CULTURE AND STUDENT ACHIEVEMENT: 
THE INTERTWINED ROLES OF PATIENCE AND RISK-TAKING

Eric A. Hanushek
Stanford University

Lavinia Kinne
ifo Institute

Philipp Lergetporer
ifo Institute

Ludger Woessmann
ifo Institute, University of Munich

March 2022
Why do results of international tests differ?

- Forbidden territory of *culture*
- Use new, scientifically validated measures
  - *Global Preference Survey (GPS)* – Falk et al., 2018
- Key measures for human capital investment
  - *Patience*
  - *Risk-taking*
Overall Conclusions

- Quantitatively strong relationship of culture and achievement
  - Patience – significantly positive
  - Risk-taking – significantly negative
- Culture explains 2/3 of country variation in achievement
- Severe biases from ignoring interrelationship
- Results consistent in cross-section and in analysis of migrants
- Results insensitive to wide variety of robustness and sensitivity analyses
- Suggestive mechanisms: culture works through parents, schools, and productivity – less through institutions
HUMAN CAPITAL INVESTMENTS

Optimal individual choices
Educational production functions
Two perspectives – same problem

1. Optimal individual investment
   - Inherently intertemporal decision making
   - Discount rates and time preferences central but little explicit analysis
   - Empirical focus: quantity, not quality

2. Education production functions
   - Largely focused on technical efficiency and productivity
   - Removed from individual optimization – many actors, aggregate inputs
   - Culture and preferences in group decisions
Central Cultural Traits for Human Capital Investments

- **Culture:** “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation” (Guiso, Sapienza, and Zingales, 2006)

- **Key dimensions of culture**
  - *Time preferences*
  - *Risk preferences*
DATA AND EMPIRICAL SPECIFICATIONS

PISA
GPS
Programme for International Student Assessment (PISA)

- Overall sample
  - Math, science, reading achievement
  - Seven waves with three year interval: 2000-2018

- Our sample
  - 49 countries with GPS
  - 1,992,276 students
  - 263 country-by-wave observations
Global Preference Survey (GPS)

- Falk, Becker, Dohmen, Enke, Huffman, and Sunde, *QJE*, 2018
- Scientifically validated international survey of preferences
  - *Gallop World Poll*
  - 76 countries in 2012
  - ≈1000 per country
- Six domains: patience, risk-taking, positive reciprocity, negative reciprocity, altruism, and trust
- Standardize to world z-values, aggregate to country level

- **Patience**: larger values indicate more likely to accept delayed gratification
- **Risk-taking**: larger values mean more likely to take risky outcomes (compared to certain)
Patience and Risk-taking across Countries

Source: Falk et al., 2018
Empirical Model

\[ T_{ict} = \beta_1 Patience_c + \beta_2 Risk_c + \alpha_1 B_{ict} + \mu_t + \epsilon_{ict} \]

- B: gender, age, migrant status
  - Include fixed effect for wave
  - Cluster errors at country level; weight by student sampling; equal country weight

- Include proximate inputs (family, school resources, institutions)
  - Descriptive analysis of channels plus sources other than culture
Basic Results in a Picture
Basic Results in a Picture
Basic Results in a Picture
Results

- Qualitative same
  - with other preferences
  - Across subjects
  - OECD and nonOECD
  - With test-taking effort

- Bigger for natives than for migrants
MIGRANT ANALYSIS
Migrant Analysis/Causation

- Consider just migrants into each country
  - Residence country fixed effects
  - Use origin country culture

\[ T_{i,oct} = \beta_1 \text{Patience}_o + \beta_2 \text{Risk}_o + \alpha_1 B_{i,oct} + \theta_c \times \mu_t + \epsilon_{i,oct} \]
Migrant Results

- Basic cross-section duplicated, smaller risk parameter
- Similar with migrant selectivity, test subject, OECD-nonOECD
- Some differences by generation, mothers and fathers,
CONCLUSIONS
Overall Conclusions

- Quantitatively strong relationship of culture and achievement
  - *Patience* – *significantly positive*
  - *Risk-taking* – *significantly negative*
- Culture explains 2/3 of country variation in achievement
- Severe biases from ignoring interrelationship
- Results consistent in cross-section and in analysis of migrants
- Results insensitive to wide variety of robustness and sensitivity analyses
- Suggestive mechanisms: culture works through parents, schools, and productivity – less through institutions