Do natural hazards transform culture?

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Our interdisciplinary team

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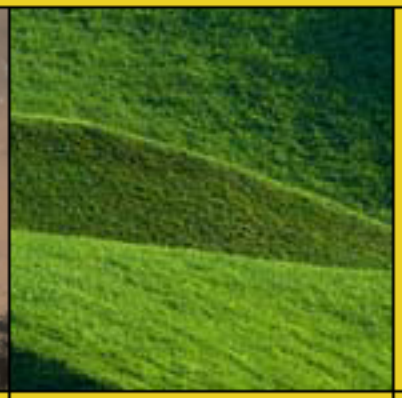
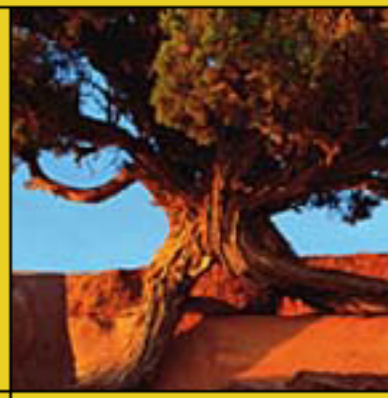
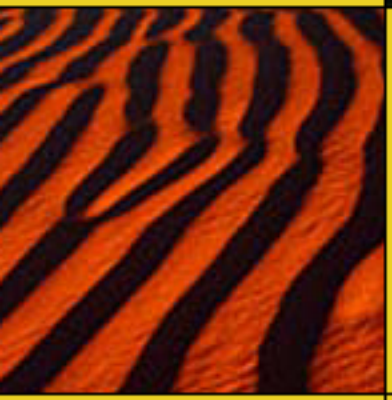
Front row from left: Peter Peregrine, Carol Ember, Eric Jones and Ian Skoggard. Back row from left: Michele Gelfand, Ben Felzer, and Teferi Abate Adem.

Main research questions

- How have human cultural groups responded to and been transformed by climate hazards, particularly those with the potential to seriously destroy food supplies?
- How does variation in frequency, severity and predictability of hazards affect the nature of those societal transformations, across time and space?

Cultural Transformations?

Are there similar responses to unpredictable environments?

Research questions			Basic assumptions	
	Comparative strategies	Previous findings	“Tight” or “loose” cultures	Subsistence diversity
Breadth of social networks	Land Access/ Sharing and cooperation	Type of political system		Control Variables

Concentrating on natural hazards affecting food supply

- Droughts
- Floods
- Hurricanes (cyclones)
- Killing frosts
- Insect and pest infestations
- Plant pathogens

Basic assumptions

- Unpredictable natural hazards may be increasing with climate change, but they are not new
- We presume that societies surviving in unpredictable environments developed a suite of adaptive traits for those environments
- If so, we should find differences when we compare societies living in less versus more predictable environments
- Those differences are strong candidates for being adaptive traits

Overall Plan

- Test theories derived from different disciplines
- Employ three types of worldwide comparison using different types of societal/cultural units in different time frames
- Use some precoded variables, but code many additional domains
- Get climate data close to community or geographic focus as much as possible

Type of comparison

- Ethnographic
  - Using the 186 society Standard Cross-Cultural Sample; most of the societies are now in *eHRAF World Cultures*
- Prehistoric comparisons of archaeological traditions
  - Using *eHRAF Archaeology,* supplemented by other archaeological site reports
- Cross-country comparisons

Previous findings

- Violence
- “Tight” versus “loose” cultures
- Political control

Violence

- Unpredictable climate-related hazards predict more violence

Ethnographic comparisons—more warfare in unpacified, nonstate societies (Ember and Ember 1992; Ember et al. 2013)

Prehistoric comparisons—Lambert (1997) in southern California; Lekson (2002) in the U.S. Southwest

Historical studies--Kang (2000) in Korea; Zhang et al. (2007) in China

Meta-analysis of 60 diachronic studies found all kinds of violence predicted by more climate unpredictability--Hsiang et al. (2013)

From Lekson. 2002. War in the Southwest, war in the world. ***American Antiquity, 64 (4):*** 615.

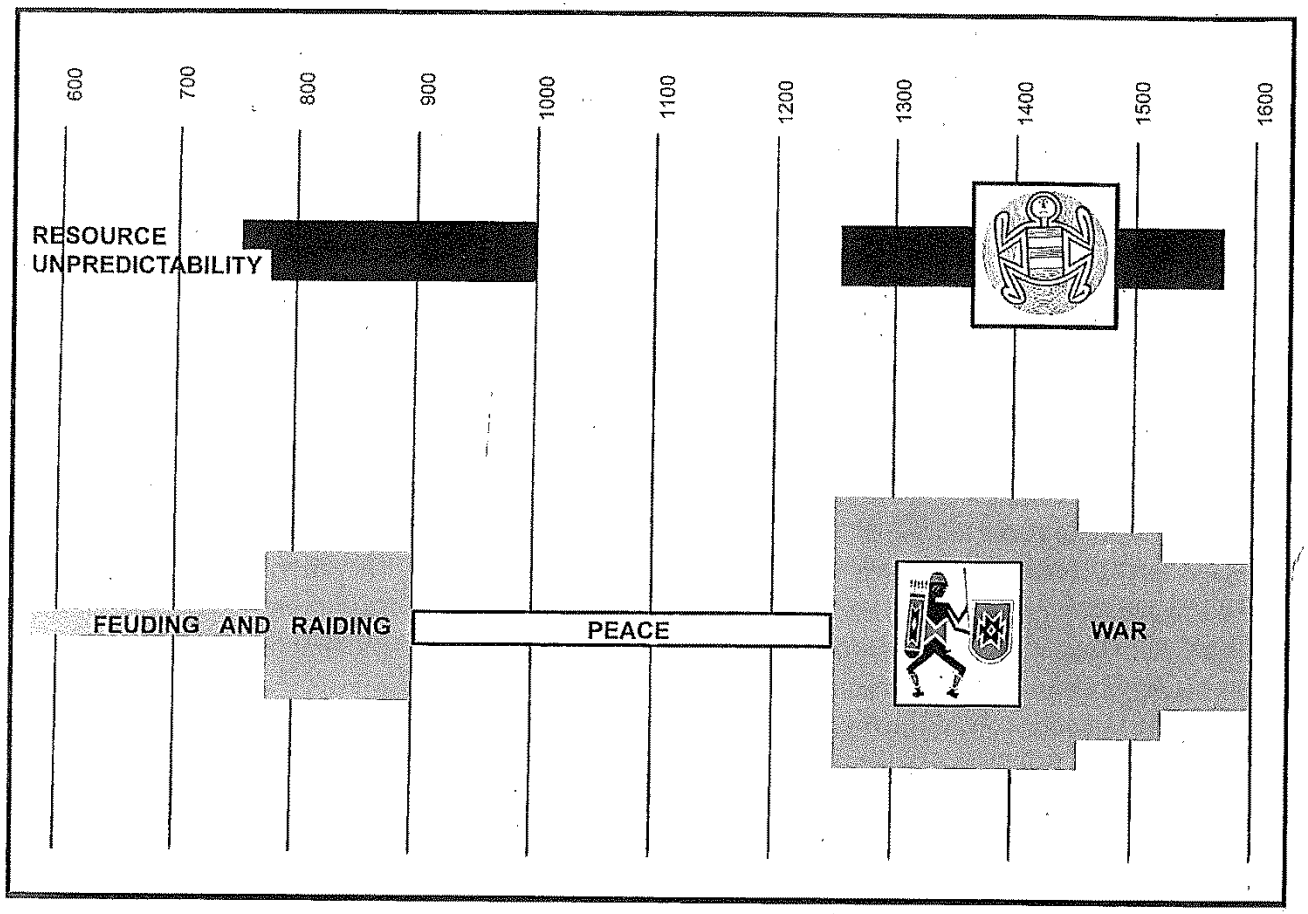


Figure 2. Schematic chronologies of resource unpredictability and violence. Periodization of resource unpredictability modified from Dean (1988, 1996); of raiding/feuding and warfare modified from LeBlanc (1999). See text for details. Note the approximate coincidence of periods of violence and periods of resource unpredictability and escalation of violence from raiding/feuding (early) to warfare (late).

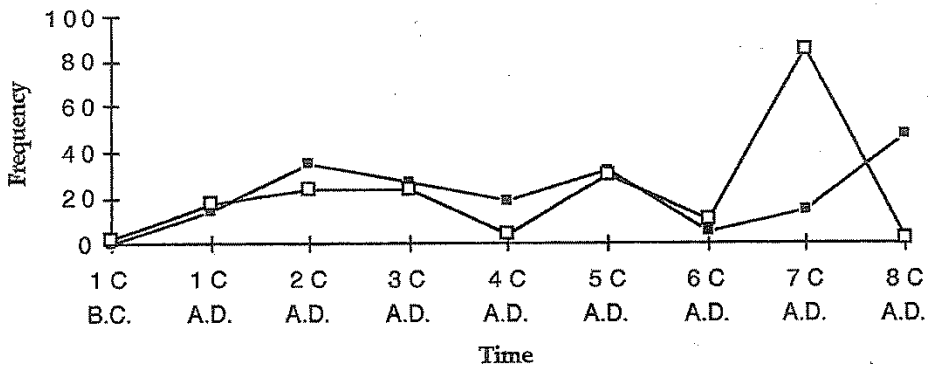


Figure 3. Filled squares are sums of number of environmental stresses; open squares are number of wars; summed across centuries

From: Kang, B. W. 2000 A reconsideration of population pressure and warfare: A protohistoric Korean case. *Current anthropology*, 41(5), 873-881.

"Tight" versus "Loose" cultures

- Original concept came from anthropologist Pertti Pelto (1968).
- "tight" vs. "loose" refers to the degree to which social norms are pervasive, clearly defined, and reliably imposed (Gelfand et al. 2011)
- Research on 33 countries (Gelfand et al. 2011) and the 50 U.S. states (Harrington and Gelfand 2014)
- "Tight" countries and "tight" states
  - had significantly more climate-related disasters
  - "Tight" countries had significantly more violence

Political Control

- Unpredictable climate-related hazards predict more exclusion & authoritarianism

Original concept came from Blanton et al. 1996 (including Peregrine)

Political control—more exclusionary political practices by leaders when disasters were more frequent or fear of disasters was present (n=29; Peregrine and Ember, *in press*)

Strategies of leaders—more exclusionary political practices, more focus on family ideology, and more economic focus on elite goods and international relations when disasters were more frequent or fear of disasters was present (n=23; Jones et al. *under review*)

Subsistence Diversity

- Monocropping is considered by development agencies to be poor practice.
- No cultures have monocropping, but some have much greater diversification than others.
- We expect people living in unpredictable environments to have developed
  - A broader range of subsistence activities
  - Greater diversity of foods collected, hunted or produced
  - Greater use of diverse econiches
  - Explicit contingency plans for disasters, including elaborated food storage systems, lending out animals, fostering out children, etc.

Broader networks

- In the absence of broader intervention by governments, people faced with disasters should try to increase the size of the social network they can turn to in times of trouble. We expect to find in more unpredictable environments
  - Deeper and broader networks based on
    - kinship
    - cross-cutting ties such as age-sets
    - ritualized dyadic friendships
    - trading and alliance partnerships
  - Networks and bonds reinforced by regular rituals and ceremonies

Land/Sharing/Cooperation

- more **elaborated** food storage
- more **food sharing** and **cooperative labor**
- more **communal property** including **secure access** to return even if have to leave for some period of time

Political system

Differences	*Corporate*	*Exclusionary*
Resources	*largely from populace*	*leader controlled* • *outside trade* • *leader-owned*
Leader differentiation	*low to moderate*	*moderate to high*
Public goods	*considerable*	*few*
Ideological system	*cosmological order*	*filial and family ties*

Control Variables

We know that we will need to control on a number of factors including:

- Subsistence strategies
- Settlement patterns
- Scale and complexity of society

Examples of coding underway

Typical family diet will be used to estimate diet diversity

- excludes societies mostly buying food

Diet Item	Frequency Eaten 1-Rare (0-10%) 2-Sometimes(10-40) 3-Frequent (40-70) 4-Very Frequent (70-90) 5-Daily (90-100)	Importance 1-Complement 2-Secondary 3-Primary	Commercially obtained or Bartered for	Seasonal?

Additional food/diet items

FOOD CONSUMPTION

Frequency and regularity of meals
- variation by age
- variation by gender
- variation by status

Allowance of between meal eating
- who is allowed to “snack”?

Who regularly eats together?
- type and size of unit eating together
- if family does not all eat together, who eats together (gender, age, etc.)

Food consumption (cont.)

Differences in access to types of food and quantity of food
- by gender
- by age
- by status (e.g., class, leadership)

Customs of hiding food or eating alone

Customary periods of fasting

Special foods for emergencies or famines
- plant foods
- animal foods

Changes in eating practices reported with emergencies or famine
- reduced number of meals?
- reduced food at meals?
- hiding of food or eating alone?
- other (explain)

Codes to use from SCCS

for Tightness vs. Looseness

Strictness of Childhood socialization

Number and strictness of rules governing sexuality
- **premarital sex**
- **extramarital sex**
- **rape**

Number and strictness of rules governing reproduction
- **menstrual taboos**
- **pregnancy restrictions**
- **birth restrictions**
- **marital intercourse**
- **contraception**

Separation of genders
- **males and females generally**
- **husbands and wives**
- **at adolescence**

Marriage and divorce
- **degree of choice in marriage**
- **degree of choice in divorce**

Flexibility of socio-political system
- **degree of hierarchy**
- **degree of participation**

Compliance and punishment involving community norms

Cohesion and loyalty to community and society

Contacts with outside groups

Additional domains to code

For tightness/looseness

Clothing and Adornment

- To what extent is clothing standardized?
- Expression of individuality in clothing
- Expression of individuality in body adornment/alteration

Emotion and Interpersonal Relationships

- Do interpersonal relationships involve physical contact?
- Are individuals encouraged to repress emotion?

Settlement and Dwelling Patterns

- Are houses built on standard pattern?
- Any room for individual expression?
- Does the settlement have a unified pattern? What is it?

Additional domains to code

For tightness/looseness (cont.)

Art

- To what extent are there rules for artistic (visual art, music, dance) expression? How much room is there for individual expression?
- Are there sanctions against certain forms of artistic expression?
- Do certain types of music or drama require synchrony

Letting go

- Are there regulated times for relaxing and "acting out"?
- To what extent are recreational drugs/alcohol consumed for relaxation purposes?

Additional questions on disasters

- Do the previous measures (Ember and Ember 1992) of natural hazards (in a 25-year period around the ethnographic present [EP] match the data from climatology?
- This is important because Ember and Ember found that threat of (but no actual disasters) in the 25 year period predicted warfare just as well as one or more actual disasters.
- How often do disasters have to occur for societies to transform their cultures? How serious do they have to be?

Caveats to predictions

- We expect that societies relying on nomadism will need more flexible personalities, so “tightness” may be maladaptive in such societies

- More complex societies may follow a strategy of excluding some individuals (e.g., lower strata) from resources rather than practicing widespread sharing

Stay tuned for results

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