## AC – K

### AC – Plan

#### Space faring nations should restrict private asteroid mining.

### AC – Advantage

#### Mining is inevitable down the line regardless of capital limits because of oligopolistic consolidation

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The proliferation of a lunar economy rests upon patient access to capital and fostering innovative ideas for large-scale development. At the moment, capital requirements for lunar miners are too high for companies to succeed in a perfectly competitive market. For the lunar economy, the emergence of large, vertically integrated companies will lead to the economies of scale necessary for proliferation. Terrestrially, when an industry becomes mature and beholden to traditional economics, like scarcity, a focus on profit margins takes over, and limitations emerge in the form of price manipulation and a lack of competition. As mentioned, the lunar economy will operate privately, and independent of scarcity, using profit margins to increase cash flow for innovation. An oligopoly of dedicated space holding companies, each comprised of diverse companies along the value chain, funded by the parent company and incentivized by prizes, will maintain a culture of innovation and competition. Rather than a few concentrated entities, each sacrificing their identity to their acquirer, the lunar economy will be an oligopoly of teams.

#### Multilateralism solves dangerous space mining and deregulation.

Edd Gent 20, freelance science and technology writer, “Space Mining Should Be a Global Project—But It's Not Starting Off That Way,” Singularity Hub, 10-12-2020, https://singularityhub.com/2020/10/12/the-us-is-trying-to-hijack-space-mining-and-there-could-be-disastrous-consequences/

Exploiting the resources of outer space might be key to the future expansion of the human species. But researchers argue that the US is trying to skew the game in its favor, with potentially disastrous consequences. The enormous cost of lifting material into space means that any serious effort to colonize the solar system will require us to rely on resources beyond our atmosphere. Water will be the new gold thanks to its crucial role in sustaining life, as well as the fact it can be split into hydrogen fuel and oxygen for breathing. Regolith found on the surface of rocky bodies like the moon and Mars will be a crucial building material, while some companies think it will eventually be profitable to extract precious metals and rare earth elements from asteroids and return them to Earth. But so far, there’s little in the way of regulation designed to govern how these activities should be managed. Now two Canadian researchers argue in a paper in Science that recent policy moves by the US are part of a concerted effort to refocus international space cooperation towards short-term commercial interests, which could precipitate a “race to the bottom” that sabotages efforts to safely manage the development of space. Aaron Boley and Michael Byers at the University of British Columbia trace back the start of this push to the 2015 Commercial Space Launch Competitiveness Act, which gave US citizens and companies the right to own and sell space resources under US law. In April this year, President Trump doubled down with an executive order affirming the right to commercial space mining and explicitly rejecting the idea that space is a “global commons,” flying in the face of established international norms. Since then, NASA has announced that any countries wishing to partner on its forthcoming Artemis missions designed to establish a permanent human presence on the moon will have to sign bilateral agreements known as Artemis Accords. These agreements will enshrine the idea that commercial space mining will be governed by national laws rather than international ones, the authors write, and that companies can declare “safety zones” around their operations to exclude others. Speaking to Space.com Mike Gold, the acting associate administrator for NASA’s Office of International and Interagency Relations, disputes the authors’ characterization of the accords and says they are based on the internationally-recognized Outer Space Treaty. He says they don’t include agreement on national regulation of mining or companies’ rights to establish safety zones, though they do assert the right to extract and use space resources. But given that they’ve yet to be released or even finalized, it’s not clear how far these rights extend or how they are enshrined in the agreements. And the authors point out that the fact that they are being negotiated bilaterally means the US will be able to use its dominant position to push its interpretation of international law and its overtly commercial goals for space development. Space policy designed around the exploitation of resources holds many dangers, say the paper authors. For a start, loosely-regulated space mining could result in the destruction of deposits that could hold invaluable scientific information. It could also kick up dangerous amounts of lunar dust that can cause serious damage to space vehicles, increase the amount of space debris, or in a worst-case scenario, create meteorites that could threaten satellites or even impact Earth. By eschewing a multilateral approach to setting space policy, the US also opens the door to a free-for-all where every country makes up its own rules. Russia is highly critical of the Artemis Accords process and China appears to be frozen out of it, suggesting that two major space powers will not be bound by the new rules. That potentially sets the scene for a race to the bottom, where countries compete to set the laxest rules for space mining to attract investment. The authors call on other nations to speak up and attempt to set rules through the UN Committee on the Peaceful Uses of Outer Space. Writing in The Conversation, Scott Shackelford from Indiana University suggests a good model could be the 1959 Antarctic Treaty, which froze territorial claims and reserved the continent for “peaceful purposes” and “scientific investigation.” But the momentum behind the US’ push might be difficult to overcome. Last month, the agency announced it would pay companies to excavate small amounts of regolith on the moon. Boley and Byers admit that if this went ahead and was not protested by other nations, it could set a precedent in international law that would be hard to overcome. For better or worse, it seems that US dominance in space exploration means it’s in the driver’s seat when it comes to setting the rules. As they say, to the victor go the spoils.

#### Dangerous mining greatly increases the risk of space debris.

Sarah Scoles 15, “Dust from asteroid mining spells danger for satellites,” New Scientist, 5-27-2015, https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/

NASA chose the second option for its Asteroid Redirect Mission, which aims to pluck a boulder from an asteroid’s surface and relocate it to a stable orbit around the moon. But an asteroid’s gravity is so weak that it’s not hard for surface particles to escape into space. Now a new model warns that debris shed by such transplanted rocks could intrude where many defence and communication satellites live – in geosynchronous orbit. According to Casey Handmer of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit 63 times on average. A satellite in the wrong spot at the wrong time will suffer a damaging high-speed collision with that dust. The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent (arxiv.org/abs/1505.03800). That may not have immediate consequences. But as Earth orbits get more crowded with spent rocket stages and satellites, we will have to worry about cascades of collisions like the one depicted in the movie Gravity. Handmer and Roa want to point out the problem now so that we can find a solution before any satellites get dinged. “It is possible to quantify and manage the risk,” says Handmer. “A few basic precautions will prevent harm due to stray asteroid material.”

#### Clustering makes the risk of collisions *uniquely high* and the risk is understated

Dr. Darren McKnight 17, Ph.D., Technical Director for Integrity Applications, Previously Senior Vice President and Director of Science and Technology Strategy at Science Applications International Corporation, “Proposed Series of Orbital Debris Remediation Activities,” 3rd International Conference and Exhibition on Satellite & Space Missions, 5/13/2017, https://iaaweb.org/iaa/Scientific%20Activity/debrisminutes03166.pdf [graphics omitted]

In the future, this population will be added to primarily from collisions between large objects in orbit as the number of LNT produced is proportional to the mass involved in a collision (or explosion).2 Cataloged debris produced from a catastrophic collision will be liberated at about 1-3 fragments per kilogram of mass involved while LNT production is around 10-40 fragments per kilogram of mass involved. The Iridium/Cosmos collision involved a total mass of 2,000kg and produced over 3,000 trackable fragments and likely 10,000-15,0003 LNT debris. The Feng-Yun purposeful collision yielded over 2,200 trackable fragments and likely over 30,000 LNT from only ~850kg of mass involved. While it is important to prevent these types of events from occurring in the future, the consequence of a collision (based on number of LNT produced) will be proportional to the mass involved in the collision. The term “mass involved” implies a good coupling of the impactor mass with the target mass. For a large fragment (e.g., several kilograms) striking a typical payload (that is densely built) in its main satellite body (vice striking a solar array or other appendage) at hypervelocity speeds (i.e., above 6km/s) will result in all the mass being “involved” in the debris. However, a large fragment striking a derelict rocket body, due to the way that the mass is concentrated at the ends of a rocket body, will likely not result in all of the mass being “involved” in the liberated debris. However, it is likely that when two large derelicts, either rocket bodies or payloads, collide with each other, then all of the mass will be involved due to the likely direct physical interaction between the mass. The table below summarizes the mass involvement scenarios which highlight why the massive-on-massive collisions are the focus of our analyses. Therefore, it is best to prevent the collision of the most massive objects with each other (higher consequence) and the ones that are the most likely (higher probability) since risk is probability multiplied by consequence. Our ability to model and predict the rate of collisions is based empirically upon only one catastrophic accidental collision event and a model developed on the kinetic theory of gases (KTG). However, clusters of massive objects that have identical inclinations plus similar and overlapping apogees/perigees may indeed have a greater probability of collision than predicted by the KTG-based algorithms as they are not randomly distributed and their orbital element evolution (e.g., change in right ascension of ascending node and argument of perigee) is also similar. It is hypothesized that these similarities could result in resonances of collision dynamics that may lead to larger probability of collision values than predicted with current algorithms. The not well-known fact is that many of the most massive objects are in tightly clumped clusters that will likely produce greater probability of collision than estimated by the KTG approach (see attached paper) and with the much larger consequence (i.e., creation of catalogued LNT fragments). The attached paper that studied this possibility shows some initial indications that this may indeed be true but much more analysis is needed to provide this conclusively. This table of clusters represents well over 50% of the total derelict mass in LEO. However, no one is currently monitoring these potential events. It is proposed that it would be a prudent risk management approach for space flight safety to monitor and characterize this inter-cluster collision risk. The Massive Collision Monitoring Activity (MCMA) is proposed whereby the encounters between members of these clusters are constantly monitored and close encounter information collected, plotted, analyzed, and shared. This would provide a rich research base for scientists and a predictive service for spacefaring countries. I am currently executing a subset of this proposed activity in an ad hoc fashion in conjunction with JSpOC. I have been monitoring the interaction dynamics between the SL-16 population in the 820- 865km altitude region for the last nine months.

#### Debris cascades cause global nuke war

Les Johnson 13, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 9-12 [language modified]

Whatever the initial cause, the result may be the same. A satellite destroyed in orbit will break apart into thousands of pieces, each traveling at over 8 km/sec. This virtual shotgun blast, with pellets traveling 20 times faster than a bullet, will quickly spread out, with each pellet now following its own orbit around the Earth. With over 300,000 other pieces of junk already there, the tipping point is crossed and a runaway series of collisions begins. A few orbits later, two of the new debris pieces strike other satellites, causing them to explode into thousands more pieces of debris. The rate of collisions increases, now with more spacecraft being destroyed. Called the "Kessler Effect", after the NASA scientist who first warned of its dangers, these debris objects, now numbering in the millions, cascade around the Earth, destroying every satellite in low Earth orbit. Without an atmosphere to slow them down, thus allowing debris pieces to bum up, most debris (perhaps numbering in the millions) will remain in space for hundreds or thousands of years. Any new satellite will be threatened by destruction as soon as it enters space, effectively rendering many Earth orbits unusable. But what about us on the ground? How will this affect us? Imagine a world that suddenly loses all of its space technology. If you are like most people, then you would probably have a few fleeting thoughts about the Apollo-era missions to the Moon, perhaps a vision of the Space Shuttle launching astronauts into space for a visit to the International Space Station (ISS), or you might fondly recall the "wow" images taken by the orbiting Hubble Space Telescope. In short, you would know that things important to science would be lost, but you would likely not assume that their loss would have any impact on your daily life. Now imagine a world that suddenly loses network and cable television, accurate weather forecasts, Global Positioning System (GPS) navigation, some cellular phone networks, on-time delivery of food and medical supplies via truck and train to stores and hospitals in virtually every community in America, as well as science useful in monitoring such things as climate change and agricultural sustainability. Add to this the [destruction] ~~crippling~~ of the US military who now depend upon spy satellites, space-based communications systems, and GPS to know where their troops and supplies are located at all times and anywhere in the world. The result is a nightmarish world, one step away from nuclear war, economic disaster, and potential mass starvation. This is the world in which we are now perilously close to living. Space satellites now touch our lives in many ways. And, unfortunately, these satellites are extremely vulnerable to risks arising from a half-century of carelessness regarding protecting the space environment around the Earth as well as from potential adversaries such as China, North Korea, and Iran. No government policy has put us at risk. It has not been the result of a conspiracy. No, we are dependent upon them simply because they offer capabilities that are simply unavailable any other way. Individuals, corporations, and governments found ways to use the unique environment of space to provide services, make money, and better defend the country. In fact, only a few space visionaries and futurists could have foreseen where the advent of rocketry and space technology would take us a mere 50 years since those first satellites orbited the Earth. It was the slow progression of capability followed by dependence that puts us at risk. The exploration and use of space began in 1957 with the launch of Sputnik 1 by the Soviet Union. The United States soon followed with Explorer 1. Since then, the nations of the world have launched over 8,000 spacecraft. Of these, several hundred are still providing information and services to the global economy and the world's governments. Over time, nations, corporations, and individuals have grown accustomed to the services these spacecraft provide and many are dependent upon them. Commercial aviation, shipping, emergency services, vehicle fleet tracking, financial transactions, and agriculture are areas of the economy that are increasingly reliant on space. Telestar 1, launched into space in the year of my birth, 1962, relayed the world's first live transatlantic news feed and showed that space satellites can be used to relay television signals, telephone calls, and data. The modern telecommunications age was born. We've come a long way since Telstar; most television networks now distribute most, if not ali, of their programming via satellite. Cable television signals are received by local providers from satellite relays before being sent to our homes and businesses using cables. With 65% of US households relying on cable television and a growing percentage using satellite dishes to receive signals from direct-to-home satellite television providers, a large number of people would be cut off from vital information in an emergency should these satellites be destroyed. And communications satellites relay more than television signals. They serve as hosts to corporate video conferences and convey business, banking, and other commercial information to and from all areas of the planet. The first successful weather satellite was TIROS. Launched in 1960, TIROS operated for only 78 days but it served as the precursor for today's much more long-lived weather satellites, which provide continuous monitoring of weather conditions around the world. Without them, providing accurate weather forecasts for virtually any place on the globe more than a day in advance would be nearly impossible. Figure !.1 shows a satellite image of Hurricane Ivan approaching the Alabama Gulf coast in 2004. Without this type of information, evacuation warnings would have to be given more generally, resulting in needless evacuations and lost economic activity (from areas that avoid landfall) and potentially increasing loss of life in areas that may be unexpectedly hit. The formerly top-secret Corona spy satellites began operation in 1959 and provided critical information about the Soviet Union's military and industrial capabilities to a nervous West in a time of unprecedented paranoia and nuclear risk. With these satellites, US military planners were able to understand and assess the real military threat posed by the Soviet Union. They used information provided by spy satellites to help avert potential military confrontations on numerous occasions. Conversely, the Soviet Union's spy satellites were able to observe the United States and its allies, with similar results. It is nearly impossible to move an army and hide it from multiple eyes in the sky. Satellite information is critical to all aspects of US intelligence and military planning. Spy satellites are used to monitor compliance with international arms treaties and to assess the military activities of countries such as China, Russia, Iran, and North Korea. Figure 1.2 shows the capability of modem unclassified space-based imaging. The capability of the classified systems is presumed to be significantly better, providing much more detail. Losing these satellites would place global militaries on high alert and have them operating, literally, in the blind. Our military would suddenly become vulnerable in other areas as well. GPS, a network of 24-32 satellites in medium-Earth orbit, was developed to provide precise position information to the military, and it is now in common use by individuals and industry. The network, which became fully operational in 1993, allows our armed forces to know their exact locations anywhere in the world. It is used to guide bombs to their targets with unprecedented accuracy, requiring that only one bomb be used to destroy a target that would have previously required perhaps hundreds of bombs to destroy in the pre-GPS world (which, incidentally, has resulted in us reducing our stockpile of non-GPS-guided munitions dramatically). It allows soldiers to navigate in the dark or in adverse weather or sandstorms. Without GPS, our military advantage over potential adversaries would be dramatically reduced or eliminated.

#### Satellites are key to environmental monitoring – debris collapses it and causes climate extinciton

Ben Biggs 18, PhD Researcher in Computer Vision and Deep Learning at the University of Cambridge, “How Satellites Can Protect Planet Earth From Disaster”, HowItWorks Daily, 12/22/2018, https://www.howitworksdaily.com/how-satellites-can-protect-planet-earth-from-disaster/

It might not look it, but our planet is a fragile place. A delicate balance of pressure, temperature and gases keeps us alive, as our atmosphere lets in enough heat for us to thrive – but not too much that we get too toasty. For many years our planet has looked after itself with ease. Now, with humans on the scene, things are changing more than ever, from climate change to mass deforestation. If our planet is going to survive long into the future it’s going to need our help. Fortunately, we’ve got plenty of missions that are working for the benefit of our world already. Using observation satellites in orbit, scientists have been monitoring Earth for decades, watching how the planet pulsates and changes over time. From orbit we can watch how species migrate, identify and predict environmental changes and even fix problems. A great example of this was the global effort to repair a hole in the ozone above the Antarctic back in 1987. Two years prior, scientists had discovered that chemicals known as chlorofluorocarbons (CFCs) – produced by fridges and aerosols, among other things – were causing the hole to grow. As a result countries around the world agreed to phase out the use of CFC as part of the Montreal Protocol. In early 2018, NASA announced that its Aura satellite had watched the hole successfully close, with it expected to fully repair as early as 2060. It was proof that we could work together to change the planet for the better. Aura is part of a broader NASA project called the Earth Observing System (EOS). This programme, which began in 1997, has seen NASA launch missions and instruments into orbit. This has included the groundbreaking Landsat series of satellites, which have provided surface images of the whole globe. Then there’s the Terra mission that launched in 2009 and studies clouds, sea ice and more from orbit. Most of these satellites are in polar orbits, which means they orbit the planet from top to bottom so that it rotates underneath and gives them a global view. Planning for the EOS began back in the 1980s, with NASA keen to regularly fly instruments for at least 15 years. “Human activity has altered the condition of the Earth by reconfiguring the landscape, by changing the composition of the global atmosphere, and by stressing the biosphere in countless ways,” they noted in a handbook in 1993. “There are strong indications that natural change is being accelerated by human intervention.” More than two dozen missions have been launched as part of the EOS to date. Among the programme’s many accomplishments, scientists watched as an ice shelf collapsed on the Antarctic Peninsula in 2002 using the Terra satellite. The same satellite, along with the Aqua satellite launched in 2002, has provided a global view of how the vegetation cycle changes over the course of a year and the effect the climate has on it. Those same two satellites have also allowed us to see how summer sea ice in the Arctic is decreasing, which means that more of the Sun’s light is being absorbed rather than being reflected, raising global temperatures. The EOS has helped in other ways too, such as enabling scientists to keep a close eye on the levels of toxic gases like carbon monoxide being emitted from massive fires in the atmosphere. This allows people on the ground to be alerted to these dangers, and they can in turn be advised to limit their outdoor activity to protect their health. The EOS is even helping to track and monitor rare animals, such as chameleons in Madagascar. Here, scientists have been able to use satellite imagery, combined with known habitats of the animals, to map out where they are likely to be living. It would take survey teams on the ground thousands of years to replicate this information without satellites. It’s not just NASA that has been keeping a close eye on the planet. The European Space Agency (ESA) runs the Copernicus project, billed as the world’s largest single Earth observation campaign. Previously known as the Global Monitoring for Environment and Security (GMES) programme, it began with the launch of the Sentinel-1A satellite in April 2014. This radar imaging satellite provides images both day and night and during all weather conditions, and these are being used to map sea ice, track oil spills and more. This has been followed by half a dozen more missions, with the latest – Sentinel-3B – launching on 25 April 2018. This mission is focusing on monitoring the behaviour and health of the oceans, but it has a wide range of abilities. It flies in formation with its predecessor, Sentinel-3A, and together the two of them can provide global data for Earth across an entire day. The satellites can measure the temperature over oceans, as well as the colour and height of the sea. They can also monitor wildfires from space, check the health of vegetation and map the way that land is being used around the world. And there are more Sentinel satellites on the way. In the coming years we’ll see the Sentinel-4 and Sentinel-5 missions launch, studying the composition of our planet’s atmosphere, while Sentinel-6 will measure global sea surface height for ocean and climate studies. “Copernicus will help shape the future of our planet for the benefit of all,” said the ESA, also noting that it isthe “most ambitious Earth observation programme to date,” one that will provide accurate and timely data on the environment, climate change and more. All of this data is vital for directing climate policy and other human activities on Earth. By observing our planet around the clock from space we can see the direct effect that humans are having on it. These are not the only climate-monitoring missions run by NASA and the ESA. The former has a number of other missions, including the Deep Space Climate Observatory, which observes the sunlit side of Earth. The latter has eight missions on the books in its Earth Explorer programme, including a mission to study how Earth’s gravity field varies over the surface of the planet, called the Gravity field and steady-state Ocean Circulation Explorer (GOCE), which ended in 2013. In 2016, countries of the world came together to sign the Paris Climate Agreement, a global effort to reduce carbon emissions to prevent the global average temperature rising by two degrees Celsius above pre-industrial levels. While the US later infamously reneged from this agreement, it was proof that with enough level-headed minds, minds that can see the data from missions showing how the planet is changing, we can take action. Humans continue to have a major effect on the planet, for better or worse, and monitoring that change is vital to our planet’s survival.

#### Unregulated mining causes space war and turns DA’s

Fengna Xu 20, Law School, Xi’an Jiaotong University, “The approach to sustainable space mining: issues, challenges, and solutions,” Fengna Xu 2020 IOP Conf. Ser.: Mater. Sci. Eng. 738 012014

3.1. Conflicts between multiple States Space resources, as res communis [3], can be appropriated to some extent on the basis of freedom of exploration and use of the outer space. However, it is likely to follow a ‘first come, first served’ approach to space resources activities. In fact, the ‘first come, first served’ approach drove early and rapid development of oil industry of the US in the 19th century, although a frenetic race among surface owners followed and led to an extraordinary waste of oil and gas. Given that so far there are no agreement or property rights on space resources, they are essentially in a ‘state of nature’. Allocation by the ‘first come, first served’ approach is simple and requires very little government involvement to deter another one (called a ‘junior’) from displacing the rightful first comer (called a ‘senior’). However, overprotecting the senior by priority rights could run the risk of disorder, waste, inequality, and even monopoly. The Outer Space Treaty, requires State parties to conduct all their activities in outer space ‘with due regard to the corresponding interests of all other States Parties’. Without specific coordinating rules, conflicts between multiple States are likely to happen. Private entities may choose to arm themselves to safeguard their own interests. In extreme cases, States may also protect them by placing weapons of mass destruction in outer space if necessary [4]. As a result, priority rights should not be absolute but subjected to some arrangements. 7

#### That goes nuclear – the domain is fragile and offense dominant, so even small incidents escalate

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Why space is a particular problem for crisis stability

For a number of reasons, space poses particular challenges in preventing a crisis from starting or from being managed well. Some of these are to do with the physical nature of space, such as the short timelines and difficulty of attribution inherent in space operations. Some are due to the way space is used, such as the entanglement of strategic and tactical missions and the prevalence of dual-use technologies. Some are due to the history of space, such the absence of a shared understanding of appropriate behaviors and consequences, and a dearth of stabilizing personal and institutional relationships. While some of these have terrestrial equivalents, taken together, they present a special challenge.

The vulnerability of satellites and first strike incentives

Satellites are inherently fragile and difficult to protect; in the language of strategic planners, space is an “offense-dominant” regime. This can lead to a number of pressures to strike first that don‘t exist for other, better-protected domains. Satellites travel on predictable orbits, and many pass repeatedly over all of the earth‘s nations. Low-earth orbiting satellites are reachable by missiles much less capable than those needed to launch satellites into orbit, as well as by directed energy which can interfere with sensors or with communications channels. Because launch mass is at a premium, satellite armor is impractical. Maneuvers on orbit need costly amounts of fuel, which has to be brought along on launch, limiting satellites‘ ability to move away from threats. And so, these very valuable satellites are also inherently vulnerable and may present as attractive targets.

Thus, an actor with substantial dependence on space has an incentive to strike first if hostilities look probable, to ensure these valuable assets are not lost. Even if both (or all) sides in a conflict prefer not to engage in war, this weakness may provide an incentive to approach it closely anyway.

A RAND Corporation monograph commissioned by the Air Force15 described the issue this way:

First-strike stability is a concept that Glenn Kent and David Thaler developed in 1989 to examine the structural dynamics of mutual deterrence between two or more nuclear states.16 It is similar to crisis stability, which Charles Glaser described as ―a measure of the countries‘ incentives not to preempt in a crisis, that is, not to attack first in order to beat the attack of the enemy,‖17 except that it does not delve into the psychological factors present in specific crises. Rather, first strike stability focuses on each side‘s force posture and the balance of capabilities and vulnerabilities that could make a crisis unstable should a confrontation occur.

For example, in the case of the United States, the fact that conventional weapons are so heavily dependent on vulnerable satellites may create incentives for the US to strike first terrestrially in the lead up to a confrontation, before its space-derived advantages are eroded by anti-satellite attacks.18 Indeed, any actor for which satellites or space-based weapons are an important part of its military posture, whether for support missions or on-orbit weapons, will feel “use it or lose it” pressure because of the inherent vulnerability of satellites.

Short timelines and difficulty of attribution

The compressed timelines characteristic of crises combine with these “use it or lose it” pressures to shrink timelines. This dynamic couples dangerously with the inherent difficulty of determining the causes of satellite degradation, whether malicious or from natural causes, in a timely way.

Space is a difficult environment in which to operate. Satellites orbit amidst increasing amounts of debris. A collision with a debris object the size of a marble could be catastrophic for a satellite, but objects of that size cannot be reliably tracked. So a failure due to a collision with a small piece of untracked debris may be left open to other interpretations. Satellite electronics are also subject to high levels of damaging radiation. Because of their remoteness, satellites as a rule cannot be repaired or maintained. While on-board diagnostics and space surveillance can help the user understand what went wrong, it is difficult to have a complete picture on short timescales. Satellite failure on-orbit is a regular occurrence19 (indeed, many satellites are kept in service long past their intended lifetimes).

In the past, when fewer actors had access to satellite-disrupting technologies, satellite failures were usually ascribed to “natural” causes. But increasingly, even during times of peace operators may assume malicious intent. More to the point, in a crisis when the costs of inaction may be perceived to be costly, there is an incentive to choose the worst-case interpretation of events even if the information is incomplete or inconclusive.

Entanglement of strategic and tactical missions

During the Cold War, nuclear and conventional arms were well separated, and escalation pathways were relatively clear. While space-based assets performed critical strategic missions, including early warning of ballistic missile launch and secure communications in a crisis, there was a relatively clear sense that these targets were off limits, as attacks could undermine nuclear deterrence. In the Strategic Arms Limitation Treaty, the US and Soviet Union pledged not to interfere with each other‘s ―national technical means‖ of verifying compliance with the agreement, yet another recognition that attacking strategically important satellites could be destabilizing.20 There was also restraint in building the hardware that could hold these assets at risk.

However, where the lines between strategic satellite missions and other missions are blurred, these norms can be weakened. For example, the satellites that provide early warning of ballistic missile launch are associated with nuclear deterrent posture, but also are critical sensors for missile defenses. Strategic surveillance and missile warning satellites also support efforts to locate and destroy mobile conventional missile launchers. Interfering with an early warning sensor satellite might be intended to dissuade an adversary from using nuclear weapons first by degrading their missile defenses and thus hindering their first-strike posture. However, for a state that uses early warning satellites to enable a “hair trigger” or launch-on-attack posture, the interference with such a satellite might instead be interpreted as a precursor to a nuclear attack. It may accelerate the use of nuclear weapons rather than inhibit it.

Misperception and dual-use technologies

Some space technologies and activities can be used both for relatively benign purposes but also for hostile ones. It may be difficult for an actor to understand the intent behind the development, testing, use, and stockpiling of these technologies, and see threats where there are none. (Or miss a threat until it is too late.) This may start a cycle of action and reaction based on misperception. For example, relatively low-mass satellites can now maneuver autonomously and closely approach other satellites without their cooperation; this may be for peaceful purposes such as satellite maintenance or the building of complex space structures, or for more controversial reasons such as intelligence-gathering or anti-satellite attacks.

Ground-based lasers can be used to dazzle the sensors of an adversary‘s remote sensing satellites, and with sufficient power, they may damage those sensors. The power needed to dazzle a satellite is low, achievable with commercially available lasers coupled to a mirror which can track the satellite. Laser ranging networks use low-powered lasers to track satellites and to monitor precisely the Earth‘s shape and gravitational field, and use similar technologies. 21

Higher-powered lasers coupled with satellite-tracking optics have fewer legitimate uses. Because midcourse missile defense systems are intended to destroy long-range ballistic missile warheads, which travel at speeds and altitudes comparable to those of satellites, such defense systems also have inherent ASAT capabilities. In fact, while the technologies being developed for long-range missile defenses might not prove very effective against ballistic missiles—for example, because of the countermeasure problems associated with midcourse missile defense— they could be far more effective against satellites. This capacity is not just theoretical. In 2007, China demonstrated a direct-ascent anti-satellite capability which could be used both in an ASAT and missile defense role, and in 2009, the United States used a ship-based missile defense interceptor to destroy a satellite, as well. US plans indicated a projected inventory of missile defense interceptors with capability to reach all low earth orbiting satellites in the dozens in the 2020s, and in the hundreds by 2030.22

Discrimination

The consequences of interfering with a satellite may be vastly different depending on who is affected and how, and whether the satellite represents a legitimate military objective.

However, it will not always be clear who the owners and operators of a satellite are, and users of a satellite‘s services may be numerous and not public. Registration of satellites is incomplete23 and current ownership is not necessarily updated in a readily available repository. The identification of a satellite as military or civilian may be deliberately obscured. Or its value as a military asset may change over time; for example, the share of capacity of a commercial satellite used by military customers may wax and wane. A potential adversary‘s satellite may have different or additional missions that are more vital to that adversary than an outsider may perceive. An ASAT attack that creates persistent debris could result in significant collateral damage to a wide range of other actors; unlike terrestrial attacks, these consequences are not limited geographically, and could harm other users unpredictably.

In 2015, the Pentagon‘s annual wargame, or simulated conflict, involving space assets focused on a future regional conflict. The official report out24 warned that it was hard to keep the conflict contained geographically when using anti-satellite weapons:

As the wargame unfolded, a regional crisis quickly escalated, partly because of the interconnectedness of a multi-domain fight involving a capable adversary. The wargame participants emphasized the challenges in containing horizontal escalation once space control capabilities are employed to achieve limited national objectives.

Lack of shared understanding of consequences/proportionality

States have fairly similar understandings of the implications of military actions on the ground, in the air, and at sea, built over decades of experience. The United States and the Soviet Union/Russia have built some shared understanding of each other‘s strategic thinking on nuclear weapons, though this is less true for other states with nuclear weapons. But in the context of nuclear weapons, there is an arguable understanding about the crisis escalation based on the type of weapon (strategic or tactical) and the target (counterforce—against other nuclear targets, or countervalue—against civilian targets).

Because of a lack of experience in hostilities that target space-based capabilities, it is not entirely clear what the proper response to a space activity is and where the escalation thresholds or “red lines” lie. Exacerbating this is the asymmetry in space investments; not all actors will assign the same value to a given target or same escalatory nature to different weapons.

#### Commercialized proximity mining operations create dual-use deflection risks – inherent interoperability makes dangerous repurposing easy and likely

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Extensive and prolonged proximity operations will be an essential element of most types of planetary defense mitigation missions. The most technologically mature method for fragmentation or deflection of a hazardous object is through a surface, subsurface, or stand-off nuclear explosion: The tremendous impulsive force of the blast and resulting surface ablation could, in one moment, deliver the necessary velocity change to the body to miss its future collision with Earth. Time permitting, to assure exact positioning and maximum deflective or fragmentation effect, the nuclear device would be buried, anchored to the surface, or orbiting just above the asteroid, an effort that would involve precise proximity operations.

On the opposite end of the spectrum for deflecting an inbound body are the “slow push" methods, which would deliver a minute but steady deflective force to the asteroid or comet, over time providing a cumulative change in velocity. With few exceptions, every proposed slow push technique would be dependent on extended operations in close proximity to the body. Gravity tractors would hover a spacecraft near the asteroid for years or decades, slowly imparting a deflective gravitational force; an enhanced gravity tractor would first collect boulders or regolith from the threatening body, to increase the mass and gravitational pull of the spacecraft. Laser or solar ablation methods would require the stationing of a spacecraft near the asteroid to direct the ablative beam. Using thrusters or a space tug would require direct physical contact with the body for years on end, nudging it to alter its velocity. Mass driver systems would land and anchor a robotic mining apparatus on the asteroid’s surface, to cast a steady stream of regolith into space and produce a minute but steady deflective counterforce.

Similarly, asteroid or comet mining would rely entirely on the ability to conduct reliable, long-term, repetitive proximity operations. Several mining concepts have been analyzed. The most common concept would land and anchor robotic mining and support systems on the asteroid or comet; these systems would methodically drill, scrape, crush, lift, or scoop the desired minerals or ice from the body. Support systems would discard unwanted tailings and transport the ore to a processing station or collection facility. The mining operation could occur on the surface, in pits, or in caverns cut into the interior of the asteroid or comet.

Alternative mining methods include leaching minerals through the injection of high pressure steam, fully encapsulating a small asteroid or comet and capturing the escaping water as the container is heated by the Sun, and collecting water vapor from a passing comet using a spacecraft stationed in a trailing position behind it. Each of these activities would require the ability to operate on and near the surface of the body for long periods.

The commonalities between planetary defense and asteroid mining are extensive for the wide range of proximity operations. For both endeavors, hovering, orbiting, landing, and anchoring on the space body are essential competencies. The same base technologies that can be used to mine metals could be employed in burying a nuclear device to fragment an asteroid, or as a mass driver apparatus used in deflection. The technologies that could be employed to secure thrusters or a solar sail to a tumbling asteroid to change its orbit could be adapted to anchor a full suite of mining equipment to the surface of a resource-rich body.

#### That increases the risk of accidental collisions, astro-terror, and space weaponization

Mares 15 [Miroslav Mares, Professor, at the Division of Security and Strategic Studies, Masaryk University, Czech Republic. Jakub Drmola PhD student, at the Divison of Security and Strategic Studies, Masaryk University, Czech Republic. Revisiting the deflection dilemma. October 1, 2015. https://academic.oup.com/astrogeo/article/56/5/5.15/235650]

Sooner or later, in order to avoid the fate of the dinosaurs, humanity needs to develop scientific and technological capabilities to prevent extinction-level impact events. But most solutions bring about new challenges, because new technologies rarely have only one application. Here lies the dilemma: any technology allowing us to deflect asteroids from a collision trajectory with the Earth could also be used to direct them towards the Earth. This means we could potentially turn any future near-miss into an impact, with all its devastating consequences.

Sagan & Ostro (1994b) concluded that this is a risk not worth taking. Considering the very low probabilities of impacts with objects larger than 1 km (generally less than 1 in 5000 for a given century), they were more worried about the misuse of such trajectory-altering technology than the undiverted asteroids themselves. Humans visited a great deal of violence upon each other during the 20th century; war has been prevalent and increasingly technological. The beginning of the 21st century does not seem overly promising either. The risk that one of humanity's irrational totalitarian powers decides to have some nearby asteroid steered towards Earth might simply be too high. Many people still see the default cosmic odds as preferable to the lessons of recent history.

Later on, a modification of sorts to the deflection dilemma appeared, positing that the “real” dilemma (Schweickart 2004, Morrison 2010) lies in putting various parts of the Earth and its population in harm's way during a deflection attempt. Inevitably, any mission to deflect an object that is on a collision course with the Earth will involve moving its supposed point of impact across the surface until it misses the planet entirely. Should such a deflection attempt fail to modify the trajectory sufficiently, the impact would still occur, albeit in a different area. This could expose to risk countries that were not originally threatened by the asteroid (depending on its size and path), while diminishing the risk to those living near the original point of impact. The damage and casualties around this new and modified point of impact would then, to some extent, be caused by those who tried but failed to deflect the asteroid. The repercussions of such an event would certainly be grave.

Privatization and industry

Both of these versions of the deflection dilemma are essentially state-centric and neither presumes that this technology might be wielded by private companies and non-state actors. But the current trend of greater involvement of private companies in space suggests that states might be unable (or unwilling) to maintain their exclusive hold on the advanced space technologies. The private sector is currently hot on the heels of national and international space agencies in exploring feasible and economically viable options. At the moment, private companies are already in the business (or at least in the process of making it a profitable business) of resupplying the International Space Station, taking tourists to the edge of space and operating communication satellites. And, recently, a new area of potential commercialization of space, asteroid mining, has received increased attention and investment. It has already spawned private companies (such as Deep Space Industries and Planetary Resources, Inc.); this industry is highly relevant to the deflection dilemma (Ostro 1999).

While the idea of mining asteroids carries with it an air of science fiction (as all space-based endeavours do, at some stage), it is based on science fact. One of the most significant facts on which to base a space mining industry is the apparent abundance of highly valued raw materials in asteroids. Platinum, rhodium and other precious metals are extremely useful because of their catalytic and electrical properties, but are also exceedingly rare in the Earth's crust. While such metals sank deep into the planet during core formation, asteroids retained their original composition and even delivered much of the accessible reserves to our planet in the form of meteorite bombardment (Willbold et al. 2011). Some of the largest known deposits of these metals on Earth are found within ancient impact craters. Platinum-group metals are deemed critical to our modern technology-based civilization, without substitutes in many applications, and their supply is at risk of “geopolitical machinations” (Graedel 2013). The combination of natural scarcity and industrial demand leads to their high price, which easily rivals that of gold. Because space missions are inherently expensive, these precious metals are prime high-value candidates for economically viable asteroid mining. Since the projected market value of these metals within an asteroid is in the order of billions or even hundreds of billions of US dollars (depending on the size of the asteroid), the success of the industry comes down to developing technically feasible and cost-effective methods of mining them and retrieving them (Blair 2000, Gerlach 2005). The other interesting and potentially worthwhile resource we could harvest from asteroids is water. Not only is liquid water required by astronauts to survive, but it can also be broken down into oxygen and hydrogen to be used as fuel. And, while water is abundant and cheap here on Earth, it is very expensive to transport it to orbit. It costs $3000–$10 000 per kilogramme to launch water (or anything else) to low Earth orbit and about two or three times more for geostationary transfer orbit (Jain & Trost 2013). It is not the prospect of procuring something we covet here on the surface of the Earth that makes this venture attractive, but rather the idea of not having to wage an expensive battle with Earth's gravity each time we want to make use of something as mundane as water in space. If the costs associated with mining water from asteroids can be brought below the cost of launching water from Earth, this seemingly counter-intuitive industry might take off and become profitable. Additionally, through the use of some form of refuelling depots, it would probably in turn make space endeavours more affordable and sustainable. The same would apply if some of the more common metals found in asteroids (such as iron or nickel) were used to build structures directly in orbit instead of launching them from the Earth. The risks of mining asteroids There are two basic ways to go about moving the resources contained within a given asteroid to the Earth. They can be extracted from the asteroid during its natural orbit and then transported to the Earth, or the entire asteroid might be moved closer to a more convenient location before starting mining. Thus repositioned, it might even be used as a shielded habitat, once hollowed out (Ostro 1999). There are different speculative costs and benefits associated with either option, which would vary with the size, orbit and composition of the asteroid. But, crucially, the second option would entail putting asteroids into orbit around the Earth, the Moon or possibly at one of the Earth's Lagrangian points. Indeed, NASA has already planned a mission to capture a small asteroid and place it in a high cislunar orbit, where it would serve as a destination for future manned missions and experiments. This “Asteroid Redirect Mission” is to take place in the next decade and is being pitched mainly as a stepping stone towards a future mission to Mars (see box “NASA's Asteroid Redirect Mission”; Brophy et al. 2012, Burchell 2014, Gates et al. 2015).

Programmes to redirect asteroids and, especially, plans to mine asteroids on an industrial scale essentially resurrect the deflection dilemma. But it is no longer a matter of superpowers intentionally misusing technology designed to prevent dangerous impacts. It becomes an issue of proliferation among private entities. Once private mining companies acquire the technical ability to redirect suitable NEOs (Baoyin et al. 2011) in order to extract platinum or water from them, perilous inflections become more likely.

The probability of accidents will rise with the number of asteroids whose trajectories we decide to manipulate. Such accidents might be very unlikely, but even a tiny technical or human error in the execution of an inflection meant to place an asteroid into the lunar or geocentric orbit might send it crashing into the Earth with potentially devastating consequences. And while we might find solace in the low probabilities associated with such an accident, even contemporary industries which are considered very safe suffer from unlikely tragedies. Despite being dependable and reliable, airliners do crash; there are a lot of them flying and very improbable accidents do happen if the dice are rolled often enough. Undoubtedly, we will not be steering as many asteroids as we steer planes any time soon, but industries tend to be more accident-prone during their infancy. Furthermore, a single asteroid can do a lot more damage than a single plane. And who is to say how much metal or water we are going to need in space over the course of the 21st century, or the next?

The second source of risk is the intentional misuse, similar to the original deflection dilemma. But the entry barrier for asteroid weaponization gets much lower if mining them and moving them around becomes a common industrial activity. This is in stark contrast to the original scenario which envisioned this technology to be used solely for planetary defence and under control of a very small number of the most powerful countries (Morrison 2010). If such a powerful technology becomes widely and commercially available, even rogue states and well-funded terrorist groups might be tempted to use it for an unexpected and devastating attack. In addition, an active asteroid mining industry would make it more difficult to detect any hostile inflection attempts among the number of legitimate and benign ones.

#### The dilemma causes the most power WMD ever – it’s more likely than natural hits and structurally outweighs

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While asteroids loom large in the horizons of habitat and some military expansionists, they receive little attention from arms controllers and most global security thinkers. As a planetary defense project, diverting asteroids seems a logical part of a Whole Earth Security program and international space infrastructure security cooperation, but opponents of military space expansion are sharply divided about asteroidal diversion. In part these disputes carry over from Cold War nuclear debates, with Edward Teller, Darth Vader for arms controllers, pushing nuclear solutions to the asteroid threat, and arms controllers raising alarms.

An important analysis of the dangers inherent in the deflection of asteroidal bodies is provided by Carl Sagan and Stephen Ostro.67 Few figures of the Space Age have been as productive and prominent as Sagan, a planetary astronomer, science educator, and SF author.68 Over the later decades of the twentieth century Sagan’s work on planetary science, particularly Mars, his television series Cosmos, and his science fiction, most notably Contact (coauthored with Ann Druyan), made him an international celebrity and influential voice for science and space exploration. Unlike virtually all other space scientists and engineers of his era, Sagan also was active in advancing nuclear arms control, studying— and publicizing—the “nuclear winter” hypothesis and promoting cooperation in space to improve Soviet-American relations.69 Although a strong supporter of the larger habitat expansionist vision, Sagan insists large-scale space activities should occur only after nuclear disarmament and planetary habitat stability have been achieved because of an ominous asteroid “deflection dilemma.”70

The essence of the deflection dilemma is simple: species and civilizational survival inevitably will eventually require the development of the ability to deflect asteroids and comets away from Earth, but this technology also inherently creates the possibility that such objects could be directed toward the Earth. The existential stakes are clear: “the destructive energy latent in a large near-Earth asteroid dwarfs anything else the human species can get its hands on,” making them potentially “the most powerful weapon of mass destruction ever devised”71 (see Table 7.4. A and B).72 Once the population of these bodies is fully mapped, and technologies to deflect them are developed, Sagan argues, the prospects for collision increase over the natural rate due to the possibility of intentional bombardment. Given these possibilities, perhaps the reason the dinosaurs lasted for nearly two hundred million years is because they did not have a space program.

In his major book on the human space future, Pale Blue Dot, Sagan lays out several scenarios for intentional collisions. His arguments are essentially the arguments of nuclear arms controllers. Madmen exist, and some “achieve the highest levels of political power in modern industrial nations.”'3 Recalling the extreme destruction caused by Hitler and Stalin, Sagan posits the possibility that a “misanthropic psychopath” or a “megalomaniac lusting after ‘greatness’ or glory, a victim of ethnic violence bent on revenge, someone in the grip of severe testosterone poisoning, some religious fanatic hastening the Day of Judgment, or just some technicians incompetent or insufficiently vigilant” will bring about a catastrophic collision.74 Earth-approaching asteroids amount to “30,000 swords of Damocles hanging over our heads,” for which “there is no acceptable national solution.”75 And, like Cole and Salkeld (not mentioned), Sagan points to the possibilities of clandestine use of this technology.

#### Accidental and intentional deflection attacks outweigh the threat of conventional hits – only building in response time with enhanced tracking and attribution solves rogue strikes that bypass conventional deterrence

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Ignoring accidental deflection, which might occur when an asteroid is moved to an Earth or Lunar orbit for research or mining purposes (see this now scrapped proposal to bring a small asteroid in to Lunar orbit), there are two categories of actors that might maliciously deflect such a body; state actors and terrorist groups.

A state actor might be incentivised to authorise an asteroid strike on an enemy or potential enemy in situations where they wouldn’t necessarily authorise a nuclear strike or conventional invasion. For example, let us consider an asteroid of around 20 m in diameter. Near Earth orbit asteroids of around this size are often only detected several hours or days before passing between Earth and the Moon. If a state actor is able to identify an asteroid that will pass near Earth in secret before the global community has, they can feasibly send a mission to alter its orbit to intersect with Earth in a way such that it would not be detected until it is much too late. Assuming the state actor did its job well enough, it would be impossible for anyone to lay blame on them, let alone even guess that it might have been caused by malicious intent.

An asteroid of this size would be expected to have enough energy to cause an explosion 30 times the strength of the nuclear bomb dropped over Hiroshima in WWII.

Footnote

\* An ‘existential threat’ typically refers to an event that could kill either all human life, or all life in general. A ‘catastrophic threat’ refers to an event that would cause substantial damage and suffering, but wouldn’t be expected to kill all human life, which would eventually rebuild.

#### Scenario planning is good for debate---breaks down cognitive biases and incorporates complementary theories.

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Furthermore, despite the fact that the danger of a world war seems less probable than in the previous century, there are several indicators suggesting that economic and policy-related uncertainty in the United States and in Europe has increased in recent decades (Azqueta-Gavaldón et al., 2019; Baker, Bloom, & Davis, 2016). The geopolitical risk index shows that perceived risks are on the rise globally despite the absence of large-scale wars (Caldara & Iacoviello, 2019). According to its authors, “the index captures an important dimension of uncertainty: the risk of events that disrupt the normal, democratic, and peaceful course of relations across states, populations, and territories” (Caldara & Iacoviello, 2019, p. 33). It reached its peak during the 2003 invasion of Iraq and spiked in correspondence with the major terrorist events in Europe in 2004, 2005, and 2015, the annexation of Crimea by Russia in 2014, and the escalation of ISIS military operations in Iraq and Syria in 2014-2015. Data pointing to increased uncertainty is also provided by the Risk Maps (Aon, 2019). In 2018, the likelihood of an armed interstate conflict was at the highest point since the end of the Cold War.

Against the background of these developments, it is not surprising that the apprehension of uncertainty constitutes a core part of the strategic doctrines of most Western countries (Porter, 2016, p. 240). It becomes evident that we need to acknowledge the world to be nonlinear and explore nonlinear thinking in order to better grasp its complexity and be better prepared for unexpected events. Not only policy-makers but also IR scholars have been caught off guard by the above-mentioned strategic surprises. Conventional IR theories failed to foresee the unleashing of these sudden events and their multiple effects (Tomé & Açıkalın, 2019, p. 4; Urry, 2003).

In this article, we argue that stepping out of the spectrum of conventional methods and research techniques and applying scenario approaches allows confronting uncertainty and preparing for the unexpected. As Bernstein et al. (2000) argue “[s]cenario-based forward thinking is a promising method for tracing the policies of actors and the evolution of the international system” (p. 70). IR scholars can at the same time remain rigorous and provide policy-relevant input that grasps the dynamics of unpredictability of real-world issues. Evidence of that can be found in the rare academic papers that have applied scenario methods to IR studies and have been published in first-class journals (Friedberg, 2005; Stein et al., 1998).

The overarching aim of this article is to show how and why scenario analysis can be applied by IR scholars as a complementary methodological approach, by making academic rigor and future analysis compatible. As we will present, scenario analysis in particular is an effective research technique to link academic theories with empirical data in order to better embrace the complexity and ambiguity of future world events, as it combines systematic future-oriented analysis with policy-relevant implications. Given the lack of adequate methods in the field of IR that allow for analyzing future events in a nonlinear perspective, systematic scenario analysis can contribute to filling the gap. Moreover, scenario approaches in IR correspond well with the thinking of scholars with an eclectic approach (Han, 2011; Katzenstein & Okawara, 2001-2002) and with those who apply more pragmatism in IR reasoning (Kratochwil & Friedrichs, 2009). They also fit into the complexity theory (e.g., Bousquet & Curtis, 2011)—a nonlinear paradigm according to which outcomes of interactions within complex and dynamically changing systems are unpredictable and emerge in various forms. From this perspective, nothing in the international environment is immutable. By applying nonlinearity and by developing a variety of plausible futures with multiple outcomes, scenario analysis corresponds well with this reasoning (Wilkinson, Kupers, & Mangalagiu, 2013).

This article proceeds as follows: We start with taking stock of the growing interest in the scenario analysis approach by different actors across the globe. Then, we define the core concepts of scenario analysis and present an example of the Multiple Scenario Generation (MSG) method applied at foresight exercises of the Dahrendorf Foresight Project. 1 Next, we discuss the extent to which scenario analysis fulfills the criteria of a social sciences research method. Finally, we show the contribution that scenarios can bring to IR studies and illustrate it with some examples. In conclusion, we sum up our claims and highlight the article’s key message.

Foresight is the new black: The proliferation of scenario analysis

Scenario exercises have proliferated since the end of the Second World War, where it was originally used for military planning (Mietzner & Reger, 2005). Over time, it has been adapted to the policy and business world. Royal Dutch Shell integrated the scenario approach into its decision-making process as early as the 1970s and became a benchmark for corporate scenario planning (Bentham, 2014). As actors increasingly saw the value of foresight for dealing with complexities, other companies, non-governmental organizations, and eventually governments, followed. Scenario approaches and other techniques of foresight studies such as wargaming, trend analysis, visioning, design futures, or horizon scanning have been gaining interest across the world over the last few decades (Babst, 2018; Barma et al., 2016; Bell, 2002; Wilkinson & Kupers, 2013).

One of the most prominent foresight exercises continues to be the Global Trends analysis conducted by the National Intelligence Council since 1997 (Office of the Director of National Security, 2019). The German Foreign Office recently presented a new data tool to enhance the evidence base for internal scenario planning exercises (Auswärtiges Amt, 2019). In France, the government-linked Centre d’analyse stratégique carries out regular analyses of geostrategic issues (Dreyer & Stang, 2013). Foresight is also conducted under the auspices of international organizations. Most notable in security policy are NATO’s Strategic Foresight Analysis and Framework for Future Alliance Operations foresight exercises that are crucial in advising its defense planning (NATO, 2013, 2015, 2017, 2018). The EU has also bolstered its foresight activities over the last two decades (Dreyer & Stang, 2013). Since 2010, the European Strategy and Policy Analysis System (ESPAS)—an inter-institutional cooperation between the European Parliament, the Secretariat of the Council, the European Commission and the European External Action Service—constitutes the broadest engagement with foresight. The increasing importance EU policy-makers attribute to strategic foresight is also reflected in the structure of the new European Commission since 2019. Commissioner for Inter-institutional relations and Foresight, Maroš Šefčovič, is tasked to “put foresight at the heart of better policymaking” (Von der Leyen, 2019).

These examples show that policy-makers increasingly look for future-oriented and actionable advice. Their demand is not only covered by intra-institutional bodies but also extends to academia. The EU’s Horizon 2020 research program recognizes the role of foresight for its programmatic orientation (European Parliament & Council, 2013) and it is geared toward the inclusion of findings generated through foresight exercises. Most explicitly, the need to apply foresight is acknowledged in relation to new security threats, including cybersecurity and is to be included in the academic projects (European Parliament & Council, 2013). Moreover, foresight activities are often required in calls for project proposals. 2 However, it is often think tankers, not university-based academics, that are in charge of foresight in Horizon 2020 projects, as is the case with the EU-LISTCO, MENARA or MEDRESET projects. 3

The strong involvement of think tanks in these foresight projects comes as no surprise, as they are the primary institutions engaged in foresight exercises also outside of Horizon 2020. Among the 10 highest-ranking European foreign policy think tanks (Mcgann, 2019), 9 were recently engaged in foresight exercises, either in the form of publications or workshops (e.g., Barrie et al., 2019; Brozus, 2018; Sweijs & Pronk, 2019). The methodology employed in these foresight exercises is often only briefly defined (e.g., Hett, Kellner, & Martin, 2014; Lehmann, 2016; Tira, 2016) or not communicated at all (e.g., Estella, 2008; Ham, 2016). This complicates assessing the rigor and robustness of resulting findings.

At the same time as this proliferation of foresight exercises is taking place in the periphery of academia—as academics do participate in foresight exercises organized by other actors—IR scholarship itself is struggling to grapple with the realities of today’s world. Its conventional methodological approaches such as empirical case studies and quantitative methods, and formal methods such as game theory or modeling (Sprinz & Wolinsky-Nahmias, 2002), predominately follow the traditional objective of social sciences to explain the past. Thus, they are not geared towards analyzing the dynamism introduced by complex and uncertain conditions, leading to the strategic blunders discussed in the introduction. Suitable methodological tools to confront these conditions are in fact scenario approaches. However, they are often discarded by academics for not fulfilling all the criteria of a (positivist) scientific methodology. As Brozus (2016) notes, foresight thus encounters similar contestation as the retrospective analysis of counterfactuals. We argue to the contrary: There are good reasons why scenario analysis can serve as a useful complementary approach for scholars committed to academic rigor but willing to approximate the IR practice. In the following section, we show how rigorous scenario analysis can be done.

Scenario analysis as a research method

Foresight studies as a research field encompasses a wide range of methods and techniques (see, e.g., Bishop, Hines, & Collins, 2007). On the most basic level, there is consensus to distinguish three foresight schools of thought (e.g., Wilkinson et al., 2013). The Probabilistic Modified Trends/Cross-Trends (PMT/CT) school focuses on enhancing predictions by using forecasting—a data-driven extrapolation of past trends into the future with help of computer models and simulations (Wilkinson, 2017). The tradition of La Prospective also uses quantitative modeling, but can have normative ambitions, guiding policy debates toward constructed utopias. Building on PMT/CT is the Intuitive Logics Model, which adds a new dynamic by modeling possible future events as interactions with the extrapolation of historic data (Bradfield et al., 2005), thus making use of both quantitative and qualitative data. Scenario analysis, which is at the heart of this paper, is situated within this particular school of thought (Bradfield et al., 2005). The next section defines the main concepts and suggests a process of application suitable for IR scholarship.

According to Kahn and Wiener (1967), a scenario is “a set of hypothetical events set in the future constructed to clarify a possible chain of causal events as well as their decision points” (p. 6). In turn, Schwartz (1996), another leading futurist, defines scenarios as “stories about the way the world might turn out tomorrow, stories that can help us recognize and adapt to changing aspects of our present environment” (p. 3). They are thus designed to detect weak signals and wild cards. Weak signals are the first important indications of an emerging future change and trends, paradigm shifts, drivers or discontinuities yet to materialize (Miles, Saritas, & Sokolov, 2016, p. 72). Wild cards, also known as Black Swans (Taleb, 2007), represent events of low probability, but with substantial impact on the human condition once they occur (Miles et al., 2016, p. 73).

There is a wide variety of scenario methodologies and there have been multiple attempts to create typologies (e.g., Bishop et al., 2007; Bradfield et al., 2005; Wilkinson et al., 2013). Wilkinson (2017) distinguishes between three main types of scenarios that are each arrived at via different methods. Horizon scanning produces possible scenarios, visioning and backcasting produce preferable scenarios, and scenario analysis—the method we discuss—produces plausible scenarios. Plausible scenarios are particularly suited as an analytical tool to contribute to IR policy debates. Contrary to preferable scenarios, they make no normative claims that would necessitate consensus about desired outcomes. And contrary to possible scenarios, they do not systematically cover all possible development, thus reducing the complexity and quantity of output and improving accessibility for the policy community. Their aim is explorative in nature. Rather than determining a certain future state of affairs, explorative scenarios seek to uncover and make apparent hitherto neglected trends, while proposing their plausible developments.

Scenarios are the final products of the scenario analysis process. Bouhalleb and Smida (2018) describe scenario analysis as “a structured and analytical process to create characterization of multiple futures to enable stakeholders to rethink strategic decisions and policies” (p. 2). Scenario analysis can be done with different techniques but usually starts with the identification of sources of future change. Key driving forces with uncertain trajectories are identified and plausible scenarios are constructed depending on how they play out. Scenario analysis involves multiple steps taking place in three distinct phases. Table 1 gives an example of this process using the MSG method which has proven useful in cases of uncertainty and complexity (Pherson, 2008, pp. 34–40; Popper, 2008). This procedure was applied to and refined by two consecutive foresight exercises by the Dahrendorf Foresight Project, between 2016 and 2018 (Sus & Hadeed, 2019). 4 It serves as an example of an analytical and participatory scenario process (for other examples, see Han, 2011, pp. 44–45) (Figure 1).

[Chart omitted]

The following paragraphs describe this nine-step process in detail and can be understood as a suggestion for an application of scenario analysis in IR scholarship. The preparatory phase (steps one to five) starts with the elaboration of a research question and the collection of all relevant elements of the scenario exercise. In our example, we asked the broad question of “how will Europe’s security environment look like in 2030?” A preparatory online survey can set the basis for the group exercises. Asking participants to judge the likelihood and impact of internal and external factors of change and to identify potential Black Swans establishes a common knowledge base. In our example, participants were encouraged to use the STEMPLE-Plus-framework, 5 and consider social, technological, economic, military/security, political, legal/normative, ecological, and other factors—such as psychological or cultural. Answer to surveys also reveal participants’ underlying assumptions—deeply held, implicit or explicit beliefs about the nature of things—and their perspectives on future developments of European security (Amer, Daim, & Jetter, 2013; Bouhalleb & Smida, 2018; Wilkinson, 2017).

In the second step, these key assumptions are categorized and checked. Participants judge them as “solid,” “caveat,” or “not solid,” depending on the certainty of their continued existence and impact. Only those deemed “solid,” where no challenge can be expected, are carried over into the next step. One assumption in our example was that the United States—withdrawal from multinational cooperation would continue. Revealing this assumption allows for the objection that this could change after the next election. After all, the institution of the “America First”-doctrine was quite unforeseen itself, and is all but uncontested in American political and policy circles. This assumption thus has a “caveat” and cannot be taken as a given when thinking about European security in 2030. The increasing impact of climate change on human lives, on the other hand, can be deemed as “solid” based on the overwhelming scientific consensus around the issue.

Confronting existing assumptions is a vital step in eradicating erroneous preconceptions and cognitive biases, in this case the status quo bias—the idea things will not change dramatically from the way they are today (Wilkinson et al., 2013). The key assumptions check thus provides a common understanding upon which the scenarios can be developed. Participants filter out those that are solid enough to become a basis for the development of key drivers.

Steps three to five consist of the identification, selection, and definition of those key drivers. Key drivers provide the backbone around which scenarios are constructed. They are the most crucial trends that shape the future. To identify them, the remaining “solid” key assumptions are discussed. From among them, the participants select the ones they deem most relevant to the question at hand. These are then defined as bidirectional levers of change that can manifest in a variety of ways. For example, United States involvement in global affairs could develop in any which way between complete withdrawal and maximum engagement. A chosen combination of drivers and their different manifestations produces the differences between scenarios. In the Dahrendorf Foresight Project, seven key drivers of security in 2030 were identified (Sus & Hadeed, 2019, pp. 14–20), such as technological progress in the EU, the United States role in European security, and China’s global power projection. Sticking with the first example, its impact on European security was connected to possible vulnerability to security threats, such as in the realm of cybersecurity. Moreover, lagging behind in the technological race could hamper competitiveness, thusly socio-economic well-being and therefore possibly political stability. Rapid technological progress, on the other hand, could produce significant economic benefits and improve the standard of living. It could also lead to an Orwellian dystopia. Variations in the manifestations of key drivers are thus both the expression of uncertainty and the determinants of the resulting scenario. These are the core elements that are being put together into coherent sets in the next phase.

The developmental phase (steps six to eight) involves the construction of individual scenarios. This takes place through conversation between participants, in what Wilkinson (2017) calls “a social learning process of storytelling and systems thinking, and an iteration between strategic conversation and analysis” (p. 20). In step six, participants determine which trends can plausibly co-exist in the future. This is done via a cross-consistency check. Participants combine key drivers into groups—in our case sets of two to four—and check them for internal consistency. It would, for example, appear implausible to foresee European technological leadership in the context of disintegrative tendencies. An EU paralyzed by political gridlock could not reasonably be expected to take the decisive action—and investments—needed to surpass its technological rivals. In this way, incoherent or implausible combinations of drivers are discarded. The remaining plausible combinations of drivers constitute the nuclei around which, in step seven, narratives are constructed. Narratives detail the development and interaction of drivers of change in the future (Wilkinson, 2017). They are important, not only to bring scenarios to life, but also to describe the transition from now to the timeframe under consideration, enhancing the scenario’s plausibility (Phadnis et al., 2014). Constructing a narrative and tracing the interactions of drivers also creates opportunities to contemplate possible Black Swan events, thereby integrating abrupt shifts in trajectory and shocks into the analysis. Narratives also help “to simplify the contextual complexities of environment and actors” (Bouhalleb & Smida, 2018, p. 3), thus contributing to the goal of scenario analysis to grapple with complexity and uncertainty. European technological leadership would, for example, be more plausible in the context of a strong and resilient Euro and flourishing trade, than in one of internal strife and struggling economies. One would imagine the establishment of well-funded cooperative research facilities and research programs in key future industries, such as Artificial Intelligence, energy production and storage, or robotics. Agreement to the necessary investment presupposes the political will and consensus between member states.

In addition to envisioning the future development of current trends, scenarios also model sudden future events, such as shocks, that can shape the events within it. In our example, European breakthroughs in quantum computing could leapfrog technological progress and thus change the European trajectory unexpectedly. Any such development is imaginable, and scenarios illuminate the path towards their possible realization.

In step eight, the thusly completed scenario is fed into a peer-reviewing process. In our case, six reviewers, expert practitioners and scholars, were asked to review individual scenarios according to three criteria to determine their merit: plausibility, consistency, and innovation. Plausibility concerns whether or not the described scenario is imaginable, and its development retraceable with rational thought. Consistency relates to the internal coherence of a scenario. If drivers, trends and developments within one scenario contradict each other, the resulting scenario is internally inconsistent. Innovation is achieved when a scenario contributes new insights into the policy debate.

The use phase (step nine) starts when the scenario development has concluded. Here, scenarios show their practical usefulness as bases to develop strategies for plausible future events (Bouhalleb & Smida, 2018) and enhance decision-making (Amer et al., 2013). They can produce early indicators by charting a path toward a plausible future, and making the developments that lead to it, observable (Bernstein et al., 2000). Such a process allows researchers and policy-makers alike to identify and detect early indications of a scenario coming to pass and thereby assess current and evolving situations (Bernstein et al., 2000). Having modeled a path towards technological backwardness, for example, could promote debates on new European research cooperation mechanisms and instruments. A collection of scenarios from the described exercise was presented to academics and policy-makers and debated among experts in detail. This suggests that scenarios can spark debate and exchange, as well as provide insight on the future between the policy world and academia.

The presented example of an application of MSG shows how it enables scholars to look into the future and contemplate the effects of trends that have not yet manifested empirically, as well as unforeseen and sudden changes in trajectories. This distinct advantage over traditional IR methods makes scenario analysis a useful addition to scholars’ methodological toolkit and enriches policy-recommendations by including considerations of plausible—even if unlikely—futures. How scholars can profit from the use of scenario analysis will be discussed in more detail in the section on added value.

Despite the fact that scenario analysis is thus well-situated to become a useful tool for academics to engage with relevant and timely phenomena, its application in the academic world is still relatively rare (for a few exceptions, see: Barma et al., 2016; Bernstein et al., 2000; Cruz, 2015; Kunstein & Wessels, 2012; Pourezzat et al., 2018; Stein et al., 1998; Sus, 2017; Sus, 2018; Vicente Oliva & Martinez-Sanchez, 2018). This can be attributed to the allegation that scenario approaches (and strategic foresight in general) are inherently non-academic, captured in the credo that social scientists should not engage in forward-reasoning. The following paragraphs discuss this methodological skepticism and attempt to diffuse it.

Criticism and merit of scenario analysis as a method

A vibrant interdisciplinary debate surrounds scenario analysis as a method (see, e.g., Amer et al., 2013; Bishop et al., 2007; Bouhalleb & Smida, 2018; Bradfield et al., 2005; Ramírez & Wilkinson, 2016). We aim to contribute to this debate with the following revision.

One objection against the application of scenario analysis in IR is that it does not satisfy all the criteria established by positivist epistemology (Ramírez & Wilkinson, 2016). Specifically, it evades falsifiability, nonsubjectivity, and replicability: As it concerns the future, it cannot establish facts, which cannot be falsified. As a creative, iterative process relying on individual expertise and group interaction, it is highly contingent on participants and context, and thus neither nonsubjective, nor replicable (Ramírez & Wilkinson, 2016). This violates the universally accepted positivist criteria established by Karl Popper (1963). 6 We argue that there are, nonetheless, good reasons to reconsider the admissibility of scenario analysis to IR scholarship. In the following paragraphs, we test the approach and the MSG in particular against the criteria for academic research defined by Gerring (2011). We find that it satisfies most of them. Moreover, we argue that scenario analysis excels at generating new knowledge—one of two overarching goals of research (Gerring, 2011)—and allows for unique interdisciplinary and multicausal reasoning.

Gerring (2011) specifies the criteria of scientific inquiry “to be cumulative, evidence-based (empirical), falsifiable, generalizing, nonsubjective, replicable, rigorous, skeptical, systematic, transparent and grounded in rational argument” (p. 11). Table 1 describes the ways in which scenario analysis responds to Gerring.

The table shows that scenario analysis satisfies eight out of eleven criteria that Gerring suggests, showcasing more methodological credentials than is often acknowledged. Those criteria it cannot satisfy—falsifiability, nonsubjectivity, and replicability—serve the overarching goal of appraising the truthfulness of claims, which scenario analysis cannot achieve. 7

In our example of the MSG process presented in the previous section, the cumulative knowledge of 21 experts was employed. Key assumptions brought into the process were based on their expertise. In the key assumptions check, the group together determined which assumptions to continue the exercise with, having to justify their selection with the use of evidence, including quantitative data. While data in itself is nonsubjective, the MSG relies on individual interpretation of evidence, as well as the interactive exploration of a group of participants, which makes it necessarily subjective. Accordingly, scenario exercises are also not replicable, as its results are arrived at through the interaction of a distinct group of experts at a distinct point in time. As time passes, new evidence appears and beliefs change, even the same group might arrive at different conclusions at a later point in time. As the results speak to the future, they are necessarily not falsifiable, although making key assumptions, drivers, and uncertainties transparent allows for discussions on their merit. As the previous section has shown, the scenario development process as applied in the presented example fulfilled Gerring’s next three criteria and was systematic, skeptical, and rigorous. The use of the STEMPLE-framework laid the groundwork for the integration of all imaginable dimensions of change. The assumptions- and coherence checks ensured that only plausible trends and combinations of trends are developed into scenarios. At last, the peer-review process validated the quality of the resulting scenarios, ensuring at the same time that they are grounded in rational arguments.

We thus observed that a rigorous application of the MSG contributes to its methodological quality, although some positivist criteria are impossible for it to satisfy. As already mentioned above, these—falsifiability, nonsubjectivity, and replicability—all serve the goal of appraisal, of which scenario analysis is incapable. 8 However, acknowledging the difficulty in appraisal should not disqualify scenario analysis as a methodology for IR since non-falsifiability is not uncommon in this field. Some of the most prominent theories employed in IR are hard to falsify and have nonetheless established themselves as reference points for large sections of social scientists, such as Weberianism, Marxism, or rational-choice theory (Gerring, 2011).

Moreover, scenario analysis excels at academia’s other goal: the discovery of new knowledge. Gerring (2011) already pointed out that both goals “are often in tension with each other” (p. 31). The more rigorous the methodological design, the more constraint must be put on the admissible evidence, limiting what researchers can hope to discover. Imagined on a spectrum between appraisal and discovery, scenario analysis would be far on the discovery end. As presented in the previous section, the iterative scenario development reveals hidden assumptions, challenges the status quo and makes explicit tacit knowledge of its participants (Ramírez & Wilkinson, 2016). It also counteracts biases, such as short-termism or linear thinking and enables constructive engagement with preconceptions. It thus helps reveal blind spots in our thinking and detect weak signals of change that might not yet express themselves empirically.

Furthermore, scenario analysis allows for a uniquely comprehensive causal reasoning. Applying the positivist framework of most traditional IR methods to our example, one could consider European security in 2030 as the dependent variable. It is determined by the key drivers, which constitute independent variables. The different combinations and values of the causal variables account for the variance of the dependent variable, consequently producing different scenarios. Thus, “a good scenario is an internally consistent hypothesis about how the future might unfold; it is a chain of logic that connects drivers to outcomes” (Bernstein et al., 2000, p. 54).

Also, the way a scenario plot is developed can be seen as a form of process tracing (Bernstein et al., 2000, p. 55). That is, projecting how a combination of certain key drivers can develop over time, what changes are expected to occur and identifying key events that might take place. Yet, in contrast to its traditional application in IR, process tracing during the scenario analysis pertains to the future, and not the past. For these reasons, we suggest the methodological admissibility of the MSG as an additional method in the toolkit of IR scholars.

Added-value of scenario analysis for IR scholarship

As Tomé and Açıkalın (2019) point out, in order to fill the gap between IR theory and real-world problems, “an increasing number of scholars have come to embrace a spirit of intellectual openness, recognizing both the need for greater flexibility in the theoretical formulations and the possibility of complementarity by other theories and approaches” (p. 12). This section discusses the added value of scenario analysis as a complementary approach to traditional IR methods. The most obvious advantage of scenario analysis as a methodology, grounded in the reservoir of foresight studies, lies by definition in its ability to tackle future events. As mentioned before, there are no specified instruments within traditional IR methods which would allow scholars to go beyond past and present. The only exception is forecasting, one of the formal methods in IR, which is, however, distinctly different from foresight. 9

The underlying logic of forecasting is to provide predictions about the future by drawing on mathematical models and big data-sets based on known patterns. Thus, it is not particularly suitable to accommodate discontinuities. Foresight, as described above, aims at going beyond existing patterns by developing alternative futures based on an innovative combination of multiple driving forces. Its goal is to capture a set of possible futures and learn from them by examining the causal relations between driving forces and their different evolutions. By applying scenario approaches, scholars can thus account for evolving dynamics and discuss such timely issues as the consequences of Brexit for both British and EU-security, economics and politics (Brakman, Garretsen, & Kohl, 2018; Martill & Sus, 2018; Musolff, 2017; Verschueren, 2017; Ziv et al., 2018). Yet, scenario analysis offers more than the possibility to talk about the future. We see a fourfold merit of adding scenario analysis to the range of methods applied by IR scholars.

Confronting enduring assumptions

As we presented in the previous section, the main feature of explorative scenarios, which are the subject of this paper, is to stimulate creative thinking by challenging the deeply held assumptions of their authors. In other words, this method is helpful for overcoming enduring cognitive biases—mental errors such as linearity, presentism, and group think caused by the subconscious and simplified information processing of humans (Heuer, 1999, pp. 111–112). Humans have the tendencies to focus on the present at the expense of the future and to think about the future in linear terms by extrapolating past trends into the future. As Gaddis (1992) points out, “we tend to bias our historical and our theoretical analyses too much toward continuity (…) we rarely find a way to introduce discontinuities into theory, or to attempt to determine what causes them to happen” (p. 52). Even if Gaddis does not explicitly mention scenarios, he refers to the concepts underlying scenario approaches (Han, 2011, p. 51). Scenario analysis attends to “deeper, otherwise left implicit, assumptions about continuous and linear patterns of development” (Wilkinson et al., 2013, p. 707). The process of scenario development invites the participants to reveal and question convictions which have so far remained unchallenged, and to question the linearity of world developments.

The ability of reexamining one’s own assumptions and going beyond linear patterns of development is essential for IR scholarship. To illustrate it with two examples: IR scholars and historians did not think that the Soviet Union could collapse and were startled by its fall, the peaceful resolution of the Cold War and the transformation of the bipolar system (Davis, 2005; Gaddis, 1992). In a similar vein, United States scholars were for decades so convinced of China’s economic, political, and cultural limitations that they neglected the possibility of its sudden ascent and were taken by surprise when it happened (Hundley, Kenzer, & Peterson, 2015). Interestingly, since the rise of China became evident, the United States debate on its future has been marked by a similar linearity of thought, leading to single-outcome predictions of China’s long-term future (Kerbel, 2004). In both cases, the discipline proved incapable of anticipating events of such importance, because scholars took for granted the status quo instead of confronting their bias towards linearity and detect manifestations of upcoming change. As a result, two major geopolitical surprises—the end of the Cold War and the rise of China have at first been neglected, forcing academia to catch up.

Against this backdrop, foresight helps IR scholars to exit the tunnel vision on world affairs and discover potentially valuable nonlinear lines of development. These can be both innovative in terms of scholarship, and policy-relevant by offering a reflection on unexpected discontinuities. Thus, it can facilitate the intellectual capability to think the unthinkable (Porter, 2016, p. 259).

Bringing forward new research questions

Scenario analysis starts with confronting one’s enduring assumptions and developing multiple causal possibilities, through which scholars can potentially discover topics that have not been examined before. One of the greatest challenges for any scholar is to identify innovative venues for research that might bring the discipline forward and advance publicity for one’s work. In Lakatosian terms, such an ability is often considered an evidence of a progressive research program. 10 Since the prime feature of scenario analysis is to detect rapid and significant shifts in trajectories, or the forces behind them, this method succors when defining new pressing topics for academia. In particular, as mentioned in the previous section, scenario analysis enables the detection of both weak signals and wild cards. By drawing attention to these hitherto overlooked but potentially pressing issues, scenario analysis can identify research agendas for further investigation (Barma et al., 2016). Therefore, scenario analysis seems to be the right tool to advance innovative research since it helps scholars drive their research into new areas, away from moribund topics that have been followed for many decades. By “identifying questions of likely future significance” (Barma et al., 2016, p. 6), scenario analysis can contribute to combatting the proliferation of researchers in fields occupying the political status quo, such as Soviet or Japan studies in the United States in the 1980s. At the same time, innovative research topics confront the uncertainties that are crucial for policy-makers to be monitored closely.

Dealing with the complexity and interdisciplinarity of real-world issues

Another added value of the scenario analysis for IR scholarship lies in its ability to provide comprehensive causal reasoning and thus to tackle complex issues. As mentioned in the introduction, the world’s complexity combined with abrupt shifts poses a challenge for IR scholarship. The possibility to accommodate multiple driving forces, to take into account different values they might take and finally to combine them with each other and see how they affect the dependent variable, makes the scenario approach quite unique. Traditional IR methods work with a limited number of independent variables, formulate and test hypotheses usually based on the relation between a single causal variable and the dependent variable. Investigating complex causal trajectories is therefore not possible. Against this background, we agree with Barma et al. (2016) and his colleagues who argue that scenarios are highly apt for dealing with complexity and uncertainty and providing academia with a tool for “actionable clarity in understanding contemporary global issues” (p. 1).

Moreover, the scenario approach helps to tackle the challenges of interdisciplinarity that is tied to complexity. By drawing on the active participation of people from different disciplines, backgrounds, and with different expertise in the scenario development process, it brings interdisciplinarity to the table by default. The key advantage of the approach is that this interdisciplinary conversation takes place prior to and during the research phase, rather than after it. This distinguishes the scenario approach from other methods that bring interdisciplinary perspectives together but do not facilitate a discussion between them, rather letting them passively co-exist. By exploring the dynamics between seemingly unrelated vectors of change (key drivers), scenario analysis can be useful for shedding light on developments that would have been overlooked by narrower research designs. In security studies, for example, scenario analysis can connect the dots between hard, soft, traditional and non-traditional understandings of security and capture the interplay of economic-societal-environmental and technological changes. Imposing interdisciplinarity also helps to counter the “hyper-fragmentation of knowledge” that “makes it difficult for even scholars in different disciplines to understand each other, much less policy-makers and general public” (Desch, 2015, p. 381).

Complex real-world issues that were tackled using scenario analysis include the Israel-Palestine conflict (Stein et al., 1998), Turkey’s geopolitical environment (Çelik & Blum, 2007), the prospects of the United States–China conflict (Friedberg, 2005) and the consequences of Brexit for EU foreign and security policy (Martill & Sus, 2018). An examination of these topics without the application of interdisciplinary approaches would not be possible precisely due to their multifaceted character.

Stepping out of the ivory tower

Finally, scenario analysis also enables IR scholars to establish a channel of communication with policy-makers other than conducting interviews for their own research or providing ad-hoc consultations. A participatory scenario process forges “deep and shared understanding between its participants” (Ramírez & Wilkinson, 2016, p. 21). In scenario workshops, academics and policy-makers work together, confront their world visions and assumptions and arrive at an agreement upon which they develop narratives for alternative futures. Hence, scenario analysis can be perceived as a tool towards more exchange between academia and policy-making that can contribute to a better understanding between the two worlds. For policy-makers, it provides the opportunity to consider long-term trends (an occasion not often found in the day-to-day nature of politics). For academics, it provides insight into which trends are most concerning for policy-makers, allowing them to check and ultimately enhance the relevance of their research agendas.

We acknowledge the difficulty to engage policy-makers in foresight exercises caused by their time-constrains and possible lack of interest. Yet, in our experience, this problem mostly refers to high-level policy-makers. Mid-level and former officials and policy-makers have more time and willingness to participate in foresight exercises and contribute equally valuable perspectives. The participatory character of foresight exercises facilitates the exchange of views from different stakeholders on an equal level. In our case, as the evaluation has shown, it has proven to be stimulating for each of the engaged groups.

Moreover, the policy dialogue benefits from scenarios’ accessibility to a broader audience. Scenario publications tend to be shorter and easier to read than the average academic publication and as Nye (2008) rightly notes “a premium on time is a major difference between the two cultures” of academia and policy-making. Since scenario publications are more suitable to the time- and attention-constraints of many policy-makers, they improve the accessibility of research findings for the policy world (Cairney & Kwiatkowski, 2017). An illustrative example is offered by a foresight exercise conducted by the Aspen Institute Berlin in 2017. A group of academics, think tank experts and policy-makers developed scenarios on the future of the liberal world order that served as raw material for a newspaper from the future titled “The Aspen Insight” and dated October 21, 2025. Not only did the presentation of the newspaper catch the attention of many Berlin-based policy-makers but the “The Aspen Insight” was also attached as a supplement to the Berlin daily Tagesspiegel, and reached more than 300,000 readers. 11

We acknowledge that the four aspects of the added value of scenario analysis for IR scholarship are interrelated and that their boundaries are not clear-cut. Yet, we believe, they highlight distinct benefits of this approach for academics that want to tackle the challenges of today’s world via their research.

Conclusions

The rationale of this article was to make the case that scenario analysis can be perceived as a social science method that enables IR scholars to systematically think about the future and to tackle challenges such as complexity and interdisciplinarity of world affairs. We began the article by discussing the existing complexity and uncertainty of the international order and by presenting growing demand for foresight studies. We observed that this demand is increasingly also directed at academia. Then, we introduced an example of how scenario analysis can be systematically executed and demonstrated why we think this approach can be recognized as a method according to the criteria for social science methodologies formulated by Gerring (2011). Finally, in line with scholars who argue that scenario analysis is a complementary resource for exploring surprising intersections of multiple variables and socio-political dynamics in international affairs (Barma et al., 2016; Han, 2011), we presented the added value of this approach to IR scholarship.

With this article, we want to inspire a debate on how foresight approaches, and scenario analysis in particular, can be used by IR scholars as complementary tools to the traditional methods. Yet, we would like to highlight one prerequisite condition for this reasoning: the rigorous execution of foresight approaches. For this, we suggested the MSG method. The accurate application of any foresight method—as with any traditional IR method—is essential for achieving an outcome that complies with academic standards. In doing so, academics can leverage the potential of this approach: confront their enduring assumptions; bring forward new research agendas; and reach out to the policy world. In other words, we believe scenario analysis can advance the adaptation of the IR discipline to today’s complex challenges.

In 2016, Flockhart argued in this journal that “[s]cholars and policy-makers should note that the coming multi-order world will be radically different, requiring new thinking and new institutions and the acceptance of diversity in both power and principle” (p. 4). Adding to this, we are convinced that an acceptance of unconventionality in methodological approaches is also needed in order to adapt to the dynamically changing international environment.

#### Blanket dismissal of the value of treaties is premature---they grant legal advantages that have empirically been used as a mechanism to reverse colonial violence.

Grossman 17 [Zoltán. Professor of Geography and Native Studies at The Evergreen State College in Olympia, Washington. 2017. Unlikely Alliances: Native Nations and White Communities Join to Defend Rural Lands. University of Washington Press]

The assertions of Native rights had created intense conflicts with rural whites in all these states, yet they were followed by some of the strongest environmental alliances seen anywhere in the country. Furthermore, the same Native leaders who had fought tooth and nail for tribal sovereignty were among the first to build bridges to their white neighbors, and the rural whites who least trusted outsiders were often those who built the bridge from the other side. Both sides had discovered that their own bonds to the land were shared more by the “Other” that had contested it than by the jaded and disengaged majority of North Americans. For the first time in over a century, tribal influence was being projected outside reservation boundaries, both to harvest and to protect natural resources. Since the 1974 Boldt Decision, Washington tribes have redefined the Salish Sea and the Pacific Coast as a common home of Indians and non-Indians, where decisions have to be made together in order for the fish to survive. In Oregon, the Umatilla Tribes used their treaty to successfully assert their water rights and bring back a fishery previously feared extinct. The removal of fish-blocking dams in Klallam and Klamath ceded territories likewise would have been impossible without treaty rights. When Wisconsin and Montana tribes enhanced their environmental regulations, under the federal Treatment as State program, they could use them to block harmful projects near their reservations. Gaming income also enabled some tribes to resist mines and to reach out to white neighbors with employment and cultural programs. These tribal powers have begun to blur the boundaries between the reservations and border towns and make them a zone of cultural and economic mixture rather than solely confrontation. Social tensions, and sometimes violence, obviously continue between Native and white neighbors, and the groups still see view the other as “in place” either on the reservation or in the border town. But this process is only beginning, after centuries of white domination. Some barriers will be difficult to break down, and some will need to stay in place to safeguard tribal sovereignty, as Native nations feel more confident in asserting their powers again in their ceded lands. In general, the places with the strongest assertions of treaty rights are where the later environmental alliances were strongest. In the early 1970s, the Lakota and Northern Cheyenne were engaged in some of the most heated land rights and water rights conflicts anywhere in the country, yet in the late 1970s they built the country’s earliest environmental alliances with white ranchers. Lac du Flambeau and Mole Lake assertively pursued spearfishing in the late 1980s, yet these two tribes had the greatest success in joining with white neighbors to stop mining proposals. In places where an initial conflict was prevented or did not occur, the environmental collaboration with white neighbors was not as fully developed. The Lac Courte Oreilles Band pursued an accommodationist strategy, after its treaty victory in the courts, but its anti-mining alliance did not strongly benefit. In Oregon, Warm Springs cooperated with local ranchers and state agencies in the 1990s, but confronted the Nestle water bottling company in the 2010s.1 In more highly developed cases (such as Umatilla and Menominee), treaty conflicts and environmental-economic cooperation were interwoven into a single tribal strategy. Umatilla leaders creatively mixed a confrontational approach around water allocation with a cooperative approach around enhancing water flows, asserting treaty rights to protect the resources for everyone. A Menominee office worked both on fishing rights and on protecting the fish from mining. The conscious mixing of particularist and universalist strategies gave the tribes a greater chance to set the agenda and to fluidly maneuver into place-based relationships. And of course in a number of cases, relations remain tense between environmentally minded tribes and anti-environmental whites. Right-wing propertyrights movements often view both tribes and environmentalists as their enemies and assert their “sense of place” to exclude them. In other cases (such as Navajo, Crow, Uintah-Ouray, and FortBerthold), tribal governments have taken a strong stand for fossil fuel development, so the only option for a (complicated) alliance is between tribal dissidents and non-Native environmentalists. In a few instances, a positive Native/non-Native relationship developed without much of a prior conflict. The Sweetgrass Hills in Montana, where tribes and white farmers stopped a gold mine project, are perhaps too far from reservations to have been the scene of a conflict. The Wallowa Valley in Oregon also was too far from Nez Perce reservations to have been the point of conflict, at least since the forced expulsion of the tribe in the 1870s. Но-Chunk and Wisconsin farmers similarly were npt in intense conflict in the late twentieth century, though resentment surfaced during the Kickapoo Valley and Sauk Prairie land claims. It may indeed have been this lack of contact that caused the alliance against military flight and bombing range expansion to split in the mid-1990s and increased contacts that caused the later alliances against springwater pumping and frac sand mining to grow. The Native/non-Native alliances demonstrate that particularism and universalism are not necessarily in contradiction. Although a strong assertion of Native identity may in the short run create conflicts with the majority white community, in the long run it can set the stage for greater cooperation, but only under certain conditions. While the case studies each have unique profiles, they also share some important patterns. These patterns may be caused by communication between the different areas, as one group is inspired by the success of another group in defending treaties and forming alliances. The patterns can also help explain why and how the alliances are formed and, in so doing, can provide some more general insights into reconciling cultural identities with cross-cultural goals. Three conditions seem to be necessary for the successful formation of a Native/non-Native environmental alliance. Each of these conditions can take multiple forms, and each of the possible forms does not have to be completely developed, but at least needs to be recognized and addressed for an alliance to get off the ground. They are a sense of common place, a sense of common purpose, and a sense of common understanding. COMMON S E N S E OF P LAC E The most successful of the alliances were born out of a common “sense of place.” The geographic setting of the environmental issue, and the hold that the landscape has on the Native and non-Indian neighbors, literally helps build common ground. A sense of place can be shaped by harvesting and other activities, cultural and familial heritage, personal emotional and cognitive experiences, and social connections.2 Even after an alliance is no longer needed, it can leave a legacy in increased public understanding of Native land ethics. Improved cultural education is not simply a means of building an alliance, but is largely a result of successful alliances. The geographic setting clearly affected the outcome of all the case studies. Native Americans and rural whites may be more likely to be bonded in defense of a landscape that both groups perceive as “sacred” or “significant”— such as the Black Hills, the Wolf River, or the Salish Sea— rather than a landscape where one or both groups see mostly economic potential. As Lakota activist Bill Means observed in South Dakota, the sacred resource of water became the “source of understanding” between tribes and white neighbors.3 Yet in other cases, as in the Klamath Basin and the Skagit Valley, tribal water rights remained a source of conflict. The proximity of a reservation to the environmental threat, and whether it is downstream, influenced the outcome of most case studies. Court-affirmed treaty rights could put the tribe in a position of co-manager of off-reservation natural resources, as at Nisqually. At Northern Cheyenne and Mole Lake, treaty rights were not as effective in protecting the reservation environment as federally backed Treatment as State status was. At Но-Chunk and Standing Rock, geographic “shell games” burdened Native residents with greater harm. The landscape can serve as a unifying concept that transcends divisions between communities. In Wisconsin, sportfisher Herb Buettner remembered speaking with Menominee tribal leader Hilary Waukau about the “truths” of the Wolf River, and, conversely, Ojibwe activist Walt Bresette recalled speaking with white farmers. Bresette commented: “They identified with us, showed respect\_\_\_ They showed they loved the Earth as much as the Anishinaabe, by the way they lived.”4 Alliances around rural environmental issues appear to be stronger if they involve rural neighbors, rather than rural people cooperating with a group located in an urban area. In Minnesota, rural whites— in an area with very few Native people—worked with urban Native groups to stop a power line in the late 1970s.5 Mdewakanton Dakota tribal members also worked with urban white environmentalists to stop nuclear waste storage next to the Prairie Island Reservation in the early 1990s.6 Both groundbreaking movements used sophisticated organizing strategies and helped to lessen racial divisions, but [[IMAGE OMITTED]] they did not establish a sense of a local bicultural place and— perhaps not coincidentally—were both also defeated by the electric utilities.7 In the Montana movement against gold mining, the alliance between Fort Belknap and urban environmental groups did not fare as well as the Sweetgrass Hills alliance that united tribes and local white farmers and ranchers. A locally based rural alliance is able to claim a defense of the place against outside interests more effectively than a purely urban-rural alliance, and frontline voices are more compelling in public relations strategies than staff members of urbanbased environmental groups. Cultural education is a possible by-product of the alliances, and a lasting cultural impression can alter relationships. Wolf River sportfisher George Rock said: “Things we’ve gained from knowing who people are will not go away.... When you work with people, you don’t just work on the issue.” Rock stated that his family “didn’t appreciate Mother Earth, or the concept of the Seventh Generation,” which he learned from Native people.8 Menominee judge Louis Hawpetoss expressed amazement at meeting sportfishers such as Rock and noted: ‘“Seventh Generation’just rolls off their tongues. I’ve never heard non- Native people talk like that.”9 The alliance building went beyond environmental goals into shifting cultural attitudes. In Wisconsin, Wolf River-area residents began a program to reintroduce wild rice to their off-reservation lake, and in South Dakota and Nebraska, ranchers participated in round dances and learned how to protect sacred burial sites on their property. At Umatilla and Lac du Flambeau, non- Indians were educated through new museums and cultural programs founded in the midst of crisis. South Dakota white ranchers joined Lakota in demanding that white youths be prosecuted for murdering a Lakota man in Sturgis.10 An alliance that begins to alter white views of Native cultures, and to improve the image of local whites in the eyes of Native residents, has greater potential than an alliance that limits dialogue to the environmental threat. Each alliance takes the relationship forward through mutual education. Even if the relationship recedes after the alliance, it generally does not return to the previous status quo. This pattern of “two steps forward, one step back,” highlighted in the South Dakota case study, can be seen in many of the alliances as they succeeded each other over the decades. COMMO N SENSE OF PURPOS E Second, the alliances are often born out of a common “sense of purpose,” or the idea that Native Americans and rural whites are in it together to meet their legal, political, or economic goals. Tribes that have enhanced their legal powers through treaty or sovereignty struggles are looked upon by many neighbors as possessing powers to protect the land. Corporations and uncooperative state and federal agencies provide ready-made common enemies for both communities. Tribal gaming can help strengthen relationships, by giving Native nations the financial resources to carry on the fight and to build influence in previously impenetrable circles, but it is not necessary. Tribal legal powers are perhaps the mostly commonly cited reason by rural whites for building ties with a Native nation. The tribe’s treaty and sovereign rights provide legal “clout” or “aces to play” that ordinary U.S. citizens do not possess. The first phase of the Crandon mine struggle, in 1976-86, saw the tribes and rural whites both opposing the mine on parallel tracks without close cooperation. After the treaty rights struggle, the second phase of the Crandon fight began in 1992 with the tribes in a stronger position on treaty rights. In Wisconsin, Sonny Wreczycki praised the role of “sovereign governments protecting our waters . . . doing better than the federal government.”11 Town of Nashville resident Tom Ward similarly credited Mole Lake’s “no compromise stance” as providing a stronger barrier against unwanted mining than the compromise-oriented stance of many white environmentalists.12 A1 Gedicks saw treaty victories as showing that the Ojibwe “are not about to back down, not going to be intimidated.”13 One negative aspect of this attitude was pointed out by Wisconsin treaty activist Debra McNutt. White people are once again “using” something owned by Native Americans, in this case treaty or sovereign rights, for their own ends— to stop a project that may threaten their livelihoods.14 Author Naomi Klein agrees that “it has to be more than an extractive relationship to those rights: ‘those rights are useful to us, because they help us protect our water, so we want to use those rights’— that’s exactly the wrong way of thinking about this.”15 Perhaps cynical non-Indian exploitation of tribal powers is inevitable, yet in some places this exploitation has also been made into a reciprocal deal. Non-Indians continue to “use” treaties to further their environmental goals, as long as Native people and their supporters can also “use” environmental issues to deepen public understanding of Indigenous self-determination and cultures. But in most alliances, the rural whites who at first exploited tribal powers later came to realize the value of those powers on their own merits. As Klein concludes: “These are rights that come out of a vision of how to live well, that were hard-won and hard-protected, and they point us toward a nonextractive regeneration-based way of living on this planet. That is the most hopeful and exciting part of this new wave of activism.”16 Common political adversaries are a necessary basis for an alliance. The most obvious “common enemy” is the corporation or agency that is planning a harmful project, but similar historical experiences also resonate. Но-Chunk tribal representatives in Wisconsin, for example, often compared the dispossession of white farmers for military or dam projects with their own expulsion from the same land a century before. A stance against racist anti-Indian organizations can also mobilize non-Indian support for tribal environmental regulations. Even a common wariness of urban-based environmental groups can be a point of agreement between Native and white rural neighbors. The role of ostensibly “neutral” government agencies often invites mistrust from Native and rural white groups, even if for different reasons. Hawpetoss, a Menominee environmentalist, recalled that “mistrust” of the Wisconsin Department of Natural Resources “brought us together” with angling groups, much as tribes and fishing groups in the Columbia and Klamath Basins often expressed a common mistrust of state and federal agencies.17 If tribal and local [[IMAGE OMITTED]] governments begin to see eye-to-eye, or even if a few local white officials shift racist patterns, cooperation can begin to flourish. A consistent message from both Native and white organizers is that an alliance is best built at the grassroots, rather than only between government officials. The experience of being in the opposition serves as a bond between community organizers. Whether the movements oppose a mine or a pipeline, they can help redirect white anger away from their Native neighbors and toward distant institutions. Economic equalization can even the playing field between rural Native and white residents. In Wisconsin and Washington, new casinos were beginning to generate new income just at the time that environmental alliances were founded. As recently as the 1980s, reservations were economically dependent on white border towns, yet the former anti-Indian protesters were employed at some casinos by the 2000s. Gaming income gave tribes access to technical expertise, public relations and lobbying resources and respect in the local business community. Wreczycki observed that local whites got to know the Mole Lake community “better when the casinos opened.”18 Yet even within successful tribal gaming states such as Wisconsin and Washington, only a handful of tribes were located close to population and tourism centers. Overstating the role of gaming revenue in the alliances overlooks the tribal cultural renaissance.19 In Montana, South Dakota, and especially Nevada, non-Indian gaming was far more pervasive than small and isolated tribal enterprises. COMMON SENSE OF UNDER STANDING Third, the alliances emerge out of a common “sense of understanding.” They sometimes are created in the process of mediating a conflict between reservation and off-reservation communities, as a conscious method of making connections. In this scenario, a certain type of cooperation can be seen as an outgrowth of conflict, to put tribes on a more equal footing with the white community. Conflict management may prove to be a result of building an alliance, but it may also be an initial reason for building the alliance in the first place. A few of the alliances, such as in Washington State, the Klamath Basin, and around Menominee, were directly born out of discussions to settle Native/non-Native resource conflicts. The conflict forced key players to sit down at the table, where they discovered their common concerns for the natural resources. Had tribes not strongly asserted their rights, the rural whites may not have sat at the table to begin with. An alliance, however difficult to form, can also be viewed as a welcome diversion from racial strife. As Bill Means observed in South Dakota: “A lot of education takes place in areas of conflict. . . both sides back up their claims with documentation.. . . It increases understanding.”20 “We can find lots of reasons not to cooperate,” said Wisconsin angler Herb Buettner, “but we have to overcome those differences.” 21 After years of frustration at the epicenter of the Ojibwe spearfishing conflict, Wisconsin schoolteacher Carolyn Parker welcomed anti-mining sentiment as an “opportunity to build an alliance over anything”22 Building a bridge is perhaps the primary visible aspect of building an alliance. The initial bridge between two communities is almost always built by key individuals whose social positionality brings them into contact with both groups, and in the process they get stepped on a lot. The “middle person” has apersonal or family history in contact with the other group and is in aposition to confront the prejudice that surfaces. In general, Native Americans tend to have more experience and knowledge of white communities than whites have of Native communities. The key individuals, then, tend to be those few whites who have had some prior contact with the tribal community. In Wisconsin, Carolyn Parker taught at the Lac du Flambeau school, Bob Schmitz cad died with Oneidas at a golf course, and Dorothy Tyra was a nurse who served tribal members. In Montana, Mert Freyholtz owned a pawn shop near three reservations, and in Nevada, Native ranchers and ranch hands worked with white ranchers. The cross-cultural inviting and trust building was carried out by these individuals and then expanded to the wider communities. A significantminority is all that is really needed to break a preexisting anti-Indian consensus, though it is difficult to form a pro-tribal consensus without majority support, as sometimes appears now in Washington State, Political equalization can be strengthened through conflict. Violent treaty conflicts in Washington and Wisconsin, or even armed standoffs in South Dakota, did not prevent environmental cooperation with the white community. Some of the most assertively pro-treaty Native activists, such as Billy Frank Jr. and Joe DeLaCruz in Washington, Gail Small and Jim Main in Montana, Bill Means and Faith Spotted Eagle in South Dakota, and Walt Bresette and Louis Hawpetoss in Wisconsin, initiated much of the cooperation with their rural white neighbors. Their “carrot-and-stick” approach sought to address past injustices and make real changes in the present, to move toward a more positive future. The strong assertion of Native rights opened up possibilities that would not have existed had the relationship remained stable and unequal. With no incentive to listen to their Native neighbors, whites would have had little reason to find common ground. With an unequal relationship with their white neighbors, the Native residents would have little incentive to collaborate with them. Mere “unity” is not enough, since a unity between unequal partners is generally short-lived. True “unity” has the prerequisite of a process of political, economic, and cultural equalization, to set the stage for an alliance based on a relatively more level playing field. It is not a matter of waiting for full Native self-determination, or the end of capitalism, but for the process of decolonization to be moving forward and not stagnating or regressing. A politically passive Native community that does not assert its rights faces the risk of being patronized as “good Indians” by non-Indian governments and of being perceived as politically weak partners by non-Indian communities. Cooperation would have certainly been possible without prior conflict, and conflicts do not inevitably lead to collaborative projects. But certain conflicts— in a particular form and met with a particular response— serve as an embryo from which cooperation can be born. The conflict should have the component of building bridges in the midst of fighting— a conscious effort by Native and non-Native leaders to find common goals. A P P L Y I N G THE CONDI TI O NS It appears that all three of these senses— of a common place, purpose, and understanding— are to some extent necessary preconditions for a successful alliance. These ingredients do not have to be equal in intensity, but they should be deciphered on their own merits. A common sense of place without a common purpose may lead, at best, to joint cultural festivals or ecotourism programs, but not to political unity or action. Many regions have programs to educate non-Indians about Native cultures. Some of these efforts (such as in the Wallowa Valley) try to combine Indian and non-Indian versions of local history. Yet in other cases, these programs have not been politicized and so have not defused white anger or refocused it on an outside enemy. At worst, a strongly held common sense of place without a common sense of purpose or understanding could fuel conflict. A sense of a common purpose without a sense of a common place may create temporary political alliances against a common enemy. But these alliances may not always build a lasting convergence between insiders defending their positive vision of the place. The Black Hills Alliance, and the Cowboy Indian Alliances, had dramatic success in blocking resource corporations. Yetbecause a strong “insider” sense of place has not been shared by Lakotas and white ranchers, the success has not translated into widespread white support for the Black Hills treaty claim. A sense of a common place or purpose without a sense of a common understanding may provide the objective conditions for an alliance, but not the conscious leadership necessary to set it in motion. Native and non-Native neighbors may share a strong appreciation of the place and seek to defend it from unwelcome intruders, but that does not mean that they will defend the place together. In the first phases of the Crandon and Penokees mine battles, Wisconsin tribes and white neighbors defended the watershed from mining companies, but on parallel tracks with little cooperation. In southern Wisconsin, the Но-Chunk and white farmers never had such a recent conflict and so were never forced into dialogue. A common sense of understanding without a common sense of place or purpose, or both, can also emerge out of a conflict. The Native and non-Native communities may consciously realize that they need to build bridges between them, but lack the materials to build such a bridge. Without a common sense of place, they cannot begin to define the local landscape as a common home. That may be one reason that alliances are more difficult to construct in urban areas with more mobile demographics. Without a common sense of purpose, they cannot construct an insider identity to confront an outside threat. State-sponsored negotiations between Native and non-Native communities (such as in South Dakota and Montana) sometimes appear to promote reconciliation for its own sake. Such efforts try to weaken ethnic or racial identities, rather than try to promote a real shift in power relations. The “reconciliation” strategy is in keeping with state views of Native sovereignty as a threatening form of “nationalism” that has to be reduced from an anti-colonial struggle to a mere demand for racial “minority rights.” Anti-Indian leader Elaine Willman reinforces this view by describing Native sovereignty as a dangerous parallel to “Middle Eastern tribalism.”23 Pentagon counterinsurgency doctrine targeting “tribal regions” around the world similarly include Indigenous movements in a “global war on tribes.”24 A MORE UNI V E R S A L I S T N A T I O N A L I S M ? Even some progressive scholars and activists minimize or dismiss local cultural resistance as an example of an intolerant, exclusive nationalism, which overlooks working-class unity or ignores global economic structures that shape local realities.25 Indigenous peoples are sometimes told that if they only look out for their own liberation, they will miss the “bigger picture” that can make fundamental change. There is a certain amount of truth that by jettisoning universalism in favor of particularism, “narrow nationalist” movements are not interested in a broader liberation of humankind from capitalist structures. Yet universalist movements that downplay cultural resistance are also limiting their options. As Black Consciousness Movement leader Steve Biko pointed out in the 1970s, South African blacks needed to build their own political confidence, cultural self-esteem, and economic institutions, before blacks and whites could truly unite as equals.26 As the poet Aime Cesaire wrote in 1956: “I’m not going to confine myself to some narrow particularism. But I don’t intend either to become lost in a disembodied universalism\_\_I have a different idea of universal. It is a universal rich with all that is particular, rich with all the particulars there are, the deep ening of each particular, the coexistence of them all.”27 Black Studies scholar George Lipsitz agrees that in an interconnected world, “there is no 'universal’ that is not actually the project of some dominant particular, and there is no ‘particular’ that exists outside of the totality of social relations.”28 Indigenous movements rarely face a stark either-or choice between particularist “identity politics” and universalist “common ground.” In many countries, such as the Philippines, Indigenous and leftist rebels have united to oust dictators and halt corporate megaprojects.29 Other creative Native movements interweave their own liberation with appeals to the larger working class, particularly in Indigenous regions of “Latin” America.30 These alliances include people joining together or finding common ground: Ecuadoran Indigenous peoples with workers and farmers, Guatemala Indigenous with poor Latinos, Bolivian Indigenous peoples with other farmers and miners, Brazilian Amazon Indigenous people with rubber tappers, Indigenous activists and striking teachers in Oaxaca, and the Zapatista movement in Chiapas with the mestizo poor.31 Huge crowds cheered a 2001 Zapatista caravan in Mexico City, showing that the insurgents’ message resonated beyond their Mayan heartland. Zapatista subcommander Marcos proclaimed: “The march for indigenous dignity must be a march of indigenous and non-indigenous. Only thus can we build a house called the world in which all of us fit, where all are equal and each one different.”32 In these instances, the particularist demands of Indigenous peoples did not contradict larger universalist demands for a socio-economic shift away from capitalism but instead complemented or even enhanced them. Because of their histories, the most oppressed groups are in a favorable position to lead national movements for change.33 They have the least emotional investment in the colonial culture, are less naive that the elite had the best interests of the people at heart, and are generally less willing to compromise with state institutions. In short, they have less to lose and more to gain than their allies do. Native/non-Native alliances are small-scale versions of these collaborations, in which Indigenous nations take a leading role in fighting not only for their own powers but for larger changes that strengthen the whole society. Native movements in North America are on the cutting edge in environmental and economic change, as dramatized by Idle No More and Standing Rock. They generally insist not on reclaiming the private property of white landowners— even if such a claim would be justified— but on ensuring that the land-based cultures of both Native and non-Native peoples can survive and prosper into the future. Tribes’ legal and political rights are serving as tools to reframe economic and cultural relations. Even if they had the power to exclude non- Indians, many Native activists claim, they would prefer to work together with them to protect land-based lifeways. They pose Indigenous sovereignty as carving out space for the application of universalist values. The roots and histories of Native sovereignty movements differ from those of the “exclusivist” right-wing nationalism and sectarianism that has torn apart regions of Europe and Asia.34 Native national self-determination emerged not out of a feudal past or modernity but out of the colonial encounter and “interaction” with white-supremacist settler colonial states.35 Indigenous precolonial societies also had generally more egalitarian economic structures than the hierarchical European societies they confronted. Karl Marx and Friedrich Engels even read U.S. anthropologist Lewis Henry Morgan’s studies of Haudenosaunee (Iroquois) society for clues into what a relatively classless society may look like.36 Glen Coulthard asserts that contemporary Indigenous demands are “based on an articulation of reciprocity which rendered not only colonial domination but also capitalist domination over the natural world as profoundly harmful and wrong. When that’s the cultural base that you’re making a claim to defend, it’s profoundly anticapitalist and anticolonial.”37 In addition, Indigenous movements treat the land and water as the source of all life, rather than life only for the human beings of their own nation. The modern Native interest in defending their political boundaries is a reaction to the sovereign state system— to build a hard “outer shell” to protect Native lifeways from state control. It remains to be seen what role non-Indians would have on reservations and reclaimed Native lands in the future. They could be seen as a continuing threat or allowed under the condition that they not usurp Indigenous governance or cultures (much like ethnic Russians in the Baltic states). The Institute for the Advancement of Hawaiian Affairs, for example, has issued the “Settler’s Code of Conduct” requiring a commitment to awareness, fairness, and action.38 Native movements have also developed a strong universalist commitment to an ecologically sustainable future, such as responding to the threat of climate change to all species, including human beings. Indigenous movements can point out possible paths that differ from paths taken by nationalists around the world. Oppressed nations can free themselves, while at the same time appealing to some citizens of the oppressor nation that they may have some common interests. The unlikely environmental alliances are only one example of how a movement for national self-determination can make this appeal. L E S S O N S OF THE A L L IA N C E S These unlikely alliances may seem to some outside observers like a “man-bitesdog” story— an exotic exception to the normal realities of Native-white conflict. They not only can more effectively defeat environmental threats than racially divided movements can. Some alliances also can claim success by extending cooperation beyond the environmental issue and having that convergence last after the immediate threat recedes. The stories of Native/non-Native alliances are replete with seemingly contradictory lessons. Native and non-Native neighbors have constructed relationships most effectively at a local grassroots scale, but only after tribes have used the national (federal) scale to shift local power relationships. They have constructed a territorial place as common ground, but only after tribes have strongly asserted their social claim to belong on that ground. They have built geographies of inclusion, but only after tribes have convinced local whites to exclude other outsider whites. Finally, they have emphasized universalist environmental values, but only after tribes have begun to uphold their particularist cultural identity. Again paraphrasing Frederick Douglass: the ground of conflict had to be plowed up before the crops of cooperation could be harvested.39 The experience of the Cowboy Indian Alliance revealed another important contradiction. In order to build an effective alliance against corporate dispossession of their land, white ranching families had to begin to understand and deal with their own history of dispossessing Indigenous land and renegotiate the meaning of home with their Native neighbors. As Scott L. Morgensen asks: “What does it mean for non-Natives. . . knowing one feels at home only to the degree that others remain dispossessed [and] being accountable to histories of Native displacement by questioning one’s sense of place?”40 Although the phenomenon of Native/non-Native alliances is relatively recent in U. S. history, and this study examined only a few dozen examples, some general trends cut across the case studies. These criteria can be used to judge the success of an alliance, though they should be taken as general observations rather than a set of hard rules. First, alliances seem to be more successful if they emphasize building grassroots rather than only institutional relationships. The “bottom-up” alliances are able to involve members of the community, rather than simply their leaders or government officials. Although “top-down” relationships can help to set a positive political tone and example to the society, they cannot substitute for social and cultural interaction between community members and can even generate resentment at the base of society. To achieve lasting success, state/ tribal resource co-management structures need to be matched by cooperation among the Native and non-Native resource users, as seen in emerging watershed councils. Grassroots oppositional alliances also need to make some changes at the top of society, in government circles, or their best intentions will probably be frustrated by bureaucracies and ambitious politicians (as happened in the Klamath Basin). A parallel track of governmental relations and grassroots community relations is the most effective strategy. Second, alliances seem to be more successful if they emphasize local place identity, rather than only state citizenship. The point of Native sovereignty is for Indigenous nations to be able to govern themselves outside the confines of non-Indian governments. Instead of waiting for official “recognition” from a state apparatus, Indigenous nations can themselves recognize and designate their own-potential partners. The United States and each of its component states are too geographically large and socially impersonal as places to build positive relationships. They also carry the baggage of centuries of white supremacy and of the exclusion of Native voices and powers. It may be easier to reframe a local or subregional place— at the human scale of the Umatilla Basin, Black Hills, Tongue River Valley, or Salish Sea— as an inclusive place of convergence. Instead of appealing to a common U.S. citizenship, with all of its boundaries and limitations, alliances can begin to define a place membership, appealing to people’s attachment to their local geography. Third, alliances seem to be more successful if they define this local place in territorial and inclusive terms, rather than in social and exclusive terms. Using a territorial definition, “Indian Country” extends far beyond the reservation boundary, and rural whites can view the reservation as part of a common and valued home, based around a natural region. Outsiders who do not share the value of home can be excluded, but those who do value the place can be recast as insiders. The geographies of inclusion define a local, cross-cultural territorial area as the home of all who live there, despite political boundaries that cut across the landscape. Fourth, alliances seem to be more successful if they recognize and respect particularist identity differences among their members, rather than if they only promote an overarching universalist message. Unity around common goals cannot succeed in the long run unless different groups in the alliance gain roughly equal resources and powers. The assertion of difference does not [[IMAGE OMITTED]] have to stand in the way of unity and can actually make a convergence more attainable. In the regions where Native nations most strongly asserted their rights, they were able to offer rural whites new ways of valuing the local place and new tools to defend it. An alliance can be divided and conquered if its white members succumb to outsider appeals to their self-interest, or it can be strengthened if the rural whites remain loyal to their Native partners. Though it may seem difficult, or even impossible, to reconcile cultural differences with intercultural similarities, these alliances have just such a combination as the centerpiece of their relationships. As a Lummi totem pole was being erected in Billings, Montana, on the Lummi Nation’s Treaty Day, January 22, 2016, Montana rancher Jeanie Alderson declared: “Solidarity is awkward and hard, but there is dignity and strength in our differences. Our unity makes us stronger.”41 When Lummi blocked the Cherry Point coal terminal that year, Chairman Tim Ballew II credited the “power of treaty rights to protect all of us, to preserve our lands and waters for everyone who calls this place home.”42 This interweaving of particularism and universalism is not simply a matter of initiating dialogue or conversations between different communities. It is also a matter of constructing grassroots relationships around a place, remaking that place into an inclusive home, and correcting the historic wrongs that had made the place less than a secure home. It is a matter of creating empathy and solidarity to replace the oppression and entitlement of settler colonialism, and moving toward decolonization on the ground.

### AC – Framing

#### I value morality, the standard is maximizing wellbeing. 2] Extinction outweighs---it’s the upmost moral evil and disavowal of the risk makes it more likely.

Burns 2017 (Elizabeth Finneron-Burns is a Teaching Fellow at the University of Warwick and an Affiliated Researcher at the Institute for Futures Studies in Stockholm, What’s wrong with human extinction?, <http://www.tandfonline.com/doi/pdf/10.1080/00455091.2016.1278150?needAccess=true>, Canadian Journal of Philosophy, 2017)

Many, though certainly not all, people might believe that it would be wrong to bring about the end of the human species, and the reasons given for this belief are various. I begin by considering four reasons that could be given against the moral permissibility of human extinction. I will argue that only those reasons that impact the people who exist at the time that the extinction or the knowledge of the upcoming extinction occurs, can explain its wrongness. I use this conclusion to then consider in which cases human extinction would be morally permissible or impermissible, arguing that there is only a small class of cases in which it would not be wrong to cause the extinction of the human race or allow it to happen. 2.1. It would prevent the existence of very many happy people One reason of human extinction might be considered to be wrong lies in the value of human life itself. The thought here might be that it is a good thing for people to exist and enjoy happy lives and extinction would deprive more people of enjoying this good. The ‘good’ in this case could be understood in at least two ways. According to the first, one might believe that you benefit a person by bringing them into existence, or at least, that it is good for that person that they come to exist. The second view might hold that if humans were to go extinct, the utility foregone by the billions (or more) of people who could have lived but will now never get that opportunity, renders allowing human extinction to take place an incidence of wrongdoing. An example of this view can be found in two quotes from an Effective Altruism blog post by Peter Singer, Nick Beckstead and Matt Wage: One very bad thing about human extinction would be that billions of people would likely die painful deaths. But in our view, this is by far not the worst thing about human extinction. The worst thing about human extinction is that there would be no future generations. Since there could be so many generations in our future, the value of all those generations together greatly exceeds the value of the current generation. (Beckstead, Singer, and Wage 2013) The authors are making two claims. The first is that there is value in human life and also something valuable about creating future people which gives us a reason to do so; furthermore, it would be a very bad thing if we did not do so. The second is that, not only would it be a bad thing for there to be no future people, but it would actually be the worst thing about extinction. Since happy human lives have value, and the number of potential people who could ever exist is far greater than the number of people who exist at any one time, even if the extinction were brought about through the painful deaths of currently existing people, the former’s loss would be greater than the latter’s. Both claims are assuming that there is an intrinsic value in the existence of potential human life. The second claim makes the further assumption that the forgone value of the potential lives that could be lived is greater than the disvalue that would be accrued by people existing at the time of the extinction through suffering from painful and/or premature deaths. The best-known author of the post, Peter Singer is a prominent utilitarian, so it is not surprising that he would lament the potential lack of future human lives per se. However, it is not just utilitarians who share this view, even if implicitly. Indeed, other philosophers also seem to imply that they share the intuition that there is just something wrong with causing or failing to prevent the extinction of the human species such that we prevent more ‘people’ from having the ‘opportunity to exist’. Stephen Gardiner (2009) and Martin O’Neill (personal correspondence), both sympathetic to contract theory, for example, also find it intuitive that we should want more generations to have the opportunity to exist, assuming that they have worth-living lives, and I find it plausible to think that many other people (philosophers and non-philosophers alike) probably share this intuition. When we talk about future lives being ‘prevented’, we are saying that a possible person or a set of possible people who could potentially have existed will now never actually come to exist. To say that it is wrong to prevent people from existing could either mean that a possible person could reasonably reject a principle that permitted us not to create them, or that the foregone value of their lives provides a reason for rejecting any principle that permits extinction. To make the first claim we would have to argue that a possible person could reasonably reject any principle that prevented their existence on the grounds that it prevented them in particular from existing. However, this is implausible for two reasons. First, we can only wrong someone who did, does or will actually exist because wronging involves failing to take a person’s interests into account. When considering the permissibility of a principle allowing us not to create Person X, we cannot take X’s interest in being created into account because X will not exist if we follow the principle. By considering the standpoint of a person in our deliberations we consider the burdens they will have to bear as a result of the principle. In this case, there is no one who will bear any burdens since if the principle is followed (that is, if we do not create X), X will not exist to bear any burdens. So, only people who do/will actually exist can bear the brunt of a principle, and therefore occupy a standpoint that is owed justification. Second, existence is not an interest at all and a possible person is not disadvantaged by not being caused to exist. Rather than being an interest, it is a necessary requirement in order to have interests. Rivka Weinberg describes it as ‘neutral’ because causing a person to exist is to create a subject who can have interests; existence is not an interest itself.3 In order to be disadvantaged, there must be some detrimental effect on your interests. However, without existence, a person does not have any interests so they cannot be disadvantaged by being kept out of existence. But, as Weinberg points out, ‘never having interests itself could not be contrary to people’s interests since without interest bearers, there can be no ‘they’ for it to be bad for’ (Weinberg 2008, 13). So, a principle that results in some possible people never becoming actual does not impose any costs on those ‘people’ because nobody is disadvantaged by not coming into existence.4 It therefore seems that it cannot be wrong to fail to bring particular people into existence. This would mean that no one acts wrongly when they fail to create another person. Writ large, it would also not be wrong if everybody decided to exercise their prerogative not to create new people and potentially, by consequence, allow human extinction. One might respond here by saying that although it may be permissible for one person to fail to create a new person, it is not permissible if everyone chooses to do so because human lives have value and allowing human extinction would be to forgo a huge amount of value in the world. This takes us to the second way of understanding the potential wrongness of preventing people from existing — the foregone value of a life provides a reason for rejecting any principle that prevents it. One possible reply to this claim turns on the fact that many philosophers acknowledge that the only, or at least the best, way to think about the value of (individual or groups of) possible people’s lives is in impersonal terms (Parfit 1984; Reiman 2007; McMahan 2009). Jeff McMahan, for example, writes ‘at the time of one’s choice there is no one who exists or will exist independently of that choice for whose sake one could be acting in causing him or her to exist … it seems therefore that any reason to cause or not to cause an individual to exist … is best considered an impersonal rather than individual-affecting reason’ (McMahan 2009, 52). Another reply along similar lines would be to appeal to the value that is lost or at least foregone when we fail to bring into existence a next (or several next) generations of people with worth-living lives. Since ex hypothesi worth-living lives have positive value, it is better to create more such lives and worse to create fewer. Human extinction by definition is the creation of no future lives and would ‘deprive’ billions of ‘people’ of the opportunity to live worth-living lives. This might reduce the amount of value in the world at the time of the extinction (by killing already existing people), but it would also prevent a much vaster amount of value in the future (by failing to create more people). Both replies depend on the impersonal value of human life. However, recall that in contractualism impersonal values are not on their own grounds for reasonably rejecting principles. Scanlon himself says that although we have a strong reason not to destroy existing human lives, this reason ‘does not flow from the thought that it is a good thing for there to be more human life rather than less’ (104). In contractualism, something cannot be wrong unless there is an impact on a person. Thus, neither the impersonal value of creating a particular person nor the impersonal value of human life writ large could on its own provide a reason for rejecting a principle permitting human extinction. It seems therefore that the fact that extinction would deprive future people of the opportunity to live worth-living lives (either by failing to create either particular future people or future people in general) cannot provide us with a reason to consider human extinction to be wrong. Although the lost value of these ‘lives’ itself cannot be the reason explaining the wrongness of extinction, it is possible the knowledge of this loss might create a personal reason for some existing people. I will consider this possibility later on in section (d). But first I move to the second reason human extinction might be wrong per se. 2.2. It would mean the loss of the only known form of intelligent life and all civilization and intellectual progress would be lost A second reason we might think it would be wrong to cause human extinction is the loss that would occur of the only (known) form of rational life and the knowledge and civilization that that form of life has created. One thought here could be that just as some might consider it wrong to destroy an individual human heritage monument like the Sphinx, it would also be wrong if the advances made by humans over the past few millennia were lost or prevented from progressing. A related argument is made by those who feel that there is something special about humans’ capacity for rationality which is valuable in itself. Since humans are the only intelligent life that we know of, it would be a loss, in itself, to the world for that to end. I admit that I struggle to fully appreciate this thought. It seems to me that Henry Sidgwick was correct in thinking that these things are only important insofar as they are important to humans (Sidgwick 1874, I.IX.4).5 If there is no form of intelligent life in the future, who would there be to lament its loss since intelligent life is the only form of life capable of appreciating intelligence? Similarly, if there is no one with the rational capacity to appreciate historic monuments and civil progress, who would there be to be negatively affected or even notice the loss?6 However, even if there is nothing special about human rationality, just as some people try to prevent the extinction of nonhuman animal species, we might think that we ought also to prevent human extinction for the sake of biodiversity. The thought in this, as well as the earlier examples, must be that it would somehow be bad for the world if there were no more humans even though there would be no one for whom it is bad. This may be so but the only way to understand this reason is impersonally. Since we are concerned with wrongness rather than badness, we must ask whether something that impacts no one’s well-being, status or claims can be wrong. As we saw earlier, in the contractualist framework reasons must be personal rather than impersonal in order to provide grounds for reasonable rejection (Scanlon 1998, 218–223). Since the loss of civilization, intelligent life or biodiversity are per se impersonal reasons, there is no standpoint from which these reasons could be used to reasonably reject a principle that permitted extinction. Therefore, causing human extinction on the grounds of the loss of civilization, rational life or biodiversity would not be wrong. 2.3. Existing people would endure physical pain and/or painful and/or premature deaths Thinking about the ways in which human extinction might come about brings to the fore two more reasons it might be wrong. It could, for example, occur if all humans (or at least the critical number needed to be unable to replenish the population, leading to eventual extinction) underwent a sterilization procedure. Or perhaps it could come about due to anthropogenic climate change or a massive asteroid hitting the Earth and wiping out the species in the same way it did the dinosaurs millions of years ago. Each of these scenarios would involve significant physical and/or non-physical harms to existing people and their interests. Physically, people might suffer premature and possibly also painful deaths, for example. It is not hard to imagine examples in which the process of extinction could cause premature death. A nuclear winter that killed everyone or even just every woman under the age of 50 is a clear example of such a case. Obviously, some types of premature death themselves cannot be reasons to reject a principle. Every person dies eventually, sometimes earlier than the standard expected lifespan due to accidents or causes like spontaneously occurring incurable cancers. A cause such as disease is not a moral agent and therefore it cannot be wrong if it unavoidably kills a person prematurely. Scanlon says that the fact that a principle would reduce a person’s well-being gives that person a reason to reject the principle: ‘components of well-being figure prominently as grounds for reasonable rejection’ (Scanlon 1998, 214). However, it is not settled yet whether premature death is a setback to well-being. Some philosophers hold that death is a harm to the person who dies, whilst others argue that it is not.7 I will argue, however, that regardless of who is correct in that debate, being caused to die prematurely can be reason to reject a principle when it fails to show respect to the person as a rational agent. Scanlon says that recognizing others as rational beings with interests involves seeing reason to preserve life and prevent death: ‘appreciating the value of human life is primarily a matter of seeing human lives as something to be respected, where this involves seeing reasons not to destroy them, reasons to protect them, and reasons to want them to go well’ (Scanlon 1998, 104). The ‘respect for life’ in this case is a respect for the person living, not respect for human life in the abstract. This means that we can sometimes fail to protect human life without acting wrongfully if we still respect the person living. Scanlon gives the example of a person who faces a life of unending and extreme pain such that she wishes to end it by committing suicide. Scanlon does not think that the suicidal person shows a lack of respect for her own life by seeking to end it because the person whose life it is has no reason to want it to go on. This is important to note because it emphasizes the fact that the respect for human life is person-affecting. It is not wrong to murder because of the impersonal disvalue of death in general, but because taking someone’s life without their permission shows disrespect to that person. This supports its inclusion as a reason in the contractualist formula, regardless of what side ends up winning the ‘is death a harm?’ debate because even if death turns out not to harm the person who died, ending their life without their consent shows disrespect to that person. A person who could reject a principle permitting another to cause his or her premature death presumably does not wish to die at that time, or in that manner. Thus, if they are killed without their consent, their interests have not been taken into account, and they have a reason to reject the principle that allowed their premature death.8 This is as true in the case of death due to extinction as it is for death due to murder. However, physical pain may also be caused to existing people without killing them, but still resulting in human extinction. Imagine, for example, surgically removing everyone’s reproductive organs in order to prevent the creation of any future people. Another example could be a nuclear bomb that did not kill anyone, but did painfully render them infertile through illness or injury. These would be cases in which physical pain (through surgery or bombs) was inflicted on existing people and the extinction came about as a result of the painful incident rather than through death. Furthermore, one could imagine a situation in which a bomb (for example) killed enough people to cause extinction, but some people remained alive, but in terrible pain from injuries. It seems uncontroversial that the infliction of physical pain could be a reason to reject a principle. Although Scanlon says that an impact on well-being is not the only reason to reject principles, it plays a significant role, and indeed, most principles are likely to be rejected due to a negative impact on a person’s well-being, physical or otherwise. It may be queried here whether it is actually the involuntariness of the pain that is grounds for reasonable rejection rather than the physical pain itself because not all pain that a person suffers is involuntary. One can imagine acts that can cause physical pain that are not rejectable — base jumping or life-saving or improving surgery, for example. On the other hand, pushing someone off a cliff or cutting him with a scalpel against his will are clearly rejectable acts. The difference between the two cases is that in the former, the person having the pain inflicted has consented to that pain or risk of pain. My view is that they cannot be separated in these cases and it is involuntary physical pain that is the grounds for reasonable rejection. Thus, the fact that a principle would allow unwanted physical harm gives a person who would be subjected to that harm a reason to reject the principle. Of course the mere fact that a principle causes involuntary physical harm or premature death is not sufficient to declare that the principle is rejectable — there might be countervailing reasons. In the case of extinction, what countervailing reasons might be offered in favour of the involuntary physical pain/ death-inducing harm? One such reason that might be offered is that humans are a harm to the natural environment and that the world might be a better place if there were no humans in it. It could be that humans might rightfully be considered an all-things-considered hindrance to the world rather than a benefit to it given the fact that we have been largely responsible for the extinction of many species, pollution and, most recently, climate change which have all negatively affected the natural environment in ways we are only just beginning to understand. Thus, the fact that human extinction would improve the natural environment (or at least prevent it from degrading further), is a countervailing reason in favour of extinction to be weighed against the reasons held by humans who would experience physical pain or premature death. However, the good of the environment as described above is by definition not a personal reason. Just like the loss of rational life and civilization, therefore, it cannot be a reason on its own when determining what is wrong and countervail the strong personal reasons to avoid pain/death that is held by the people who would suffer from it.9 Every person existing at the time of the extinction would have a reason to reject that principle on the grounds of the physical pain they are being forced to endure against their will that could not be countervailed by impersonal considerations such as the negative impact humans may have on the earth. Therefore, a principle that permitted extinction to be accomplished in a way that caused involuntary physical pain or premature death could quite clearly be rejectable by existing people with no relevant countervailing reasons. This means that human extinction that came about in this way would be wrong. There are of course also additional reasons they could reject a similar principle which I now turn to address in the next section. 2.4. Existing people could endure non-physical harms I said earlier than the fact in itself that there would not be any future people is an impersonal reason and can therefore not be a reason to reject a principle permitting extinction. However, this impersonal reason could give rise to a personal reason that is admissible. So, the final important reason people might think that human extinction would be wrong is that there could be various deleterious psychological effects that would be endured by existing people having the knowledge that there would be no future generations. There are two main sources of this trauma, both arising from the knowledge that there will be no more people. The first relates to individual people and the undesired negative effect on well-being that would be experienced by those who would have wanted to have children. Whilst this is by no means universal, it is fair to say that a good proportion of people feel a strong pull towards reproduction and having their lineage continue in some way. Samuel Scheffler describes the pull towards reproduction as a ‘desire for a personalized relationship with the future’ (Scheffler 2012, 31). Reproducing is a widely held desire and the joys of parenthood are ones that many people wish to experience. For these people knowing that they would not have descendants (or that their descendants will endure painful and/or premature deaths) could create a sense of despair and pointlessness of life. Furthermore, the inability to reproduce and have your own children because of a principle/policy that prevents you (either through bans or physical interventions) would be a significant infringement of what we consider to be a basic right to control what happens to your body. For these reasons, knowing that you will have no descendants could cause significant psychological traumas or harms even if there were no associated physical harm. The second is a more general, higher level sense of hopelessness or despair that there will be no more humans and that your projects will end with you. Even those who did not feel a strong desire to procreate themselves might feel a sense of hopelessness that any projects or goals they have for the future would not be fulfilled. Many of the projects and goals we work towards during our lifetime are also at least partly future-oriented. Why bother continuing the search for a cure for cancer if either it will not be found within humans’ lifetime, and/or there will be no future people to benefit from it once it is found? Similar projects and goals that might lose their meaning when confronted with extinction include politics, artistic pursuits and even the type of philosophical work with which this paper is concerned. Even more extreme, through the words of the character Theo Faron, P.D. James says in his novel The Children of Men that ‘without the hope of posterity for our race if not for ourselves, without the assurance that we being dead yet live, all pleasures of the mind and senses sometimes seem to me no more than pathetic and crumbling defences shored up against our ruins’ (James 2006, 9). Even if James’ claim is a bit hyperbolic and all pleasures would not actually be lost, I agree with Scheffler in finding it not implausible that the knowledge that extinction was coming and that there would be no more people would have at least a general depressive effect on people’s motivation and confidence in the value of and joy in their activities (Scheffler 2012, 43). Both sources of psychological harm are personal reasons to reject a principle that permitted human extinction. Existing people could therefore reasonably reject the principle for either of these reasons. Psychological pain and the inability to pursue your personal projects, goals, and aims, are all acceptable reasons for rejecting principles in the contractualist framework. So too are infringements of rights and entitlements that we accept as important for people’s lives. These psychological reasons, then, are also valid reasons to reject principles that permitted or required human extinction.

#### 3] That is the only egalitarian metric---anything else collapses cooperation on collective action crises and makes extinction inevitable

Khan 18 (Risalat, activist and entrepreneur from Bangladesh passionate about addressing climate change, biodiversity loss, and other existential challenges. He was featured by The Guardian as one of the “young climate campaigners to watch” (2015). As a campaigner with the global civic movement Avaaz (2014-17), Risalat was part of a small core team that spearheaded the largest climate marches in history with a turnout of over 800,000 across 2,000 cities. After fighting for the Paris Agreement, Risalat led a campaign joined by over a million people to stop the Rampal coal plant in Bangladesh to protect the Sundarbans World Heritage forest, and elicited criticism of the plant from Crédit Agricolé through targeted advocacy. Currently, Risalat is pursuing an MPA in Environmental Science and Policy at Columbia University as a SIPA Environmental Fellow, “5 reasons why we need to start talking about existential risks,” https://www.weforum.org/agenda/2018/01/5-reasons-start-talking-existential-risks-extinction-moriori/)

Infinite future possibilities I find the story of the Moriori profound. It teaches me two lessons. Firstly, that human culture is far from immutable. That we can struggle against our baser instincts. That we can master them and rise to unprecedented challenges. Secondly, that even this does not make us masters of our own destiny. We can make visionary choices, but the future can still surprise us. This is a humbling realization. Because faced with an uncertain future, the only wise thing we can do is prepare for possibilities. Standing at the launch pad of the Fourth Industrial Revolution, the possibilities seem endless. They range from an era of abundance to the end of humanity, and everything in between. How do we navigate such a wide and divergent spectrum? I am an optimist. From my bubble of privilege, life feels like a rollercoaster ride full of ever more impressive wonders, even as I try to fight the many social injustices that still blight us. However, the accelerating pace of change amid uncertainty elicits one fundamental observation. Among the infinite future possibilities, only one outcome is truly irreversible: extinction. Concerns about extinction are often dismissed as apocalyptic alarmism. Sometimes, they are. But repeating that mankind is still here after 70 years of existential warning about nuclear warfare is a straw man argument. The fact that a 1000-year flood has not happened does not negate its possibility. And there have been far too many nuclear near-misses to rest easy. As the World Economic Forum’s Annual Meeting in Davos discusses how to create a shared future in a fractured world, here are five reasons why the possibility of existential risks should raise the stakes of conversation: 1. Extinction is the rule, not the exception More than 99.9% of all the species that ever existed are gone. Deep time is unfathomable to the human brain. But if one cares to take a tour of the billions of years of life’s history, we find a litany of forgotten species. And we have only discovered a mere fraction of the extinct species that once roamed the planet. In the speck of time since the first humans evolved, more than 99.9% of all the distinct human cultures that have ever existed are extinct. Each hunter-gatherer tribe had its own mythologies, traditions and norms. They wiped each other out, or coalesced into larger formations following the agricultural revolution. However, as major civilizations emerged, even those that reached incredible heights, such as the Egyptians and the Romans, eventually collapsed. It is only in the very recent past that we became a truly global civilization. Our interconnectedness continues to grow rapidly. “Stand or fall, we are the last civilization”, as Ricken Patel, the founder of the global civic movement Avaaz, put it. 2. Environmental pressures can drive extinction More than 15,000 scientists just issued a ‘warning to humanity’. They called on us to reduce our impact on the biosphere, 25 years after their first such appeal. The warning notes that we are far outstripping the capacity of our planet in all but one measure of ozone depletion, including emissions, biodiversity, freshwater availability and more. The scientists, not a crowd known to overstate facts, conclude: “soon it will be too late to shift course away from our failing trajectory, and time is running out”. In his 2005 book Collapse, Jared Diamond charts the history of past societies. He makes the case that overpopulation and resource use beyond the carrying capacity have often been important, if not the only, drivers of collapse. Even though we are making important incremental progress in battles such as climate change, we must still achieve tremendous step changes in our response to several major environmental crises. We must do this even while the world’s population continues to grow. These pressures are bound to exert great stress on our global civilization. 3. Superintelligence: unplanned obsolescence? Imagine a monkey society that foresaw the ascendance of humans. Fearing a loss of status and power, it decided to kill the proverbial Adam and Eve. It crafted the most ingenious plan it could: starve the humans by taking away all their bananas. Foolproof plan, right? This story describes the fundamental difficulty with superintelligence. A superintelligent being may always do something entirely different from what we, with our mere mortal intelligence, can foresee. In his 2014 book Superintelligence, Swedish philosopher Nick Bostrom presents the challenge in thought-provoking detail, and advises caution. Bostrom cites a survey of industry experts that projected a 50% chance of the development of artificial superintelligence by 2050, and a 90% chance by 2075. The latter date is within the life expectancy of many alive today. Visionaries like Stephen Hawking and Elon Musk have warned of the existential risks from artificial superintelligence. Their opposite camp includes Larry Page and Mark Zuckerberg. But on an issue that concerns the future of humanity, is it really wise to ignore the guy who explained the nature of space to us and another guy who just put a reusable rocket in it? 4. Technology: known knowns and unknown unknowns Many fundamentally disruptive technologies are coming of age, from bioengineering to quantum computing, 3-D printing, robotics, nanotechnology and more. Lord Martin Rees describes potential existential challenges from some of these technologies, such as a bioengineered pandemic, in his book Our Final Century. Imagine if North Korea, feeling secure in its isolation, could release a virulent strain of Ebola, engineered to be airborne. Would it do it? Would ISIS? Projecting decades forward, we will likely develop capabilities that are unthinkable even now. The unknown unknowns of our technological path are profoundly humbling. 5. 'The Trump Factor' Despite our scientific ingenuity, we are still a confused and confusing species. Think back to two years ago, and how you thought the world worked then. Has that not been upended by the election of Donald Trump as US President, and everything that has happened since? The mix of billions of messy humans will forever be unpredictable. When the combustible forces described above are added to this melee, we find ourselves on a tightrope. What choices must we now make now to create a shared future, in which we are not at perpetual risk of destroying ourselves? Common enemy to common cause Throughout history, we have rallied against the ‘other’. Tribes have overpowered tribes, empires have conquered rivals. Even today, our fiercest displays of unity typically happen at wartime. We give our lives for our motherland and defend nationalistic pride like a wounded lion. But like the early Morioris, we 21st-century citizens find ourselves on an increasingly unstable island. We may have a violent past, but we have no more dangerous enemy than ourselves. Our task is to find our own Nunuku’s Law. Our own shared contract, based on equity, would help us navigate safely. It would ensure a future that unleashes the full potential of our still-budding human civilization, in all its diversity. We cannot do this unless we are humbly grounded in the possibility of our own destruction. Survival is life’s primal instinct. In the absence of a common enemy, we must find common cause in survival. Our future may depend on whether we realize this.