On the Importance of Culture for Understanding Long-Run Economic Growth and Development

Nathan Nunn
Harvard University

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Questions that I will address in today’s talk:

1. What is culture? Why would it ever arise?
2. How big are the cultural differences in the world today?
3. Where do these cultural differences come from?
4. Does culture matter for long-run growth and development?
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Human beings have cognitive limits. 
Even in normal everyday life we are overloaded with information that requires cognitive effort to process. 
  E.g., the ‘invisible gorilla’ (Simons and Chabris, 1999).
In the face of these limits, we have developed heuristics or shortcuts that help us make decisions.
These may be less precise, but they save on cognitive costs. 
  They are fast and frugal.
Can manifest themselves as deeply held values (e.g., religion) or gut-feelings about the right or wrong action in certain situation (e.g., system 1).
Players:
- Society consists of a large population of individuals.
- Each period, a new generation is born, and the older generation eventually dies.

Actions:
- The new generation chooses an action, either 0 or 1.
- There are two (unobservable) states of the world, either 0 or 1.
- In each state, one of the two actions yields a higher payoff than the other.
Environment, actions, and payoffs

Payoffs:

<table>
<thead>
<tr>
<th></th>
<th>Environment 0</th>
<th>Environment 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action 0</td>
<td>0</td>
<td>$\pi + b$</td>
</tr>
<tr>
<td>Action 1</td>
<td>$\pi - b$</td>
<td>$\pi + b$</td>
</tr>
</tbody>
</table>

- The state of the environment is unobservable.
- Each period, there is a shock with probability $\Delta \in (0, 1)$.
- When a shock is experienced, then there is a new draw and thus an equal probability of being in state 0 or 1.
Two types of players:

1. **Non-traditionalists (NT):** ignore tradition and engage in trial and error, learning the optimal action with certainty.
   - Learning comes at a cost $c > 0$.

2. **Traditionalists (T):** value tradition, and adopt the action (i.e., culture) of a randomly chosen person from the previous generation.
   - Relying on tradition is costless.

$p$ denotes the proportion of traditionalists in the economy.
Expected payoffs to non-traditionalists

- Non-traditionalists ignore tradition and engage in trial and error.
- They bear a cost $c$, but choose the right action with certainty.
- Therefore, expected payoffs are:

$$\Pi^{NT} = \pi + b - c$$
Some ways for traditionalists to obtain the right action

1. I copy a non-traditionalist from the previous generation; and there was no shock last period:

\[ Pr = (1 - p)(1 - \Delta) \]
Some ways for traditionalists to obtain the right action

2. I copy a traditionalist from the previous generation, who had copied a non-traditionalist from the previous generation; and there were no shocks during this time:

\[ Pr = p(1 - p)(1 - \Delta)^2 \]
3. I copy a traditionalist, who copied a traditionalist, who copied a non-traditionalist; and there were no shocks during this time:

\[
Pr = p^2 (1 - p) (1 - \Delta)^3
\]
4. I copy a traditionalist, who copied a traditionalist, who copied a traditionalist, who copied a non-traditionalist; and there were no shocks during this time:

\[ Pr = p^3(1 - p)(1 - \Delta)^4 \]

5. Etc, etc, until infinity.

The sum probability of all of these events is:

\[
\sum_{t=1}^{\infty} p^{t-1}(1 - p)(1 - \Delta)^t
\]
Expected payoffs to traditionalists

- With probability $\sum_{t=1}^{\infty} p^{t-1}(1 - p)(1 - \Delta)^t$, a traditionalist:
  - Adopts the right action and receives $\pi + b$.

- With probability $1 - \sum_{t=1}^{\infty} p^{t-1}(1 - p)(1 - \Delta)^t$, a traditionalist:
  - Either, still adopts the right action and receives $\pi + b$ (50% chance)
  - Or, adopts the wrong action and receives $\pi - b$ (50% chance)
  - Thus, her expected payoff is:
    
    $$0.5(\pi + b) + 0.5(\pi - b) = \pi$$
Expected payoffs to traditionalists

\[ \Pi^T = \sum_{t=1}^{\infty} p^{t-1}(1 - p)(1 - \Delta)^t \cdot [\pi + b] \]

\[ + \left[ 1 - \sum_{t=1}^{\infty} p^{t-1}(1 - p)(1 - \Delta)^t \right] \cdot \pi \]

\[ = \pi + b(1 - p)(1 - \Delta) \sum_{t=1}^{\infty} p^{t-1}(1 - \Delta)^{t-1} \]

\[ = \pi + \frac{b(1 - p)(1 - \Delta)}{1 - p(1 - \Delta)} \]
Expected payoffs to non-traditionalists:

$$\Pi^{NT} = \pi + b - c$$

Expected payoffs to traditionalists:

$$\Pi^{T} = \pi + \frac{b(1 - p)(1 - \Delta)}{1 - p(1 - \Delta)}$$
Expected payoffs and the frequency of traditionalists

Long-Run Payoffs

\[ \Pi^T = \pi + b \cdot (1 - \Delta) \]

\[ \Pi^N_T = \pi + b \cdot (1 - p) \cdot (1 - \Delta) / [1 - p \cdot (1 - \Delta)] \]

Proportion of traditionalists in the population, \( p \)
A key prediction of the model

- Under fairly general conditions, there is always some reliance on culture.
- Culture arises because it is a short-cut that saves on information acquisition and processing costs ($c$ in the model).
An example of the benefits of tradition
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Cultural differences across societies

Two strategies have been used to measure culture across societies:

1. Bring people into the lab:

2. Study natural settings where people from different cultural backgrounds face the same decision in the same environment:
   - Fernandez and Fogli (2006, 2009)
   - Giuliano (2007)
   - Algan and Cahuc (2010)

An important fact for economic development is that the cultural characteristics of Western European are not the norm, but are typically outliers.

- See Henrich, Heine, and Norenzayan (2010).
Which line is longer?
Figure 2. Müller-Lyer results for Segall et al.’s (1966) cross-cultural project. PSE (point of subjective equality) is the percentage that segment a must be longer than b before subjects perceived the segments as equal in length. Children were sampled in the 5-to-11 age range.
The Ultimatum Game

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Behavior in the Dictator and Ultimatum games emerged. That is, it may be that what behavioral economists have been measuring among undergraduates in such games is a specific set of social norms, culturally evolved for dealing with money and strangers, that have emerged since the origins of agriculture and the rise of complex societies.

In addition to differences in populations' willingness to reject offers that are too low, the evidence also indicates a...
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Mueller-Lyer illusion: Living in a carpentered world
Mueller-Lyer illusion: Living in a carpentered world

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6. Explaining individual differences within groups

In contrast to the power of our group-level measures in statistically explaining between-group differences in experimental behaviors, our individual-level variables explain little of the variation within or across groups. With a few group-specific exceptions, nothing we measured about individuals other than their group membership (society, village, camp, or other subgroup membership) predicted experimental behavior. Here we summarize our findings concerning individual attributes and experimental play in within-group analyses. Sex, wealth, and age do not generally account for any significant portion of the variance in game play. However, in the UG, sex was marginally significant among the Tsimane, where males offered 10% more than females (Gurven 2004a). Among the Hadza, women's UG offers strongly increased with camp population size, but camp size was not important to men's offers. Conversely, in the DG, it was the offers of Hadza men that increased with camp size (Marlowe 2004a). As in the UG,
The Lamalera

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Long-run determinants

- Trust (& related prosocial traits)
  - Slave trade: Nunn and Wantchekon (2011)
  - Colonial indirect rule: Blouin (2015)
  - Habsburg state: Becker et al. (2016)
  - DRC rubber concessions: Lowes and Montero (2016)
  - Missions: Valencia Caicedo and Voth (in progress)

- Gender norms
  - The plough: Alesina, Giuliano, and Nunn (2013)
  - Communism: Campa and Serafinelli (2015)

- Collectivism/individualism
  - Wet rice: Talhelm et al. (2014)
Do good states make good citizens? (Lowes et al. forthcoming)

The Kuba Kingdom (Lowes et al. forthcoming)

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States and norms of rule following (Lowes et al. forthcoming)
Kuba vs. non-Kuba: All rounds

Average amount allocated to other party

Kananga Citizen (p=0.23)
Coethnic (p=0.03)
Non-Coethnic (p=0.01)
Government (p=0.01)
Average (p=0.01)

Non-Kuba
Kuba Ethnicity
90% CI

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Are the Kuba exceptional?

Ethnic Group

Amount missing (CF)

0 25 50 75 100 125 150

Bindi (p=0.03)
Kete (p=0.02)
Kuba
Lele (p=0.02)
Luluwa (p=0.28)
Luntu (p=0.25)

90% CI
Shorter-run determinants

- Economic shocks
  - Recessions: Giuliano and Spilimbergo (2014)
- Violence and conflict
  - Civil war: Bauer et al. (2016)
  - Interstate war: Campante and Yanagizawa-Drott (2016)
- Socialization activities
  - 4th of July: Madestam and Yanagizawa-Drott (2011)
  - Political protests: Madestam et al. (2013)
- Policies
  - Monetary incentives: Bowles and Polania-Reyes (2012)
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Bulletproofing beliefs (Nunn and Sanchez de la Sierra, 2017)
Existing research has focused on state centralization as being important for long-run growth and development.


However, African societies also differ in important (cultural) dimensions.

1. Segmentary lineage structures
2. Age sets
Definition from Evans-Pritchard and Fortes (1940):

1. Political and administrative association are based on a (unilineal) lineage structure.
2. Individuals are aware of their genealogical relationship to other tribe members, including most recent common ancestor
   - And, this biological distance guides social interactions.
3. Patterns of residence are based on the lineage structure.
Segmentary lineage societies (Moscona, Nunn, and Robinson, 2017)
Literature in anthropology hypothesizes a link between segmentary lineage organizations and the incidence and escalation of armed conflicts.

Evans-Pritchard (1969), discussing the Nuer, explains:

“The members of any segment unite for war against adjacent segments of the same order and unite with these adjacent segments against larger sections.”

Bedouin proverb:

“I against my brothers; my brothers and I against my cousins; my cousins, my brothers, and I against the world.”
We code 145 African societies as either having or not having segmentary lineage systems.

- From the *Ethnographic Survey of Africa*, a series of studies edited by Daryll Forde and produced from the 1940s until the 1970s.

- Connect ethnic groups to conflict using the location of conflict.
Segmentary lineage and the incidence of localized smaller-scale conflicts

\[ e( \text{Segmentary Lineage} | X ) \]

coef = 0.992, (robust) se = 0.224, t = 4.43

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RD estimates: Ethnic identity

Fraction of Afrobarometer Pop. Identifying as SLS Member

Distance to Border (km)

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RD estimates: Segmentary lineage and the incidence of localized smaller-scale conflicts

\[ \log(1 + \text{Deadly Non-Civil Conflict Incidents}) \]

Distance to Border (km)

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Age sets: Traditional Ngbaka initiation ceremony

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Age sets: Contemporary Ngbaka initiation ceremony

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Social organization: Age sets

Definition (Radcliffe-Brown, 1929):
- A recognized and sometimes organized group consisting of persons (often male persons only) who are of the same age.
- An age-set is normally formed of all those males who are initiated at one time.
- Once a person enters a given age-set, he remains a member of the same age-set for the remainder of his life.
- Each age-set normally passes from one age grade to another as a group.
Age sets and governance

Why age sets might matter:

- Age sets build strong horizontal (within cohort) ties.
- These are even stronger than vertical (within lineage) ties.
- For example, a young man will have a much stronger allegiance with those in his age set than with elders, the chief, or even his own father.
Evidence from baseline surveys in Gemena (200 villages)

Individuals from villages with age sets:
1. Are less likely to believe that it is important to agree with elders.
2. Trust their chief less.

This is despite the fact that chiefs in villages with age sets are:
1. More likely to be appointed democratically.
2. Provide more public goods.
Age sets and the accountability of chiefs

Village Chief is Elected

Share of Men in Village that have Participated in an Ageset Initiation

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Age sets and public goods provision by chiefs

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Other examples

- **Kinship tightness (e.g., cousin marriage):**
  - Associated with less democracy (Schulz, 2017)
  - Associated less generalized trust and lower incomes (Enke, 2017)
  - Associated with more corruption (Akbari et al., 2016)

- **Matrilineality:**
  - Associated with less within-household cohesion, but healthier and more educated children (Lowes, 2016)

- **Bride price at marriage:**
  - Associated with more education of girls (Ashraf et al., 2016)
Cousin marriage and democracy (Schulz, 2017)

FIGURE I
Percent cousin-marriages (first and second degree) and Polity IV’s democracy index (averaged over the years 2001 to 2010).

-10
-5
0
5
10
Democracy
0 20 40 60 80
Cousin Marriage (%)

Linear Fit
Rho: -0.73, p<0.0001, N=71

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Kinship tightness and agricultural intensity reflect the causal negative effect of kinship tightness on technological progress, or, e.g., decreasing part of the relationship between kinship tightness and agricultural intensity caused the emergence of tight kinship structures, it is not at all obvious whether the straightforward (causal) interpretation: even if it was true that agricultural subsistence advanced as the subsistence style of Western Europeans.

Gated production modes that – according to the classification in the EA – are at least as advanced as technologically more advanced production techniques including fertilization, crop rotation, or other techniques to shorten or eliminate fallow periods. As the agricultural production technology becomes more advanced, kinship tightness decreases again, which is reminiscent of the "curvilinear hypothesis" in anthropology (Blumberg and Winch, 1972). Table 19 in Appendix B analyzes this pattern more rigorously through OLS regressions and conditional on the vector of "EA controls", compare, e.g., column (5) of Table 6.

In an appendix, the data presented in this section evidently do not lend themselves to a straightforward interpretation: even if it was true that agricultural subsistence advanced as the subsistence style of Western Europeans.

The histogram reveals that kinship tightness indeed significantly increases, for example, in hunter-gatherer lifestyles (first two categories) to extensive agriculture. However, as the agricultural production technology changes from hunter-gatherer lifestyles to extensive agriculture, kinship tightness decreases again, which is reminiscent of the "curvilinear hypothesis" in anthropology (Blumberg and Winch, 1972).
Conclusions

1. Because humans have cognitive limits, culture provides an effective short-cut for decision-making.
2. We observe vast differences in culture traits across societies
   - Western European cultural traits are not the norm.
3. Cultural traits evolve through systematic historical processes.
4. Cultural differences are important determinants of factors that affect long-run growth.
   - E.g., conflict, quality of institutions, etc.