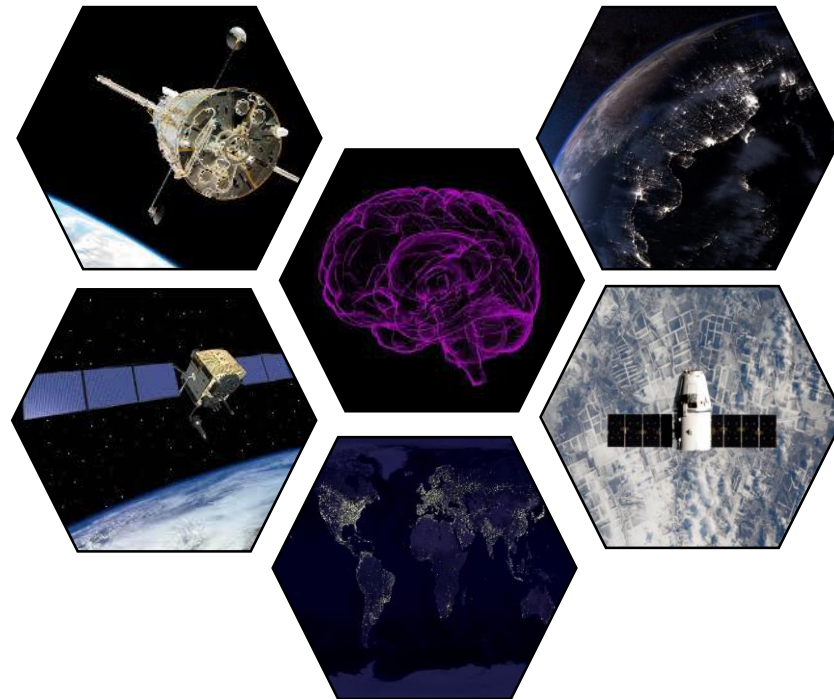


MINDSPACE: Cognition in space operations

Dr Nicholas Wright

Intelligent Biology.

Georgetown University



Strategy is the art of creating power.

(Sir Lawrence Freedman, Strategy, 2013)

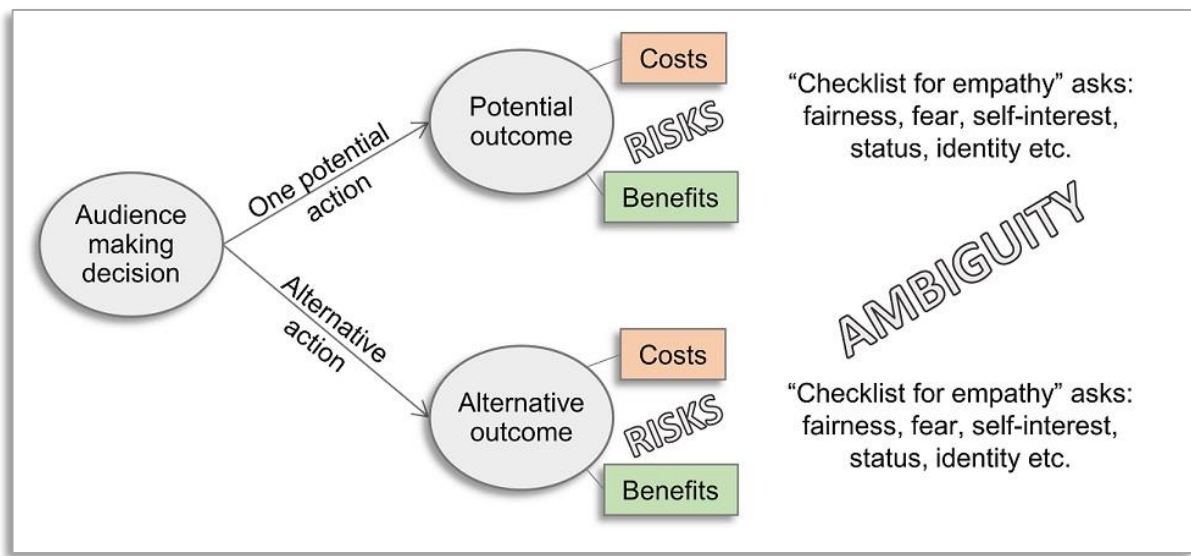
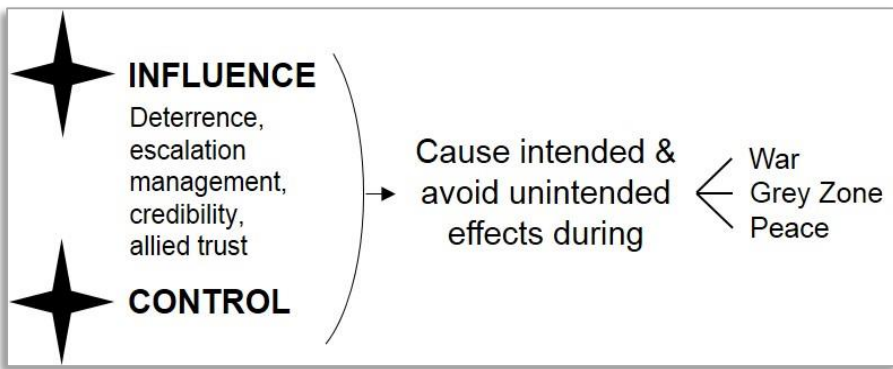
How do you create power in space?

Influence *and* control

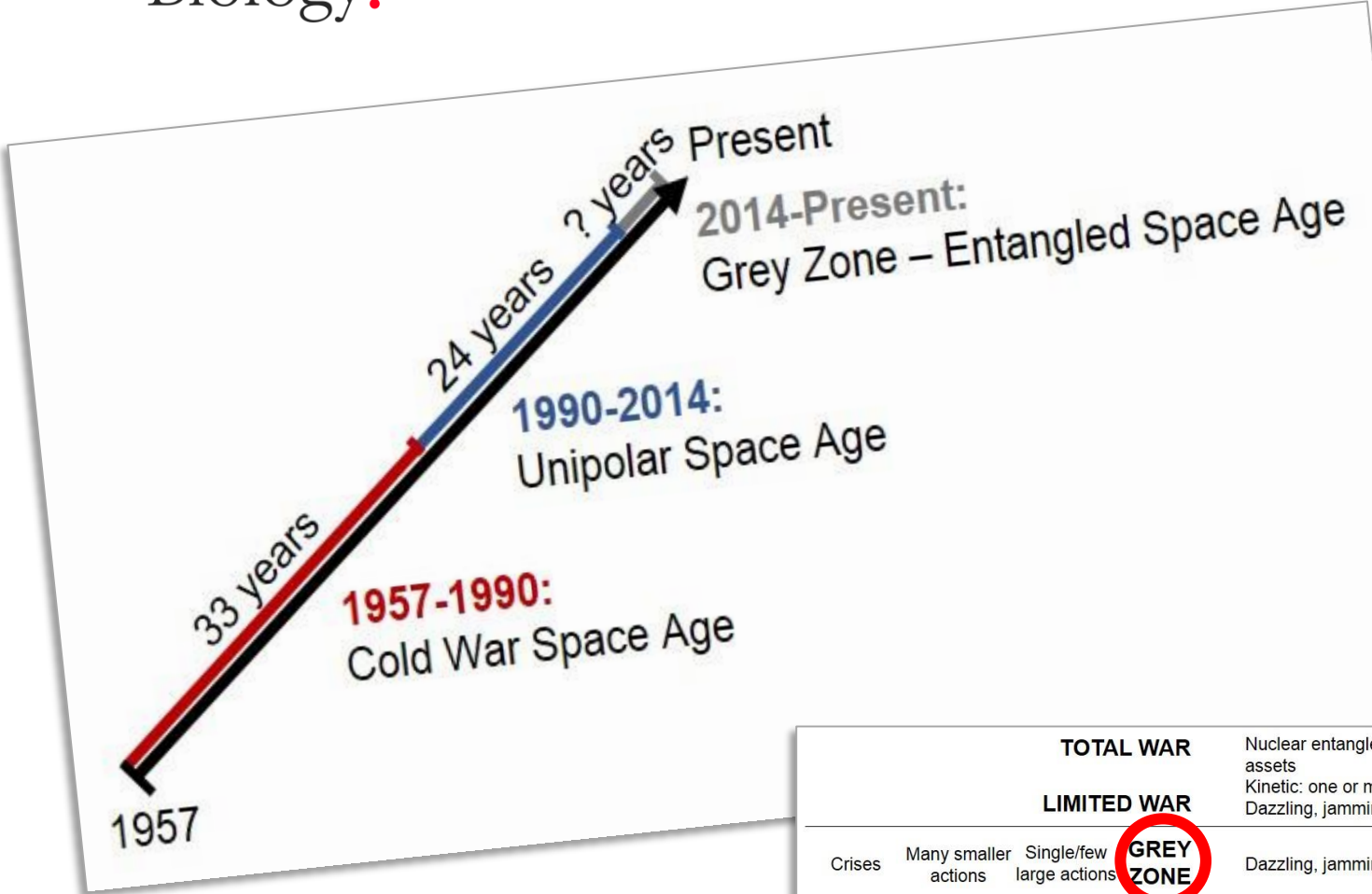
Fundamentally cognitive:
realistic about human nature





Creating power now and
in the future

Strategy in space is the art of creating power in space.



Space operations, and their cognitive dimensions, differ from other domains in their *character* but not in their *nature*.



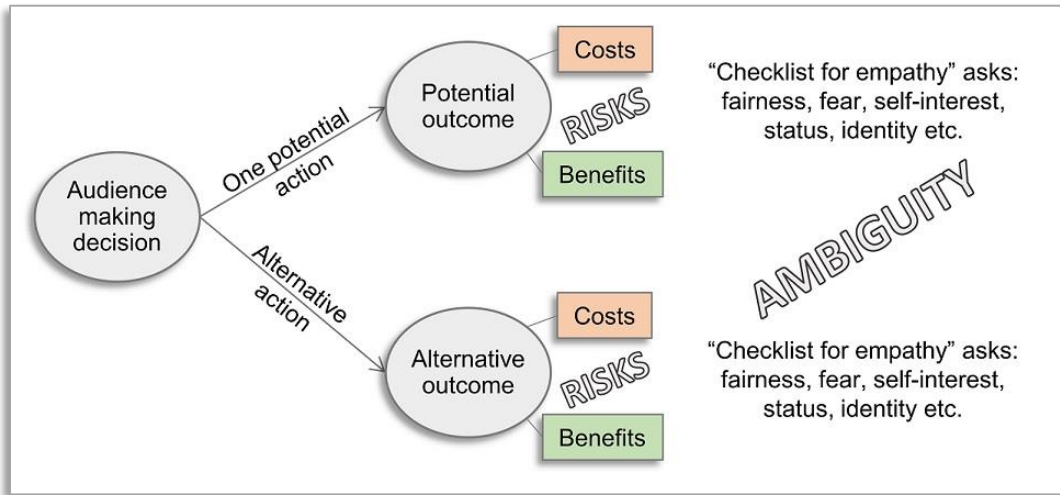
		TOTAL WAR	Nuclear entangled space assets	
		LIMITED WAR	Kinetic: one or many targets Dazzling, jamming, cyber etc.	
Crises	Many smaller actions	Single/few large actions	GREY ZONE	Dazzling, jamming, cyber etc. 
Crises	"Normal" competition (e.g. economic competition, espionage)	PEACE	Espionage etc.	

Distinguishing features:

- space strategic conflict mirrors the Grey Zone conflict on earth;
- conventional and nuclear space missions are deeply entangled.

Think “outside-in”

Place the audience’s decision-making process at the heart of influence



“Checklist for empathy”

Self-interest

Fairness

Fear

Identity

Status

Expectations

Context, opportunity, capability

Compatible with e.g. “Deterrence Operations Joint Operating Concept”

Take culture seriously

Does strategic thinking really differ between China and the U.S.?

Deterrence, escalation management, offense and defense

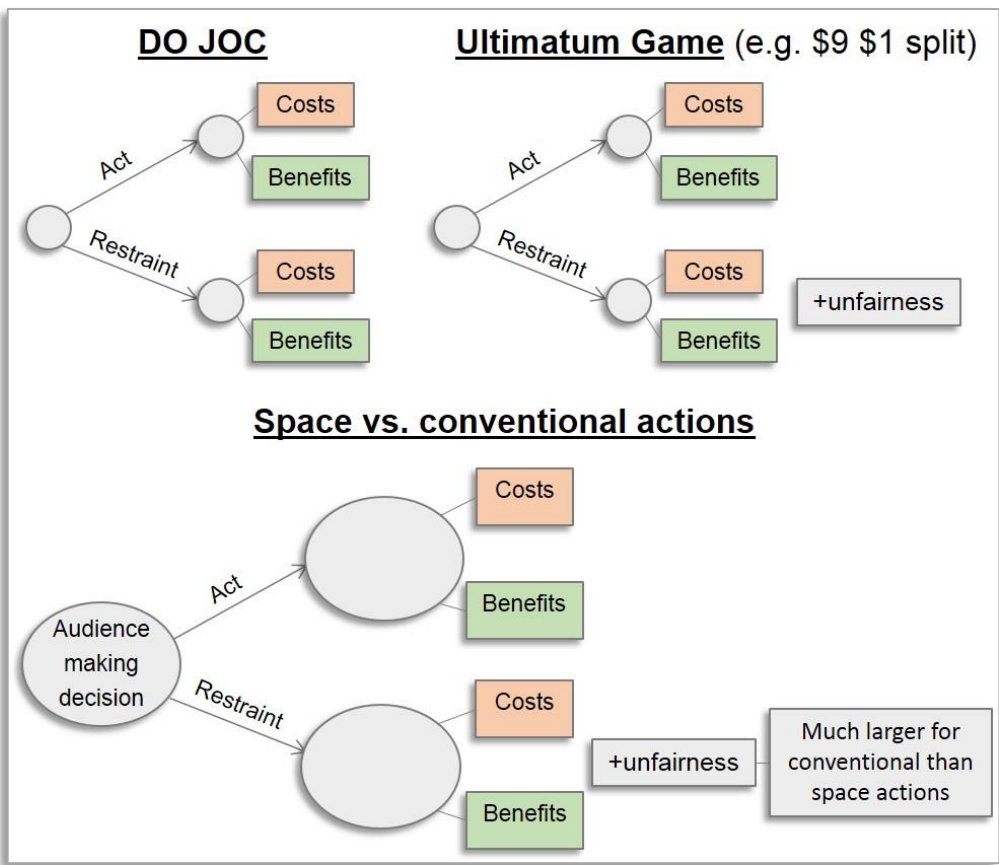
<i>Key factors for space</i>	
Uninhabited; destructiveness	
Attribution; Damage assessment; Dual use; Highly classified; Reversibility	
Borderless; Debris	
Fragility; offense dominance	
<i>Additional US factors:</i> Asymmetric space dependency	
Extended deterrence	
<i>Additional PRC factors:</i> More context-dependent view	

Deterrence, escalation management, offense and defense

<i>Key factors for space</i>	<i>Cognitive foundations</i>
Uninhabited; destructiveness	Less social motivations
Attribution; Damage assessment; Dual use; Highly classified; Reversibility	Uncertainty, risk, ambiguity
Borderless; Debris	Tragedy of commons
Fragility; offense dominance	Rapid decision-making
<i>Additional US factors:</i> Asymmetric space dependency	Optimism; pruning
Extended deterrence	Trust and confidence.
<i>Additional PRC factors:</i> More context-dependent view	Cross-cultural cognitive differences

Key factors for space	Cognitive foundations
Uninhabited; destructiveness	Less social motivations


SOCIAL MOTIVATIONS – A CAUSE OF MIXED PERCEPTIONS



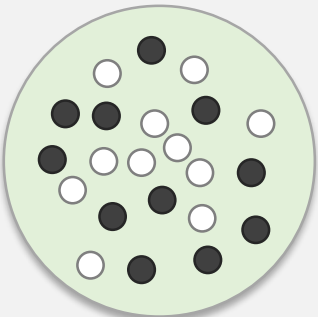
- 1. Credible deterrence is likely harder than anticipated. Ask “how fair will this be perceived to be?”*
- 2. Mismatched civilian-military perceptions: Mitigate by communicating political and military impacts ahead of time and during crises*
- 3. U.S. cross-domain responses to space actions may have reduced perceived legitimacy – work harder than one may anticipate to contain political impacts*
- 4. Anticipated complications for U.S. responses make space attractive for the Grey Zone.*
- 5. From allies’ perspectives, is extended deterrence against adversary space operations credible? Build trust.*


Key factors for space	Cognitive foundations
Attribution; Damage assessment; Dual use; Highly classified; Reversibility	Uncertainty, risk, ambiguity

MASTERING UNCERTAINTY

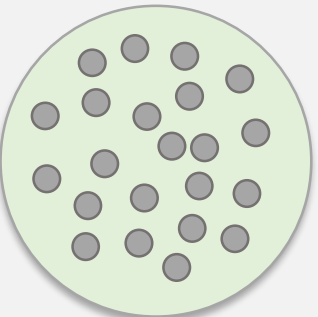


Risk
One layer of uncertainty





Ambiguity
A second layer of uncertainty



Ambiguity

1. *Ambiguity is a tool. E.g. more deniable offensive actions; affect outcomes in third party states without visible commitment; less face lost if red lines crossed.*
2. *To reduce the ambiguity of an adversary's actions, invest in attribution, and how to communicate attribution to key audiences (e.g. allies).*
3. *To deter ambiguous actions may require communicating to the adversary ahead of time.*
4. *Conciliatory gestures in other domains.*

Risk

1. *To deter, consider communicating "likelihood" of response rather than "magnitude" or "timeliness".*
2. *Use baseline data to turn events from ambiguous to risky.*
3. *Humans overweight small probabilities, so reversible counter-space may have greater impact than anticipated.*
4. *Communicating escalation risks in space likely requires clearer signals than anticipated.*

BORDERLESS SPACE – INFLUENCE TO AVOID TRAGEDY



We all lose if we aren't influenced to collectively show restraint.

1. *Control isn't enough. Influence is the only way to manage a potential Tragedy.*
2. *Debris is unlikely to significantly weigh on adversary choice, but we can influence actors to show restraint.*
3. *Reputation is in the eyes of others, thus:*
 - *Increase the reputational costs of debris in key audiences by effectively communicating attribution.*
 - *Build key audiences' understanding that space can be damaged.*
4. *Convey that creating debris wantonly is itself punishable.*
5. *Use norms, institutions and legitimacy:*
 - *The U.S. cannot impose norms on its own. Build extended influence with allies and third parties.*
 - *Tailor the costs and benefits of cooperation.*
6. *The U.S. is the biggest actor in space, so its actions critically determine international norms and expectations.*

Fragility; offense dominance

Rapid decision-making

LIVING WITH OFFENSE DOMINANCE

- 1. Attend to the perceived offense-defense balance.*
 - Increase resilience.*
 - Consider doctrine and rhetoric from the competitor's perspective.*
- 2. Manage time pressure. During crises, consider deliberate and obvious pauses to slow decision-making.*
- 3. Manage stress.*
 - Space simulations for top civilian, as well as military, decision-makers – and replicate stress conditions in the field.*
 - U.S. decision-makers may not appreciate the unfamiliarity of allies and key third parties with space operations – encourage allies to conduct their own simulations and also to conduct joint simulations.*



Key factors for space	Cognitive foundations
Additional US factors: Asymmetric space dependency	Optimism; pruning

ASYMMETRIC SPACE DEPENDENCY – IMPRUDENT PLANNING



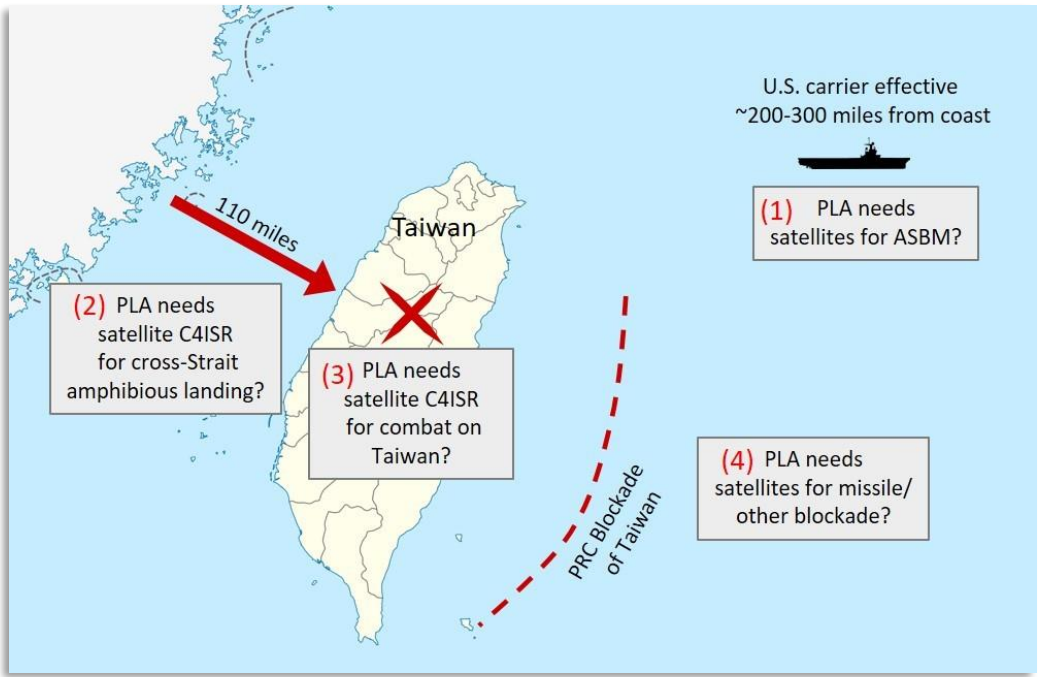
Two ways the brain thinks ahead that may affect planning.

“Pruning”: Humans tend to be averse to looking beyond a big negative event.

Recommend integrated wargames and systematically ask “what happens the day after”.

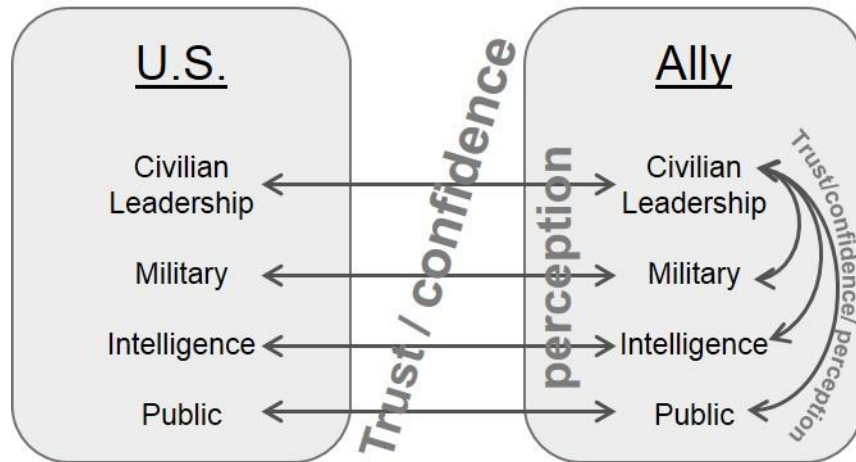
“Optimism bias”: Humans tend to plan optimistically.

Recommend asking “If I were planning this for another state, how would my plans differ?”



Key factors for space	Cognitive foundations
Additional US factors: Extended deterrence	Trust and confidence

EXTENDED INFLUENCE - TRUST

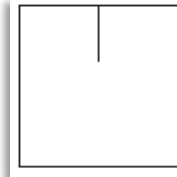
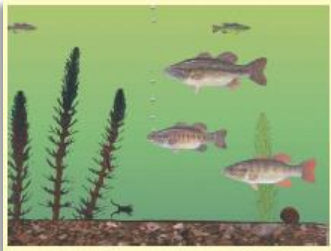


1. Consider the bandwidth of trust-building.
2. Building trust takes **time**.
3. Manage predictability in U.S. actions, e.g. warn allies before space operations.
4. Encourage change within the allies, who need to understand U.S. thinking on space.
 - training, doctrine and simulations, both within countries such as UK or Japan and jointly.
5. Liking and similarity build trust – build U.S. soft power.
6. Manage expectations
 - e.g. will the U.S. really help counter non-kinetic activities against Japanese satellites?

<i>Key factors for space</i>	<i>Cognitive foundations</i>
<i>Additional PRC factors: More context-dependent view</i>	Cross-cultural cognitive differences




MORE CONTEXT-DEPENDENT STRATEGY IN SPACE

East Asians tend to engage in more context-dependent or holistic cognitive processes by attending to the relationship between the object and the context in which it is located; whereas Westerners are more context-independent.



1. *Chinese thinking on deterrence is more context-dependent:*
 - *Pre-emption within the context of deterrence*
 - *Compellence and deterrence in the context of repeated interactions*
 - *Deterrence and warfighting are both understood holistically within the context*
2. *Chinese views of defense and offense:*
 - *Understood holistically; and defensive context renders even major offensives defensive.*
 - *E.g. "Active defense"*

Recommend: To militate against their cultural prisms, U.S. analysis can specifically ask 'what is the broader context of this action'

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Grey Zone conflict in space is necessarily limited conflict, and thus the central aim is to influence the decision-making of adversaries and other key audiences – success requires policymakers understand and wield influence in space.

Five multiples of the Grey Zone

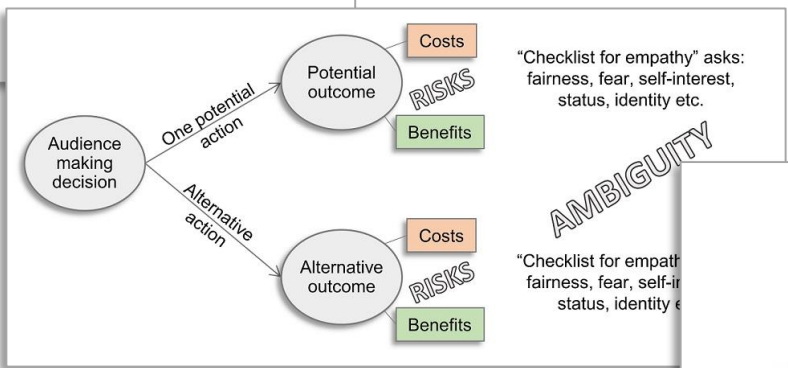
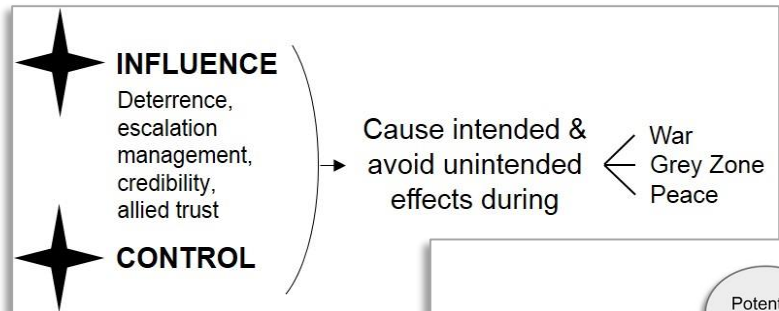
- Multiple levels (e.g. state, non-state actor, population)
- Multiple instruments of power (e.g. cross-domain actions)
- Multiple timeframes (e.g. crises, cumulative actions, norms)
- Multiple audiences (e.g. allies, neutrals)
- Multiple interpretations (ambiguity is a tool)

Strategy in space is the art of creating power in space.

“Space power. The total strength of a nation’s capabilities to conduct and **influence** activities to, in, through, and from space to achieve its objectives.”

- Joint Publication 3-14 “Space Operations”

We aim to describe how, for the current epoch, based in evidence.



AMBIGUITY

