

Forecasting intra-state conflicts

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The “hard sciences”

Why is prediction so hard in the social sciences?

Dealing with one of the most complex phenomenon:

The “hard sciences”

Why is prediction so hard in the social sciences?

Dealing with one of the most complex phenomenon:

Social Behavior

- ① Growth of prediction and forecasting approaches
- ② Some context to the growth conflict forecasting
- ③ Social science as predictive science
- ④ How to predict a conflict

Predictive turn in conflict studies

- Gurr and Lichbach, 1986
- O'brien, 2002
- Schrodtt, 2006
- Goldstone et al., 2010
- Ward, 2010
- Weidmann and Ward, 2010
- Schneider, Gleditsch and Carey, 2011
- De Mesquita, 2011
- Ward et al., 2013
- Gleditsch and Ward, 2013
- Hegre et al., 2013
- Bell et al., 2013
- Brandt, Freeman and Schrodtt, 2014
- Muchlinski et al., 2016

Characteristics of predictive approaches

- $Y = f(X) + \epsilon$
- Focus on \hat{Y} rather than $\hat{\beta}$
- $\hat{Y} = \hat{f}$

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Special issue on forecasting

Edited by Håvard Hegre, Nils W Metternich, Håvard Møkleiv Nygård & Julian Wucherpfennig

Introduction

Håvard Hegre, Nils W Metternich,
Håvard Møkleiv Nygård & Julian Wucherpfennig –
Introduction: Forecasting in peace research

Research Articles

Nils B Weidmann & Sebastian Schutte – Using night
light emissions for the prediction of local wealth

Michael D Ward & Andreas Beger – Lessons from near
real-time forecasting of irregular leadership changes

Anita R Gohdes & Sabine C Carey – Canaries in a
coal-mine? What the killings of journalists tell us
about future repression

Frank DW Wilmer, Andrew M Linke, John O'Loughlin,
Andrew Gettelman & Arlene Laing – Subnational
violent conflict forecasts for sub-Saharan Africa,
2015–65, using climate-sensitive models

Michael Colaresi & Zuhaib Mahmood – Do the robot:
Lessons from machine learning to improve conflict
forecasting

Ursula Daxecker & Brandon C Prins – Financing
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Håvard Hegre, Håvard Møkleiv Nygård & Ranveig
Flaten Røedler – Evaluating the scope and intensity of
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Lars-Erik Cederman, Kristian Skrede Gleditsch & Julian
Wucherpfennig – Predicting the decline of ethnic civil
war: Was Gurr right and for the right reasons?

Daina Chiba & Kristian Skrede Gleditsch – The shape
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Evidence from a panel survey in Liberia

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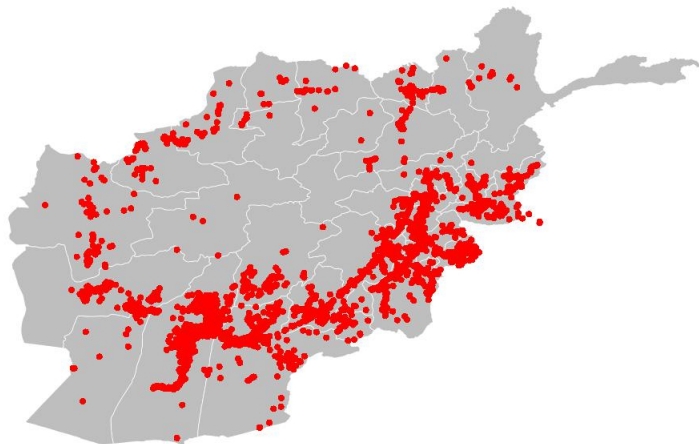
Curse or fortune?

The increasing demand to explain and predict conflictual behavior



Curse or fortune?

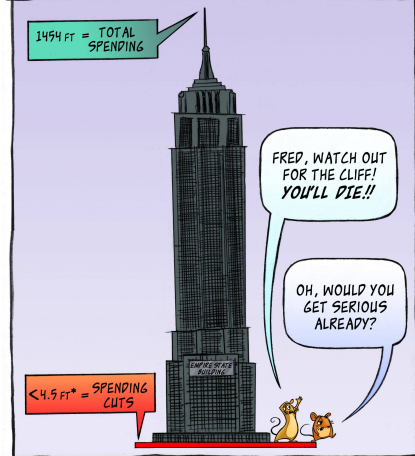
The increasing demand to explain and predict conflictual behavior



Curse or fortune?

The increasing demand to explain and predict conflictual behavior

WHAT IF THE U.S. WENT OVER THE "FISCAL CLIFF"?
2013'S 'WOULD-BE' SPENDING CUTS MEASURED IN FEET



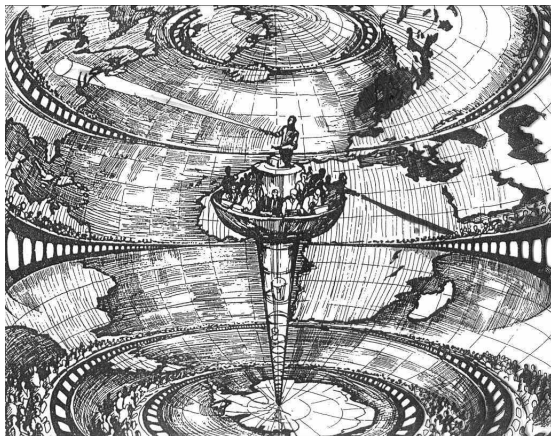
*DRAWING NOT TO SCALE
(REP AREA WOULD BE TOO PAMMY SMALL TO SEE)

60COMICS.COM/OF-MICE-AND-MUD



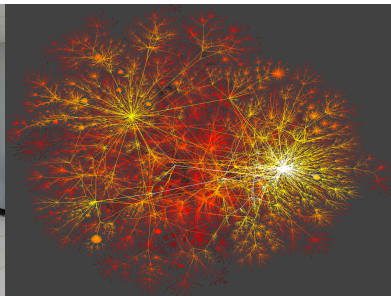
Curse or fortune?

The increasing ability to explain and predict conflictual behavior



Curse or fortune?

The increasing ability to explain and predict conflictual behavior



Social radar

Is it the social science “space race”?



Dr. Mark Maybury (Chief Scientist of the United States Air Force)

“The Air Force and the Navy in this and other countries have a history of developing Sonar to see through the water, Radar to see through the air, and IR [infrared] to see through the night. Well, we also want to see into the hearts and the minds of people” (In Wired.com 01/19/12)

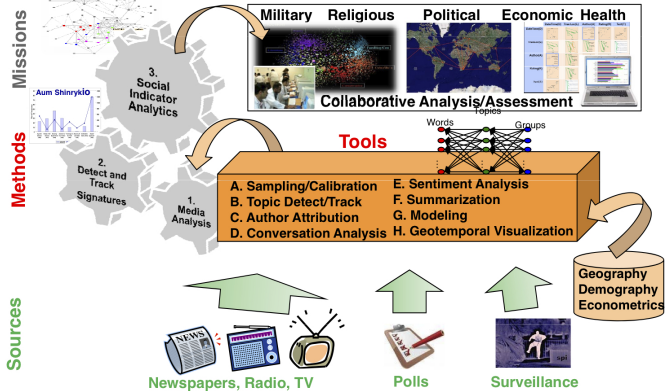
Social radar

Is it the social science "space race"?



Social Radar

Strategic Communication Counter Insurgency Humanitarian Relief

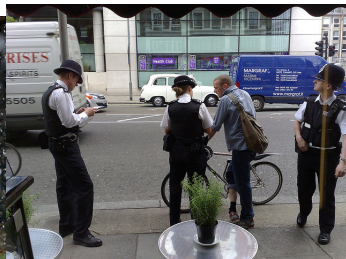


Pentagon
125 000 000
USD

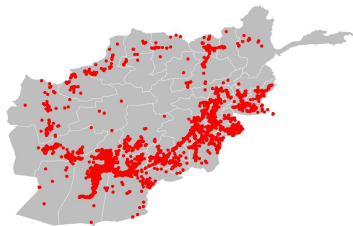
NSF
(Total Political Science Funding)
33 000 000 USD

Everyday forecasts and conditional behavior

Everyone of us is making predictions and conditions their behavior



General forecasts and conditional policies



Little prediction case study

- A study tries to understand the link between democratization and civil war
 - Democracy measured on a 20 point scale (0=fully autocratic; 20=fully democratic)
 - Civil war measured binary (0=no civil war; 1=civil war)
- The study finds that an increase in democracy by one point, decreases the risk of conflict by 5 percent.
 - Imagine the risk of war in the Dem. Rep. Congo is 25 percent and we suddenly see a strong autocratic shift from 15 on the democracy scale to 10.
 - What is the updated risk of war in the DRC?

Skepticism of prediction = Skepticism of social sciences?

- Increasing skepticism of whether we can predict accurately
- Oftentimes the argument is: “We can explain, but not predict.”
- But what does that mean if we at the same time believe in generalizable explanations?
- Doesn't generalizability imply predictability?

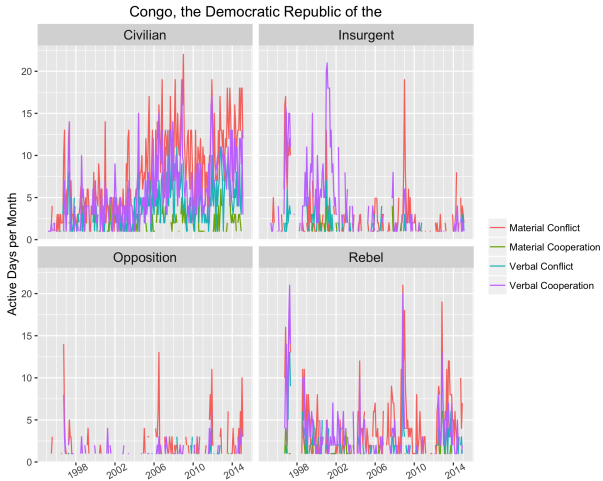
Prediction of conflictual events

Prediction tool	Example
Subject matter experts	CIA
Prediction markets	Iowa Market
Actor-based/game theoretical models	Bueno de Mesquita
Statistical models	CRISP

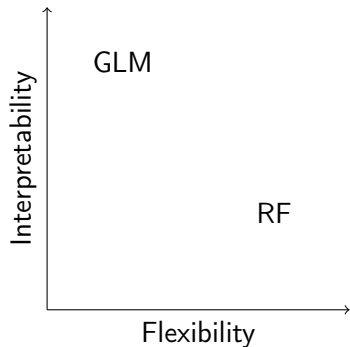
Statistical Predictions

How are they are generated

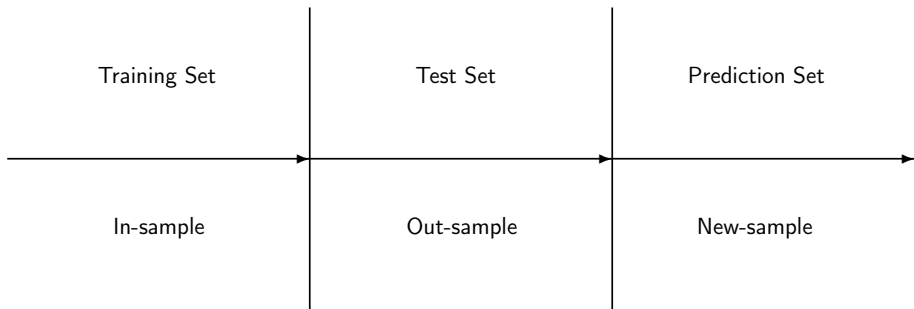
- Input data
 - Dynamic indicators (News wires, newspapers, media)
 - Structural indicators (political, economic, geographic, ethnic)
- Estimation
 - Statistical models
- Predictions
 - In-Sample
 - Out-Sample
 - Forecasting



Approaches and tradeoffs



How can we be confident in our predictions?



Estimation

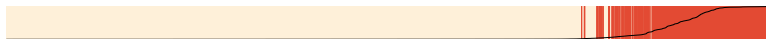
Hierarchical model estimates

	$\hat{\beta}$	$\sigma_{\hat{\beta}}$	Z-score
(Intercept)	0.48	1.09	0.44
High intensity conflictual events $_{t-1}$	1.94	0.13	14.45
Low intensity conflictual events $_{t-1}$	1.01	0.19	5.43
Excluded population $_{t-1}$	7.01	1.12	6.27
Excluded population $^2_{t-1}$	-7.79	1.40	-5.57
log GDP/capita $_{t-1}$	-0.62	0.15	-4.11
Democ $_{t-1}$	-0.26	0.05	-5.13
Autoc $_{t-1}$	-0.12	0.06	-2.14
Spatial low intensity conflictual events $_{t-1}$	-0.68	0.46	-1.48

In- and Outsample predictions

Separation plots for CRISP Model Prediction of UCDP Data

In-Sample: January 2001–December 2010



Out-of-Sample: January 2011–December 2011



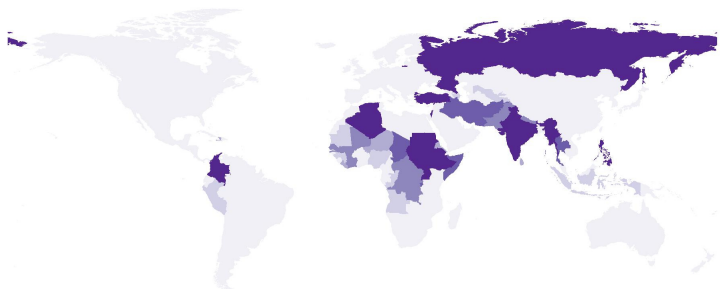
Predictions for 2012

10 Countries with Highest Average Probability of Continuing Conflict and 5 With Highest Average Probability of New Conflict

	01/2012	02/2012	03/2012	04/2012	05/2012	06/2012	07/2012	08/2012	09/2012	Forecast 10/2012 - 03/2013
Sudan	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
India	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.94	0.99
Ethiopia	0.98	0.99	0.99	0.99	0.97	0.96	0.99	0.99	0.97	0.99
Russia	0.99	0.96	0.96	0.99	0.99	0.96	0.99	0.99	0.96	0.99
Israel	0.98	0.98	0.98	0.97	0.98	0.98	0.98	0.98	0.98	0.99
Turkey	0.99	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.92	0.99
Algeria	0.99	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.99
Philippines	0.98	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.89	0.99
Colombia	0.99	0.97	0.97	0.97	0.98	0.97	0.98	0.99	0.88	0.99
Uganda	0.93	0.95	0.95	0.99	0.99	0.99	0.95	0.94	0.96	0.99
Chad	0.67	0.64	0.64	0.60	0.66	0.66	0.67	0.67	0.67	0.99
DR Congo	0.29	0.33	0.37	0.33	0.35	0.38	0.36	0.35	0.41	0.91
Nepal	0.30	0.33	0.32	0.32	0.33	0.33	0.34	0.34	0.37	0.90
Mali	0.27	0.26	0.71	0.86	0.89	0.24	0.28	0.28	0.27	0.83
Sri Lanka	0.16	0.14	0.13	0.51	0.14	0.56	0.55	0.54	0.16	0.64

Predictions for 2012

Map for CRISP Model Predictions of Civil War (October 2012-March 2013), with darker colors presenting higher probabilities



- Predicting is becoming the “gold standard” in social science
- Big data and new methods allow for improved prediction of conflict
- However, the money allocation does favor a particular branch of social science. Does this lead to less scientific freedom?
- How are scientific insights used?
- Curse or fortune?