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Polycentricity and Space Governance

Executive Summary

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In the 65 years since the launch of Sputnik, the political environment in space has grown exponentially more complex. In the early days of spaceflight, the space arena was essentially a bicentric domain, with two major powers pursuing space activities of limited utility. This is no longer the case. With a myriad of different actors and interests, there are many different levels and centers at which governance in space is "done," and many facets even among those levels and centers.

The multitude of these decision centers underlies the description of space as a polycentric governance system. While definitions of polycentricity differ slightly from one author to another, it can most generally be described as:

> **A system of governance in which multiple authorities oversee the same area, albeit with different but overlapping interests and scopes of responsibility.**

Polycentricity is not a novel concept. In fact, it is an inherent attribute of many governance systems, particularly global systems. Today, space, like most other shared domains, is inherently polycentric—with both resources and consequences spanning jurisdictions. Embracing the fragmented nature of space and governing at multiple levels will help develop a resilient space governance regime.

Polycentricity is an inherent property or characteristic of the way space governance has evolved over time. The "good" or "bad" of this property comes not from the type of system, but from a misunderstanding about the appropriate levels of government at which actions should be taken and frustration at stagnation within the current system.

The question then comes not from defining the system, but determining how to best leverage the differing levels of government. While not exhaustive, two criteria that can help to determine the optimal level of governance for a particular issue are the cost to entry and the risk to operations:

Criteria 1: Barrier to Entry

- How widely accessible is a technology or domain? If a technology or domain is not widely accessible, it can be easier and more efficient for a smaller group to gain consensus, and have decisions made and actions moved forward. If a technology is widely proliferated, collective action is more difficult. Low

entry costs into a domain tend to encourage more innovation and an increase in decisionmaking centers. Barrier to entry is in part dictated by the pace of technological change. Where technology evolves more rapidly, barriers to entry generally decline. With some reservations, lower levels of governance will be more equipped to oversee domains with low barriers to entry, as they are more agile.

Criteria 2: Risk to Operations

- How great a danger does a technology or action pose to normal operations in a domain? The less danger associated with a technology or action, the more likely it is that a lower level of governance can be an appropriate level to oversee it. According to the principles of subsidiarity, when issues can be localized, they should be, in order to streamline governance. When actions pose a high risk to normal operations or when the risk posed affects large swaths of the operators, decisionmaking should be moved up the chain to a higher level of governance. Like barriers to entry, this criterion is mutable over time. What once posed a danger could become normalized over time, or as technology changes.

These categories are mutable; designations of situations are flexible and will change over time. However, broadly, this matrix can be a helpful tool for conceptualizing the levels of government that could be most effective at dealing with different situations in space.

With the varied and growing number of interests and actors in space, outer space is a polycentric system. Polycentric governance systems are those in which there are multiple authorities that oversee the same area, albeit with different but overlapping interests and scopes of responsibility. This multilevel system is a benefit to the evolving domain, allowing for the agility to react to changing situations and address them with the appropriate flexibility.

The challenge then, regarding polycentricity, is not that the system is fragmented. Rather, the challenge lies in embracing the "messy" system and working the issues in space governance at the appropriate levels.

	LOW RISK TO OPERATIONS	HIGH RISK TO OPERATIONS
HIGH BARRIER TO ENTRY	**Subnational** Launch provision	**International** Nuclear nonproliferation measures, ASAT bans
LOW BARRIER TO ENTRY	**Subnational** Data storage and sharing, smallsats	**National** Jamming, cyber threats

Figure 3. Framework for polycentric space governance in the context of barriers to entry and risk to operations. Representative governance issues are included in each of the four quadrants.

While not exhaustive, these two criteria together encompass a wide range of situations and provide a good starting point for determining appropriate levels of governance.

In situations with a high barrier to entry, whether that be through expensive technology, nuclear weapons, or niche interests, the "coherence and effectiveness of small groups" will tend to allow interested entities to organize more easily than in situations with very low barriers to entry.[1]

The easier entry is into a given domain, the more likely it is that technological and social change will outpace the ability of higher levels of government to respond. In situations with lower risk to the environment, these low barrier domains or technologies may be most effectively governed at a subnational level, allowing localized groups to form and self-govern. This will allow groups to take advantage of the benefits of decentralization, allowing rules to change as "experience accumulates" and, with relatively separate governance systems, allow for more experimentation in order to "drastically reduce the probability of immense failures for an entire region." [2]

While, when possible, it can be preferable to move governance down to the lowest level to allow for flexibility and responsiveness, situations with security and sustainability challenges will require higher levels of governance. The international and national levels are more positioned to consider long-term sustainment of the space environment, rather than be swayed by short-term gain. As stated above, the higher the risk to the operational environment, the higher the level of government that that situation should be handled at. This is exemplified by international efforts like the Partial Test Ban Treaty and current attempts to ban the use of kinetic anti-satellite weapons. These goals come from the highest level, in reaction to situations that have the potential to render orbits completely unusable.

CONCLUSION

Issues that are very likely to lead to catastrophic risk, and that deal with technology or domains that have a higher barrier to entry are generally best handled at the international level. For situations with high barriers to entry, international bodies are able to set standards before mass proliferation of a risky technology, for example, and are more likely to have success in shaping norms around potential risks from the outset. In riskier scenarios, it is more important to have one standard well communicated and enacted broadly.

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A framework, however conceptually helpful, means little if it is not applicable and understandable. This matrix, while new, can be used to evaluate situations in space and in a number of different domains beyond. In an increasingly globalized world, barriers to entry and risk to operations will continue to be salient characteristics of new situations.

[1] Olson 1971
[2] Ostrom 1999.

IMPORTANT TERMS TO UNDERSTAND POLYCENTRICITY

- **Norm entrepreneurs**
  Actors who develop and promote the adherence of new rules of behavior.
- **Complex adaptive system**
  A self-organized group that changes its rules as it gains more experience. This term is most often used in relation to environmental governance.
- **Decentralization**
  The transfer of authority and responsibility for public functions from the central government to intermediate and local governments, quasi-independent government organizations, or the private sector.
- **Permissionless innovation**
  A principle, coined by researchers at the Mercatus Center, suggesting that innovators be generally left free to experiment with new technologies and business models without oversight from a governing body.
- **Polycentricity**
  A system of governance in which there are multiple decisionmaking centers that interact with each other over a common domain.
- **Precautionary principle**
  A principle suggesting innovators be overseen by public officials, mandating approval before beginning to develop and deploy new capabilities.
- **Self-governance**
  The ability of a group to self-regulate independently, without oversight from an external authority. Self-governance is sometimes treated as synonymous to polycentricity, but this is a false equivalence. Self-governance can be one component of a polycentric system, but polycentric systems are not entirely self-governed.
- **Subsidiarity**
  Originally enshrined under the Catholic Church in 1891 as a "middle way" between laissez-faire capitalism and socialism, subsidiarity allowed more independence among the more local levels of authority. In the context of governance, subsidiarity refers to the delegation of rulemaking to a lower, usually more specific, body. It is an organizing principle that matters ought to be handled at the lowest competent authority, and that a central authority should perform only those tasks which cannot be performed at a more immediate or local level.

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