

# Multidisciplinary Perspectives on Appropriate Technology

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# Decision making in a complex world

- The world is highly complex and uncertain.
- Humans have limited attention, time, and cognitive abilities.
- We have developed cognitive shortcuts that aid in decision-making.
- One of these is that we rely on information that is transmitted across generations.
  - Each generation does not have to 'reinvent the wheel.'
  - Knowledge from previous discoveries can be taught to subsequent generations at low cost.
- Knowledge transmission often takes the form of tradition, custom, cultural values, beliefs, etc.

# The benefits of tradition: Maize, pellagra, and nixtamalization



- Maize is deficient in the essential amino acids lysine and tryptophan, and in niacin.
  - Niacin deficiency causes pellagra: diarrhea, skin rashes, dementia, and death.
- A solution is alkali processing
  - Dried corn is cooked in a solution of lime (calcium oxide) in water.
  - Increases the bioavailability of amino acids and niacin.

# The benefits of tradition: Agama Tirtha

J. Stephen Lansing (2009)

- Hindu based belief system in Bali.
- Farmers organize into democratic collectives called *subak*.
- Using religious calendars, all *subaks* in a region coordinate planting.
- Elaborate multi-day and multi-location rituals must occur prior to planting.



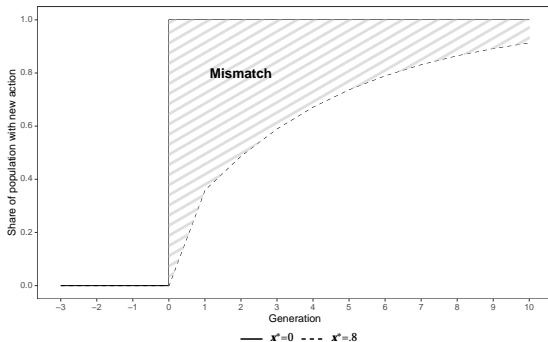
# On the benefits of tradition: Agama Tirtha

J. Stephen Lansing (2009)

- In 1979, the Asian Development Bank launched the Bali Irrigation Project.
- Farmers were legally mandated to adopt new quick-maturing varieties and engage in uncoordinated planting and harvesting.
- By the 1980s, crops were consistently overwhelmed with pests.



# Change when there's culture and tradition



- In equilibrium, cultural traits evolve slowly.
  - This is (dynamically) optimal.
- If the environment changes, traits may not be optimized for their current environment.
  - In biology, this is called 'evolutionary mismatch'.

# Distrust in Africa

Source: Nunn and Wantchekon (AER, 2011)

**Table 1.** The Method of Enslavement of Koelle's Informants

Manner of Enslavement	Percentage
Taken in a war	24.3%
Kidnapped or seized	40.3%
Sold/tricked by a relative, friend, etc.	19.4%
Through a judicial process	16.0%

*Notes:* The data are from Sigismund Koelle's Linguistic Inventory. The sample consists of 144 informants interviewed by Koelle for which their means of enslavement is known.

# Agriculture and gender norms

Source: Alesina, Giuliano, and Nunn (QJE, 2013)





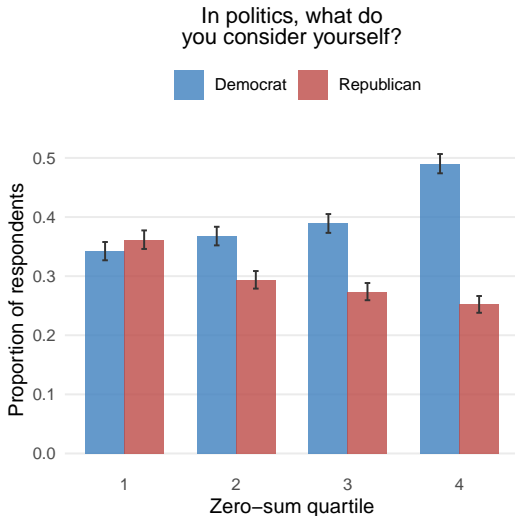
# Zero-sum thinking: Mismatched policies and institutions

Source: Chinoy, Nunn, Sequeira, and Stancheva (2022)

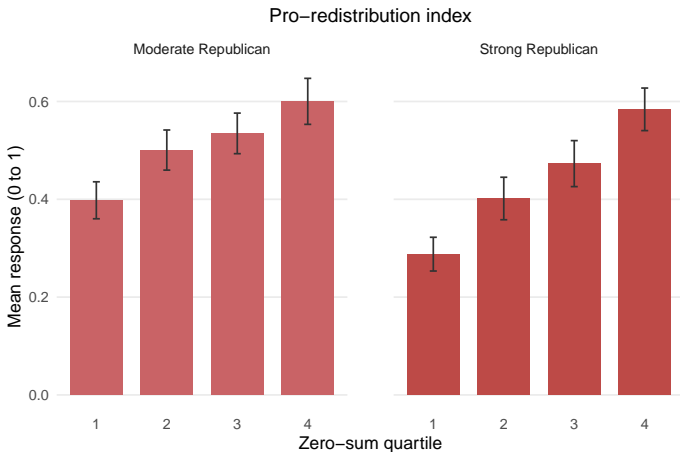


# Zero-sum, politics, and policy preferences ( $n = 15,000$ )

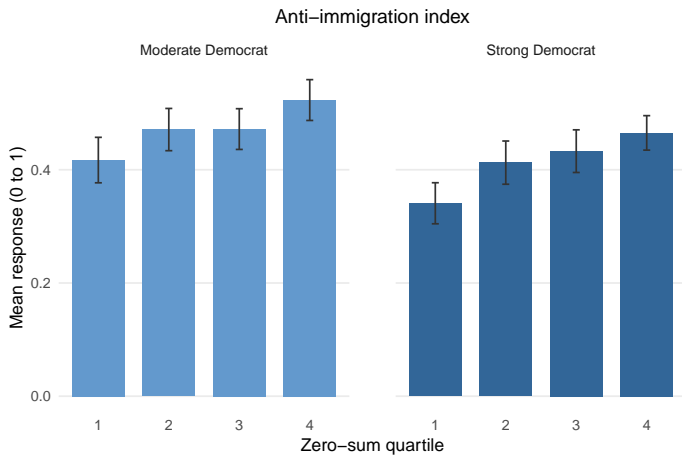
Source: Chinoy, Nunn, Sequeira, and Stancheva (2022)



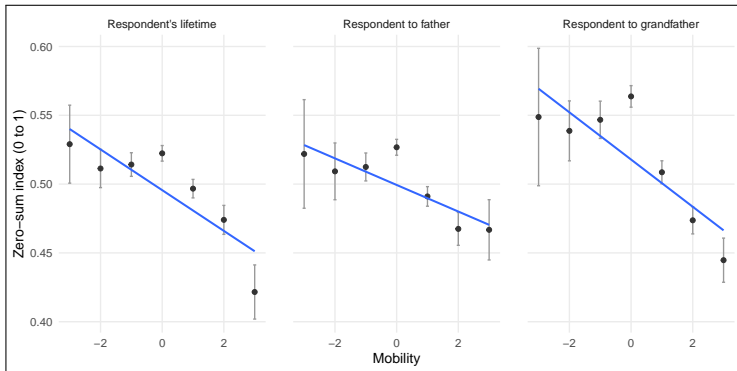
# Support for government redistribution among Republications



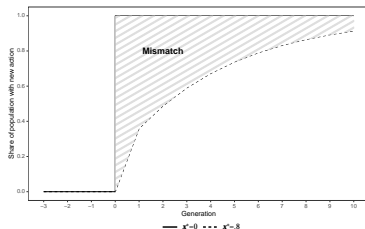
# Concern about immigration among Democrats



# Zero-sum thinking and ancestral upward mobility



# Disagreement across cohorts

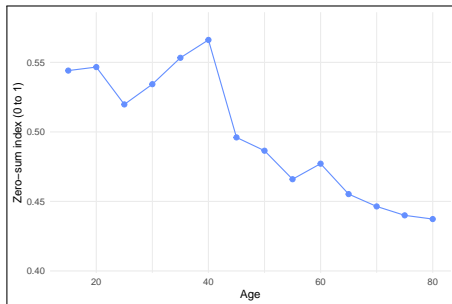


- For mismatch to occur, the world must change.
- With mismatch, younger generations will have beliefs that are better matched to the current environment.
- The economic environment of the U.S. was less zero-sum in the past.
  - In the mid-1800s, the U.S. had very high rates of economic mobility (Long & Ferrie, AER, 2013).
  - Since then, mobility has steadily declined (Chetty et al., 2017; Feigenbaum, EJ, 2018, Song et al., PNAS, 2020).

# Economic change, mismatch, and ZS across cohorts

Pre-tax income growth (for the bottom 50% of U.S.) when the cohorts in our sample were born:

- 1930-40 [80-90yrs]: 12%
- 1940-50 [70-80yrs]: 88%
- 1950-60 [60-70yrs]: 30%
- 1960-70 [50-60yrs]: 53%
- 1970-80 [40-50yrs]: 3%
- 1980-90 [30-40yrs]: -1%
- 1990-00 [20-30yrs]: 14%
- 2000-10 [10-20yrs]: -5%



# Taking stock

- Social learning across generations (i.e., tradition) provides benefits
  - Each generation does not need to 'reinvent the wheel.'
- Although tradition does have benefits, it can generate 'mismatch'.
  - Values and beliefs may not always be perfectly suited for the current environment.
- Evidence that cultural mismatch can lead to institutional or policy mismatch.
- Raises the question of possible cases of mismatch in the U.S. today
  - Healthcare policy?
  - Second amendment ('right to keep and bear arms')?
  - Stand your ground laws?
  - Environmental legislation?