



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

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Why do results of international tests differ?

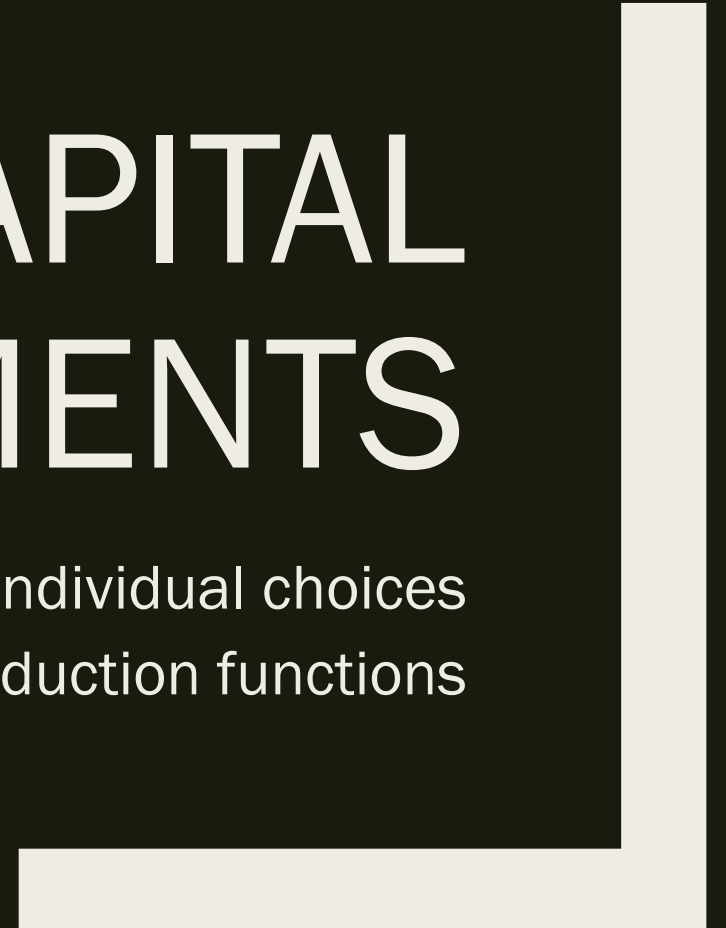
- Forbidden territory of *culture*
- Use new, scientifically validated measures
 - *Global Preference Survey (GPS) – Falk et al., 2018*
- Key measures for human capital investment
 - *Patience*
 - *Risk-taking*

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*
- *Variety of riskiness: Weiss (1972), Levhari and Weiss (1974)*
- *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

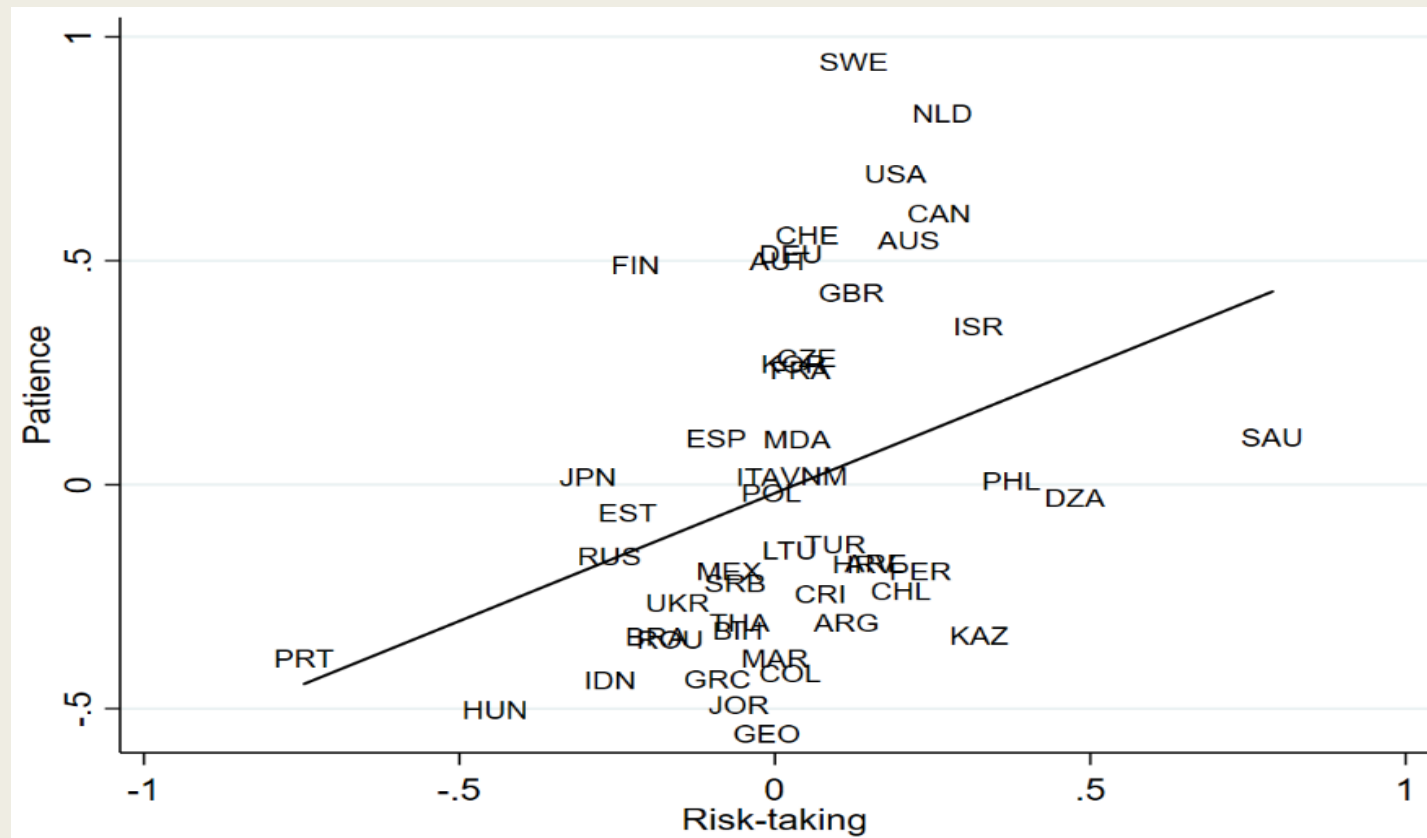
Programme for International Student Assessment (PISA)

- 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

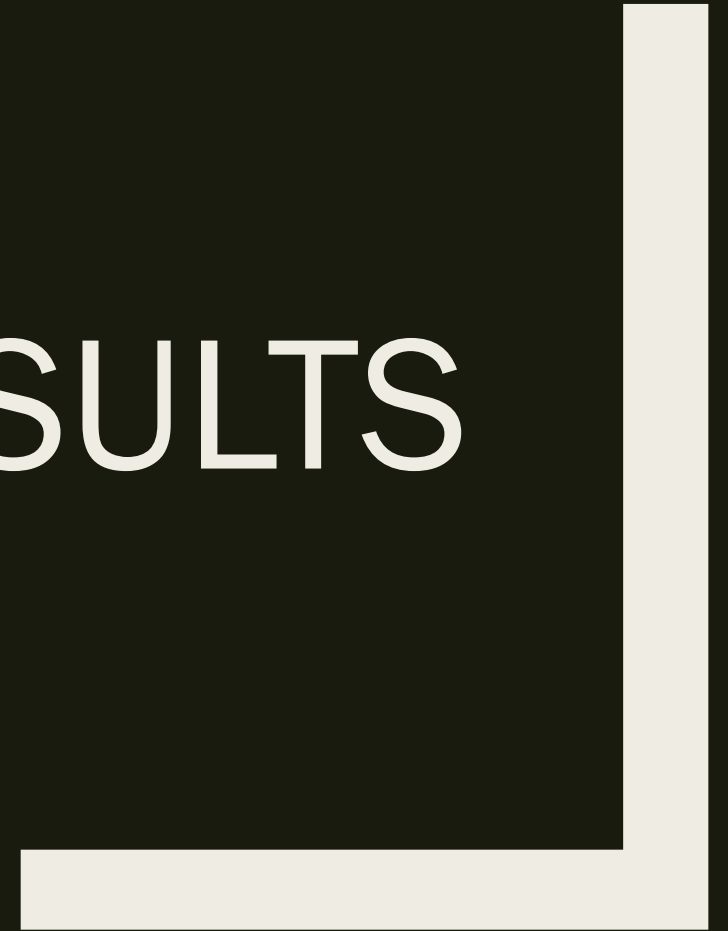
Empirical Model

$$T_{ict} = \beta_1 \textit{Patience}_c + \beta_2 \textit{Risk}_c + \alpha_1 B_{ict} + \mu_t + \varepsilon_{ict}$$

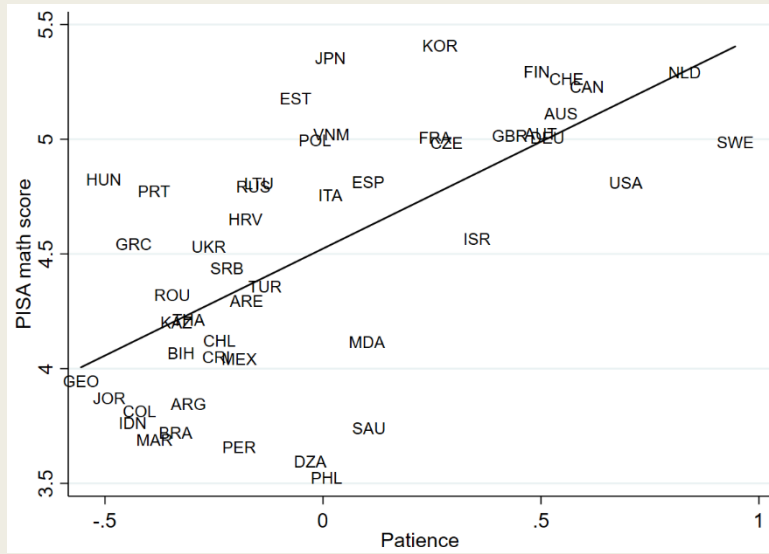
- B: gender, age, migrant status
 - *Include fixed effect for wave*
 - *Cluster errors at country level; weight by student sampling; equal country weight*

- Include proximate inputs (family, school resources, institutions)
 - *Descriptive analysis of channels plus sources other than culture*

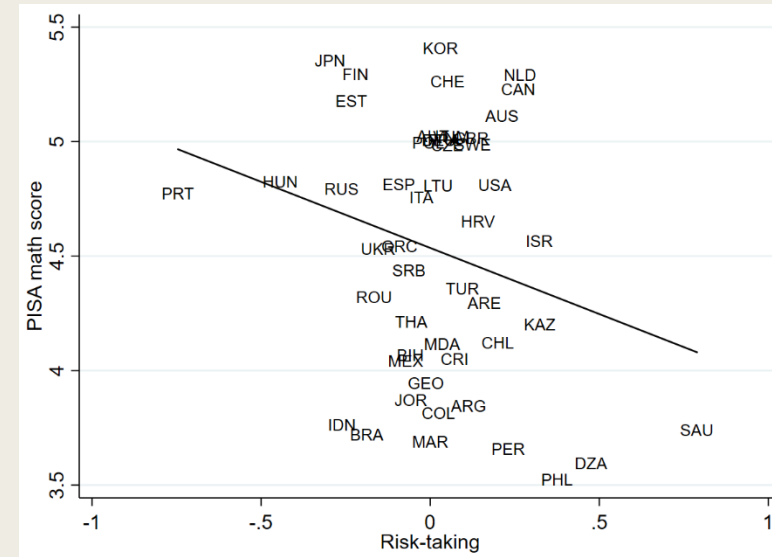
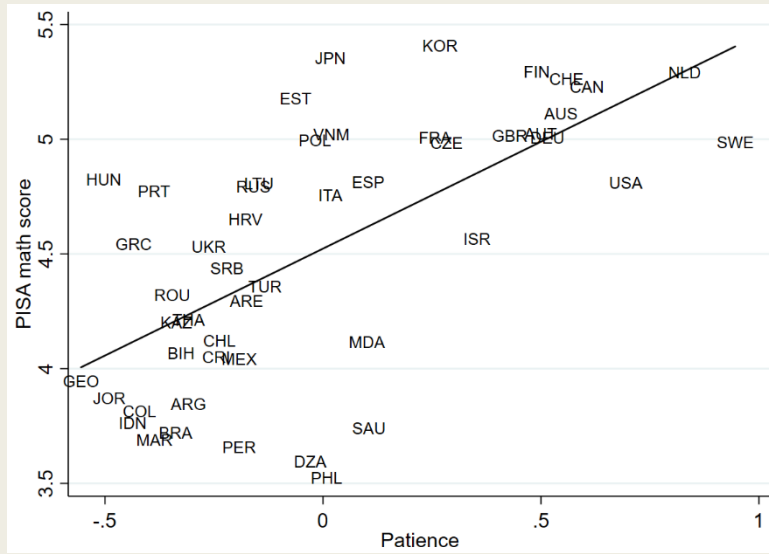
BASIC RESULTS



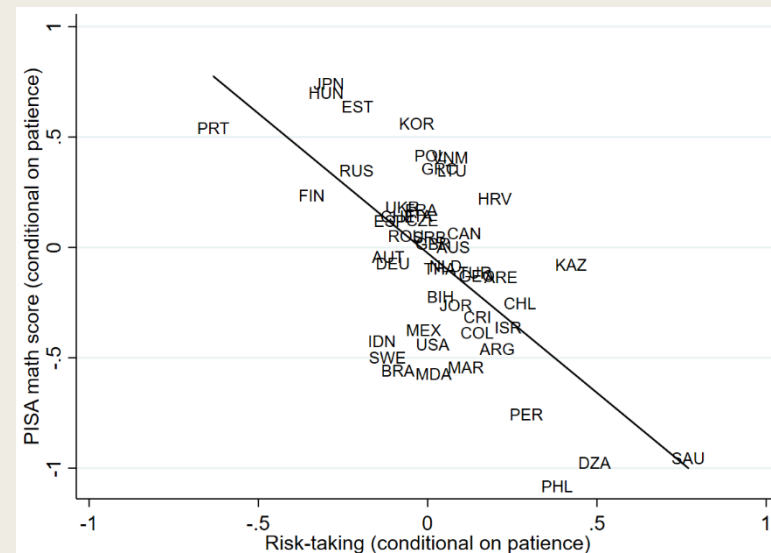
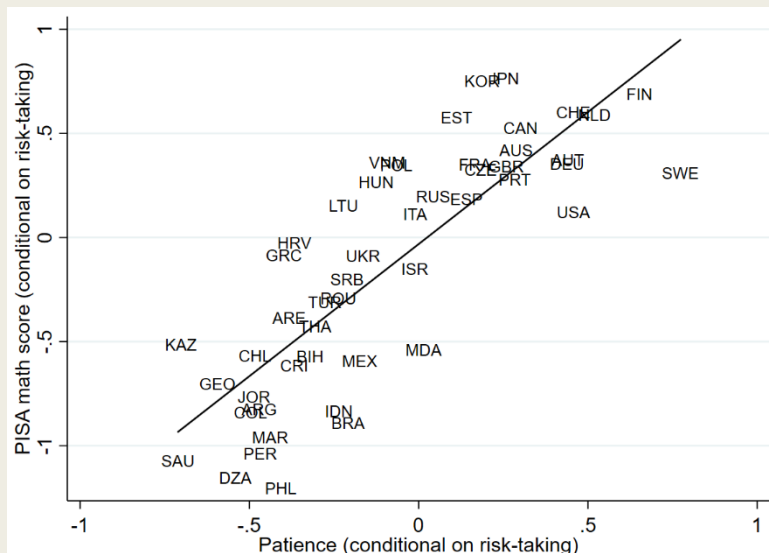
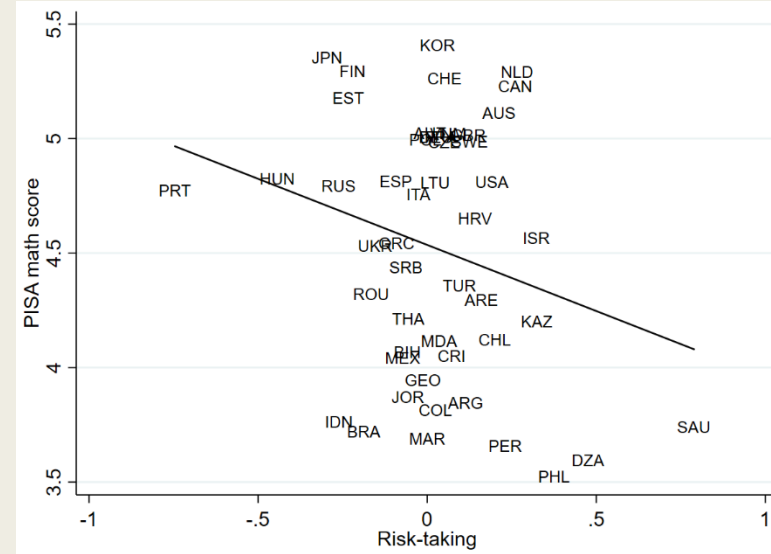
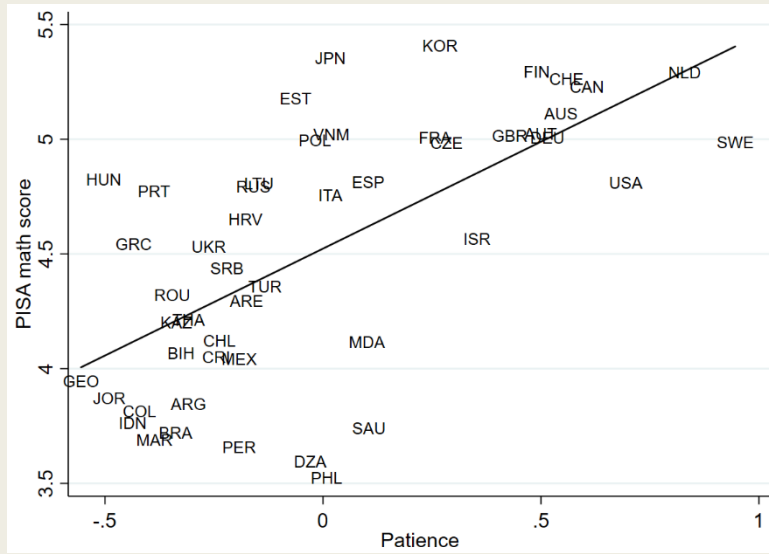
Basic Results in a Picture



Basic Results in a Picture



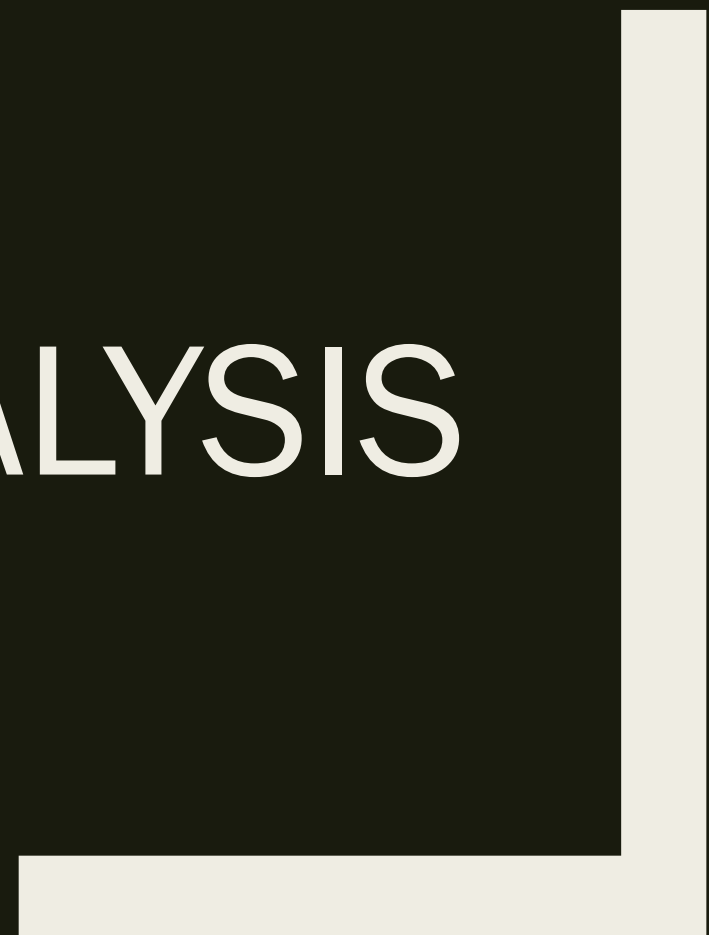
Basic Results in a Picture



Results

- Qualitative same
 - *across PISA waves (2000-2018)*
 - *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*

$$T_{ioct} = \beta_1 \text{Patience}_o + \beta_2 \text{Risk}_o + \alpha_1 B_{ioct} + \theta_c \times \mu_t + \varepsilon_{ioct}$$

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



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