

Environmental causes of Conflict

Spring 2020 (Block III)

Dr. Babak RezaeeDaryakenari

**Leiden University
The Institute of Political Science**



**Universiteit
Leiden**
The Netherlands

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Week 1: Introduction

Introduction

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Babak Rezaee

- ▶ Ph.D. in Political Science from Arizona State University (ASU)
- ▶ MS in Economics from W. P. Carey School of Business, ASU
- ▶ MS in Applied Economics from Sharif University of Technology
- ▶ BA in Industrial Engineering from Iran University of Science & Technology
- ▶ Research interests: political conflict, political violence, cyber conflict, political forecasting

The objectives

The objective of the course is

- ▶ unpacking the meaning of environment and conflict as two rather elusive concepts
- ▶ Discussing the literature on environmental security aiming to answer three main questions.
 - First, how do climate change and weather anomalies as well as resource scarcity and abundance start and amplify conflict?
 - Second, how does conflict affect the environment and exacerbate environmental issues?
 - Finally, how can we ease and possibly resolve environment-related conflicts?
- ▶ Concluding the first part of the course (Block III) by discussing the different methodological approaches that scholars and practitioners use for studying environmental security threats.

Tell us about yourself

- ▶ Your name
- ▶ Your major
- ▶ Why did you take this course?
- ▶ Tell us something interesting about yourself
- ▶ ...

Syllabus

The is available on the course' blackboard page.

- ▶ **Research question:** “Can we talk meaningfully about a scientific understanding of the causes of domestic political violence?”(17)
- ▶ What does **scientific understanding** mean?
 1. Data/Observations/Evidences
 2. Theorizing and developing hypotheses to explain the data/observations/evidences
 3. Empirical analysis of developed hypotheses
 4. Modifying the hypotheses and theories
 5. Back to step 3

- ▶ **Research question:** “Can we talk meaningfully about a scientific understanding of the causes of domestic political violence?”(17)
- ▶ Three suggested frameworks in the literature for explaining domestic political violence:
 1. Socio-psychological approaches such as Ted Gurr’s *Why Men Rebel* (1979) (individual level)
 2. Political conflict approaches such as Charles Tilly’s *From Mobilization to Revolution* (1978) (group level)
 3. Structural-determinist approaches such as Theda Skocpol’s *State and Social Revolutions* (1979) (Macro level)
- ▶ **The main argument of this study:** “These frameworks are not mutually exclusive”(19), so we can synthesize these approaches to fill theoretical gaps and improve the explanatory power of these theories.

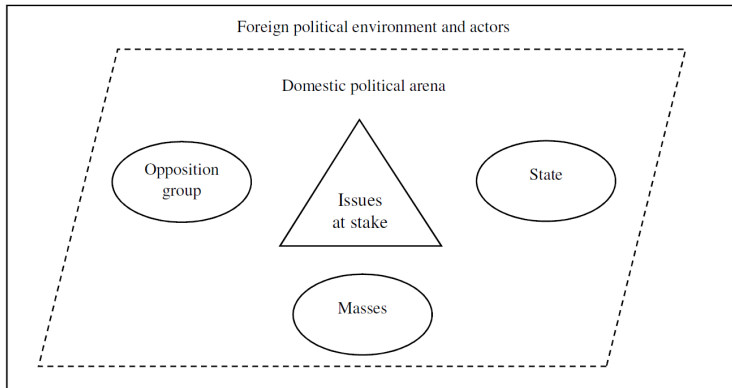


Figure 1: A schematic view of players and factors involved in a political conflict

Micro-Mobilization: The role of Appeals

- ▶ “[B]y issuing appeals, groups are able to *convince* people to adopt the group’s *world-view*, and thus mobilize them.”(22)
- ▶ Recruitment process
- ▶ Are benefits of joining rebels and supports provided by rebellions always financial?
- ▶ Examples? (ISIS)

The effectiveness of Appeals

- ▶ “Why are appeals effective?”, and “How effective are they?” (25 & 26)
- ▶ ethnic/religious vs economic/political factors
- ▶ “There is violence at some periods but not at others, and thus explaining based on enduring social conditions are not especially helpful-if these conditions were the determinative ones, violence would be more or less continuous” (27).
- ▶ What are the three problems, discussed in the paper, with this criticism?
 1. The distinction between absolute and relative deprivation
 2. Different categories have different mobilization potential (Collective action)
 3. The impact of the repressive capacity of state

The effectiveness of Appeals (cont'd)

- ▶ What do you think about these problems? Agree or disagree?
Do you want to add more?

The interaction of the state and rebel groups

- ▶ What are the state's tools for generating loyalty? Concession or/and repression
- ▶ Which tool is more effective?

State-structural constraints

- ▶ Rebellions and revolutions are rare events. Why?
- ▶ Skocpol (1979) claims social movements can be successful when the state experiences a low coercive capacity.
- ▶ How does this decrease in coercive capacity happen?
- ▶ “A state’s power is a function of the state’s structural positions in society and the international system.”(32)
- ▶ Could we add international organizations, NGOs, and etc? We will return to this question later.
- ▶ Withdrawal of support from dominant classes and foreign competition can decrease the state’s coercive capacity, and increase the likelihood of group mobilization and the chance of state failure.

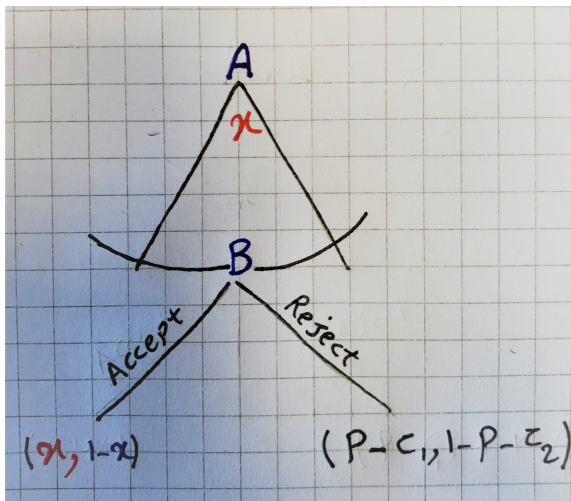
Central puzzle

- ▶ Wars (violent conflicts) are costly, *but* nonetheless they recur!
Why?
- ▶ Solutions:
 1. People are sometimes or always irrational.
 2. Leaders enjoy the benefits of war but soldiers and citizen pay the costs.
 3. **Even rational leaders who consider the risks and costs of war may end up fighting.**

It is like Dividing cake/pie?



Rubinstein Bargaining model



Why bargaining fails, and we observe war/violent conflict?

- ▶ Private information/ Asymmetric information
- ▶ Indivisibility problem
- ▶ Credibility problem
- ▶ time horizons

- └ Fearon (1995) & Toft (2006): Rationalist Explanations for War
- └ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

Pattern of Political Violence

- ▶ What do we mean by a *pattern of violence*?
- ▶ What should we mean by a *pattern of violence*?
- ▶ The paper provides a new conceptualization of political violence, defining an organization's pattern of violence as the configuration of
 - repertoire
 - targeting
 - frequency
 - technique
- ▶ This approach adds precision to the documentation and analysis of political violence, clarifies the evaluation of rival theories, and opens up new research questions.

└ Fearon (1995) & Toft (2006): Rationalist Explanations for War

└ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

The importance of defining 'patter of violence'

Which civil war was more violent?

- ▶ Yemen civil war
- ▶ Colombian civil war
- ▶ Iraq civil war
- ▶ Syrian civil war
- ▶ Rwanda Civil War

Which military organization was/is more violent?

- ▶ ISIS
- ▶ Hamas
- ▶ Fatah
- ▶ Al-Qaeda
- ▶ KKK
- ▶ FARC

And, similar questions...

- └ Fearon (1995) & Toft (2006): Rationalist Explanations for War
- └ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

Why Patterns Matter for the Analysis of Political Violence

- ▶ Kalyvas 2006 The Logic of Violence in Civil War
- ▶ Weinstein 2007 Inside Rebellion: The Politics of Insurgent Violence

- └ Fearon (1995) & Toft (2006): Rationalist Explanations for War
- └ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

Defining Pattern of Violence

*The pattern of violence on the part of an armed organization is comprised of the **repertoire** of violence in which the organization regularly engages and, for each element of the repertoire, its **targeting, frequency, and technique**. P:23*

- └ Fearon (1995) & Toft (2006): Rationalist Explanations for War
- └ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

Defining Pattern of Violence (2)

Table 1
Definition of “pattern of violence”

Dimension	Definition	Examples (not exhaustive)
Repertoire	The forms of violence in which the organization regularly engages	Homicide, torture, forced displacement, rape, forced abortion, etc.
Targeting	For each element of the repertoire, the social groups against whom the organization regularly engages with that form of violence.	An ethnic group, male members of an ethnic group, political prisoners, prisoners of war, LGBTI persons, combatants of rival organizations, residents of “enemy” village or neighborhood, etc.
Technique	How the organization carries out that form of violence against that social group	Techniques of killing include execution by firearm, execution by machete, shelling, suicide bombing, etc.
Frequency	The count (of events or victims) or the rate of attacks, of victimization or of perpetration by the armed organization using a specified repertoire element, targeting and technique (or their specified aggregates, e.g., the frequency of torture with any technique). If a count, ideally it would include some estimate (however rough) of its uncertainty. If a rate, both the numerator and the denominator should be clearly specified.	For example, take a case in which the repertoire element is torture and the social group is political detainees. (Assume that the analyst is not concerned with differences in technique). If it is possible to estimate frequency, the count would be the incidence (the number of incidents of torture or of persons, along with an estimate of its uncertainty), prevalence, ^a or rate of perpetration, ^b depending on the purpose of the analysis.

A. The number of persons tortured at least once/the number of detainees

B. The number of incidents or persons tortured/the number of members of the relevant unit of the armed organization (all members or the members of the responsible unit, depending on the purpose of the analysis)

- └ Fearon (1995) & Toft (2006): Rationalist Explanations for War
- └ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

Pattern of violence in matrix form with prevalence estimate of frequency

Figure 1
Pattern of violence in matrix form with prevalence estimate of frequency

	Killing	Torture	Rape
Supposed defectors	100%	Not documented	Not documented
Ethnic group 1	25%	Not documented	10%
Political prisoners	Not documented	Not documented	Not documented
Male	Not documented	100%	50%
Female	Not documented	50%	50%
Political party 1	5%	Not documented	Not documented
Residents of enemy villages	Not documented	Not documented	Not documented

- └ Fearon (1995) & Toft (2006): Rationalist Explanations for War
- └ Francisco Gutierrez-Sanin and Elisabeth Jean Wood (2017)

- ▶ The pattern of violence (A, X, T, L) is the matrix summarizing for organization A, subunit X, at time period T, and at location L the forms of violence.
- ▶ Well founded documentation and analysis of political violence should specify the level(s) of resolution (what values of A, X, T, and L) it employs.
- ▶ Why is distinguishing between repertoire and technique important?
- ▶ When is it justifiable to focus on only one repertoire element?

Session 2: Measuring climate change?

Measuring Climate Change

by Noreen Parks (2002)

and

Economist's Guide to Climate Change Science

by Solomon Hsiang and Robert E. Kopp (2018)

A comprehensive system of climate observations

- ▶ The US national capability for assessing, forecasting, and planning for climate change remains inadequate.
- ▶ "We do not have measurements of key variables such as soil moisture, ice thickness, the state of the upper ocean, and vegetation around the earth"
- ▶ Lack of a comprehensive plan leads to changes that might not affect climate forecasting, but can have significant effects on studying climate change patterns:
"You might end up with records that have jumps in them that might be interpreted as climate change when they mostly come from operational changes."
- ▶ Investment (\$450 million) is required to adhere to the "ten commitments" by the climate community.

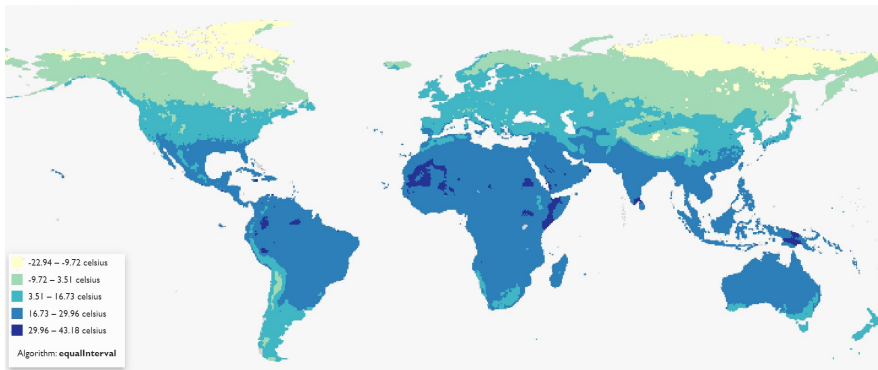
PRIO-GRID

- ▶ Parks wrote this report in 2002, and since that year, the scientific community has come a long way, though there are still limitations.
- ▶ PRIO-GRID by *Peace Research Institute Oslo* maintain a comprehensive list of geo-referenced/spatial data, including climate-related data:

<https://grid.prio.org>

Temperature 2000 (PRIO-GRID)

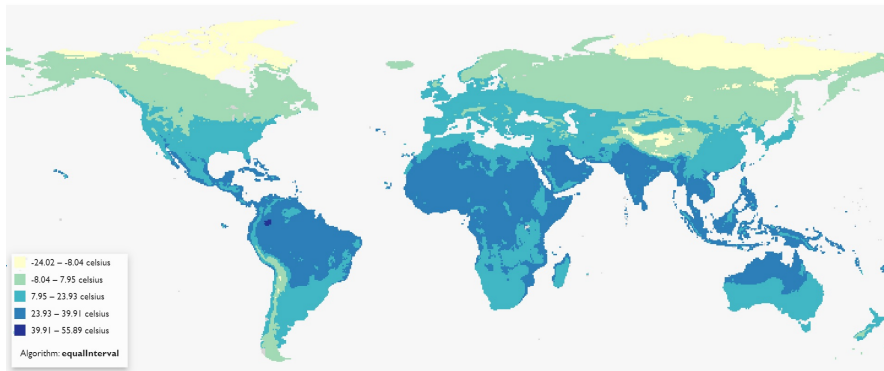
temp gives the yearly mean temperature (in degrees Celsius) in the cell, based on monthly meteorological statistics from GHCN/CAMS, developed at the Climate Prediction Center, NOAA/National Weather Service.



Variable Source: [GHCN/CAMS](#)

Temperature 2014 (PRIO-GRID)

temp gives the yearly mean temperature (in degrees Celsius) in the cell, based on monthly meteorological statistics from GHCN/CAMS, developed at the Climate Prediction Center, NOAA/National Weather Service.



Variable Source: **GHCN/CAMS**

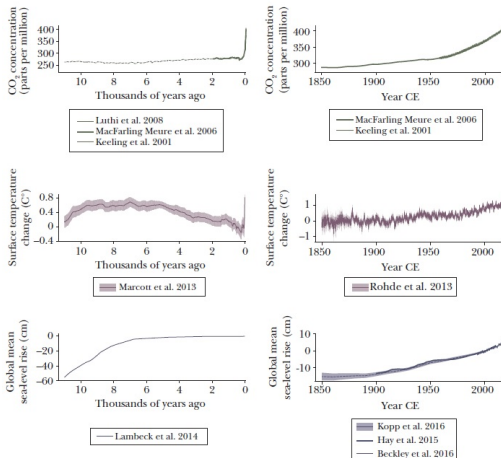
Hsiang and Kopp (2018)

- ▶ Let's watch a video that helps to refresh our memories about this paper: Watch
- ▶ The paper reviews scientific findings about climate change.
- ▶ Also, it gives some suggestions about how social scientists, with a focus on economists, can contribute to the climate-related issues.

Establishing Baseline Climates

Figure 1

Atmospheric CO₂ Concentrations, Global-Mean Surface Temperature, and Global-Mean Sea Level



Emission scenarios

- ▶ Why are there different scenarios?
- ▶ What are the differences between "high-", "moderate-", and "low-"? How are they measured?
- ▶ How do these scenarios conclude the detection and attribution of climate change?

Observed and Projected Climate Changes in the Modern World

Table 2

Statements of the Intergovernmental Panel on Climate Change (IPCC) on Detection and Attribution of Global Climate Change

<i>First Assessment Report</i> (1990)	"Unequivocal detection of the enhanced greenhouse effect from observations is not likely for a decade or more."
<i>Second Assessment Report</i> (1995)	"The balance of evidence suggests a discernible human influence on global climate."
<i>Third Assessment Report</i> (2001)	"Most of the observed warming over the last 50 years is <i>likely</i> * to have been due to the increase in greenhouse gas concentration."
<i>Fourth Assessment Report</i> (2007)	"Most of the observed increase in global average temperatures since the mid-20th century is <i>very likely</i> due to the observed increase in anthropogenic greenhouse gas concentrations."
<i>Fifth Assessment Report</i> (2013)	"It is <i>extremely likely</i> that human influence has been the dominant cause of the observed warming since the mid-20th century."

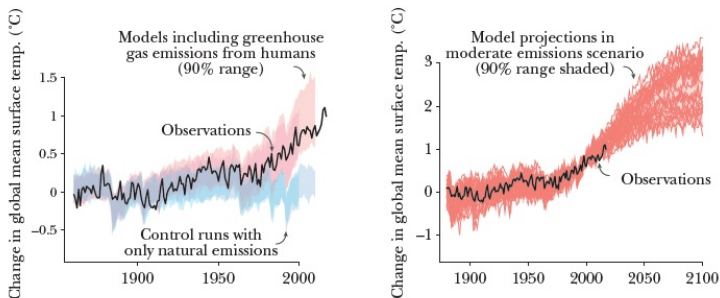
Source: The IPCC Assessment Reports can be found at https://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml.

* The uncertainty language used by the IPCC is precisely defined: *likely* refers to an assessed probability of at least 66 percent, *very likely* implies at least 90 percent, and *extremely likely* means at least 95 percent.

Observed and Projected Climate Changes in the Modern World (2)

Figure 2

Average Annual Global Mean Surface Temperature, Compared to Distributions of Climate Model Simulations



Sources: Data comes from Jones, Stott, and Christidis (2013), Morice, Kennedy, Rayner, and Jones (2012), and Taylor, Stouffer, and Meehl (2012).

The consequences of climate change?

- ▶ Temperature changes
- ▶ Precipitation change
- ▶ Humidity changes
- ▶ Tropical cyclones
- ▶ Sea-Level rise
- ▶ Droughts and floods
- ▶ Clouds
- ▶ Ocean acidification

Climate-conflict scholars mostly focused on the first two issues and mostly ignored other consequences.

How Economists Can Help Climate Science

- ▶ Improving Emissions Forecasts
- ▶ Focusing Climate Research to Support Investigation of Economic and Social Questions

How Political Scientists Can Help Climate Science

▶ Discuss!

Session 3: Personal violence

Temper, Temperature, and Temptation: Heat-Related Retaliation in Baseball

by Larrick, Timmerman, Carton, and Abrevaya (2011)
and

Dowry death: Response to weather variability in India
by Sekhri and Storeygard (2014)

Do climate shocks have adverse effects at the individual level?

- ▶ Ted Gurr argued that individual level deprivation can increase the risk of collective violence.
- ▶ Can climate shocks frustrate individuals at the individual level and increase personal violence?
- ▶ If the response is yes, then we can build on these findings and develop some other theories at the group and macro-level conflicts.
- ▶ If the response is no, then the theories founded on the individual level frustrations can face a serious challenge.
- ▶ Also, if the response is positive, we need to theorize this link between climate shocks, individual frustrations, and personal violence.

In-group discussions: Larrick et al. (2011) (5 minutes)

- ▶ Discuss with your friends the findings of this paper (Not more than 1 minutes)
- ▶ Discuss what you found interesting in this paper, and what was not convincing?
- ▶ Can you extend these arguments to other cases? Can find other applications for them?
- ▶ How do you evaluate these extensions?

Heat and Provocation

- ▶ Building on laboratory studies in Psychology suggests an association between high temperature and batter being hit as a retaliatory response in a baseball game.
- ▶ If temperature alters:
 - (a) the interpretation of the ambiguous aggression cue
 - (b) the assessment of the appropriate response to that cue
- ▶ The above psychological patterns are translated/applied to a baseball game:
 - heat-induced anger would increase the changes that an ambiguous cue-a hit teammate-is appraised as an intentional, provocative act.
 - heat-induced anger would also make retaliation more likely because anger primes aggressive scripts.
- ▶ What is the conditional effect here?
- ▶ What is the non-linear association in this paper?

In-group discussions: Sekhri and Storeygard (2014) (5 minutes)

- ▶ Discuss with your friends the findings of this paper (Not more than 1 minutes)
- ▶ Discuss what you found interesting in this paper, and what was not convincing?
- ▶ Can you extend these arguments to other cases? Can find other applications for them?
- ▶ How do you evaluate these extensions?

Sekhri and Storeygard (2014)

- ▶ The paper identifies two links between climate shocks and violence, mostly focusing on the murder of a member within a family.
 - Miguel (2005) finds that extreme rainfall leads to an increase in religiously motivated murders of elderly woman.
 - Sekhri and Storeygard (2014) find that a deviation from rainfall trend increases dowry death in India.
 - Both focus on consumption smoothing, but the first one through decreasing the household consumption, and the second one through increasing income.
 - What is consumption smoothing? Modigliani consumption cycle?

Social, economic, and legal context

- ▶ The husband and his family demand money or property from the wife's family.
- ▶ Sometimes, a husband and his family put pressure on the wife and her family to increase/adjust the amount of dowry.
- ▶ This can lead to the murder of the wife, and then the husband would be free to remarry, and receive dowry from a new wife's family.
- ▶ Why the husband can relatively easily get away with the murder?

Income risk and gains from appropriation

- ▶ Each individual deriving his livelihood from agriculture can allocate his time to below activities:
 - labor
 - leisure
 - appropriation
- ▶ Both labor and appropriation yield consumption goods.
- ▶ Returns to labor in agriculture sector, considering climate shocks, are stochastic.
- ▶ In bad weather condition, agriculture production decreases, and becomes less productive, so its opportunity cost relative to appropriation decreases. Thus, appropriation becomes a more beneficial option.
- ▶ By putting pressure on the wife, the husband can increase the amount of dowry, and if these pressures and violence kills the wife, there is a good chance that the husband get away with it, remarry and receive a new dowry payment!

Climate shocks, consumption smoothing, and personal violence

- ▶ How the suggested mechanism in this paper is different from Miguel (2005)?
- ▶ Can you apply these arguments to similar cases?
- ▶ What are the coping mechanisms? How can these adverse effects can be mitigated?

Session 4: Crime

Weather and Crime
by Cohen (1990)
and
**Climate Change and Levels of Violence in Socially
Disadvantaged Neighborhood Groups**
by Mares (2013)

In-group discussions: Cohen (1990) (7 minutes)

- ▶ Discuss with your friends the findings of this paper (Not more than 1 minutes)
- ▶ Discuss what you found interesting in this paper, and what was not convincing?
- ▶ Can you extend these arguments to other cases? Can find other applications for them?
- ▶ How do you evaluate these extensions?

Weather and Crime

- ▶ A survey on the studies of the association between weather variability and crime
- ▶ It covers a good range of environmental changes as well as different types of crimes
- ▶ The suggested theoretical background focuses on:
 - Rational choice and situational approaches suggest that immediate crises, events, and conditions are important factors in the offender's decision.
 - A higher temperature makes the weather nicer for outdoor activities and increases the risk of inter-personal conflict. Also, too much increase in the weather can be risky, as it decreases the number of people outside, but there are few people/witnesses to deter the inter-personal conflict, if it happens.
 - The paper highlights the importance of distinguishing between a linear and a curvilinear association.

Heat and Crime: the correlational research

1. Heat and collective violence
2. Heat and assault
3. Heat and homicide
4. Heat and rape
5. Heat and robbery
6. Heat and domestic violence
7. Heat and non-aggressive crimes

Heat and Crime: the experimental research

1. What are the advantages of an experimental research?
2. What are the disadvantages of an experimental research?
3. How can we address these issues?
4. What are the inconsistencies between the findings of correlational research and experimental research about the association between weather and crime?

Other climatical changes and crime

1. Cold and crime
2. Sunlight and crime
3. Rain and crime
4. Wind and crime
5. Barometric pressure and crime
6. Humidity and crime

Problems with the research on weather and climate associations

- ▶ Definitional problems
- ▶ Improper sample size
- ▶ Statistical and methodological techniques

In-group discussions: Mares (2013) (5 minutes)

- ▶ Discuss with your friends the findings of this paper (Not more than 1 minutes)
- ▶ Discuss what you found interesting in this paper, and what was not convincing?
- ▶ Can you extend these arguments to other cases? Can find other applications for them?
- ▶ How do you evaluate these extensions?

Main arguments

- ▶ Studying violent crime is important because of its effects on
 - the quality of life
 - the health of residents
 - imposing a large financial burden on health care providers
 - *The paper nicely and at the beginning underscores the importance of the research for different audiences!*
- ▶ The climate change literature shows that economically disadvantage populations may experience a larger health impact,
- ▶ but what about disadvantaged neighborhood? *Why studying at the neighborhood is important?*
- ▶ What is the difference between direct and indirect links between heat and violence.
- ▶ Highlighting the importance of a linear and quadratic (curvilinear) association.

Identified issues in the current literature and suggested solutions

- ▶ The author identifies two flaws in the literature studying climate change and inter-personal violence:
 - Using annual data
 - The effects of climate change on the level violence in disadvantaged areas is not studied, despite a high correlation between seasonal variations in temperature.
- ▶ The paper uses St. Louis as a case, how is this case selection justified?
- ▶ If temperature is in rise and the trend of violence in decline, isn't it paradoxical to study a positive association between temperature anomaly and violence?
- ▶ Main finding: In disadvantaged neighborhoods, the level of violence during summer is already high, the increase of temperature in winter, as a result of climate change, can be problematic.

Session 5: Resources Scarcity vs. Resource Curse (1)

**Demand, supply, and restraint: Determinants of domestic
water conflict, and cooperation**
by Bohmelt et al (2014)

In-group discussions: (5 minutes)

- ▶ Discuss with your friends the findings of this paper (Not more than 1 minutes)
- ▶ Discuss what you found interesting in this paper, and what was not convincing?
- ▶ Can you extend these arguments to other cases? Can find other applications for them?
- ▶ How do you evaluate these extensions?

Existing research on environmental factors and domestic conflict or cooperation

- ▶ Malthusian view about the link between resource scarcities and violent conflict.
- ▶ What is cornucopians' reactions to the Malthusian view?
- ▶ How are these views applied to climate-conflict literature?
- ▶ What is the criticism that the paper raises about the case-study studies on the security implications of climate change?
- ▶ Why does the paper suggest a conflict-cooperation continuum instead of conflict-peace continuum?

A theory of domestic water conflict and cooperation: demand, supply, and restraint

- ▶ What are the demand side factors? How do they contribute to the domestic conflict-cooperation outcome?
 - population
 - agricultural productivity
 - economic development
- ▶ What are the supply side factors? How do they contribute to the domestic conflict-cooperation outcome?
 - precipitation
 - temperature
- ▶ What are the restraint factors? How do they affect the above demand-supply framework?
 - democratic institutions
 - political stability

Is anything missing from this framework?

- ▶ Are there any other factors missing from the framework?
- ▶ How do you extend this framework?
- ▶ Can you apply this framework to inter-state conflict-cooperation outcomes?

Empirical analysis

- ▶ What is the research design?
- ▶ How is the robustness check conducted?
- ▶ How is the prediction power of the models?
- ▶ How do you extend the empirical analysis?

How Do Natural Resources Influence Civil War? Evidence from Thirteen Cases

by Ross 2004

In-group discussions: (5 minutes)

- ▶ Discuss with your friends the findings of this paper (Not more than 1 minutes)
- ▶ Discuss what you found interesting in this paper, and what was not convincing?
- ▶ Can you extend these arguments to other cases? Can find other applications for them?
- ▶ How do you evaluate these extensions?

- ▶ Three different (classic) outcomes variables related to Civil War:
 - Onset
 - Duration
 - Intensity

- ▶ Can you add more to this list?
 - Violence against civilian
 - Sexual violence
 - Child soldiering
 - Adverse effects on the environment
 - food crisis
 - Population displacements
 - Public health effects

Theoretical arguments

Hypotheses on the onset of civil war
1. Looting by potential rebels → startup costs funded → civil war
2. Resource extraction → grievances among locals → civil war
3. Resource extraction → incentive for separatism → civil war
4. State depends on resource revenues → state weakness → civil war*
Hypotheses on the duration of civil war
5. Looting by weaker (stronger) party → more arms → war prolonged (shortened)
6. War (peace) appears financially profitable → less (more) incentive for peace → war prolonged (shortened)
7. Resource wealth in separatist region → commitment problem → war prolonged*
Hypotheses on the intensity of civil war
8. Two sides engage in resource battles → more casualties
9. Two sides engage in cooperative plunder → fewer casualties

*Hypothesis is not tested in the sample.

FIGURE 1. *Hypothesized causal mechanisms*

Theoretical arguments (post-empirical test)

10. Resource wealth → **foreign intervention** → civil war
11. **Futures contracts for resource booty** → startup costs funded → civil war
12. Weaker (stronger) side sells **futures contracts for resource booty** → war lengthened (shortened)
13. **Preemptive repression** by government to protect resources → more casualties

FIGURE 2. *Unanticipated mechanisms*

Empirical evaluations

- ▶ What is the research design?
- ▶ How are the cases selected?
- ▶ Can we observe a process-tracing approach here?
- ▶ Is process-tracing possible only through qualitative-research?
- ▶ Are these empirical results generalizable?