Thresholds in Cyberspace

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Cyber Thresholds and U.S. Strategy

Cyber Command Vision: persistent engagement will "operate continuously below the threshold of armed conflict to weaken our institutions and gain strategic advantage"

Defense Cyberspace Strategy: defend forward will "disrupt or halt malicious cyber activity at its source, including activity that falls below the level of armed conflict"

The creation and management of thresholds is vital to the success of U.S. cyber strategy—both at the low end of conflict to restrain escalation from U.S. cyber attacks and at at the high end to deter adversary strategic cyber attack.

Thresholds: What are They?

- Intimately tied to conceptions of escalation
  - Morgan et al: “an increase in the intensity or scope of conflict that crosses threshold(s) considered significant by one or more of the participants.”

- Connable et al: “a negotiated, declared, or tacitly understood delimiter between measures short of war and high-order conflict (such as full-scale conventional or nuclear war).”

- Kahn, ladders, and thresholds

- Thresholds vs. red lines vs. firebreaks

FIGURE 3
AN ESCALATION LADDER
A Generalized (or Abstract) Scenario

		AFTERMATHS
CIVILIAN CENTRAL WARS	44.	Spasm or Insensate War
	43.	*Some Other Kinds of Controlled General War*
	42.	Civilian Devastation Attack
	41.	Augmented Disarming Attack
	40.	Countervalue Salvo
	39.	Slow-Motion Countercity War
		(CITY TARGETING THRESHOLD)
MILITARY CENTRAL WARS	38.	Unmodified Counterforce Attack
	37.	Counterforce-with-Avoidance Attack
	36.	Constrained Disarming Attack
	35.	Constrained Force-Reduction Salvo
	34.	Slow-Motion Counterforce War
	33.	Slow-Motion Counter-“Property” War
	32.	Formal Declaration of “General” War
		(CENTRAL WAR THRESHOLD)
EXEMPLARY CENTRAL ATTACKS	31.	Reciprocal Reprisals
	30.	Complete Evacuation (Approximately 95 per cent)
	29.	Exemplary Attacks on Population
	28.	Exemplary Attacks Against Property
	27.	Exemplary Attack on Military
	26.	Demonstration Attack on Zone of Interior
		(CENTRAL SANCTUARY THRESHOLD)
BIZARRE CRISES	25.	Evacuation (Approximately 70 per cent)
	24.	Unusual, Provocative, and Significant Countermeasures
	23.	Local Nuclear War—Military
	22.	Declaration of Limited Nuclear War
	21.	Local Nuclear War—Exemplary
		(NO NUCLEAR USE THRESHOLD)
INTENSE CRISES	20.	“Peaceful” World-Wide Embargo or Blockade
	19.	“Justifiable” Counterforce Attack
	18.	Spectacular Show or Demonstration of Force
	17.	Limited Evacuation (Approximately 20 per cent)
	16.	Nuclear “Ultimatums”
	15.	Barely Nuclear War
	14.	Declaration of Limited Conventional War
	13.	Large Compound Escalation
	12.	Large Conventional War (or Actions)
	11.	Super-Ready Status
	10.	Provocative Breaking Off of Diplomatic Relations
		(NUCLEAR WAR IS UNTHINKABLE THRESHOLD)
TRADITIONAL CRISES	9.	Dramatic Military Confrontations
	8.	Harassing Acts of Violence
	7.	“Legal” Harassment—Retortions
	6.	Significant Mobilization
	5.	Show of Force
	4.	Hardening of Positions—Confrontation of Wills
		(DON’T ROCK THE BOAT THRESHOLD)
SUBCRISIS MANEUVERING	3.	Solemn and Formal Declarations
	2.	Political, Economic, and Diplomatic Gestures
	1.	Ostensible Crisis
		DISAGREEMENT—COLD WAR

What Creates Thresholds?

- Thresholds defined by two characteristics
  - Strength of the threshold
  - Location of threshold on escalation ladder
- Thresholds constructed by perceptions of cost
  - Potential retaliation cost
  - Domestic cost
  - Normative cost
- Agreed upon thresholds
  - Provide definitions
  - Create consequences
  - Verifiable
- Effects-based vs. means thresholds

Characteristics that Create Strong Thresholds
Treaties with punishment mechanisms
Agreed upon definitions of threshold
Precedent of a threshold over time (e.g. nuclear non-use)
Costly declaratory statements (i.e. red lines)
Domestic punishment mechanisms
First order effects vs. cascading effects
Overt actions
Characteristics that Move Thresholds Up Ladder
Significant and measurable physical effects
Gross violent effects
Civilian effects vs. military effects
Physical scope of effects
High-saliency means
High-order economic effects

Where Do Thresholds Exist?

- Means-based:
  - Nuclear Threshold
  - Chemical/biological weapons taboo
  - Unmanned vs. manned

- Effects-based:
  - Civilian targets
  - Spread of conflict to another country
  - Invasion of a country

- Legal/Treaty:
  - Declaration of war
  - Violation of an arms control treaty

Norms, IR Theory, and Thresholds

- Norms: “collective expectations for the proper behavior of actors with a given identity.” Ronald L. Jepperson, Alexander Wendt, and Peter Katzenstein, “Norms, Identity, and Culture in National Security”

- Norm life cycle
  - Emergence
  - Cascade
  - Internalization

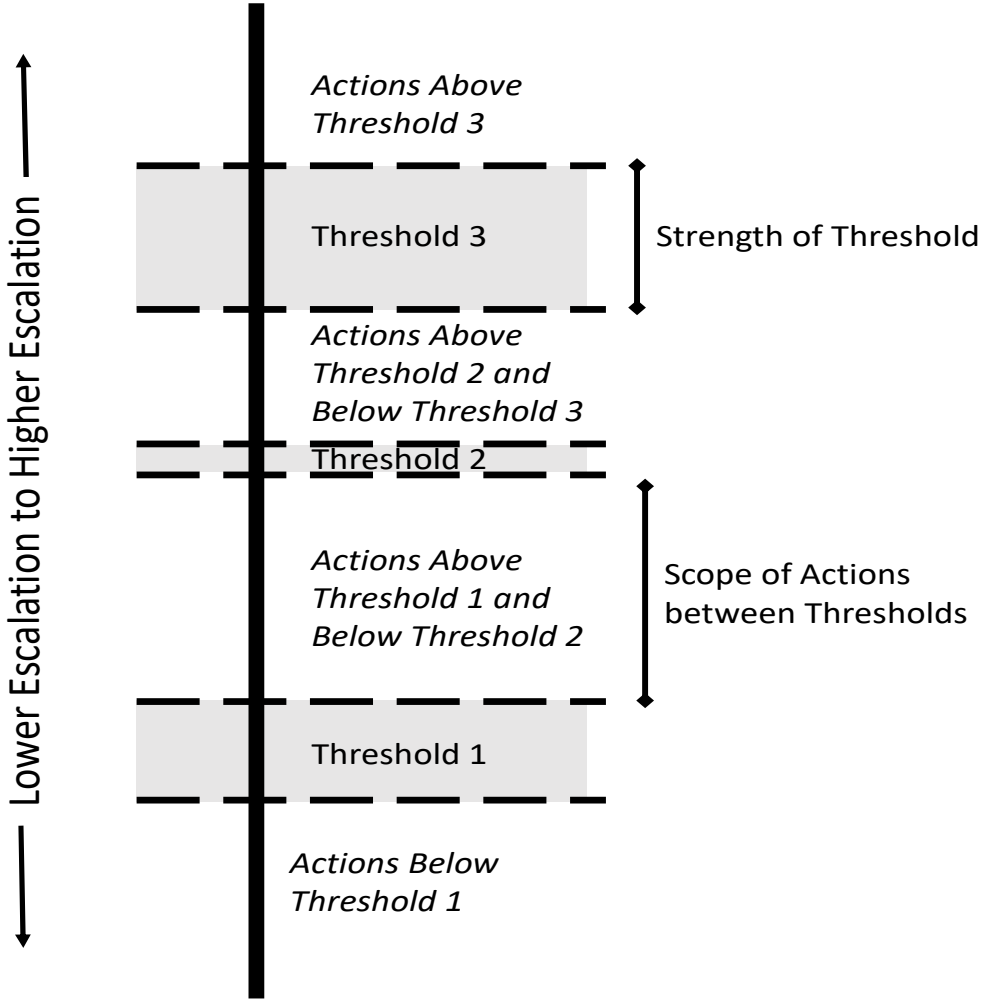
- Norm success:
  - Specificity
  - Durability
  - Concordance

- Importance of norm entrepreneurs

	Stage 1 *Norm emergence*	*Stage 2* *Norm cascade*	*Stage 3* *Internalization*
Actors	Norm entrepreneurs with organizational platforms	States, international organizations, networks	Law, professions, bureaucracy
Motives	Altruism, empathy, ideational, commitment	Legitimacy, reputation, esteem	Conformity
Dominant mechanisms	Persuasion	Socialization, institutionalization, demonstration	Habit, institutionalization

Finnemore and Sikkink

Thresholds: Fleshing out the Concept



The Cyber Threshold: Empirical Evidence

- Effects-based vs. means-based debate

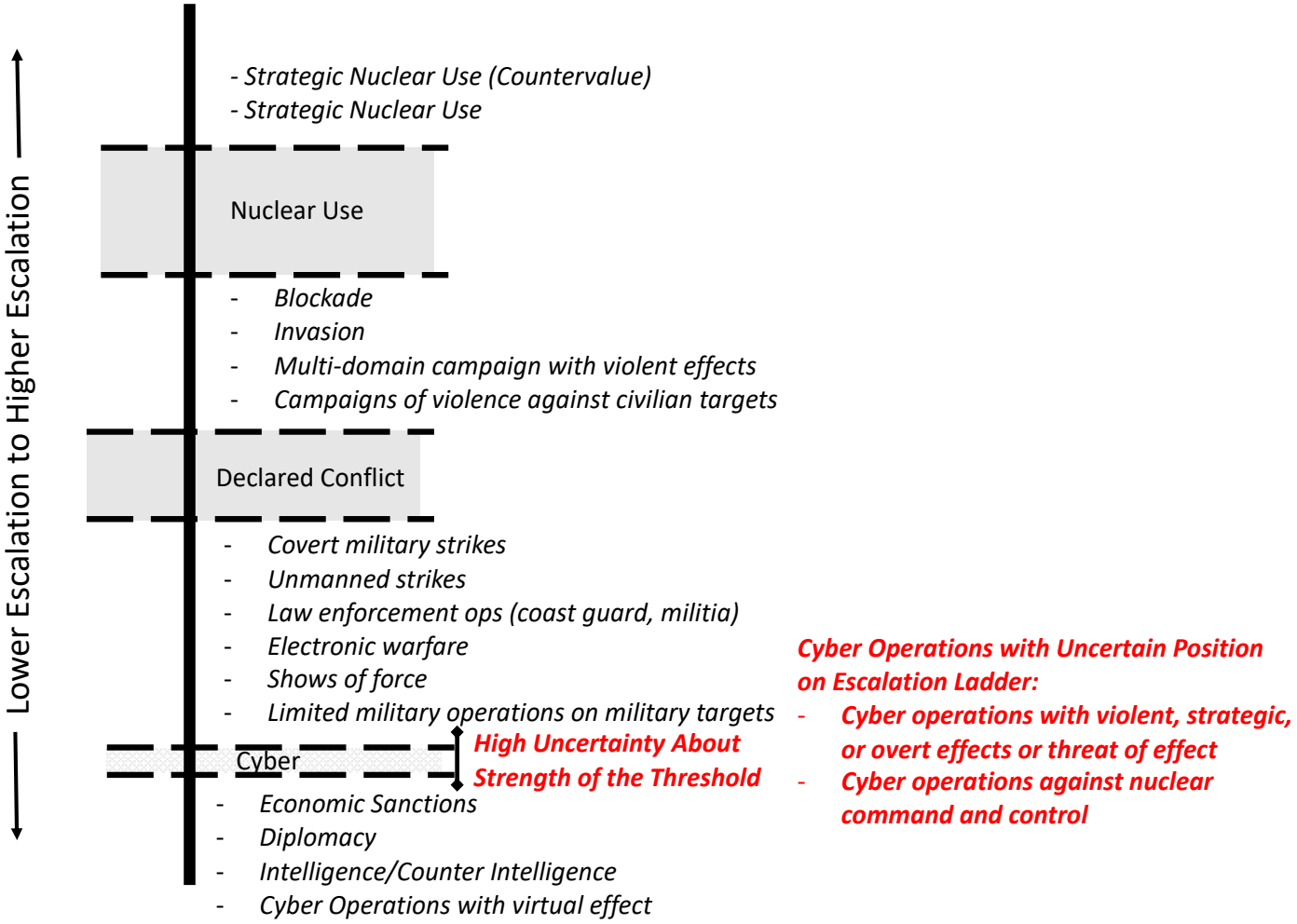
- Large-N Dataset analysis
  - Valeriano and Maness
  - Valeriano, Jensen, and Maness

- Analysis of existing campaigns
  - Ukraine data: Kostyuk and Zhukov
  - Stuxnet: Lindsay 2012

- Analysis of cyber op characteristics: Borghard and Lonergan

- Wargame and experimental data
  - Kreps and Schneider (2019)
  - Schneider (2017)
  - Valeriano and Jensen (2019)

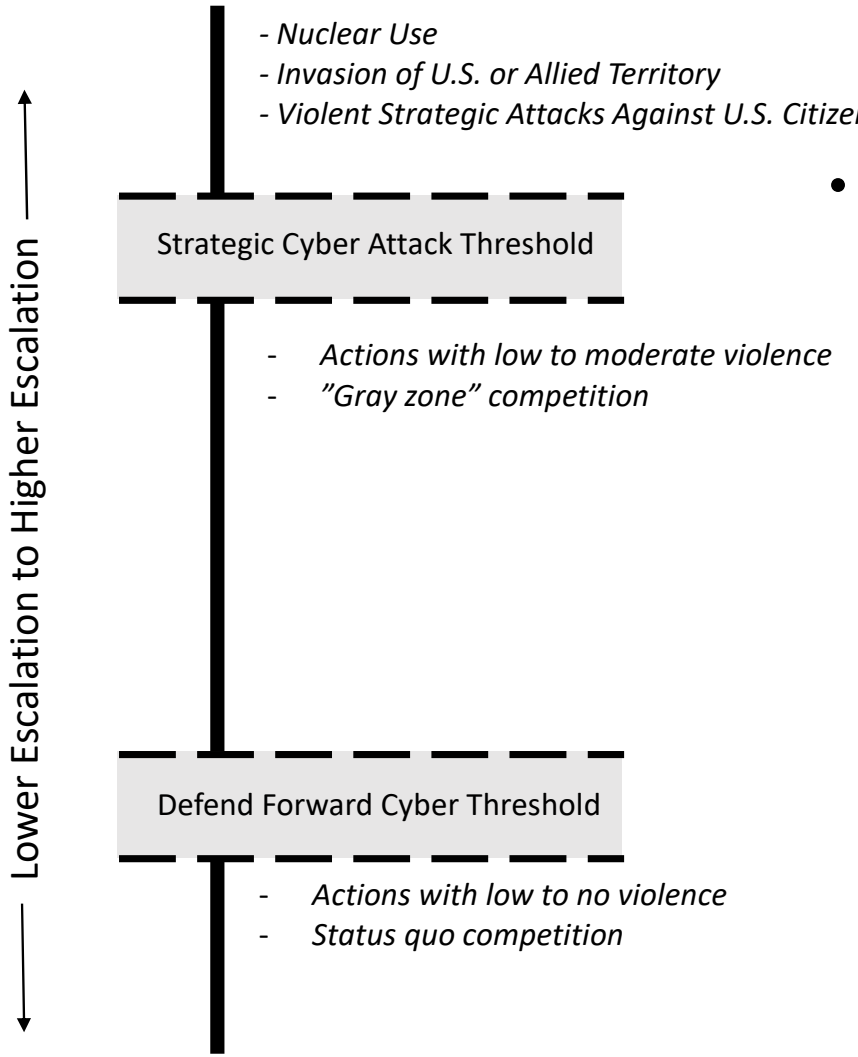
Empirical Evidence of Cyber Escalation



Cyber Operations with Uncertain Position on Escalation Ladder:

- ***Cyber operations with violent, strategic, or overt effects or threat of effect***
- ***Cyber operations against nuclear command and control***

The Cyber Threshold Problem



- Strategy requires two thresholds
  - Lower threshold that restrains U.S. and other state cyber activity from violent retaliation
  - Higher threshold that deters others from taking strategic cyber attacks against the U.S.
  - How can these coexist?

Recommendations: Solving The Cyber Threshold Problem

- Determine the cyber thresholds the U.S. wants to create
  - Low level, defend forward threshold: counter-cyber operations
  - Strategic threshold: attacks with violent effects on U.S. citizens, infrastructure, or nuclear capabilities

- U.S. as a norm entrepreneur
  - Norm-building between militaries, economic organizations
  - Positive incentives: info-sharing, burden sharing
  - Negative incentives: punishments
  - Solve the hypocrisy problem
    - No First Use Policy

- Resiliency and cross-domain punishment

Questions