientists and space law experts alike have called for a legal delay to the ITU’s decision on whether or not to accept SpaceX’s proposal to launch more satellites. If these parties are successful, a precedent-setting legal case regarding space debris mitigation and satellite use in space may well provide a solution to the outdated Outer Space Treaty of 1967.

#### The aff interprets OST enforcement as an OUF (Orbital Use Fee). Proportionality in relation to the space industry solves best without harming it and any other solution only worsens the threat – models.

Rao et al 20. Akhil, Matthew Burgess, and Daniel Kaffine \*Department of Economics, Middlebury College, Middlebury \*\*Cooperative Institute for Research in Environmental Sciences, University of Colorado, Environmental Studies Program, and Department of Economics \*\*\*Department of Economics. 2020 [PNAS, “Orbital-use fees could more than quadruple the value of the space industry,” <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7293599/>] Justin

The space industry’s rapid recent growth represents the latest tragedy of the commons. Satellites launched into orbit contribute to—and risk damage from—a growing buildup of space debris and other satellites. Collision risk from this orbital congestion is costly to satellite operators. Technological and managerial solutions—such as active debris removal or end-of-life satellite deorbit guidelines—are currently being explored by regulatory authorities. However, none of these approaches address the underlying incentive problem: satellite operators do not account for costs they impose on each other via collision risk. Here, we show that an internationally harmonized orbital-use fee can correct these incentives and substantially increase the value of the space industry. We construct and analyze a coupled physical–economic model of commercial launches and debris accumulation in low-Earth orbit. Similar to carbon taxes, our model projects an optimal fee that rises at a rate of 14% per year, equal to roughly $235,000 per satellite-year in 2040. The long-run value of the satellite industry would more than quadruple by 2040—increasing from around $600 billion under business as usual to around $3 trillion. In contrast, we project that purely technological solutions are unlikely to fully address the problem of orbital congestion. Indeed, we find debris removal sometimes worsens economic damages from congestion by increasing launch incentives. In other sectors, addressing the tragedy of the commons has often been a game of catch-up with substantial social costs. The infant space industry can avert these costs before they escalate.

In 2017, 466 new satellites were launched—more than double the previous year’s launches and more than 20% of all active satellites in orbit in 2017 (1, 2). Rapid space industry growth is projected to continue, driven largely by commercial satellites (Fig. 1). This growth is driving buildup of debris in low-Earth orbit, currently including over 15,000 objects (3). Collision risk from debris is costly; collisions damage or destroy expensive capital assets that are difficult or impossible to repair. Debris buildup could eventually make some low-Earth orbits economically unviable and other orbits difficult or impossible to access (4). In the worst case—although uncertain and occurring over long time horizons—debris growth could become self-sustaining due to collisions between debris objects, a tipping point called Kessler Syndrome (4, 5).

Proposed solutions have so far largely been technological and managerial, aimed at mapping, avoiding, and removing debris (6, 7). These include end-of-life deorbit guidelines and “keep out” zones for active satellites and nets, harpoons, and lasers to deorbit debris (6). However, with open access to orbits, reducing debris and collision risk incentivizes additional satellite launches, which eventually restore the debris and risk. For instance, if firms were willing to tolerate a 0.1% annual risk of satellite loss before a technological improvement in debris removal, they will be willing to launch more satellites until the 0.1% annual risk of satellite loss was restored.

Thus, the core of the space debris problem is incentives, not technology. Since satellite operators are unable to secure exclusive property rights to their orbital paths or recover collision-related costs imposed by others, prospective operators face a choice between launching profitable satellites, thereby imposing current and future collision risk on others, or not launching and leaving those profits to competitors. This is a classic tragedy of the commons problem (1, 3, 8, 9). It can be economically efficiently addressed via incentive-based solutions, such as fees or tradable permits per year in orbit, analogous to carbon taxes or cap and trade (8, 10–12). Incentives should target objects in orbit—rather than launches—because orbiting objects are what directly imposes collision risk on other satellites (13). We quantify the economic benefits of implementing such incentives to correct the underlying open-access problem.

We use a coupled physical–economic model combining rich physical dynamics with satellite economics to quantify the benefits of an internationally harmonized “orbital-use fee” (OUF) relative to a business as usual (BAU) open-access scenario and relative to a scenario with active debris removal. An OUF is a type of Pigouvian tax—a well-known economic instrument for addressing externality problems (14). Our model accounts for the effects of each scenario on satellite launch decisions (Materials and Methods and SI Appendix). While we focus on an OUF for analytical convenience, it is conceptually equivalent to other mechanisms for pricing orbits, such as tradable permits.

Our physical model of satellite and debris evolution in orbit obeys relevant accounting identities and utilizes reduced form approximations of physical processes validated in other works (15, 16). We fit and calibrate the model using data on collision risk and orbital debris from the European Space Agency (ESA) (17) and data on active satellites from the Union of Concerned Scientists (UCS) (2) (Materials and Methods and SI Appendix). The ESA dataset covers 1958 to 2017, and the UCS dataset covers 1957 to 2017. Our physical model assumes runaway debris growth (Kessler Syndrome) cannot occur, which likely leads our model to understate the benefits of OUFs (Materials and Methods). Our economic model assumes that satellites are launched and operated to maximize per satellite private profits, net of any fees, subject to collision risk. We calibrate the model by fitting the BAU scenario (no fees or debris removal) to historical industry data and launch trends (1, 2) (Materials and Methods and SI Appendix).

We project future launch rates to 2040 under the BAU scenario using our fitted model and published projections of future growth of the space economy (18). The projections in ref. 18 were developed by projecting how the industries constituting the space sector—telecommunications, imaging, etc.—would grow from 2017 to 2040 under different assumptions on their individual profitability over time, then aggregating up to obtain projections for the space sector. We then calculate launch rates that would maximize the long-run value of the industry, and we calculate the time series of OUFs that would incentivize these optimal launch rates. The industry value is measured as net present value (NPV)—the long-run value of the entire fleet of satellites in orbit, accounting for both the financial costs of replacing satellites due to natural retirement and collisions as well as the opportunity cost of investing funds in satellites rather than capital markets. For instance, an NPV of $1 trillion in 2020 means the sum total of the stream of net benefits, looking from 2020 into the future and accounting for the timing of the net benefits, is $1 trillion.

Although our models are deliberately simplified for tractability, they are based on previously validated approaches to orbital object modeling (15, 16), and our calibrations allow us to reproduce observed trends and magnitudes in the growth of orbital debris and satellite stocks as well as the calculated collision risk (Fig. 3). Nonetheless, our projections should be interpreted as order of magnitude approximations that can be refined as needed by more detailed models. In these respects, our approach mirrors integrated assessment modeling approaches that have been useful in developing solutions to other natural resource management problems (e.g., ref. 19).

RESULTS

We project that shifting from open access to the optimal series of OUFs in 2020 would increase the NPV of the satellite industry from around $600 billion under BAU to around $3 trillion—a more than 4-fold increase (4.18- to 6.49-fold increases in 95% of parameter sets randomly drawn from their calibrated distributions) (Fig. 2D). Assuming a 5% market rate of return, an increase of $2.5 trillion in NPV would be equivalent to annual benefits of approximately $120 billion in perpetuity. The large immediate increase in NPV that we project in each OUF scenario, relative to BAU (Fig. 2A), comes primarily from the immediate effect of reducing launch activity while the satellite and debris stocks are suboptimally high (SI Appendix).

Based on our calculations (Materials and Methods), the optimal OUF starts at roughly $14,900 per satellite-year in 2020 and escalates at roughly 14% per year (aside from some initial transition dynamics) to around $235,000 per satellite-year in 2040. Rising optimal price paths are common in environmental pricing such as carbon taxes (20), although declining optimal price paths are also possible (21). The rising price path in this case partly reflects the rising value of safer orbits (resulting in rising industry NPV) (Fig. 2A) from the OUF. For comparison, the average annual profits of operating a satellite in 2015 were roughly $2.1 million. The 2020 and 2040 OUF values we describe amount to roughly 0.7 and 11% of average annual profits generated by a satellite in 2015.

Forgone NPV from the satellite industry in 2040—which is the cost of inaction under BAU—escalates from around $300 billion if optimal management begins in 2025 to around $700 billion if optimal management begins in 2035. Without OUFs, losses remain substantial even when active debris removal (implemented in the model as removal of 50% of debris objects in orbit each year) is available. In a best-case analysis where we assume debris removal is costless (i.e., it requires no payments nor additional satellites to implement), debris removal can only recover up to 9.5% of the value lost under open access. (The satellite industry’s willingness to pay for debris removal is not easily calculable in our model [SI Appendix, section 1.9.2].) At worst, debris removal can exacerbate orbital congestion via a rebound-type effect, causing additional losses on the order of 3% of the value already lost from open access (Fig. 4 and SI Appendix). The inability of debris removal to induce efficient orbit use is driven by open-access launching behavior and underscores the importance of policies to correct economic incentives to launch satellites.

DISCUSSION

The costly buildup of debris and satellites in low-Earth orbit is fundamentally a problem of incentives—satellite operators currently lack the incentives to factor into their launch decisions the collision risks their satellites impose on other operators. Our analysis suggests that correcting these incentives, via an OUF, could have substantial economic benefits to the satellite industry, and failing to do so could have substantial and escalating economic costs.

Escalating costs of inaction are a common feature of the tragedy of the commons, evident in several other sectors in which it went unaddressed for lengthy periods (22). For example, tens of billions of dollars in net benefits are lost annually from open-access or poorly managed fisheries globally (23). Similarly, open access to oil fields in the United States at the turn of the century drove recovery rates down to 20 to 25% at competitively drilled sites, compared with 85 to 90% potential recovery under optimal management (24). Open access to roadways—somewhat analogous to orbits—is estimated to create traffic congestion costs in excess of $120 billion/y in the United States alone (25). In contrast, there is still time to get out ahead of the tragedy of the commons in the young space industry.

The international and geopolitically complex nature of the space sector poses challenges to implementing orbital-use pricing systems, but these challenges need not be insurmountable. Theory suggests countries could each collect and spend OUF revenues domestically, without losing economic efficiency, as long as the fee’s magnitude was internationally harmonized (20). Engaging in such negotiations would be in the economic interests of all parties involved (26). An example of such a system is the Vessel Day Scheme (VDS) used by the Parties to the Nauru Agreement (PNA) to manage tuna fisheries. Under the VDS, PNA countries each lease fishing rights within their waters, using a common price floor (27). The European Union’s Emissions Trading System provides an example of an internationally coordinated tradable permit system (28). Notably, each of these pricing programs is built on a preexisting international governance institution (the Nauru Agreement and the European Union).

An OUF could also be built within existing space governance institutions, such as the Outer Space Treaty (29). For example, Article VI states that countries supervise their space industries, which provides a framework for OUFs to be administered nationally. Article II prohibits national appropriation of outer space but does not prohibit private property rights, potentially allowing for tradable orbital permitting.

#### Resolved means immediate and certain.

Austin 11 – Vichina Austin – 8-15-2011 – “Why is “resolved” used ahead of a question in a debate title, instead of saying “the Subject, topic” or alike” – <https://english.stackexchange.com/questions/8608/why-is-resolved-used-ahead-of-a-question-in-a-debate-title-instead-of-saying> -- Program of Study and Committee at St Mary’s College – Elmer

The word resolved stated before the resolution means "obsolete", to deal with successfully, clear up, an immediate course of action, **meaning that the plan would immediately be enacted.** Therefore, if you come across a case that involves something like cooperation with other countries or anything that takes a significant amount of time, you can argue that it violates the word resolved.

### 1AC – Adv – Debris – Shorter

#### The advantage is debris:

#### Massive satellite development incoming and cascades debris – lack of regulations raises the risk and turns any reason satellites are good.

Hattenbach 19. Jan Hattenbach sat down with Stijn Lemmens, Senior Space Debris Mitigation Analyst at the European Space Agency (ESA) in Darmstadt, Germany, to talk about how Starlink plays into the space junk problem. 6/3/19. [Sky Telescope, “DOES STARLINK POSE A SPACE DEBRIS THREAT? AN EXPERT ANSWERS,” <https://skyandtelescope.org/astronomy-news/starlink-space-debris/>] Justin

Jan Hattenbach: The recent launch of the first 60 “Starlink” satellites has sparked outrage on social media. Some critics claim the “mega-constellation” of satellites by the U.S. company SpaceX will increase the risk of creating more space junk, even calling it a threat to space flight itself. What is your opinion — is this criticism justified or exaggerated?

Web around the worldWhen up and running Starlink will provide internet access to locations across the planet. SpaceX

Stijn Lemmens: We're talking about a constellation that — if it ever comes to full fruition — would include up to 12,000 members. Several nations have launched almost 9,000 satellites over the past six decades. Of these, about 5,000 are still in orbit. So we are talking about doubling the amount of traffic in space over a couple of years, or over a decade at most, compared to the last 60 years.

However, the space debris issue is mostly caused by the fact that we leave objects behind in orbit, which are then a target for collisions either with fragments of a previous collision event or with big, intact objects. Currently, most space debris comes from explosive break-up events; in the future, we predict collisions will be the driver. It's like a cascade event: Once you have one collision, other satellites are at risk for further collisions.

Over the past two decades, there has been a lot of effort to establish guidelines and codes of conduct. For low-Earth orbit (LEO), there is a well-known guideline to take out your spacecraft, satellite, or launch vehicle upper stage, within 25 years after the end of mission.

To have a reasonable shot at having a stable space environment, the goal is to have at least 90% of the satellites and launch-vehicle upper stages with lifetimes longer than 25 years take themselves out of orbit, or put themselves into orbits with lifetimes less than 25 years.

However, we are not really good at doing this at the moment. We’re talking about success rates of 5% to 15% for satellites (launch vehicle orbital stages do notably better, with success rates of 40-70% in low-Earth orbit). Already with current traffic, we have reasonable concerns that we're creating a real debris issue out there.

If we're now thinking about putting another couple of thousands of satellites up there, with levels of compliance similar to what we've been doing so far, then we're talking about a possible catastrophe.

Operators of any type of large satellite constellation would have to behave far better than most current actors in spaceflight have been doing. And this is the concern: Before you launch, operators can of course say and demonstrate that they are going to comply with all international norms and guidelines. But it's only after launch that we know how responsible their behavior actually was.

JH: Do you have the impression that SpaceX is aware of their responsibility?

SL: They are certainly aware of the problem. For example, to get a license to launch in the U.S. with a mission like theirs, where they are exchanging data between the mainland, space, and other operators, you need to request a license, in this case from the Federal Communications Commission (FCC). To obtain this license, they must demonstrate what they will do with respect to space debris mitigation. So they needed to demonstrate a certain adherence to the norms.

But the real question is whether the current norms are actually sufficient for large constellations, or if we are putting the bar too low with respect to future sustainability. We are talking about thousands of new satellites — the risk is that the cumulative effect is not captured in the current level of guidelines. So SpaceX would have to voluntarily demonstrate higher levels of commitment.

JH: When asked about these issues, SpaceX responded that they believe they have the “most advanced system” for space debris mitigation, e.g. that the Starlink satellites are “designed to be capable of fully autonomous collision avoidance – meaning zero humans in the loop.” Are you confident that such a system will work, especially considering the numbers?

SL: I have no technical visibility on how they implement their system, so I cannot make a judgment if it will work with their satellites or not. What I can say is that it will require a certain improvement on the current state-of-the-art. On the other hand, if a pair of Starlink satellites does collide within the operation orbit, SpaceX will be the first one who will be badly affected by the fragmentation cloud the collision generates. It's in their own best interest to make sure their system works.

JH: You mentioned the launch license issued by the FCC, which is a federal commission of the United States. However, space is not the property of the U.S. or any other country. Is there an international body that has a say in these matters?

SL: Five outer space treaties, established in the 1960s, 70s and 80s, do not mention space debris. Instead, there is a lot of coordination, first of all on the agency level. The Inter-agency Space Debris Coordination Committee coordinates 13 of the world's space agencies, including the ESA, NASA, the China National Space Administration, and Russia’s Roscosmos,to come up with debris mitigation guidelines, share best practices, and try to address the problem in a way that makes sense to everyone. The United Nations Committee on the Peaceful Uses of Outer Space has taken on these guidelines . This committee includes politicians from many countries, including those not currently flying in space. Industries in many countries likewise discuss these issues within the International Organization for Standardization.

So there is a lot of coordination internationally to make sure that we play by the same rules and implement the same set of standards. But right now there is no way to directly interface with any nation's sovereignty over what it launches — the outer space treaties make nation states responsible for the behavior of their individuals or private companies.

#### Democratization of technology spurs rapid development – feedback loops ensures debris cascades

BERNAT 20. Pawel @ Military University of Aviation. 11/4/20. [SAFETY ENGINEERING OF ANTHROPOGENIC OBJECTS, “ORBITAL SATELLITE CONSTELLATIONS AND THE GROWING THREAT OF KESSLER SYNDROME IN THE LOWER EARTH ORBIT,” Volume 4, PDF] Justin

The second decade of the 21st century has brought a dynamic and somewhat surprising development of the space industry. Since 1972 – the Apollo 17 crew mission to the Moon, the humankind has not left the safe environment of Earth’s orbit, and for years the global space sector has been progressing in slow but steady pace run by a few largest space agencies like American NASA, European ESA, Japanese JAXA, and Chinese CNSA. The most significant achievement of the “old ways” of managing outer space exploration is the International Space Stations (ISS) that has facilitated more than 20 years of continuous crewed operations.

The situation started to change at the turn of the century when new generations of private entrepreneurs began to invest in and develop space technologies like rocket boosters, spaceships, and what most important for the subject of the paper – satellites and their constellations. This new shift is known among the space industry as “Space 2.0”, and its emergence is dated around 2000-2002 when the companies like SpaceX, Blue Origin, and Virgin Galactic were established. (Pyle, 2019). The real change, however, came in 2012 when the first SpaceX commercial mission was successfully launched to the ISS (NASA, 2012).

Since then, the participation of the private sector in the space industry has skyrocketed, especially in the United States. Today, SpaceX is the only entity that provides reusable rockets (first stage and fairings) that is capable of vertical launch and landing. Their current flagship rocket – Falcon 9 has carried out 23 successful missions in 2020 (SpaceX, 2020) and another four are planned for December of that year (Weitering, 2020). Moreover, thanks to Crew Dragon spaceship developed by the company, Americans have regained this year the capacity of sending astronauts from their own soil after nine years of buying the seats on Russian Soyuz capsule. SpaceX is now in the process of building a communication satellites constellation that will be addressed and analyzed in the paper.

Nowadays, in the space industry, we witness a very productive cybernetic feedback look between the development of space technologies, the democratization of those technologies, and a substantial reduction of prices. The latter is even more significant if we compare the cost of launching cargo into orbit now and 20 years ago – Falcon 9 is over ten times cheaper than Space Shuttle (Jones, 2018). This, of course, directly translates into the mass and number of objects that we are able to put in the orbit viably. Once the constellations consisting of thousands of satellites were unthinkable, but in the current environment, they become a reality.

Space 2.0 also has brought new threats and challenges in the sphere of national and international security. The increase in launch capacity, among other factors, has led to progressive militarization and weaponization of space and new arms race (Bernat, 2019), which has also contributed to the growing numbers of orbiting objects.

The goal of the paper is to present the argumentation that the threat posed by the cascading collisions in the Earth’s orbit (Kessler syndrome) is becoming more severe due to the construction of orbital satellite constellations; the threat that presents a real danger for people during their EVAs and orbital infrastructure, which may bare immediate consequences for safety and security systems on Earth. In order to provide the theoretical context for the above claim, the following issues will be presented and discussed: (1) space debris, (2) the Kessler syndrome, (3) orbital debris models, (4) the legal issues related to space debris and mitigation actions against their proliferation, and (5) the planned and being currently developed orbital satellite constellations and how they contribute to the growing threat of the Kessler syndrome.

#### Privatization drive rivalries and exponentially increases debris – lack of regulations spikes it.

BERNAT 20. Pawel @ Military University of Aviation. 11/4/20. [SAFETY ENGINEERING OF ANTHROPOGENIC OBJECTS, “ORBITAL SATELLITE CONSTELLATIONS AND THE GROWING THREAT OF KESSLER SYNDROME IN THE LOWER EARTH ORBIT,” Volume 4, PDF] Justin

5. Orbital satellite constellations and the growing threat of the Kessler syndrome

Space 2.0 – the new era of space exploration that we witness now in the 21st century means, in words of Buzz Aldrin, “moving human enterprise into space” (Pyle, 2019, p. xiv). The process of commercialization of outer space has already begun and is not limited to private companies providing technologies and services for national or international space agencies, as it was in the past. On the contrary, private companies from the space sector have now matured to carry out their own independent projects.

As for 2020, SpaceX is a company that serves as the best example – it launches satellites to the orbit, both for state and private contractors, it successfully realized two crew missions to the International Space Station, and is in the process of constructing Starlink satellite constellation that will provide high-speed internet access across the planet.

Each satellite weighs around 260 kg, is equipped with an ion propulsion system, autonomous collision avoidance system, and orbits Earth at approximately 540-560 km altitude (Starlink, 2020). At the beginning of November 2020, more than 860 Starlink satellites were orbiting the Earth (Jewett, 2020). Immediate plans include launching 12,000 satellites, but they assume a potential later extension to 42,000 (Henry, 2019a). Of course, SpaceX has employed, at least declaratively, all necessary measures to keep the space clean – the satellites are equipped with the deorbiting system, and in the event of inoperability of the propulsion system (Starlink, 2020). The orbital collisions are, however, inevitable. As it was shown before, the possibility of collisions grows with the number of orbital objects. Bastida Virgili with the team compared (2016, p. 154-155) orbital debris environment development without and with a large hypothetical constellation consisting of merely 1080 satellites, distributed across 20 orbital planes at 1,100 km altitude (Fig. 5).

Chart, line chart

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Figure 5. Comparison of long term evolution of the number of objects in LEO with and without the constellation (Virgili et al., 2016, p. 155)

It has to be noted that although SpaceX’s Starlink is the only constellation that is being built in orbit, it is not the only one planned. There are at least a few initiatives aiming at the same goal – to construct internet infrastructure at the Earth’s orbit. The planned Kuiper Systems LLC, which is a subsidiary of Amazon and intends to place 3,236 broadband satellites in the LEO, is one of Starlink’s biggest competitors (Henry, 2019b). Now, there is even a rivalry between the two companies because Kuiper’s lowest orbital shell is planned to be 590 km, with a tolerance of 9 km either above or below (Cao, 2020), which is the altitude of Starlink satellites. Moreover, the race for space in orbit is now at the beginning.

The outer space is vast. It increasingly becomes more cluttered with both operational satellites and space debris. The threat of collisions increases and no institution or body has enough power to license, coordinate and regulate what is sent to the orbit. The UNOOSA has not such power. National states decide what the companies from the space industry can launch to space. In the United States, which is most advanced in the area of private constellations, it is the Federal Aviation Administration (FAA) that issues the appropriate approvals. The race to put broadband internet satellites bears similarities to the gold rush – there are no rules, at the global level, apart from first-come, first-served.

#### Models are rigorous—inserted below.

Virgili et al. 16. Bastida, J.C. Dolado, H.G. Lewis, J. Radtke, H. Krag, B. Revelin, C. Cazaux b , C. Colombo, R. Crowther, M. Metz. 4/26/16. [Act Astranautica “Risk to space sustainability from large constellations of satellites,” <https://sci-hub.se/10.1016/j.actaastro.2016.03.034>.] Justin

1.3. Simulation approach and result analysis A Monte Carlo (MC) approach was used to simulate the evolution of the object population over a period of 200 years under different post-mission disposal requirements, with four different tools (MEDEE – Modelling the Evolution of Debris on Earth's Environment [9], LUCA – Long Term Utility for Collision Analysis [10], DAMAGE – Debris Analysis and Monitoring Architecture to the Geosynchronous Environment [11] and DELTA – Debris Environment Long Term Analysis [12]). For analysis purposes, the effective number of objects was used where the contribution to the population by each object was weighted by the proportion of the orbital period spent in LEO. In a first step, four different evolutionary models performed an analysis of two reference scenarios. One scenario considered only the evolution of the background population and non-constellation traffic. The second scenario augmented the first with the addition of the representative constellation, with the requirement that 90% of the constellation satellites achieved post-mission disposal to orbits with remaining lifetimes of 25 years. The manoeuvres performed at the mission end to meet the disposal requirement are assumed to be impulsive (i.e. instantaneous) and result in an eccentric orbit with the apogee near the original (constellation) altitude and the perigee at an altitude such that the effects of atmospheric drag would cause the orbit to decay within 25 years. Two of the models considered an apogee remaining at the operational constellation altitude, while the other two reduced the apogee by 50 km. The purpose of these scenarios is to provide a cross-comparison of the models in terms of their predictions of the total object population, which take into account the effects of the constellation. As the distribution of the MC results for the models is of the same nature and the results are independent, a bootstrapping [20] approach is used to derive the mean, the standard deviation and the confidence levels at 95% of the combined results of all the MC runs from the four models (cf. Fig. 1), although not all the models performed the same number of MC runs (see Table 1). The main source of variation inside a particular model's MC runs included the randomness in collision activity, while the different models used their own solar activity forecast.

#### That drives a space arms race which enhances the risk of debris cascades, closes off space exploration, and causes conflict.

Shah 20. Sachin Shah is a write for Cornell Undergraduate Law and Society Review. 8/30/20 [CORNELL UNDERGRADUATE LAW & SOCIETY REVIEW “The International Legal Regulation of Space Debris,” <https://www.culsr.org/articles/the-international-legal-regulation-of-space-debris>] Justin

The body of legal regulations regarding the use of space (space being defined as the area above the jurisdiction of air law) by public and private entities is referred to as space law. Currently, there are only about five such regulations of space, the most significant of those being the United Nations’ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereinafter referred to as the Outer Space Treaty) of 1967. In this article, I would like to specifically describe and analyze the laws and regulations’ handling of the increasingly prevalent issue of space debris in orbit around Earth. The National Aeronautics and Space Administration (NASA) defines space debris as “any man-made object in orbit about the Earth which no longer serves a useful function.” [1] However, a major point of confusion discussed below is that the Outer Space Treaty does not explicitly define what it refers to as “space objects,” nor does it mention whether space debris are space objects. An excessive clustering of space debris is a problem for a few reasons. It may result in a phenomenon known as the Kessler Syndrome, in which there is a “cascade created when debris hits a space object, creating new debris and setting off a chain reaction of collisions that eventually closes off entire orbits.” [2] This endangerment of Earth’s future ability to explore extraterrestrial planets and life must be avoided at all costs. Furthermore, space debris in orbit around Earth limits the amount of available space for satellites to orbit, which may result in the Tragedy of the Commons: multiple actors will aggressively vie, in an arms race, for their right to space as it is a limited resource. [3] Space debris is thus a potentially pressing issue in our increasingly technological world. In this essay, I will analyze the existing regulation of space debris as outlined in the Outer Space Treaty, point out the issues with these regulations of space debris and discuss potential solutions, and, finally, discuss legal considerations for private enterprises as well.

#### Satellites solves the grid and every extinction scenario.

Pellegrino & Stang 16. Massimo Pellegrino, Master’s Degree in Space Studies from ISU, with Gerald Stang, Senior Associate Analyst at the EUISS, holds BSc and MSc degrees in chemical engineering from the University of Saskatchewan and an MA in international affairs from the School of International and Public Affairs at Columbia University (“Space Security for Europe”, *EU Institute for Security Studies*, published July 2016, <https://www.iss.europa.eu/content/space-security-europe>, accessed 7-10-2019) bm

Modern societies are highly dependent on the continuous operation of critical infrastructure to ensure the provision of basic goods and services. They consist of assets, systems or parts thereof which are so vital, that their disruption would significantly impact the economy, national security, public health, safety, or social well-being. Examples of critical infrastructure include energy, water, food supply, communication, transportation, and waste processing systems. Space assets are so deeply embedded in developed economies that a day without fully functioning space capabilities would severely restrict or even endanger our lives.

Space systems are critical for running energy grids and telecommunication networks, border and maritime surveillance, crisis management and humanitarian operations, environmental and climate monitoring, verification of international treaties and arms control agreements, and the fight against organised crime and terrorism. Space assets also provide the technological backbone for other critical infrastructures. The synchronisation of power grids and telecommunication networks, for example, is heavily dependent on GNSS timing signals and any disruption would create a domino effect on other critical infrastructures (see Figure 5).

Satellites also play a central role in supporting defence systems and military operations. They are force multipliers that provide intelligence, surveillance, and reconnaissance (ISR) capabilities, as well as communication, navigation, positioning and timing signals. Armed forces do not only use their own space systems, but are also significant consumers of space services provided by private operators. In fact, about 90% of US military communications traffic passes through civilian satellites, many of which privately owned, rather than through dedicated systems designed to withstand attempted interruptions.1 The reliance of both civilian and military users on space systems therefore places them firmly in the area of critical infrastructure. Some critical space systems, such as the American GPS, are under foreign control, and the governments controlling those systems retain the authority to disrupt services, even for allies, in case of a national emergency. While the United States announced that it has no intention of ever intentionally degrading public GPS signals (also known as ‘Selective Availability’) and that the next generation of GPS satellites will not include this feature, other governments might still do so.2

These dependences engender new and growing vulnerabilities. Reliance on space is likely to increase further as space capabilities and services improve in diversity, quality and affordability. Close to 1,500 satellites with a launch mass of over 50 kg are expected to be launched over the next decade; an increase of 50% compared to 2005-2014. This estimate excludes both the expected proliferation of smaller satellites (such as CubeSats), but also the planned OneWeb and Steam mega-constellations for global internet broadband service. Advances in small satellite capabilities and in launch technology (e.g. SpaceX’s Falcon rocket family) have already lowered the cost of access to space. About 45% more CubeSats were launched in 2014 than in 2013 (130 vs. 91), accounting for 63% of all satellites launched3 . However, just as the reliance on space increases, so too do threats and vulnerabilities. Therefore, in order to realise the full potential of investments in space, critical space systems need to be adequately protected and the space environment properly managed.

#### Grid security is an impact filter.

Denkenberger 21 [David Denkenberger, Anders Sandberg, Ross John Tieman, and Joshua M. Pearce, \* assistant professor of mechanical engineering at University of Alaska Fairbanks, “Long-term cost-effectiveness of interventions for loss of electricity/industry compared to artificial general intelligence safety,” 2021, *European Journal of Futures Research*, Vol. 9, Issue 1, https://doi.org/10.1186/s40309-021-00178-z, EA]

Civilization relies on a network of highly interdependent critical infrastructure (CI) to provide basic necessities (water, food, shelter, basic goods), as well as complex items (computers, cars, space shuttles) and services (the internet, cloud computing, global supply chains), henceforth referred to as industry. Electricity and the electrical infrastructure that distributes it plays an important role within industry, providing a convenient means to distribute energy able to be converted into various forms of useful work. Electricity is one component of industry albeit a critical one. Industry provides the means to sustain advanced civilization structures and the citizens that inhabit them. These structures play a critical role in realizing various futures by allowing humanity to discover and utilize new resources, adapt to various environments, and resist natural stressors.

Though industry is capable of resisting small stressors, a sufficiently large event can precipitate cascading failure of CI systems, resulting in a collapse of industry. If one does not temporally discount the value of future people, the long-term future (thousands, millions, or even billions of years) could contain an astronomically large amount of value [18]. Events capable of curtailing the potential of civilization (existential risks, such as human extinction or an unrecoverable collapse) would prevent such futures from being achieved, implying reducing the likelihood of such events is of the utmost importance [100]. Reducing the prevalence of existential risks factors; events, systemic structures, or biases which increase the likelihood of extinction but do not cause extinction by themselves is also highly valuable. Complete collapse or degraded function of industry would drastically reduce humanity’s capacity to coordinate and deploy technology to prevent existential risks, representing an existential risk factor. Consequently, interventions preventing loss of industry, reducing the magnitude of impacts, or increasing speed of recovery could be extremely valuable.

Existential risk research is, by nature, future focused, requiring the investigation of events that have not yet occurred. Futures studies methodologies are often applied to uncover salient trends or events, and explore potential causal structures [54, 123]. Probabilistic modeling techniques can then be used to determine the likelihood of such events occurring, including adequate treatment of uncertainty [101]. The cost-effectiveness modeling approach outlined in this paper is an example of this, attempting to assess the marginal utility of losing industry interventions on improving the long-term future. This approach could guide future efforts to assess the relative cost-effectiveness of interventions for different risks, existential or otherwise. More practically, this research can inform prioritization efforts of industrialized countries by providing estimates of the cost of global industrial collapse, and the utility of resilience interventions. This is relevant to the European Union which has a highly industrialized economy, providing $2.3 Trillion USD of the $13.7 Trillion USD global total of value add manufacturing [122]. The EU has shifted toward a more proactive foresight approach about natural and man-made disasters, noting the importance of rare high-impact events, systemic risks, and converging trends requiring better data and forecasting to drive a more ambitious crisis management system [47]. Still, it is clear that most academic and institutional emphasis has been on “ordinary” rather than extreme disasters, and risks from industry to the public and environment rather than widespread failures of industrial services causing harm.

The integrated nature of the electric grid, which is based on centralized generation makes the entire system vulnerable to disruption.1 There are a number of anthropogenic and natural catastrophes that could result in regional-scale electrical grid failure, which would be expected to halt the majority of industries and machines in that area. A high-altitude electromagnetic pulse (HEMP) caused by a nuclear weapon could disable electricity over part of a continent [16, 48, 66, 93]. This could destroy the majority of electrical grid infrastructure, and as fossil fuel extraction and industry is reliant on electricity [49], industry would be disabled. Similarly, solar storms have destroyed electrical transformers connected to long transmission lines in the past [117]. The Carrington event in 1859 damaged telegraph lines, which was the only electrical infrastructure in existence at the time. It also caused Aurora Borealis that was visible in Cuba and Jamaica [70]. This could potentially disable electrical systems at high latitudes, which could represent 10% of electricity/industry globally. Though solar storms may last less than the 12 h that would be required to expose the entire earth with direct line of sight, the earth’s magnetic field lines redirect the storm to affect the opposite side of the earth [117]. Lastly, both physical [6, 8, 69, 89, 111] and cyber attacks [3, 63, 90, 96, 118, 128, 130] could also compromise electric grids. Physical attacks include traditional acts of terrorism such as bombing or sabotage [130] in addition to EMP attacks. Significant actors could scale up physical attacks, for example by using drones. A scenario could include terrorist groups hindering individual power plants [126], while a large adversary could undertake a similar operation physically to all plants and electrical grids in a region. Unfortunately, the traditional power grid infrastructure is simply incapable of withstanding intentional physical attacks [91]. Damage to the electric grid resulting in physical attack could be long lasting, as most traditional power plants operate with large transformers that are difficult to move and source. Custom rebuilt transformers require time for replacement ranging from months and even up to years [91]. For example, a relatively mild 2013 sniper attack on California’s Pacific Gas and Electric (PG&E) substation, which injured no one directly, was able to disable 17 transformers supplying power to Silicon Valley. Repairs and improvements cost PG&E roughly $100 million and lasted about a month [10, 102]. A coordinated attack with relatively simple technology (e.g., guns) could cause a regional electricity disruption. However, a high-tech attack could be even further widespread. The Pentagon reports spending roughly $100 million to repair cyber-related damages to the electric grid in 2009 [57]. There is also evidence that a computer virus caused an electrical outage in the Ukraine [56]. Unlike simplistic physical attacks, cyber attackers are capable of penetrating critical electric infrastructure from remote regions of the world, needing only communication pathways (e.g., the Internet or infected memory sticks) to install malware into the control systems of the electric power grid. For example, Stuxnet was a computer worm that destroyed Iranian centrifuges [73] to disable their nuclear industry. Many efforts are underway to harden the grid from such attacks [51, 63]. The U.S. Department of Homeland Security responded to ~ 200 cyber incidents in 2012 and 41% involved the electrical grid [103]. Nations routinely have made attempts to map current critical infrastructure for future navigation and control of the U.S. electrical system [57].

The electric grid in general is growing increasingly dependent upon the Internet and other network connections for data communication and monitoring systems [17, 112, 118, 127, 135]. Although this conveniently allows electrical suppliers management of systems, it increases the susceptibility of the grid to cyber-attack, through denial of webpage services to consumers, disruption to supervisory control and data acquisition (SCADA) operating systems, or sustained widespread power outages [3, 72, 118, 120]. Thus global or regional loss of the Internet could have similar implications.

#### Debris triggers miscalculated war.

Acton and McDonald 21. James M. Acton is co-director of the Nuclear Policy Program and holds the Jessica T. Mathews Chair at the Carnegie Endowment for International Peace. Thomas D. MacDonald is a fellow in the Nuclear Policy Program. 12/10/21. [Defense One, “Nuclear Command-and-Control Satellites Should Be Off Limits,” <https://www.defenseone.com/ideas/2021/12/nuclear-command-and-control-satellites-should-be-limits/187472/>] Justin

When Russia blew up an old satellite with a new missile on November 15, it created an expanding cloud of debris that will menace the outer space environment for years to come.

Hypersonic fragments from the collision with Moscow’s ground-launched, anti-satellite weapon risk destroying other satellites used for communications, meteorology, and agriculture. They even pose a danger to China’s Tiangong Space Station and the International Space Station, where personnel—including Russia’s own cosmonauts—were forced to don spacesuits and flee into their escape capsules ahead of approaching debris.

But the greatest danger that this careless stunt highlighted is to a different potential target: high-altitude satellites used for nuclear command and control. Those critical satellites face the threat of being attacked by co-orbital anti-satellite weapons, that is, other spacecraft with offensive capabilities. Destroying a nuclear command-and-control satellite, even unintentionally, could lead a conventional conflict to escalate into a nuclear war. As such, the United States, China, and Russia have a shared interest in ensuring the security of each other’s high-altitude satellites.

Satellites are integral to the United States’ nuclear command-and-control system. They would be the preferred means to transmit a presidential order to use nuclear weapons and would provide the first warning of an incoming nuclear attack. Russia uses satellites for similar purposes, even if it appears not to rely on them quite as much as the United States. While little is publicly known about China’s nuclear command-and-control system, the U.S. Department of Defense has assessed that China is in the process of developing a space-based early-warning system.

The most important nuclear command-and-control satellites—those for communications and early warning—are located in high-altitude orbits. Fortunately, most are strung out about 22,500 miles above the equator—far above the debris from Russia’s ground-launched anti-satellite weapon test. These satellites, however, are growing more vulnerable, particularly to co-orbital anti-satellite weapons.

Nuclear command-and-control satellites might be attacked deliberately, as the prelude to a nuclear war. In a conventional conflict, if China, Russia, or the United States decided to use nuclear weapons first—or believed that its opponent was about to do so—it might try to degrade the adversary’s nuclear command-and-control system preemptively. China, for example, might attack U.S. early-warning satellites to weaken the United States’ homeland missile defenses. Conversely, the United States might target Chinese communication satellites to interfere with Beijing’s ability to wield its nuclear forces.

In a conventional war, however, nuclear command-and-control satellites might be attacked and threatened for altogether different reasons—creating the risk that nuclear war might be triggered inadvertently.

The United States, in particular, is deeply reliant on satellites to enable conventional operations. Moreover, most, if not all, nuclear command-and-control satellites also support nonnuclear missions—making them tempting targets even in a purely conventional conflict. For example, some U.S. satellites transmit orders to both U.S. conventional and nuclear forces. Russia might attack these satellites to try to undermine the United States’ ability to prosecute a conventional war, but with the added and unintended effect of degrading the U.S. nuclear command-and-control system.

Washington would be hard pressed to determine the intent behind such attacks. It could easily misinterpret them as preparations for a nuclear war and respond accordingly. It might threaten to use nuclear weapons unless its adversary backed off. In fact, the Trump administration’s nuclear policy explicitly threatened the use of nuclear weapons in precisely this circumstance. The Biden administration can and should remove this threat as part of its ongoing Nuclear Posture Review.

To make matters worse, it might not take actual attacks against nuclear command-and-control satellites to spark this kind of escalation. Satellites in high-altitude orbits are periodically moved to different positions to optimize their performance. Especially in a conventional conflict, a repositioning operation that led one spacecraft to approach a nuclear command-and-control satellite might appear to the latter’s owner as the beginning of an attack against its nuclear command-and-control system. Once again, the potential consequences could be catastrophic.

#### Any nuclear war causes extinction – ice age and famine.

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A war fought with 21st century strategic nuclear weapons would be more than just a great catastrophe in human history. If we allow it to happen, such a war would be a mass extinction event that [ends human history](https://ratical.org/radiation/NuclearExtinction/StarrNuclearWinterOct09.pdf). There is a profound difference between extinction and “an unprecedented disaster,” or even “the end of civilization,” because even after such an immense catastrophe, human life would go on.

But extinction, by definition, is an event of utter finality, and a nuclear war that could cause human extinction should really be considered as the ultimate criminal act. It certainly would be the crime to end all crimes.

The world’s leading climatologists now tell us that nuclear war threatens our continued existence as a species. Their studies predict that a large nuclear war, especially one fought with strategic nuclear weapons, would create [a post-war environment in which for many years it would be too cold and dark to even grow food](http://climate.envsci.rutgers.edu/pdf/RobockToonSAD.pdf). Their findings make it clear that not only humans, but most large animals and many other forms of complex life would likely vanish forever in a nuclear darkness of our own making.

The environmental consequences of nuclear war would attack the ecological support systems of life at every level. Radioactive fallout, produced not only by nuclear bombs, but also by the destruction of nuclear power plants and their spent fuel pools, would poison the biosphere. Millions of tons of smoke would act to [destroy Earth’s protective ozone layer](https://www2.ucar.edu/atmosnews/just-published/3995/nuclear-war-and-ultraviolet-radiation) and block most sunlight from reaching Earth’s surface, creating Ice Age weather conditions that would last for decades.

Yet the political and military leaders who control nuclear weapons strictly avoid any direct public discussion of the consequences of nuclear war. They do so by arguing that nuclear weapons are not intended to be used, but only to deter.

Remarkably, the leaders of the Nuclear Weapon States have chosen to ignore the authoritative, long-standing scientific research done by the climatologists, research that predicts virtually any nuclear war, fought with even a fraction of the operational and deployed nuclear arsenals, will leave the Earth essentially uninhabitable.

### 1AC – Framing

#### The standard is maximizing expected wellbeing-hedonistic act util

#### 1] Actor spec—governments must use util because they don’t have intentions and are constantly dealing with tradeoffs—outweighs since different agents have different obligations—takes out calc indicts since they are empirically denied-the aff would have governments sign on a treaty which enacts the plan.

#### 2] Death is bad and outweighs – a] agents can’t act if they fear for their bodily security which constrains every ethical theory, b] it destroys the subject itself – kills any ability to achieve value in ethics since life is a prerequisite which means it’s a side constraint since we can’t reach the end goal of ethics without life

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

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**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** o f 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.

#### 4] Extinction outweighs

MacAskill 14 [William, Oxford Philosopher and youngest tenured philosopher in the world, Normative Uncertainty, 2014]

The human race might go extinct from a number of causes: asteroids, supervolcanoes, runaway climate change, pandemics, nuclear war, and the development and use of dangerous new technologies such as synthetic biology, all pose risks (even if very small) to the continued survival of the human race.184 And different moral views give opposing answers to question of whether this would be a good or a bad thing. It might seem obvious that human extinction would be a very bad thing, both because of the loss of potential future lives, and because of the loss of the scientific and artistic progress that we would make in the future. But the issue is at least unclear. The continuation of the human race would be a mixed bag: inevitably, it would involve both upsides and downsides. And if one regards it as much more important to avoid bad things happening than to promote good things happening then one could plausibly regard human extinction as a good thing.For example, one might regard the prevention of bads as being in general more important that the promotion of goods, as defended historically by G. E. Moore,185 and more recently by Thomas Hurka.186 One could weight the prevention of suffering as being much more important that the promotion of happiness. Or one could weight the prevention of objective bads, such as war and genocide, as being much more important than the promotion of objective goods, such as scientific and artistic progress. If the human race continues its future will inevitably involve suffering as well as happiness, and objective bads as well as objective goods. So, if one weights the bads sufficiently heavily against the goods, or if one is sufficiently pessimistic about humanity’s ability to achieve good outcomes, then one will regard human extinction as a good thing.187 However, even if we believe in a moral view according to which human extinction would be a good thing, we still have strong reason to prevent near-term human extinction. To see this, we must note three points. First, we should note that the extinction of the human race is an extremely high stakes moral issue. Humanity could be around for a very long time: if humans survive as long as the median mammal species, we will last another two million years. On this estimate, the number of humans in existence in the The future, given that we don’t go extinct any time soon, would be 2×10^14. So if it is good to bring new people into existence, then it’s very good to prevent human extinction. Second, human extinction is by its nature an irreversible scenario. If we continue to exist, then we always have the option of letting ourselves go extinct in the future (or, perhaps more realistically, of considerably reducing population size). But if we go extinct, then we can’t magically bring ourselves back into existence at a later date. Third, we should expect ourselves to progress, morally, over the next few centuries, as we have progressed in the past. So we should expect that in a few centuries’ time we will have better evidence about how to evaluate human extinction than we currently have. Given these three factors, it would be better to prevent the near-term extinction of the human race, even if we thought that the extinction of the human race would actually be a very good thing. To make this concrete, I’ll give the following simple but illustrative model. Suppose that we have 0.8 credence that it is a bad thing to produce new people, and 0.2 certain that it’s a good thing to produce new people; and the degree to which it is good to produce new people, if it is good, is the same as the degree to which it is bad to produce new people, if it is bad. That is, I’m supposing, for simplicity, that we know that one new life has one unit of value; we just don’t know whether that unit is positive or negative. And let’s use our estimate of 2×10^14 people who would exist in the future, if we avoid near-term human extinction. Given our stipulated credences, the expected benefit of letting the human race go extinct now would be (.8-.2)×(2×10^14) = 1.2×(10^14). Suppose that, if we let the human race continue and did research for 300 years, we would know for certain whether or not additional people are of positive or negative value. If so, then with the credences above we should think it 80% likely that we will find out that it is a bad thing to produce new people, and 20% likely that we will find out that it’s a good thing to produce new people. So there’s an 80% chance of a loss of 3×(10^10) (because of the delay of letting the human race go extinct), the expected value of which is 2.4×(10^10). But there’s also a 20% chance of a gain of 2×(10^14), the expected value of which is 4×(10^13). That is, in expected value terms, the cost of waiting for a few hundred years is vanishingly small compared with the benefit of keeping one’s options open while one gains new information.

#### 5] No intent-foresight distinction for states.

Enoch 07 Enoch, D [The Faculty of Law, The Hebrew Unviersity, Mount Scopus Campus, Jersusalem]. (2007). INTENDING, FORESEEING, AND THE STATE. Legal Theory, 13(02). doi:10.1017/s1352325207070048 https://www.cambridge.org/core/journals/legal-theory/article/intending-foreseeing-and-the-state/76B18896B94D5490ED0512D8E8DC54B2

The general difficulty of the intending-foreseeing distinction here stemmed, you will recall, from the feeling that attempting to pick and choose among the foreseen consequences of one’s actions those one is more and those one is less responsible for looks more like the preparation of a defense than like a genuine attempt to determine what is to be done. Hiding behind the intending-foreseeing distinction seems like an attempt to evade responsibility, and so thinking about the distinction in terms of responsibility serves 39. Anderson & Pildes, supra note 38. I will use this text as my example of an expressive theory here. 40. See id. at 1554, 1564. 41. For a general critique, see Mathew D. Adler, Expressive Theories of Law: A Skeptical Overview, 148 U. PA. L. REV. 1363 (1999–2000). 42. As Adler repeatedly notes, the understanding of expression Anderson & Pildes work with is amazingly broad, so that “To express an attitude through action is to act on the reasons the attitude gives us”; Anderson & Pildes, supra note 38, at 1510. If this is so, it seems that expression drops out of the picture and everything done with it can be done directly in terms of reasons. 43. This may be true of what Anderson and Pildes have in mind when they say that “expressive norms regulate actions by regulating the acceptable justifications for doing them”; id. at 1511. http://journals.cambridge.org Downloaded: 03 Aug 2014 IP address: 134.153.184.170 Intending, Foreseeing, and the State 91 to reduce even further the plausibility of attributing to it intrinsic moral significance. This consideration—however weighty in general—seems to me very weighty when applied to state action and to the decisions of state officials. For perhaps it may be argued that individuals are not required to undertake a global perspective, one that equally takes into account all foreseen consequences of their actions. Perhaps, in other words, individuals are entitled to (roughly) settle for having a good will, and beyond that let chips fall where they may. But this is precisely what stateswomen and statesmen—and certainly states—are not entitled to settle for.44 In making policy decisions, it is precisely the global (or at least statewide, or nationwide, or something of this sort) perspective that must be undertaken. Perhaps, for instance, an individual doctor is entitled to give her patient a scarce drug without thinking about tomorrow’s patients (I say “perhaps” because I am genuinely not sure about this), but surely when a state committee tries to formulate rules for the allocation of scarce medical drugs and treatments, it cannot hide behind the intending-foreseeing distinction, arguing that if it allows45 the doctor to give the drug to today’s patient, the death of tomorrow’s patient is merely foreseen and not intended. When making a policy-decision, this is clearly unacceptable. Or think about it this way (I follow Daryl Levinson here):46 perhaps restrictions on the responsibility of individuals are justified because individuals are autonomous, because much of the value in their lives comes from personal pursuits and relationships that are possible only if their responsibility for what goes on in the (more impersonal) world is restricted. But none of this is true of states and governments. They have no special relationships and pursuits, no personal interests, no autonomous lives to lead in anything like the sense in which these ideas are plausible when applied to individuals persons. So there is no reason to restrict the responsibility of states in anything like the way the responsibility of individuals is arguably restricted.47 States and state officials have much more comprehensive responsibilities than individuals do. Hiding behind the intending-foreseeing distinction thus more clearly constitutes an evasion of responsibility in the case of the former. So the evading-responsibility worry has much more force against the intending-foreseeing distinction when applied to state action than elsewhere.

#### 6] Only consequentialism explains degrees of wrongness—if I break a promise to meet up for lunch, that is not as bad as breaking a promise to take a dying person to the hospital. Only the consequences of breaking the promise explain why the second one is much worse than the first which is the most intuitive.

### 1AC - UV

#### 1] Evolution proves our theory true

**Johnson and Thayer 16** – Dominic D. P. Johnson, D.Phil., Ph.D.\* and Bradley A. Thayer, Ph.D., “The evolution of offensive realism Survival under anarchy from the Pleistocene to the present,” https://www.cambridge.org/core/services/aop-cambridge-core/content/view/56B778004187F70B8E59609BE7FEE7A4/S073093841600006Xa.pdf/div-class-title-the-evolution-of-offensive-realism-div.pdf

Few principles unite the discipline of international relations, but one exception is anarchy—the absence of government in international politics. Anarchy is, ironically, the ‘‘ordering’’ principle of the global state system and the starting point for most major theories of international politics, such as neoliberalism and neorealism.42,43,44,45 Other theoretical approaches, such as constructivism, also acknowledge the impact of anarchy, even if only to consider why anarchy occurs and how it can be circumvented.46,47 Indeed, the anarchy concept is so profound that it defines and divides the discipline of political science into international politics (politics under conditions of anarchy) and domestic politics (politics under conditions of hierarchy, or government). Given the prominence of the concept in present-day international relations theory, it is striking that anarchy only took hold as a central feature of scholarship in recent decades, since the publication of Kenneth Waltz’s Theory of International Politics in 1979. In fact, however, **anarchy has been a constant feature of the entire multimillion year history of the human lineage (and indeed the 3.5 billion–year history of the evolution of all life on Earth before that). It is not just that we lack a global Leviathan today; humans never had such a luxury. The fact that human evolution occurred under conditions of anarchy, that we evolved as hunter-gatherers in an ecological setting of predation, resource competition, and intergroup conflict, and that humans have been subject to natural selection** for millions of years **has profound consequences for understanding human behavior**, not least how humans perceive and act toward others. Scholars often argue over whether historically humans experienced a Hobbesian ‘‘state of nature,’’ but—whatever the outcome of that debate—it is certainly a much closer approximation to the prehistoric environment in which human brains and behavior evolved. **This legacy heavily influences our decision-making and behavior today, even—perhaps especially—in the anarchy of international politics**. We argue that **evolution under conditions of anarchy has predisposed human nature toward the behaviors predicted by offensive realism: Humans**, particularly men, **are strongly self-interested, often fear other groups, and seek more resources, more power, and more influence** (as we explain in full later). **These strategies** are not unique to humans and, in fact, **characterize a much broader trend in behavior among mammals as a whole—especially primates**—as well as many other major vertebrate groups, including birds, fish, and reptiles. **This recurrence of behavioral patterns** across different taxonomic groups **suggests that the behaviors characterized by offensive realism have broad and deep evolutionary roots**. This perspective does not deny the importance of institutions, norms, and governance in international politics. On the contrary, it provides or adds to the reasons why we demand and need them, and indeed why they are so hard to establish and maintain. Until recently, **international relations theorists rarely used insights from the life sciences to inform their understanding of human behavior**. However, **rapid advances in the life sciences offer increasing theoretical and empirical challenges to scholars in** the social sciences in general and **international relations** in particular, who are therefore under increasing pressure to address and integrate this knowledge rather than to suppress or ignore it. Whatever one’s personal views on evolution, **the time has come to explore the implications of evolutionary theory for mainstream theories of international relations**. **The most obvious challenge that evolutionary theory presents to international relations concerns our understanding of human nature**. Theories purporting to explain human behavior make explicit or implicit assumptions about preferences and motivations, and mainstream theories in international politics are no exception. Many **criticisms of international relations theories focus on these unsubstantiated or contested assumptions about underlying human nature. The parsimony of general theories depends on how well they explain phenomena across space and time**; in other words, the more closely they coincide with empirical observations across cultures and throughout history. The most enduring theories of international relations, therefore, will be ones that are able to incorporate (or at least do not run against the grain of) evolutionary theory. Although Thomas Hobbes claimed to have deduced Leviathan scientifically from ‘‘motion’’ and the physical senses, he was writing two hundred years before Darwin and so had no understanding of evolution. International relations scholars have tended to claim to deduce their own theories from Hobbes, or subsequent philosophers who followed him, and we suggest it is time to revisit the idea of foundational scientific principles. **Starting with biology, or with human evolutionary history, has never been typical in international relations scholarship**, but this approach is now less exotic than it once seemed as innovators in a range of social sciences, including economics, psychology, sociology, and political science, pursue this line of inquiry. **International relations stands to gain from** similar **interdisciplinary insights**. At the dawn of the 21st century, an era that will be dominated by science at least as much as philosophy, **we have the opportunity to move away from untested assumptions about human nature. Instead, we can make more concrete predictions about how humans tend to think and act in different conditions, based on new scientific knowledge about human cognition** and behavior, **and in particular a greater understanding of the social and ecological context in which human brains and behaviors evolved**. But what was that context?

#### 2] Youth participatory action research enables *transformative resistance* and is crucial to make activism work

Cammarota and Fine 08

(Julio, Education@Arizona, Michelle, UrbanEducation@TheGraduateCenterNYU, *Youth Participatory Action Research*

In the Matrix, Morpheus, played by Laurence Fishburne, places Keanu Reeves’ character Neo in a chair to tell him face to face about the real truth of his experience. Morpheus shows Neo a red pill in one hand and a blue one in the other, describing that the red pill will lead him “down the rabbit hole” to the truth while the blue pill will make him forget about their conversation and return everything back to “normal.” Neo looks confused and worried, hesitates for a moment, and then reaches to grab and then swallow the red pill. " e “blue and red pill” scene in ! e Matrix serves as an excellent metaphor for the relationships some educators/activists have with their students, and the kinds of choices we ask them to make. The critical educational experience offered might lead the student “down the rabbit hole” past the layers of lies to the truths of systematic exploitation and oppression as well as possibilities for resistance. A$ er he ingests the red pill, Neo ends up in the place of truth, awakening to the reality that his entire world is a lie constructed to make him believe that he lives a “normal” life, when in reality he is fully exploited day in and day out. What is “normal” is really a mirage, and what is true is the complete structural domination of people, all people. " is book, Revolutionizing Education, literally connects to the metaphorical play on chimera and veracity forwarded by the narrative in ! e Matrix. Examples are presented throughout in which young people resist the 1 normalization of systematic oppression by undertaking their own engaged praxis—critical and collective inquiry, re% ection and action focused on “reading” and speaking back to the reality of the world, their world (Freire, 1993). The praxis highlighted in the book—youth participatory action research (YPAR)—provides young people with opportunities to study social problems affecting their lives and then determine actions to rectify these problems. YPAR, and thus Revolutionizing Education, may extend the kinds of questions posed by critical youth studies (Bourgois, 1995; Fine and Weis, 1998; Giroux, 1983; Kelley, 1994; Macleod, 1987; McRobbie, 1991; Oakes et al., 2006; Rasmussen et al., 2004; Sullivan, 1989; Willis, 1977). How do youth learn the skills of critical inquiry and resistances within formal youth development, research collectives, and/or educational settings? How is it possible for their critical inquiries to evolve into formalized challenges to the “normal” practices of systematic oppression? Under what conditions can critical research be a tool of youth development and social justice work? The Matrix infers revolution by showing how Neo learns to see the reality of his experiences while understanding his capabilities for resistance. " e YPAR cases presented in this book also follow a similar pattern: young people learn through research about complex power relations,histories of struggle, and the consequences of oppression. They begin to re- vision and denaturalize the realities of their social worlds and then undertake forms of collective challenge based on the knowledge garnered through their critical inquiries. As you will read in this volume, the youth, with adult allies, have written policy briefs, engaged sticker campaigns, performed critical productions, coordinated public testimonials—all dedicated to speaking back and challenging conditions of injustice. What perhaps distinguishes young people engaged in YPAR from the standard representations in critical youth studies is that their research is designed to contest and transform systems and institutions to produce greater justice—distributive justice, procedural justice, and what Iris Marion Young calls a justice of recognition, or respect. In short, YPAR is a formal resistance that leads to transformation—systematic and institutional change to promote social justice. YPAR teaches young people that conditions of injustice are produced, not natural; are designed to privilege and oppress; but are ultimately challengeable and thus changeable. In each of these projects, young people and adult allies experience the vitality of a multi- generational collective analysis of power; we learn that sites of critical inquiry and resistance can be fortifying and nourishing to the soul, and at the same time that these projects provoke ripples of social change. YPAR shows young people how they are consistently subject to the impositions and manipulations of domi-nant exigencies. These controlling interests may take on the form of white supremacy, capitalism, sexism, homophobia, or xenophobia—all of which is meant to provide certain people with power at the expense of subordinating others, many others. Within this matrix or grid of power, the possibilities of true liberation for young people become limited. Similar to the film the Matrix, the individual, like Neo, may be unaware of the infections of power fostering oppression. The dawning of awareness emerges from a critical study of social institutions and processes in influencing one’s life course, and his/her capacity to see differently, to act anew, to provoke change. Critical youth studies demonstrate that the revolutionary lesson is not always apprehended in schools; sometimes, young people gain critical awareness through their own endogenous cultural practices. Such is the case of Willis’ (1977) Lads in Learning to Labor. Working- class youth attain insights about the reproductive function of schools through their own street cultural sensibilities. However, they use these insights to resist education en masse by forgoing school for jobs in factories. Scholars (Fine, 1991; Solórzano and Delgado- Bernal, 2001) identify this form of resistance as “self- defeating,” because the students’ choice to forgo school for manual labor contributes to reproducing them as working class. Although the Lads resist the school’s purpose of engendering uneven class relations, their resistance contributes to this engendering process by undermining any chance they had for social mobility. Young people also engage in forms of resistance that avoid self- defeating outcomes while striving for social advancement. Scholars (Fordham, 1996) identify this next level of resistance as “conformist”—in the sense that young people embrace the education system with the intention of seeking personal gains, although not necessarily agreeing with all the ideological ! ligree espoused by educational institutions. " ey use schooling for their own purposes: educational achievements that garner individual gains with social implications beyond the classroom, such as economic mobility, gender equality, and racial parity. Solórzano and Delgado- Bernal (2001: 319–20) contend that students may attain another, yet more conscious form of resistance, which they call “transformational resistance.” A transformational approach to resistance moves the student to a “deeper level of understanding and a social justice orientation.” Those engaged in transformational resistance address problems of systematic injustice and seek actions that foster “the greatest possibility for social change” (ibid.). Although Solórzano and Delgado- Bernal (2001) provide a useful typology (self- defeating, conformist, and transformational) that acknowledges the complexities of resistance, the education and development processes leading to resistances are somewhat under- discussed. Apparently, the production of cultural subjectivities (Bourgois, 1995; Levinson et al., 1996; Willis, 1977) is related to resisting ideological oppressions. However, these cultural productions tend to occur in more informal settings (non- institutional, non- organizational) such as peer groups, families, and street corners. The work presented in this volume agitates toward another framework— where youth are engaged in multi- generational collectives for critical inquiry and action, and these collectives are housed in youth development settings, schools, and/or research sites. With this series of cases, we challenge scholars, educators, and activists to consider how to create such settings in which research for resistance can be mobilized toward justice. A key question is whether resistance can develop within formal proces ses (pedagogical structures or youth development practices). If this question is left $ unattended, we risk perceiving youth resistances as “orientations” as opposed to processes. In other words, the kinds of resistances, whether self- defeating, conformist, or transformational, will be identified as emerging from some inherent fixxed, cultural sensibility. This perspective of young people sustains the ridged essentialization trap that has plagued studies of youth for years (Anderson, 1990; Newman, 1999; Ogbu, 1978). The traditional essentialized view maintains that any problem (poverty, educational failure, drug and alcohol abuse, etc.) faced by youth results of their own volition, thereby blaming the victim for the victim’s problems. Critical youth studies goes beyond the traditional pathological or patronizing view by asserting that young people have the capacity and agency to analyze their social context, to engage critical research collectively, and to challenge and resist the forces impeding their possibilities for liberation. However, another step is needed to further distance critical youth studies from essentialized perspectives by acknowledging that resistances can be attained through formal processes in “real” settings, through multi- generational collectives, and sometimes among youth alone. YPAR represents not only a formal pedagogy of resistance but also the means by which young people engage transformational resistance. (1-4)

#### 3] The alt cedes the celestial commons to the hands of global imperialism. Only IR education can create momentum to demilitarize space.

Raymond Duvall 6 – Professor of Political Science @ Univ of Minnesota, Taking Sovereignty Out of This World: Space Weapons and Empire of the Future, October 2006, <https://www.files.ethz.ch/isn/111193/Taking%20Sovereignty%20Out%20of%20This%20World.pdf>

III. Space Weapons, Sovereignty, and the Constitution of Empire Each of the three new forms of military use of space, if brought into effect, will dramatically affect political societies on Earth. Missile defense has as its aim the creation of a shield for the territory of the U.S. (and possibly some selected allies). To the extent that it is accomplished, this would partially re-inscribe, through a truly three-dimensional shield, the borders of the United States—in Herz’s terms, its “hard shell”—and accordingly its effective sovereignty as political subject. At the same time, it would reduce or even eliminate the capacity of other political subjects to exercise an effective deterrent defense against U.S. intervention in their affairs—that is to say, it would further erode their sovereignty. The second type of militarization—space control—is both a form of “privatizing” the commons of orbital space and a form of military exclusion, an extra-territorial complement to the effort to create an exclusive territorial “hard shell” for just one state (and perhaps its “friends”) through missile defense. In the first respect, it can be understood as a type of “primitive accumulation”,48 whereby the commons of orbital space is effectively colonized and “made safe” for the capitalist interests that flow through it—primarily information services at this point in time. Here, the project of space control is constitutive of the U.S. as expressly capitalist state—sovereign subject of a particular global socio-economic order. In the second respect, that moment of constitution is conjoined with the constitution of an exclusive—a singular—sovereignty in regard to the workings of that socio-economic order through the global commons of orbital space. Finally, the placing of weapons in space capable of targeting objects on or near the Earth’s surface creates a new form of territorial rule. Whereas modern military action has been concerned principally with occupying and controlling territory, and whereas modern sovereignty is accordingly territorially defined, this form of weaponization of space would dispense with the need for such cumbersome military practices, and the pretense of sovereign territorial authority. Instead, through increased precision in space-based weapons systems, combined with the ability to target and attack anywhere on the Earth on a very short notice—ranging from minutes to seconds depending upon the weapon system—it becomes possible to “surveil and punish” any potential enemy of such a system.49 This is constitutive of a globally singular sovereign, capable of deciding the exception for the entirety of humanity, with no terrestrial “outside” to the scope of its sovereignty.50 Our argument, in simple terms, is that the militarization of space reconstitutes and alters the social production of political society in three interlocked ways that are rooted respectively in three distinct forms of putting economies/cartographies of violence into practice in outer space. The conjoint effect of those three processes of reconstitution is to substitute the consolidation of an extra-territorial system of rule—which we refer to as empire of the future—for the competitive sovereignties of the modern states-system. Missile defense The first instance of weaponization of space will probably be the deployment of a spacebased missile defense system. Indeed, the U.S. military is already testing several prototypes of components of such a system. Two of the most notable examples of this are NFIRE (Near Field Infrared Experiment) and the MDA (Missile Defense Agency) Space Test Bed. “NFIRE … is an experimental satellite to be launched in on (sic) a rocket in 2006 that is designed to distinguish between a ballistic missile’s fiery plume and the rocket itself, according to an official at the Missile Defense Agency (MDA)”.51 The MDA Space Test Bed is slated to receive funding in 2008, with the aim of integrating already existing space technologies into a system that can intercept ballistic missiles in their boost phase from orbital space.52 Such a system replaces deterrence with defense. In realist literature, the sovereignty of states is often closely linked to their ability to deter enemies from attacking. During the Cold War, nuclear weapons, through their capacity to deter attack, were cited as one of the potential means by which states could protect their territorial integrity, and, in turn, their sovereignty.53 Kenneth Waltz has argued that the proliferation of nuclear weapons and their deterrent effects actually stabilizes international relations, making the world safer and, implicitly, strengthening the security of sovereign states.54 A missile defense system, developed by and operative for only one state (or that state and its allies), undermines the logic of deterrence. States lacking the missile defense system become increasingly vulnerable to (even nuclear) attack by the state that has such a system.55 In a fashion entirely consistent with the logic of John Herz’s predictions made in the 1950s, the “hard shell” of defensible territory is thereby lost for those states. The realist argument that has largely carried the day for the past half century in critical response to Herz—that the deterrent effect of mutual assured destruction of two states possessing nuclear weapons re-inscribes the logic of territorial state sovereignty—accordingly is brought into doubt. With the advent of exclusive missile defense, it is worth re-examining—indeed reinvigorating—Herz’s original argument, because if the U.S. were to develop a sufficiently sophisticated missile defense shield the deterritorializing effect on the sovereignty of other states would be precisely those that he forecasted. There would be a significant twist, however, because, for the U.S., control of an effective missile defense system would markedly re-inscribe its territorial “hard shell” and its sovereignty in exclusively shielding it from the threat of (missile-based) nuclear attack by others. The sovereignty of one state is reproduced, while that of other states is eroded. Space control The doctrine of space control has emerged in the U.S. military out of the belief that assets in space represent a potential target for enemies of the U.S.56 There are two kinds of vulnerable U.S. assets: private-commercial; and military. One concern is that rivals may attack commercial satellites, thereby disrupting the flow of information and potentially inflicting significant harm on global markets. Militarily, a second concern is that, through its increasing reliance on satellites for its Earth-based military operations, the U.S. has created an “asymmetrical vulnerability”. An adversary (including a non-state, “terrorist” organization) could effectively immobilize U.S. forces by disabling the military satellites that provide communication, command, and control capabilities. As noted above, U.S. military planners are already warning about a possible “Space Pearl Harbor”. Consequently, the doctrine of space control is designed to protect commercial and military satellites from potential attacks, and ultimately to prevent rivals from having access to space.57 As of the year 2000 there were over 500 satellites in orbit owned by 46 countries, worth in excess of $250 billion. With the rise of the information economy, satellites are playing an increasing role in international trade and finance. As such, U.S. military planners are concerned about commercial satellites. One rationalization for the weaponization of space is that these commercial assets represent a vulnerability to economic sabotage and terrorism. As Lambeth has argued, The most compelling reason for moving forward for dispatch toward acquiring at least the serious elements of space control capability is that the United States is now unprecedentedly invested and dependent upon on-orbit capabilities, both military and commercial. Since these equities can only be expected to grow in sunk cost, it is fair to presume that they will eventually be challenged by potential opponents.58 Notice how this description of space control discusses space in terms of a set of capital assets that should be protected from external threats. While scholars have for a long time debated whether one, if not the, primary objective of U.S. military endeavors is to protect the interests of business, when it comes to questions of space control it is one of only two things in space to protect. There are no human populations in space—with the exception of the two or three occupants on the International Space Station—that could be killed by conflict in space, so the thing that is being secured through the project of space control is technology—either commercial satellites or military assets. In Volume One of Capital, Marx chided classical political economists for their inability to explain how workers became separated from the means of production. Whereas political economists such as Adam Smith argued that a previous accumulation of capital was necessary for a division of labor, Marx argued that this doctrine was an absurd doctrine. Division of labor existed in pre-capitalist societies where workers were not alienated from their labor. Instead, Marx argued that the actual historical process of primitive accumulation of capital was carried out through brute force. The discovery of gold and silver in America, the extirpation, enslavement and entombment in mines of the indigenous population of that continent, the beginnings of the conquest and plunder of India, and the conversion of Africa into a preserve for the commercial hunting of blackskins, are all things which characterize the dawn of the era of capitalist production. These idyllic proceedings are the chief moments of primitive accumulation.59 While not a perfect analogy, because of the lack of labour occurring in orbital space, the doctrine of space control is part and parcel of an ongoing process of such primitive accumulation. One of the purposes of the 1967 Outer Space Treaty was to keep outer space a commons where all states, regardless of technical ability or economic or military power, could participate in the potential benefits space has to offer. In the years since this treaty was signed, the primary economic use of space has been for commercial communications satellites. This industry has expanded dramatically in the last two decades. Total revenues for commercial space-related industries in 1980 were 2.1 billion dollars; by 2003 this figure had expanded to $91 billion and it was expected to increase at least as rapidly into the foreseeable future.60 On the economic front, space control is about determining who has access to this new economy. Positions in orbit for satellites are a new form of “real estate,” and by controlling access to outer space the U.S. would be forcibly appropriating the orbits around Earth, thereby placing the U.S. in a position to determine which governments and corporations could use space. In effect, orbital slots around earth would be turned into private property. This process of primitive accumulation is of importance to our concerns in two ways. First, the doctrine of space control represents the extension of U.S. sovereignty into outer space. In addition to being a clear violation of international law, it reinforces the constitutive effect identified in the previous section on missile defense, namely to re-inscribe the “hard shell” borders of the U.S., which are now extended to include the “territory” of outer space. This simultaneously constitutes the exclusive sovereignty of the U.S., while displacing the sovereignty of other states Second, space control bears significantly on the production of political subjectivities. The original Star Trek series would begin with the voice of Captain Kirk describing space as the “final frontier”. While presenting the exploration of space as a largely peaceful enterprise, the TV show was also drawing upon its viewers’ “memories” of the “western frontier” of 19th century U.S. expansion. At least since the writings of Frederick Turner, there has been the notion that the frontier represents the well-spring of U.S. ingenuity, freedom, and creativity. According to Turner, because as they expanded westward settlers in the U.S. had to continually adapt to a new environment, they became increasingly “American”. The theme of the frontier as essential for American identity has had a significant discursive role in U.S. imperialist expansion.61 Although Turner concluded that the American frontier had closed by the late 1890s, he argued that the U.S. could extend it frontier into new countries, such as Latin America. Theodore Roosevelt, influenced by the Turner thesis, concluded that in order to maintain the exceptional American identity new frontiers had to be opened overseas. The notion of frontiers, then, has been integral to the U.S. imperialist project since its outset. The doctrine of space control, seen in this light, is simply an extension of the imperial logic. By expanding into and taking control of the “final frontier” the U.S. is continuing to renew an exceptional—an exclusive—identity by adapting itself to the harsh realities of a new environment. So, the doctrine of space control can be read as extending U.S. sovereignty into orbit. While a clear violation of international law, this de facto expansion of U.S. sovereignty will have two effects. First, it enables a process of primitive accumulation, whereby orbital spaces around earth are removed from the commons initially established by the Outer Space Treaty, and places them under the control of the U.S. for use and perhaps even ownership by businesses sympathetic to U.S. interests. The U.S. becomes even more than it is now the state for global capitalism, the global capitalist state. Second, this doctrine of space control is part of the ongoing re-production of American subjects as “Americans”. Embedded within space control is the notion that space is a new frontier. Following the Turner thesis and Roosevelt’s doctrine of imperialist expansion, there has long been a drive for Americans to seek out new frontiers as a way of renewing the American identity and promoting American values of individuality, innovation, and exceptionalism. Force application from orbital space Force application entails using weapons either based in space or passing through space to attack targets within Earth’s atmosphere. For technical reasons, such weapons systems are still many years off, but substantial research is being conducted, and military strategists and policy analysts are already discussing how these weapons might be used.62 The major advantage of space-based weapons aimed at Earth-based targets is that they can deliver an attack to any point on the Earth in an extremely short period of time, and it is virtually impossible to defend against them. They become the violent parallel to the surveillance panopticon. In order to investigate what the constitutive effects on sovereignty and political subjectivities would be of force application from outer space, we need to look at two aspects of these weapons: what they can do—their technical aspects—and how they would be useful—their tactical aspects.63 Technically, the two types of weapons systems discussed in the previous section—laserenergy and kinetic-energy—would have different uses. Laser weapons are the quickest and most precise, but they also apply the least amount of force. In theory, such weapons would take only seconds to use and could reach any target on earth instantaneously. They are not very destructive, however, and as such would not be very useful against large-scale and/or heavily shielded targets. Conversely, kinetic-energy weapons have the potential to deliver very destructive amounts of force. They would take a few hours to deploy, however. While they could also be designed to attack any point on earth, they are only useful against fixed targets, because of the time they take to deploy. In addition to laser and kinetic-energy systems, conventional weapons, such as bombs and missiles, might also be placed in space. They would occupy a middle ground. It would take approximately ten minutes to launch these weapons from space, and they could attack any targets that earth-based conventional weapons do.64 The tactical advantages of these types of weapons are obvious. Their tremendous range enables space-based weapons to reach targets that other weapons cannot, and because they are based in outer space there are no concerns about violating the airspace of other states in transit. They can also be used on very short notice, in contrast to the days to weeks typically required to deploy earth-based weapons, such as airplanes, ships, or troops. The major drawback of these weapons is their cost. In addition to the very high cost of developing state-of-the-art weaponry, there is also the high cost associated with placing these weapons into orbit.65 As such, they would likely have relatively limited use,66 particularly if other types of military forces can accomplish the same mission for a lower cost. Why, for instance, would the military use a kinetic-energy weapon orbiting in space against a terrestrial target when a similar result could be produced by an Earth-based system, such as a cruise missile or a bomb? The prime advantage of these weapons is their ability to be used on short notice at targets that are out of the reach of conventional weapons. In what kind of military operations, then, would space-based weapons be primarily useful? Military policy analysts have speculated on just such questions of the political utility of these weapons. Alternatively, a space weapon might be the weapon of choice for an otherwise lower-value target if the space weapon were the only choice available in time, particularly for a time critical political effect. For example, a locomotive might not be worth a space-delivered smart munition. However, it might be well worth the use of a space-delivered smart munition to target a locomotive pulling a train full of people forced from their homes for transport to the border or to a concentration camp at the beginning of an ethnic cleansing campaign – particularly if aircraft and helicopters cannot reach the train because air defenses have not been suppressed, basing and overflight rights have not been granted, or coalition consensus on the action has not been reached.67 This scenario is fascinating for the political logic at work within it—space weapons are required to launch an attack at an otherwise inaccessible target. The three reasons that the target might be inaccessible all have to do with potential gaps in imperial power. Either the defenses of the target country have not been suppressed, or other states have not consented to let the forces fly through their airspace, or other coalition members—presumably in NATO or the UN—have not consented to the action. The first “justification” for the use of the weapon involves clear erasure of the sovereignty of the targeted state, as it eliminates any pretense of that country’s defensibility. The second and third “justifications” diminish, by circumvention, the sovereignty of other states. All three buttress the exclusive capacity of the U.S. to act unilaterally in deciding the exception globally. In all three cases, the only practical use for this weapon is in an imperial project! The chief advantage of space weapons is their ability on very short notice to attack a target that is out of reach of conventional forces. What places these targets “out of reach” is the sovereignty of other states as exercised through those states’ abilities to defend their territory, control their airspace, and/or participate (jointly) in authorized decision of the (global) exception. The constitutive effect of these weapons, then, is to strip states of their sovereignty—they are constituted as subjects lacking authorization of decision, and lacking boundary effectively demarcating inside from outside. What modern sovereignty does (as identified in section I. above) is taken from them. Furthermore, given the potential targets that these weapons could destroy, and how they are used, space-based systems are most useful against small groups and individuals. While the purpose of the use of space-based weapons in the above example was to prevent genocide, the means by which this attack was carried out was essentially assassination—the assassination of those driving the vehicle to carry out the ethnic cleansing. Space-based weapons, then, are most useful at targeting individuals and groups on short notice in order to achieve a political objective. We have already seen potential glimpses of this type of warfare in recent years. Consider, for example, that the Iraq War began with a so called “decapitation strike” aimed at assassinating Saddam Hussein in the hope of ending the war before it began. Similar tactics have been used by the Israeli Defense Forces to kill specific leaders of the Palestinians. Also, the U.S. has used Unmanned Aerial Vehicles equipped with missiles to target specific members of Al Qaeda and the Taliban in Afghanistan and Pakistan. Placing weapons in space aimed at terrestrial targets would only accelerate the ability to carry out these types of “targeted killings” (a.k.a. assassinations). Space weapons would enable those who control them to kill any person at any point on Earth on extremely short notice. Thus, application of force from outer space would have at least three crucially important constitutive effects. First, it would constitute the possessor of these weapons—presumably the U.S.—as the center of a globally extensive, late-modern empire,68 a sovereign of the globe. But this global sovereign would exercise its power in a new way. Rather than needing to control the land, sea, and airspace of all of the Earth, it could rely on space weapons— because they enable the precise application of force at any point on earth, on short notice— to control the globe. While these weapons are not particularly useful in fighting large-scale wars, or in the conquest of territory, they make such conventional uses of military power moot, in large part. There is no longer a need to exercise sovereign power through the control of territory, all one has to do is kill—or perhaps even threaten to kill—potential adversaries around the world in order to gain one’s wishes. In short, the type of power potentially wielded by such a sovereign would be far more absolute than any encountered throughout history.69 Second, these weapons, just as space-based missile defense was seen above to do, would effectively strip states of their ability to exercise sovereignty over their territories. While de jure sovereignty may remain intact, their de facto sovereignty would be effectively erased. For decades, realist international relations scholars have promoted the idea that states secure their sovereignty through self-help.70 If states lack the capacity to defend themselves from adversaries they are particularly vulnerable to attack and conquest. While other scholars from liberal and constructivist schools of thought have questioned how closely sovereignty is linked to military capability, throughout history states with disproportionate military power have repeatedly violated the sovereignty of weaker states.71 While space-based weapons in and of themselves would not enable conquest of another state, they could be used very effectively to achieve precise political objectives without a credible possibility of retaliation. Imagine what impact these weapons would have on U.S. foreign policy with respect to two of its most pressing objectives at this point in time. Consider, for one, how useful such weapons might be with respect to preventing a rival state such as Iran or North Korea from acquiring nuclear weapons. While there has been speculation that the U.S. or Israel may launch air strikes against potential nuclear weapons manufacturing facilities in these countries, the logistics—getting access to airspace from neighboring countries, and the possibility of retaliation against military forces in the area—make such operations difficult to carry out. Using weapons in space to conduct such missions would avoid these logistical difficulties, thereby making them easier (and presumably more likely). The threat of using space weapons on either the manufacturing sites of weapons of mass destruction or on the political leadership of an adversary in most cases probably would be sufficient to alter the behaviour of governments. In short, if the U.S. were to deploy such weapons in space, they would likely be used to much the same effect as the gunboat diplomacy of the 19th century. A second contemporary policy objective is to fight specific non-state actors. The 9/11 Commission Report discussed in great detail the logistical obstacles that prevented the Clinton administration from capturing or killing Osama Bin Laden.72 The primary obstacle was the difficulty in either launching cruise missiles into Afghanistan through another state’s airspace or deploying U.S. Special Forces in an area so remote from U.S. military bases. Again, had the U.S. had space-based weapons at the time, they probably would have been the weapons of choice. When combined with intelligence about the location of a potential target, they could be used to kill that target on very short notice without violating the air space of other states, or needing to have a military base nearby to offer a support role. In effect, any person or group of people anywhere on Earth could be targeted on very short notice, thereby constituting everyone everywhere as objects of the global sovereign. All would be subject to the rule of the U.S. state. The sovereignty of states would no longer be an obstacle to killing enemies, and these assassinations could be carried out rather easily without the threat of retaliation by the state whose sovereignty has been violated. The example of using space weapons to target non-state actors such as Osama Bin Laden and Al Qaeda points to a third constitutive effect of space weapons. Because these weapons could target anyone, anywhere, at anytime, everyone on the Earth is effectively reduced to “bare life.”73 As Agamben demonstrates in Homo Sacer (1998), one of the constitutive powers of the sovereign is to determine who is outside the laws and protections of the state. While human rights regimes and the rule of law may exist under a late-modern global empire policed by space weapons,74 the global sovereign will have the ability to decide the exception to this rule of law, and this state of exception in many cases may be exercised by the use of space weapons that constituted this sovereign in the first place. Constituting empire of the future Each of the three forms of space weaponization has important constitutive effects on modern sovereignty, and, in turn, productive effects on political subjectivities. Exclusive missile defense constitutes a “hard shell” of sovereignty for one state, while erasing the sovereign political subject status of other states. Space control reinforces that exclusive constitution of sovereignty and its potentiality for fostering unilateral decision. It also constitutes the ‘space-controlling’ state, the U.S., as sovereign for a particular global social order, a global capitalism, and as a state populated by an exceptional people, “Americans.” Space weaponization in the form of capacities for direct force application obliterate the meaning of territorial boundaries for defense and for distinguishing an inside from an outside with respect to the scope of policing and law enforcement—that is authorized locus for deciding the exception. States, other than the exceptional “American” state, are reduced to empty shells of sovereignty, sustained, if at all, by convenient fiction—for example, as useful administrative apparatuses for the governing of locals. And their “citizens” are produced as “bare life” subject to the willingness of the global sovereign to let them live. Together, these three sets of effects constitute what we believe can appropriately be identified as late-modern empire, the political subjects of which are a global sovereign, an exceptional “nation” linked to that sovereign, a global social order normalized in terms of capitalist social relations, and “bare life” for individuals and groups globally to participate in that social order. If our argument is even half correct, the claim with which this paper began—that modes of political killing have important effects—would be an understatement! IV. Coping with Empire of the Future If the logic of space weaponization is to constitute a new, historically unprecedented form of empire, there are significant theoretical and practical implications. By way of conclusion, we take up some of the most important of those implications briefly in this section. Re-theorizing empire Broadly speaking, recent theorizing on imperialism has posited two competing pictures of empire. On the one hand, scholars have put forward a global hegemonic view of empire in which a great power – presumably the United States – through a combination of hard and soft power dominates the international system to such an extant that it becomes the de facto sovereign of a global order.75 On the other hand, theorists such as Hardt and Negri have posited a de-centered version of Empire in which a network of loosely integrated institutions govern the various facets of the lives of subjects to such an extent that all political subjects on the planet are governed under a single, dispersed regime that they have labeled Empire. Our paper rejects both these images of Empire, and uses the site of space weaponization to posit a third version of Empire that is neither the de-centered late modern vision of Hardt and Negri, nor the centralized hegemonic vision of both advocates and opponents of American Imperialism. Imagining resistance Given these grim prospects for a de-territorialized global rule of late-modern empire, are there any possibilities for resistance? Historically, every advance in the weaponry of imperial powers has always been met with an advance in counter hegemonic weaponry. Most recently, insurgents in Afghanistan and Iraq have been able to counter the technological superiority of the U.S. forces with very simple yet effective Improvised Explosive Devices. As such, it is reasonable to conclude that space weaponry could be countered through a variety of asymmetrical tactics such as disabling space weapons while in orbit through energy, kinetic or even nuclear anti-satellite attacks, attacking the locations where space weapons are produced or launched, attack the research and development centers (such as universities) that are integral to the production of these systems, organizing strikes for the workers involved in harvesting the raw materials for these systems, and refusing to pay taxes to the political apparatuses that control these systems. While it is difficult to imagine what precise form resistance to these systems might take, it is not unreasonable to conclude that even in a context of space-based empire, some for of political and military resistance will be possible. That being said, just because resistance to space-based empire is a possibility, it by no means follows that such space-based empires are either inevitable or desirable. That is why we believe that resistance to placing weapons in space must begin now. Such resistance could take several forms. In the last 15 years social constructivists have made a convincing case that taboos against the use of chemical weapons, nuclear weapons and land mines have shamed states into abstaining from using these weapons.76 IR scholars should build on this research to focus on creating a taboo against the use and hopefully even the development of space weapons. Second, there is a need to educate the public about the dangerous consequences of placing weapons in space. As of this moment, most information about weapons in space is produced by defense agencies and related think tanks with a vested interest in them. As such, most research largely ignores the dangers of these weapons. An increased awareness of those dangers, not only to those potentially targeted by such weapons but also citizens of countries such as the U.S. that may deploy them, may create public pressure to cut funding to the development programs. If action is not taken now, we believe that the possibilities for resistance to these weapons will decrease dramatically once they are placed in orbit. The state of global domination constituted by such a weapons regime would mean that those who dared to speak out against such a regime might themselves become potential targets of such weapons.

#### 4] Analysis through the lens of statehood and security is good – vigilance solves their offense and turns the alt.

Robin Luckham 17, Emeritus fellow at the Institute of Development Studies, University of Sussex, “Whose violence, whose security? Can violence reduction and security work for poor, excluded and vulnerable people?” Peacebuilding, 5:2, 99-117

6. The two faces of security – and of peace Security, especially state security, tends to be enacted in contexts of the violently contested political authority. Often it is enacted through violent power, rebranded as legitimate force. Small wonder that some in the development community, including those who drafted SDG 16, hesitate to use the word at all. But although security is a deeply disputed idea, it is also a highly necessary one. Security functions simultaneously as an analytical construct, as a frame for policy and as a moral narrative. It is distinct from the equally ambiguous if less contentious concept of peace. Yet, at the same time, it is often seen as essential to the preservation of peace. Most of the things that international decision-makers, political and security elites and development practitioners do in security’s name are supposed to protect the safety and welfare of people in a world of multiple challenges and threats. However, there is a tendency to slide from global, to national, to citizen and to human security and back again, without enough serious reflection on how they interconnect and on where tensions and contradictions lie hidden. Development agencies have too often plunged into security policies and programmes, without a clear understanding of where they might lead, who would benefit and how they might go wrong. The ambiguities stem in part from a deep-seated tension between two distinct visions of security (summarised in Table 3), which interconnect, yet are in deep tension with eachother. On the one hand, security can be seen as a process of political and social ordering, aiming to reduce violence and keep the peace. As such it is territorially organised and kept in place globally as well as nationally through the authoritative discourses and practices of power, including socially sanctioned violence. It connects to conceptions of what Galtung termed ‘negative peace’: the ending of overt violence, without necessarily transforming the conditions giving rise to this violence or attending to the quality of the subsequent peace. In this view security is a public good delivered in principle by states, much like official or donor-driven development.29 Yet in a world where states and indeed the international order face sustained challenges, security is often kept in place also through alternative nonstate or ‘hybrid’ networks of violence and protection.30 Moreover, security is far from being an unalloyed public good. In principle, it is equally shared and socially inclusive, even if in practice it is anything but, especially at the insurgent margins where insecurity is most acute. For in practice it protects socially embedded power, established property relations and social privilege – and reinforces global, national and local inequalities. On the other hand, security can be seen (in the vernacular) as an entitlement of citizens and more widely human beings to social peace and protection from violence, abuses of rights and social injustice, along with other existential risks such as famine or disease. It connects to the idea of ‘positive peace’, including transformations in the social conditions giving rise to violence and deepening the relationships between states and their citizens. The vernacular understandings, day-to-day experience, resilience and agency of the people and groups who are ‘secured’ and ‘developed’ are in this view the touchstone by which to evaluate security and violence reduction. Most people fall back upon their social identities – as women and men, members of families, clans, castes, ethnic groups, sects, religions and nationalities – to navigate their social worlds, to respond to insecurity