Do Arms Races Lead to War?

POSC 3610 – International Conflict

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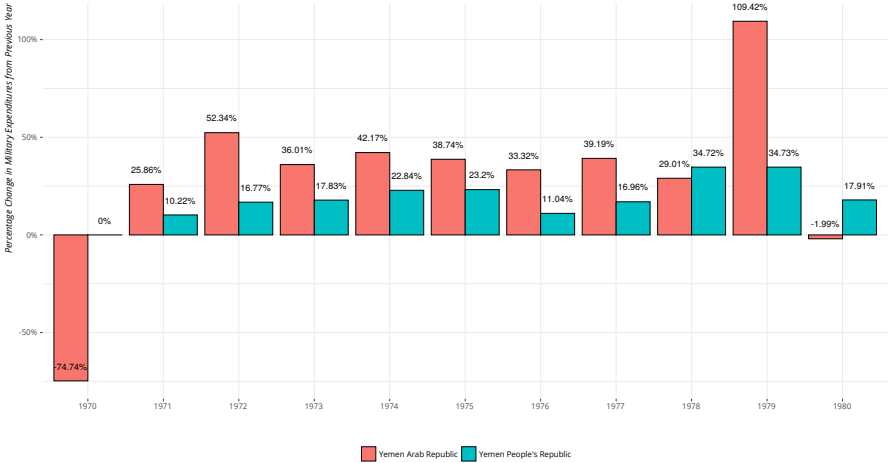
Goal for Today

Discuss whether arms races lead to war or not.

MIC of the Day: Second Yemenite War (MIC#2357)

The Yemeni Arms Race Visualized, 1970-1980

Gibler et al. (2005) record an arms race here from 1971 to 1979 based on changes in military expenditures between the two states.



Data: Correlates of War National Material Capabilities (v. 6.0)

Arms Races and War

We want to know the association between arms races and war.

- Similar to our interest in alliances.

We have two general predictions of the relationship.

1. Preparedness model
2. Escalation/spiral model

The arguments/intuition for both can be ported from our discussion about alliances.

Wallace's (1979, 1982) Design

Wallace proposes a rudimentary competitive hypothesis test.

- Unit of analysis: great power disputes (1814-1965)
- DV: war or no war
- IVs:
  - arms race/no arms race
  - status quo/revisionist consideration

Editorial note: a lot of what's happening here is a leap of faith.

- Wallace describes, but never makes available, his coding of arms races.

Wallace's (1979, 1982) Competitive Hypothesis Test

The preparedness model is vindicated if:

- the SQ state is comparably strong/stronger
- An observed arms races does not lead to war.

The spiral model is vindicated if:

- There is no effect of SQ/revisionism on escalation
- The arms race leads to war.

Table 1: A Reproduction of Wallace's (1982) Table 1

	Revisionist Superiority	**No Revisionist Superiority**
War	9	17
No War	19	54

Note:

chi sq. = 0.338. p-value: 0.561. Phi: 0.08

Wallace's Results, in Brief

Table 1:

- There were 28 disputes where the revisionist was absolutely superior. 9 escalated to war (32%).
- There were 125 disputes where the revisionist wasn't superior. 54 escalated to war (43%).
- If there were no differences between groups, the probability of us observing those differences is ~.561.

Table 2: A Reproduction of Wallace's (1982) Table 4

	Arms Race	**No Arms Race**
War	23	3
No War	5	68

Note:

chi sq. = 58.995. p-value: 0. Phi: 0.8

Wallace's Results, in Brief

Table 2 (i.e. his Table 4):

- There were 28 disputes with arms races preceding them. 23 escalated to war (82%).
- There were 71 disputes without arms races preceding them. 3 escalated to war (4%).
- If there were no differences between groups, the probability of us observing that is basically 0.

Wallace: the preparedness model fails to explain the facts on both accounts.

Diehl's (1983) Objections

Diehl raises several limitations in Wallace's original study.

1. Wallace disaggregates every WWI and WWII dispute.
    - Both are over a quarter of his data set.
2. Wallace includes disputes not independent of ongoing wars.
    - e.g. USSR-Japan, 1945
    - WWI and WWII account for 80% of his explanatory power.
3. Wallace's polynomial arms race functions is not without problems.
    - A biased measure, it would inadvertently pick up unilateral buildups.

Not helping matters: Wallace described but never released his data.

Table 3: A Reproduction of Diehl's (1983) Table 2

	MMB	**No MMB**
War	3	9
No War	10	64

Note:

chi sq. = 1.062. p-value: 0.4. Phi: 0.11

Do Arms Races Lead to War?

This debate was an open-ended question through the 1980s.

- Inferences very sensitive to design decisions
- Samples and arms race estimates varied from study to study, complicating matters.

Sample (1997) is a sort of Solomon to this debate.

- Arms races lead to war, but Wallace's results are unreasonably stark.

What Can We Do Here?

Let's put our own spin on this.

- *Unit of analysis*: non-directed dyad-years
- *DVs*: confrontation onset, confrontation fatalities (min., max.), escalation to dyadic war.
- *Main IV*: arms race (Gibler et al., 2005), MMB (my recreation of Gibler et al., 2005)
    - Total *n* of interest: 71 arms races and 116 MMBs
- *Controls*: rivalry, joint democracy, major power status, contiguity, CINC (W/S), min. GDP per capita, joint alliance
- *Methods/notes*: adjustments for temporal dependence, sample selection.

Table 4: A Dangerous Dyad-ish Analysis of Inter-state Conflict Onset

	MMB (1816-2010)	Arms Race (1816-1992)
Arms Race/MMB	0.178	0.572***
	(0.187)	(0.148)
Ongoing Rivalry	1.329***	1.531***
	(0.061)	(0.072)
Land Contiguity	0.778***	0.621***
	(0.066)	(0.074)
CINC Proportion	0.313**	0.172
	(0.101)	(0.118)
Both Major Powers	0.465***	0.412***
	(0.092)	(0.100)
Major-Minor	0.045	0.126+
	(0.067)	(0.076)
Defense Pact	0.014	-0.023
	(0.062)	(0.075)
Joint Democracy	-0.685***	-0.901***
	(0.093)	(0.138)
Min. GDP per Capita in Dyad	0.079***	0.083***
	(0.018)	(0.020)
Num.Obs.	102177	77504

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: A Dangerous Dyad-ish Analysis of Inter-state Conflict Fatalities

	Min. Fat. (MMB, 1816-2010)	Max. Fat. (MMB, 1816-2010)	Min. Fat. (AR, 1816-1992)	Max. Fat. (AR, 1816-1992)
Arms Race/MMB	1.107**	1.046*	0.878*	0.761*
	(0.401)	(0.440)	(0.352)	(0.382)
Ongoing Rivalry	0.288	0.303	-0.262	-0.327
	(0.193)	(0.211)	(0.279)	(0.303)
Land Contiguity	0.205	0.191	0.225	0.244
	(0.171)	(0.188)	(0.204)	(0.221)
CINC Proportion	-0.027	-0.188	0.101	-0.073
	(0.229)	(0.251)	(0.294)	(0.320)
Both Major Powers	0.996***	0.907***	0.975***	0.900**
	(0.222)	(0.243)	(0.262)	(0.285)
Major-Minor	0.656***	0.676***	0.682***	0.691***
	(0.157)	(0.172)	(0.191)	(0.207)
Defense Pact	-0.410**	-0.498**	-0.461*	-0.561**
	(0.144)	(0.158)	(0.193)	(0.210)
Joint Democracy	-0.376+	-0.441+	-0.255	-0.257
	(0.227)	(0.249)	(0.378)	(0.410)
Min. GDP per Capita in Dyad	-0.185***	-0.229***	-0.151**	-0.186***
	(0.040)	(0.044)	(0.047)	(0.051)
Num.Obs.	2173	2173	1685	1685

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

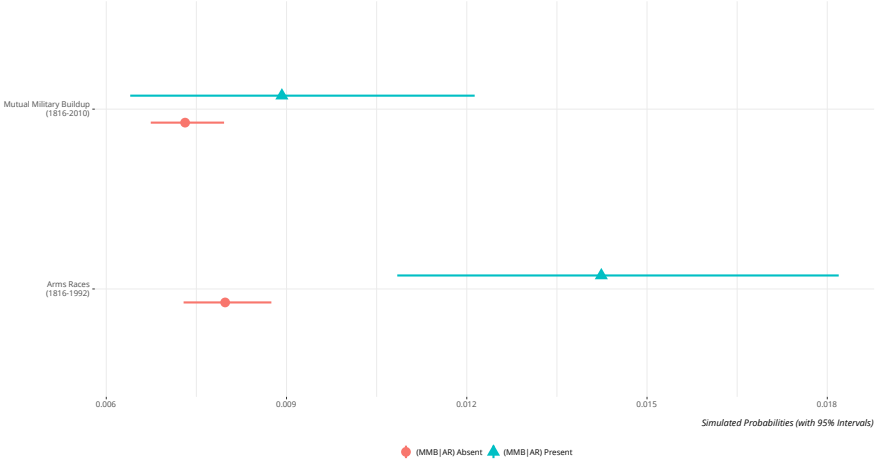
Table 6: A Dangerous Dyad-ish Analysis of Inter-state Conflict Escalation

	MMB (1816-2010)	Arms Race (1816-1992)
Arms Race/MMB	0.571*	0.384*
	(0.237)	(0.189)
Ongoing Rivalry	0.178	0.003
	(0.150)	(0.177)
Land Contiguity	0.033	0.040
	(0.119)	(0.120)
CINC Proportion	-0.272	-0.246
	(0.184)	(0.193)
Both Major Powers	0.884***	0.789***
	(0.146)	(0.149)
Major-Minor	0.572***	0.494***
	(0.115)	(0.118)
Defense Pact	-0.435**	-0.429**
	(0.134)	(0.141)
Joint Democracy	-4.289	-4.237
	(75.582)	(74.722)
Min. GDP per Capita in Dyad	-0.051+	-0.029
	(0.027)	(0.028)
Num.Obs.	2173	1685

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The Effect of Mutual Military Buildups and Arms Races on Confrontation Onset

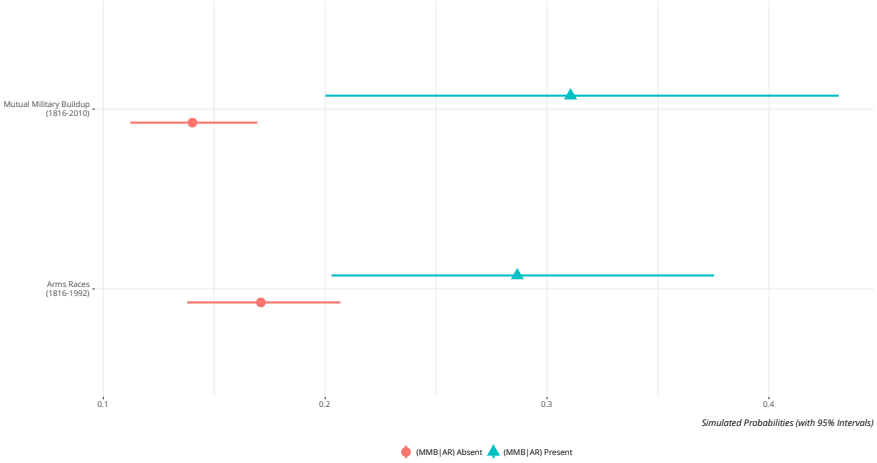
There is no discernible effect of mutual military buildups, but arms races increase confrontation onset by about 78%.



Estimates generated by simulation from the models shown earlier in this presentation.

The Effect of Mutual Military Buildups and Arms Races on Confrontation Escalation

Arms races increase the likelihood of escalation to war by about 64%. Mutual military buildups: about 120%.



Estimates generated by simulation from the models shown earlier in this presentation.

Substantive Takeaways

The connection between arms races/MMBs is pretty clear.

- Discernible effect for arms races (if not MMBs) at onset phase.
  - FWIW: the rivalry indicator accounts for the MMB coefficient at onset phase.
- Discernible effect for both on conflict severity.
- Arms races/MMBs are more likely to coincide with escalation to dyadic war.

Conclusion

What we know:

- Arms races raise probability of dispute escalation to war.
- Much greater (weaker) support for steps-to-war (neorealism/preparedness) model on arms race vis-a-vis alliances.

What we don't know:

- What causes the arms race itself.
- How military technology intersects with the "arms race."
- How arms races emerge outside of rivalry.
- How domestic considerations can be adequately disentangled from the arms race.

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