One if by land, and two if by sea: Cross-domain contests and the escalation of international crises

J Andrés Gannon
Department of Political Science
University of California, San Diego

Motivation

In a first, Israel responds to Hamas hackers with an air strike

Israel military said it bombed building housing Hamas cyber forces.

As India's Physical Borders Quiet Down, Its Virtual Ones Are Under Siege

Tanks vs. Drones Isn't Rock, Paper, Scissors

Unmanned combat air vehicles have notched up kills against armored fighting vehicles all over the world. Does it mean the end of the tank?

Problem

Policymakers don't know whether to respond to aggression "in-kind"

How will responding to aggression at *sea* with aggression in the *air* impact:

- ○ The intensity of violence?
- ○ The duration of the crisis?

"One if by land, two if by sea, three if by Russian troll farm."

Solution

Record the means by which military threats and warfighting were deployed during 455 international crises from 1918-2010

Allows us to answer:

1. Are cross-domain conflicts novel?
   - **No**, the rate has been constant for a century
2. Are cross-domain conflicts concerning?
   - **No**, lower levels of violence and no longer in duration

Hope to convince you

1. Means by which states fight matters

2. Deterrence (optimist) vs spiral (pessimist) models of conflict have untested, competing predictions

3. New dataset on means of conflict in 455 crises from 1917-2010 can help

4. Find conflicts with "un-like" means are less violent and no longer in duration

1. Means matter

Conduct of conflict influences war's severity (Talmadge 2019), duration (Allen 2007), and outcome (Post 2019)

One way to conceptualize "means" is as domains (Lindsay and Gartzke 2019):

- **Traditional**: land (Levy and Thompson 2010), air (Martinez-Machain 2015), and sea (Caverley and Dombrowski 2020)
- **Novel**: WMD (Kissinger 1960), space (Early 2014), and cyber (Schneider 2017)

But existing research on military domains:

- Focuses on novel, empirically challenging domains (Horowitz 2020)
- Focuses on within-domain, rather than cross-domain effects (Borghard and Lonergan 2017)

2. Contrasting theories of cross-domain conflict

Are demonstrations of resolve/credibility enhanced or hindered by shifts to new domains?

Spiral model: conflicts involving dissimilar domains are *more* intense

- Miscalculation over proportionality (Morrow 2019)
- Miscalculation over capabilities and stakes (O'Neil 1991, Lindsay and Gartzke 2019)

Deterrence model: conflicts involving dissimilar domains are *less* intense

- Swift victory (Rovner 2020)
- Signaling graduated escalation (Quek 2013, Montgomery 2020)

3. New Data

Corpus: International Crisis Behavior (ICB) dataset (Brecher and Wilkenfeld 1997)

Scope: narratives of 455 international crises from 1917-2010

Crisis definition:
1. Actor perceives a threat to one or more of its basic values
2. Actor aware of a finite timeline for responding
3. Heightened probability of military hostilities

3. New Data

Verb: Action vs speech vs cognition
Action: raises in alert level, mobilizations, military exercises, weapons tests, deployments, shows of force, blockades, attacks, invasions, and bombardments

| Domain	Description
Land	Armored vehicles, artillery, and troops
Air	Bombers, fighters, and missiles
Sea	Aircraft carriers, submarines, and surface ships
WMD	Nuclear, chemical, and biological weapons
Space	Satellites and surveillance beyond the earth's atmosphere
Cyber	Information operations and cyber disruption

Sample Narrative

Gulf of Sidra I, 1981

A crisis for Libya was triggered by a U.S. announcement on 12 August 1981 that its Sixth Fleet would hold maneuvers in the Mediterranean. Libya responded with a full military alert the same day. And on the 18th it accused the U.S. of violating Libya's territorial waters by holding naval exercises within the Gulf of Syrte. The next day two U.S. F-14s shot down two Libyan SU-22 fighters 60 miles from Libya's coast, but within the Gulf of Syrte--the only act of violence in this crisis. The U.S. also warned Libya against retaliation, threatening to use military force if Libya attacked U.S. aircraft or ships involved in the Sixth Fleet exercise.

Crisis	Actor	**Land**	**Air**	**Sea**	**WMD**	**Space**	**Cyber**
330	US	0	1	1	0	0	0
330	Libya	0	1	0	0	0	0

Domain Distribution


Crisis-Actors per Domain (1918-2015)
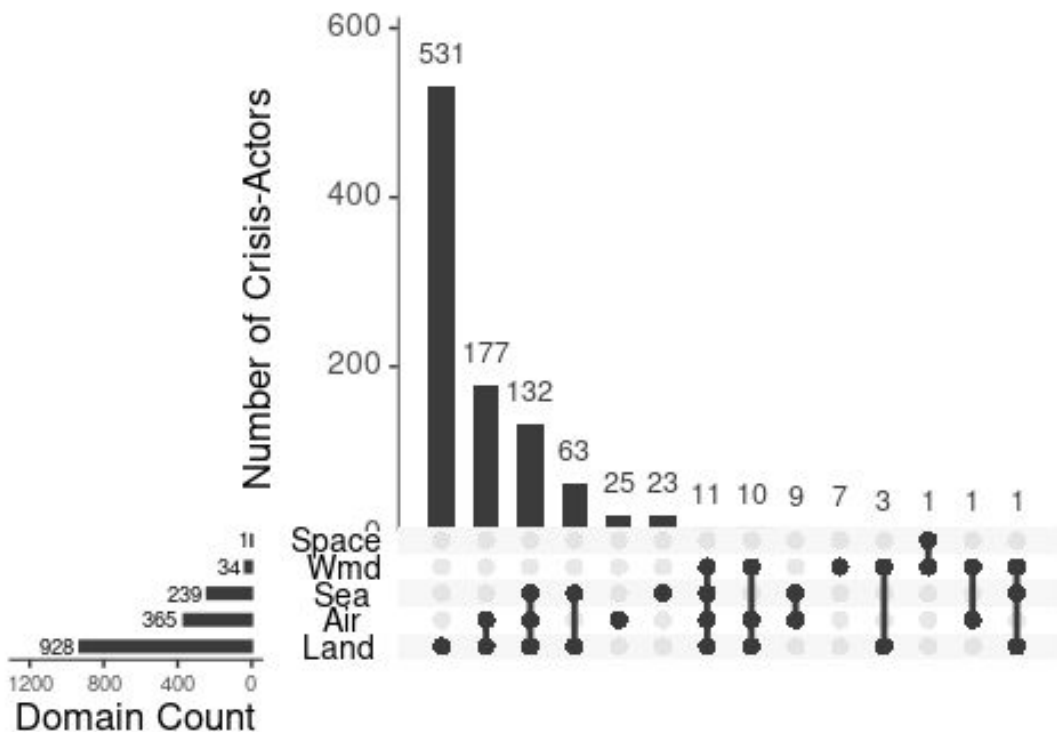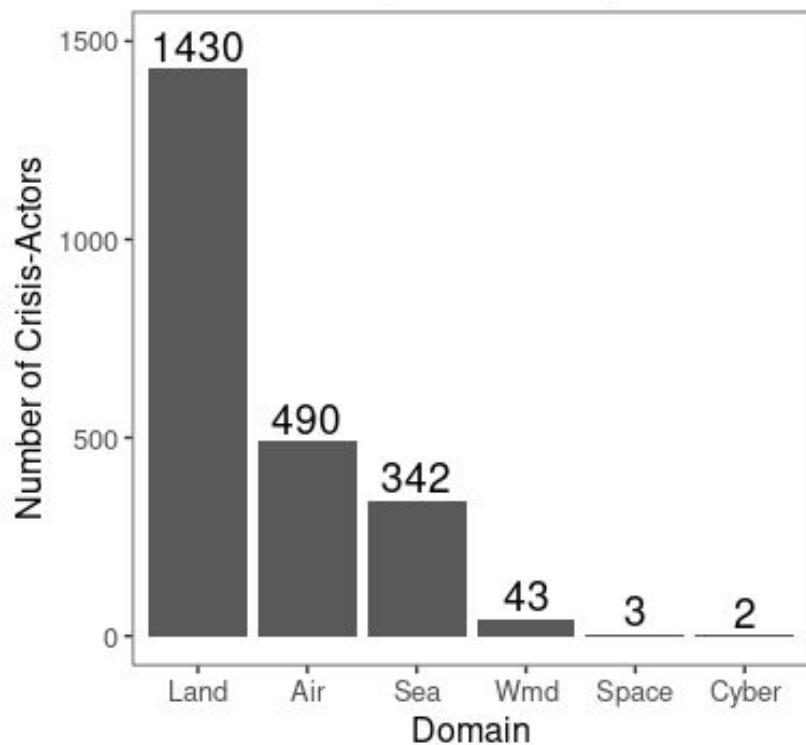
Measuring "cross-domainness"

**Crisis-dyad Jaccard similarity coefficient**: ratio of the intersection to the union of both sides in a crisis

$$d_J(A, B) = 1 - J(A, B) = \frac{|A \cup B| - |A \cap B|}{|A \cup B|}.$$

Crisis	Belligerents	Land	Air	Sea	WMD	Space	Cyber	Jaccard
N Korea Nuclear IV (2009)	US, Japan, S Korea	-	-	1	-	-	-	1
	N Korea	-	-	-	1	1	-	
Yemen War IV (1967)	Yemen, Egypt	1	1	-	1	-	-	0.67
	Saudi Arabia	1	-	-	-	-	-	
Kashmir I (1947)	India	1	1	-	-	-	-	0.5
	Pakistan	1	-	-	-	-	-	
Gulf of Tonkin (1964)	S. Vietnam, U.S.	1	1	1	-	-	-	0.33
	N. Vietnam	1	-	1	-	-	-	
Kashmir II (1965)	India	1	-	-	-	-	-	0
	Pakistan, China	1	-	-	-	-	-	

Measuring "cross-domainness"

Measuring "cross-domainness"

Cross-domainness Over Time (1918-2010)
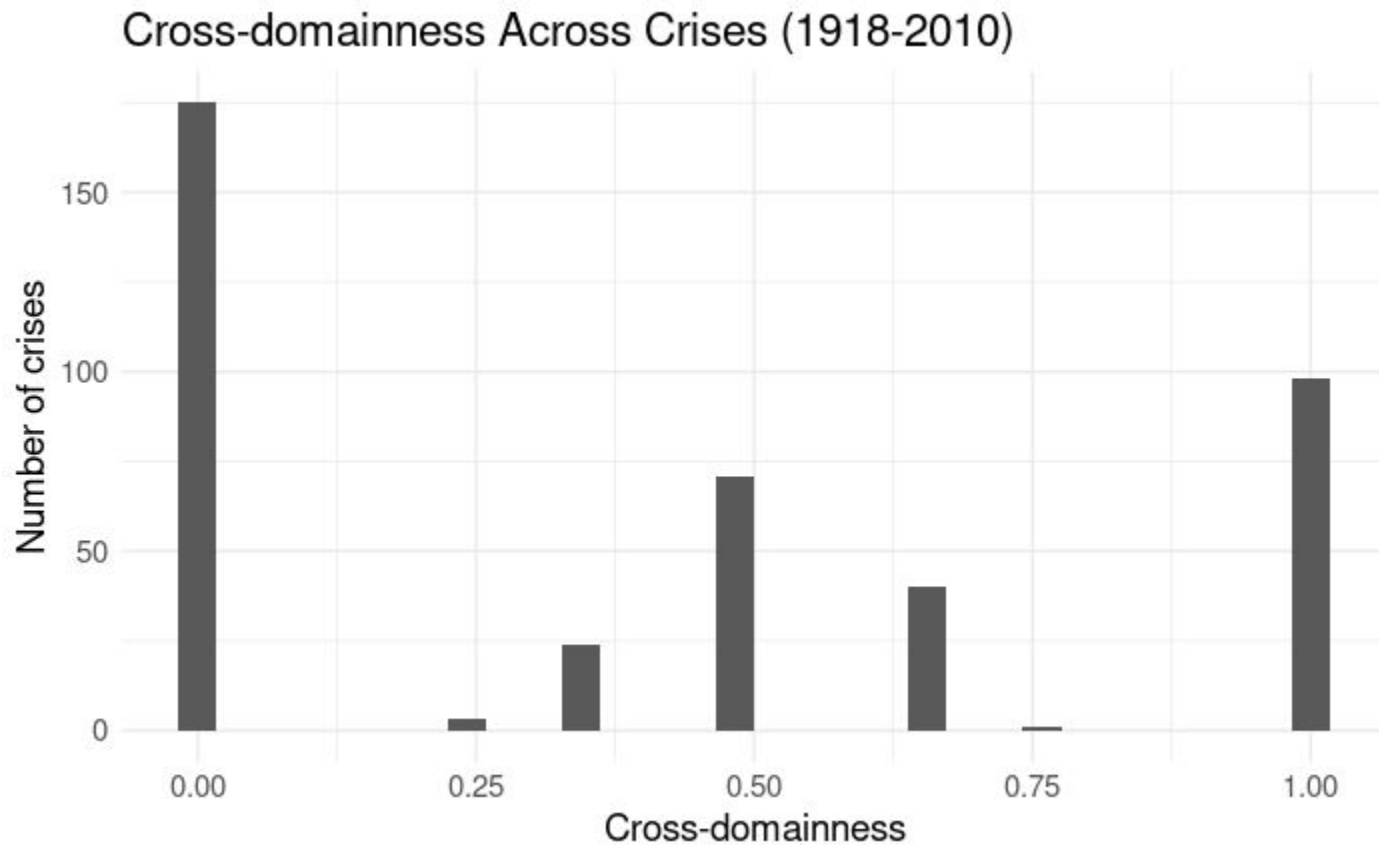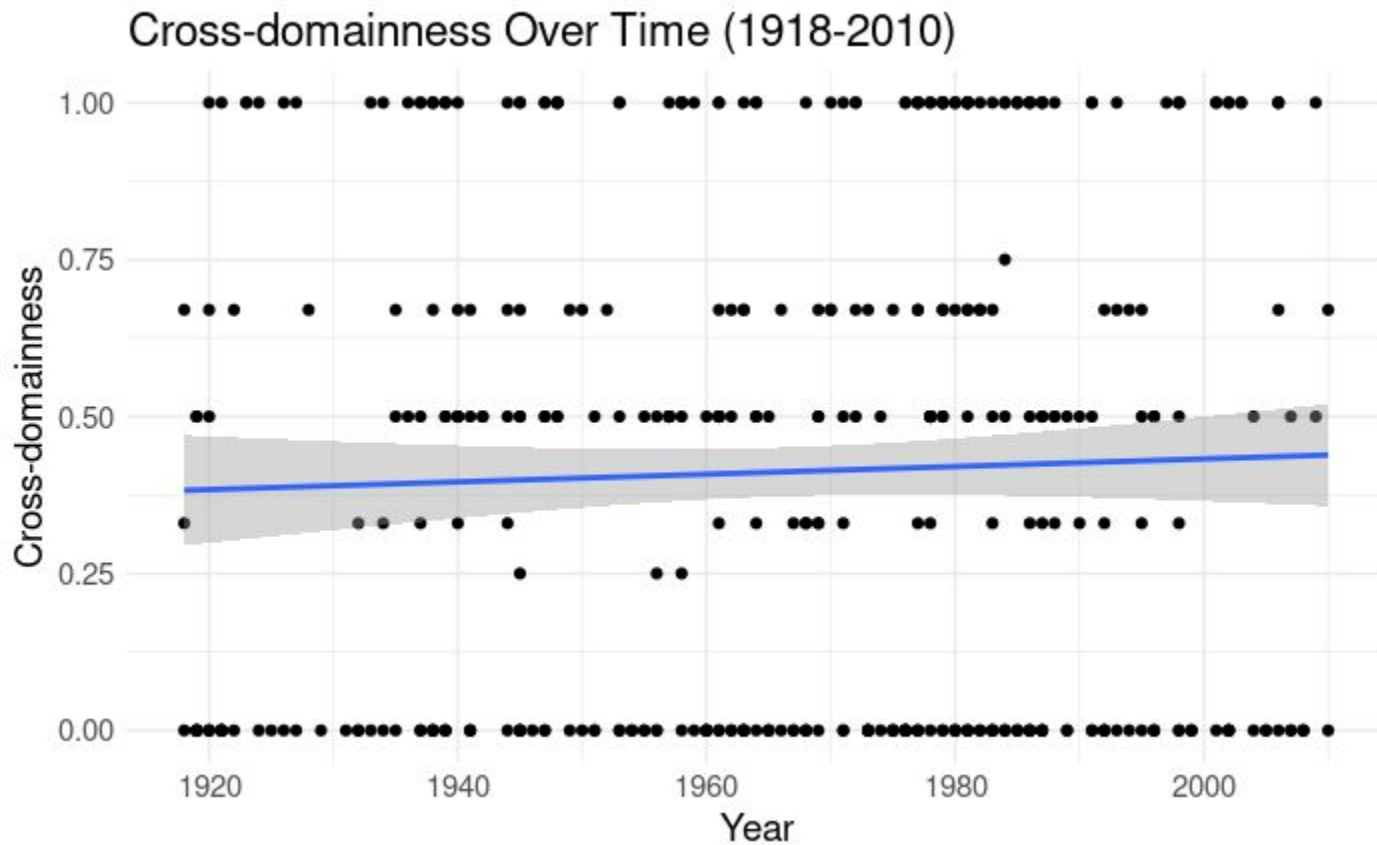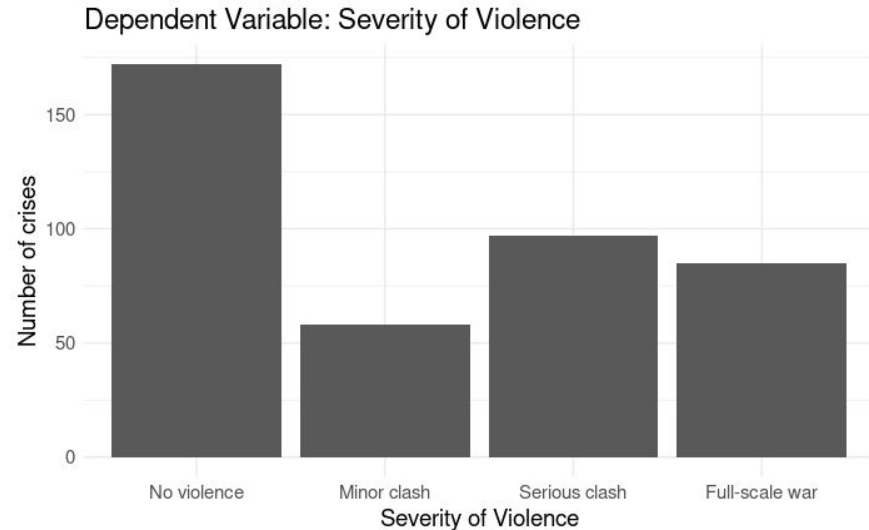
4. Results

Unit of analysis: crisis

DV: violence severity/crisis duration

IV: "cross-domainness"

Controls: number of actors, protracted crisis, territorial crisis, major power involvement, ethnic crisis, contiguity

Models: ordered probit and log-normal time accelerated hazard

Dependent Variable: Severity of Violence

Dependent Variable: Crisis Duration
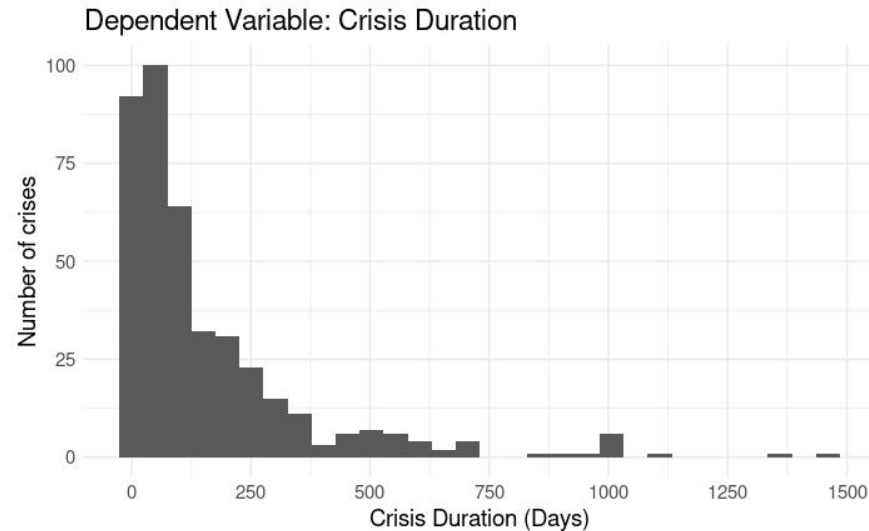
Model 1-2: Violence Severity

As cross-domainness increases, crisis severity decreases

Substantive interpretation (odds ratio): serious clash or full scale war is 44% less likely when crisis is fully cross-domain than when crisis is fully within-domain

	Violence Intensity	
	Model 1	Model 2
Cross-domainness	−0.50***	−0.41***
	(0.14)	(0.15)
No. of actors		0.08***
		(0.02)
Power Dissimilarity		−0.00
		(0.00)
Protracted Crisis		0.29**
		(0.13)
Territorial Crisis		0.09
		(0.14)
Major Power Involv.		0.42***
		(0.14)
Ethnic Crisis		0.17
		(0.14)
Contiguity		0.25*
		(0.15)
Intercept		
Log (scale)		
AIC	1071.81	884.31
BIC	1087.90	926.99
Log Likelihood	−531.91	−431.15
Deviance	1063.81	862.31
Num. obs.	412	358

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Model 3-4: Crisis Duration

As cross-domainness increases, crisis duration does not change

Substantive interpretation: negative coefficients associated with shorter duration, positive coefficients associated with longer duration

	Crisis Duration	
	Model 3	Model 4
Cross-domainness	−0.29*	−0.21
	(0.16)	(0.17)
No. of actors		0.07***
		(0.02)
Power Dissimilarity		0.00
		(0.01)
Protracted Crisis		−0.12
		(0.15)
Territorial Crisis		−0.02
		(0.16)
Major Power Involv.		0.07
		(0.16)
Ethnic Crisis		0.65***
		(0.16)
Contiguity		−0.07
		(0.17)
Intercept	4.45***	3.86***
	(0.09)	(0.23)
Log (scale)	0.29***	0.25***
	(0.03)	(0.04)
AIC	4981.74	4307.61
BIC	4993.80	4346.41
Log Likelihood	−2487.87	−2143.80
Deviance		
Num. obs.	412	358

***$p < 0.01$; **$p < 0.05$; *

Conclusion

1. Crises have always been cross-domain

Takeaway: don't reinvent the wheel to understand cross-domain dynamics

2. Cross-domain conflicts are less violent and no longer than within-domain conflicts

Takeaway: don't sound the alarm about "taking an ear for an eye"

3. There is more to learn about how states fight

Takeaway: research disaggregating domains, disaggregating actions, examining sequence, and explaining domain choice are worthy endeavors