The persistent effect of competition on prosociality

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Teaching slides

RCT ID: AEARCTR-0002288

Introduction

- **Prosociality:** positive other-regarding behaviors and beliefs
  - Composite measure covering altruism, reciprocity, and trust

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  - Composite measure covering altruism, reciprocity, and trust
- Prosociality is a key driver of social interactions and affects outcomes at all levels:
  - Trade and growth (e.g. Guiso et al. 2009; Algan & Cahuc 2010)
  - Happiness, health, employment, wages
    (e.g. Deming 2018; Becker et al. 2012; Kosse & Tincani 2020)

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    (e.g. Deming 2018; Becker et al. 2012; Kosse & Tincani 2020)
- Where do individual differences in prosociality come from?
- How do policy interventions shape prosociality?

Introduction

Determinants of prosociality

- Genetic differences: $\sim$ 20% of variation (Cesarini et al. 2008, 2009)
- Enriching the social environment persistently **increases** prosociality (Rao 2019; Cappelen et al. 2020; Kosse et al. 2020)

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$\rightarrow$ **Open question:** Which aspects of the social environment **attenuate** the formation of prosociality?

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$\rightarrow$ **Open question:** Which aspects of the social environment **attenuate** the formation of prosociality?

$\rightarrow$ Prime candidate: competition

Previous lit: competition/tournaments in firms

"There are incentives for uncooperative behavior in any firm that awards pay (...) on the basis of some relative comparison between employees."

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- Competition and *sabotage*

  (e.g. Harbring & Irlenbusch 2011; Balafoutas et al. 2012; Chowdhury & Gürtler 2015)

- Competition and *prosocial behavior*

  (e.g. Buser & Dreber 2016; Ter Meer 2014; Grosch et al. 2017)

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$\rightarrow$ Competitive *situations* (within a group) $\rightarrow$ uncooperative behavior

This paper

Research question

Does *growing up* in a competitive environment *persistently* attenuate the formation of prosociality?

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Research setup

1. Field experiment: 2-year treatment period
2. Panel framework: baseline, endline & 4-year follow-up

Overview

1. The intervention (RCT): PACE in Chile
2. Data
3. Analyses
4. Conclusion

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Education and labor market situation in Chile

- High education earnings premium
- Low intergenerational mobility

Education and labor market situation in Chile

- High education earnings premium
- Low intergenerational mobility
- Series of social unrests since 2006
- Problem: admission to university is based on a centralized test (PSU)
  - Admission requirement: being above threshold
  - $\sim$70% of students from low socio-economic status (SES) families take the test but less than 10% get admitted

The intervention: PACE

- 2014: PACE (program to provide effective access to higher education)
  - Goal: allow the best low SES students to enter universities
  - Target: schools with high share of students from low SES families
  - **Percentage plan:** guaranteed uni admission for **top 15%** of school

The intervention: PACE

- 2014: PACE (program to provide effective access to higher education)
  - Goal: allow the best low SES students to enter universities
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  - **Percentage plan:** guaranteed uni admission for **top 15%** of school
- 2016: Roll-out of PACE $\rightarrow$ MinEduc defined new set eligible schools
  - Budget constraints $\rightarrow$ **randomized allocation** (Cluster RCT)
  - 64 schools became part of PACE $\rightarrow$ Treatment group
  - 64 schools did not become part of PACE $\rightarrow$ Control group

Access to university: with PACE and without PACE

Control group (no PACE)

- Admission based on centralized test (enrollment: $\sim$ 8.5%)
  - *Less competitive environment*: relative comparisons within school do not matter

Access to university: with PACE and without PACE

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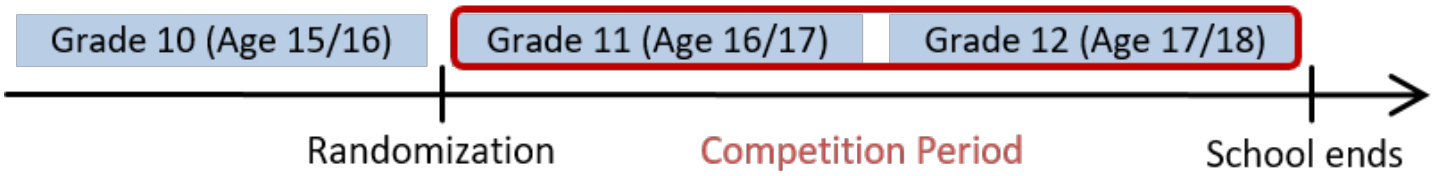
Treatment group (PACE)

- Admission based on centralized test
- **PACE slots:** admission for **top 15%** of school (GPA of grades 11 & 12)
  - *More competitive environment*: relative comparisons within school are decisive

Timing and Interpretation

Timing for the cohort under study



Timing and Interpretation

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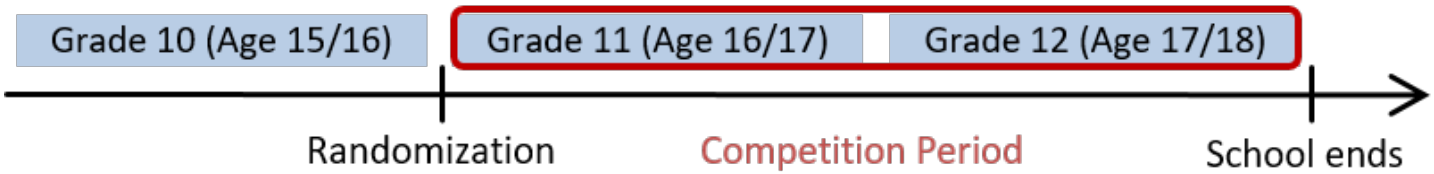

Comparison between treatment and control group:

$\rightarrow$ Effect of living in a more competitive environment for **two years**

▸ Manipulation check

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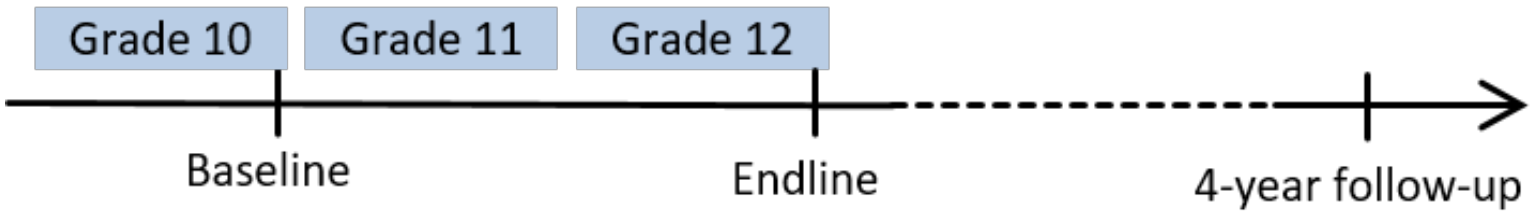
Data: sources and measures (1/2)



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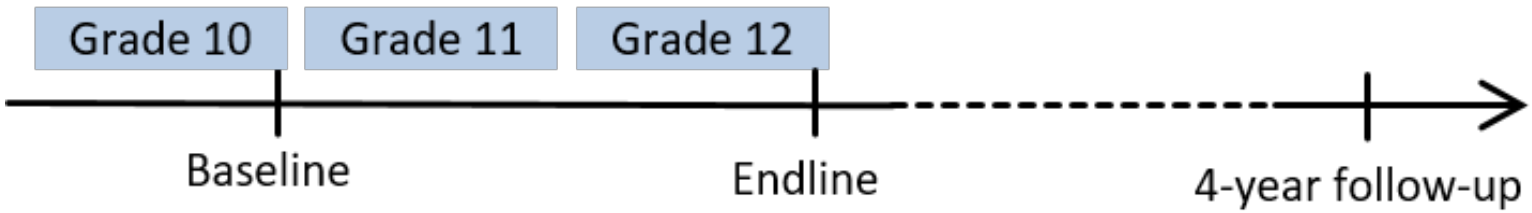

- **Baseline**: registry data
  - Sample: 128 schools ($T = 64$, $C = 64$), $>$ 8,000 students
  - Measures: achievement test, socio-demographics
  - Sample is balanced across treatment and control groups ▸ Comparison

Data: sources and measures (2/2)

- **Endline**: own data collection in schools (paper & pencil survey)
  - Sample: $\sim$ 70% of enrolled students (at baseline)

    $\sim$ 40 observations per school

    $\rightarrow$ No selective attrition (Analysis) ($\rightarrow$ IPW)
  - Key measure: prosociality

Data: sources and measures (2/2)

- **Endline**: own data collection in schools (paper & pencil survey)
  - Sample: $\sim$ 70% of enrolled students (at baseline)
    $\sim$ 40 observations per school
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  - Key measure: prosociality

- **4-year follow-up**: own data collection (online/phone survey)
  - Sample: $\sim$ 20% of endline sample
    $\sim$ 8 observations per school
    $\rightarrow$ No selective attrition (Analysis) ($\rightarrow$ IPW)
    $\rightarrow$ Power: Independent observations, within cluster corr, items
  - Key measure: prosociality

Data: measuring prosociality (endline)

As in Kosse & Tincani (2020, *Nature Comm.*):

- Survey: items on **altruism, positive reciprocity** and **trust** (GPS, Falk et al. 2016/18) ▸ Details
  - Generally framed items, not limited to a specific context
    e.g. “When someone does me a favor, I am willing to return it”
- Measure: PCA $\rightarrow$ first component
  - Trait-like level of stability
  - High predictive power for labor market outcomes

Data: measuring prosociality (4-year follow-up)

Two sets of items

- Generally framed: same at endline (GPS) + additional (GPS/WVS)
- Focus on former high-school peers (adapted GPS/WVS)

Three measures

- Combined prosociality measure: PCA using all items
  - Minimizes measurement error $\rightarrow$ Maximizes power
- General prosociality: PCA using generally framed items
- Prosociality towards former peers: PCA using items on former peers
  - General effect vs. effect on former peers only

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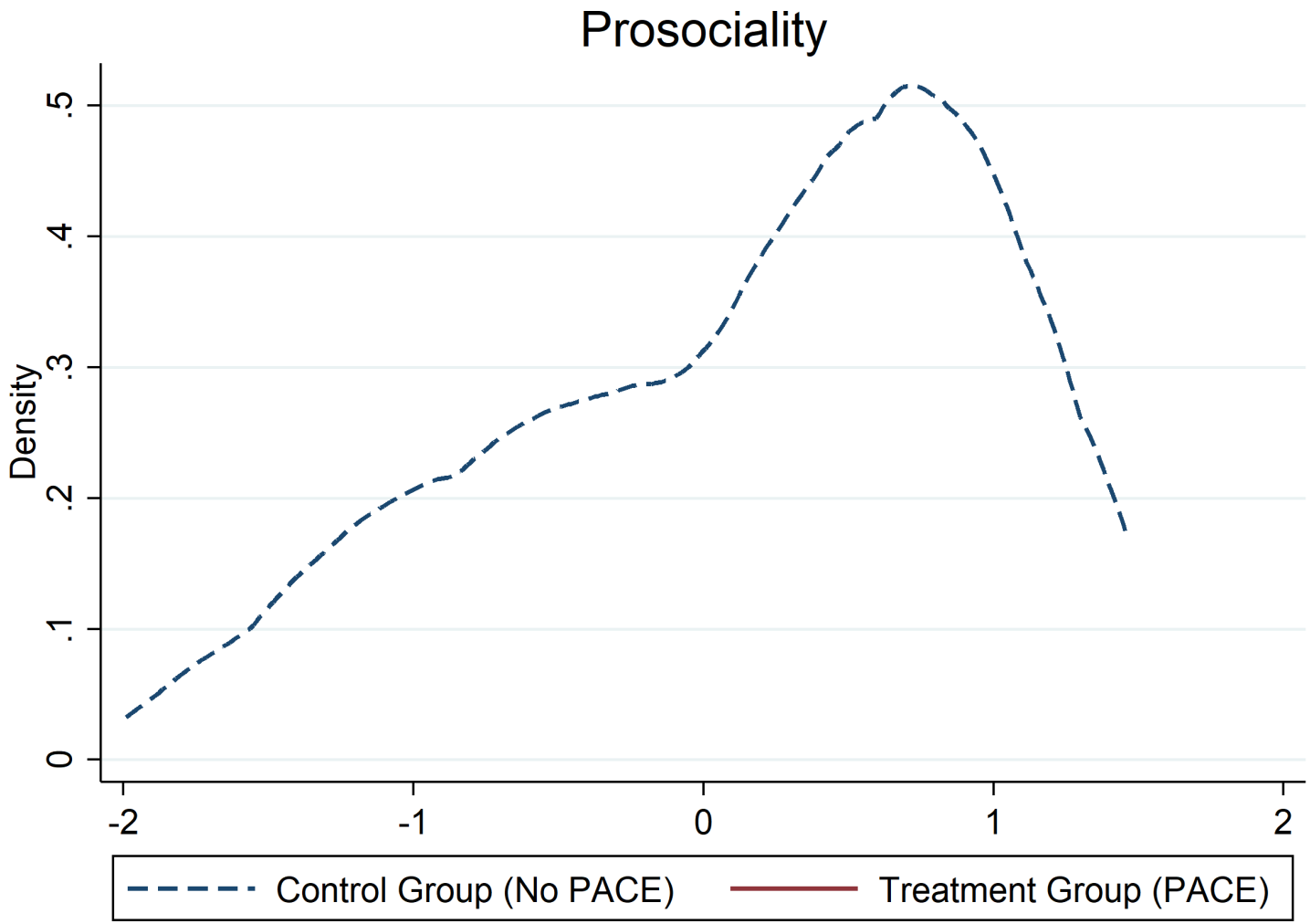
Results: the effect of PACE on prosociality (endline)



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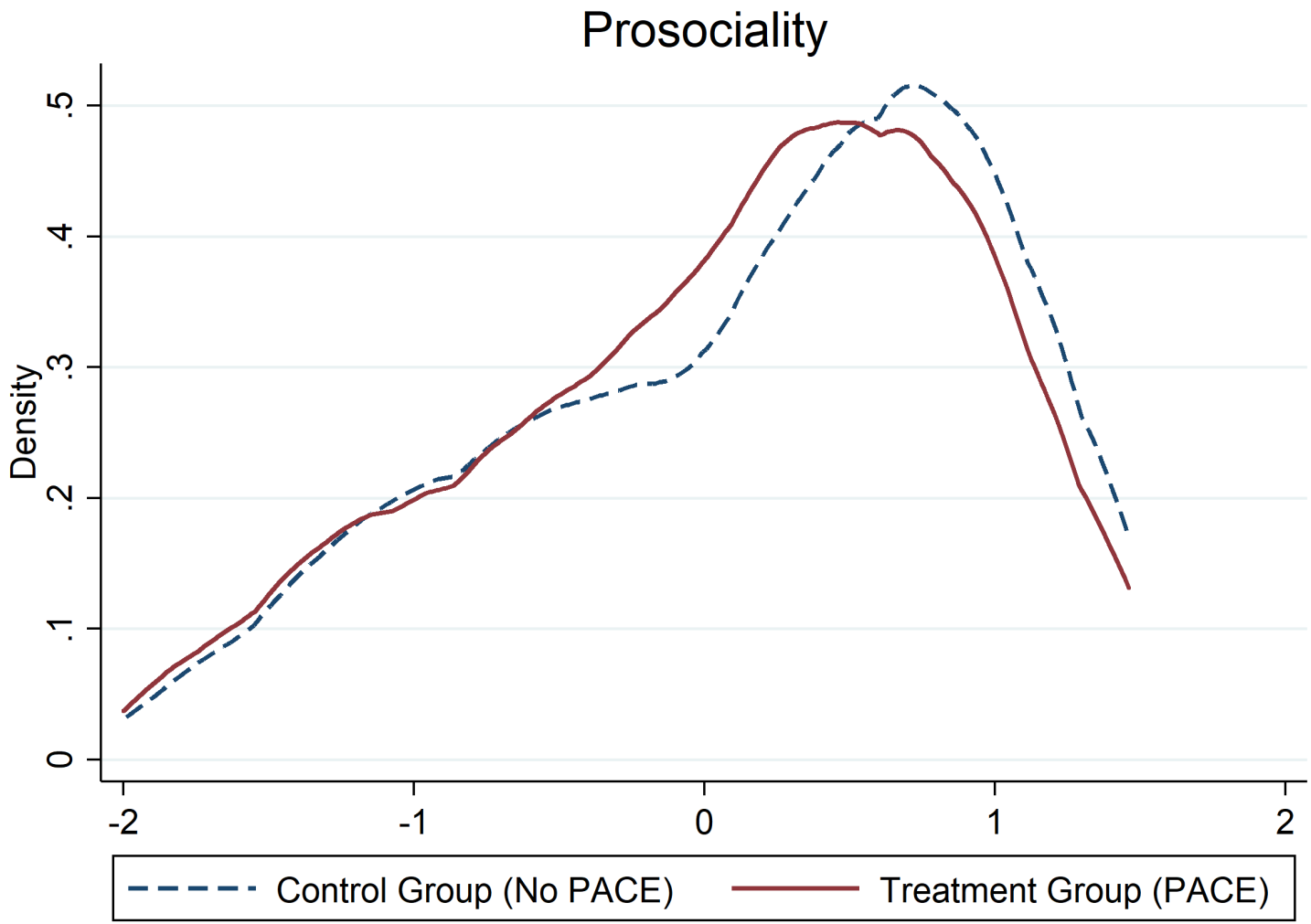

Results: the effect of PACE on prosociality (endline)

	Std. prosociality at age 17/18		
	(1)	(2)	(3)
Treatment dummy	-0.107**	-0.112***	-0.113***
	(0.053)	(0.041)	(0.043)
Achievement (at baseline, standardized)		0.108***	0.109***
		(0.015)	(0.016)
Female		0.125***	0.131***
		(0.034)	(0.035)
Very low SES dummy		0.017	0.019
		(0.031)	(0.032)
Weights	No	No	IPW
Observations	5,343	5,343	5,343

Coefficients OLS estimates. SE clustered at school level are shown in parentheses. Columns 2 and 3 includes the standard baseline controls from Tincani et al (2023): achievement, female, age, very low SES, never failed a grade and high school type. ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. ▸ Lee bounds

Results: the effect of PACE on facets of prosociality

	Standardized Altruism (1)	Standardized Trust (2)	Standardized Reciprocity (3)
Treatment dummy	-0.066	-0.067	-0.115
Original p-values	(0.113)	(0.019)	(0.004)
Two-stage q-values	[0.040]	[0.020]	[0.013]
Observations	5,343	5,343	5,343

Coefficients are ordinary least squares estimates. All regressions use the standard baseline controls. Original *p*-values are shown in (parentheses), false discovery rates in form of sharpened two-stage shown in [square brackets]. ***, **, * indicate significance at the 1%, 5% and 10% level.

Results: heterogeneity by gender

See also Gneezy et al. (2003) and Buser & Dreber (2016)

	Standardized prosociality	
	Females	Males
Treatment dummy	-0.082	-0.143***
	(0.057)	(0.053)
Observations	2,507	2,836

Standard errors clustered at the school level. All regressions use the standard baseline controls and apply IPW. ***, **, * indicate significance at the 1%, 5% and 10% level, respectively.

▸ Heterogeneity by rank

Interpretation: Tournament vs Teachers/Principals

- No TE on grading patterns
- No TE on teachers' effort and focus of instruction
- No TE on support offered to students
- No TE on assignment of students to classrooms

  $\rightarrow$ Details: Tincani, Kosse, and Miglino (2023)

Results: 4-year follow-up

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	Prosociality (age 21/22, standardized)		
	(1)	(2)	(3)
Panel A: Joint measure of prosociality			
Treatment dummy	-0.152**	-0.140**	-0.153**
	(0.067)	(0.064)	(0.069)
Panel B: General prosociality			
Treatment dummy	-0.126*	-0.118*	-0.135*
	(0.072)	(0.071)	(0.074)
Panel C: PS towards former schoolmates			
Treatment dummy	-0.132**	-0.122*	-0.129*
	(0.065)	(0.062)	(0.068)
Baseline controls	No	Yes	Yes
Weights	No	No	IPW
Observations	1,018	1,018	1,018

SEs clustered at the school level. ***, **, * indicate significance at the 1%, 5% and 10% level.

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a. Enduring exposure to a competitive environment attenuates the formation of prosociality $\rightarrow$ persistent and general effect

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   - Laboratory and firm context $\rightarrow$ field and education context

b. Policy perspective: unintended side effects of percentage plans
   - Optimal policy design

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Back-up slides

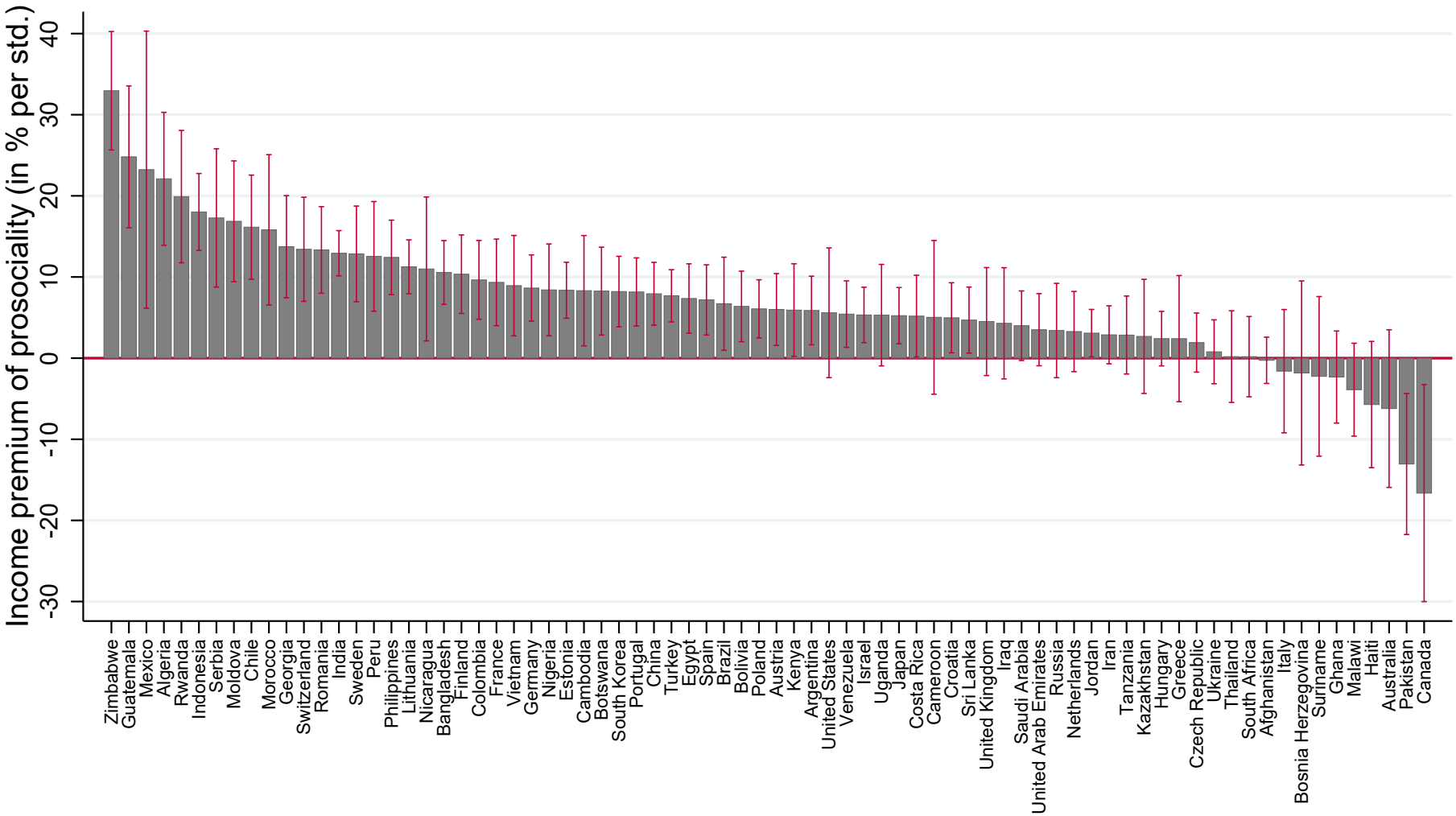
Prosociality predicts life-outcomes

	Subj. health (5-point Likert) (1)	**Happiness** (11-p. Likert) (2)	**Gross wage** (hourly, in €) (3)	**Unempl.** (dummy) (4)	**Education** (in years) (5)
Std. prosociality	0.149***	0.462***	0.847***	-0.022***	0.492***
	(0.007)	(0.014)	(0.120)	(0.003)	(0.022)
Age (in years)	-0.021***	-0.004***	0.254***	-0.001**	-0.017***
	(0.000)	(0.001)	(0.011)	(0.000)	(0.001)
Female dummy	-0.115***	-0.150***	-4.569***	0.022***	-0.543***
	(0.013)	(0.026)	(0.239)	(0.006)	(0.042)
Observations	17,741	17,737	8,807	11,241	16,967
R^2	0.181	0.065	0.108	0.006	0.047

Kosse et al. (2020, *JPE*), SOEP data from 2003 to 2009, ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively. ▸ Back

Income premia of prosociality around the world

Back

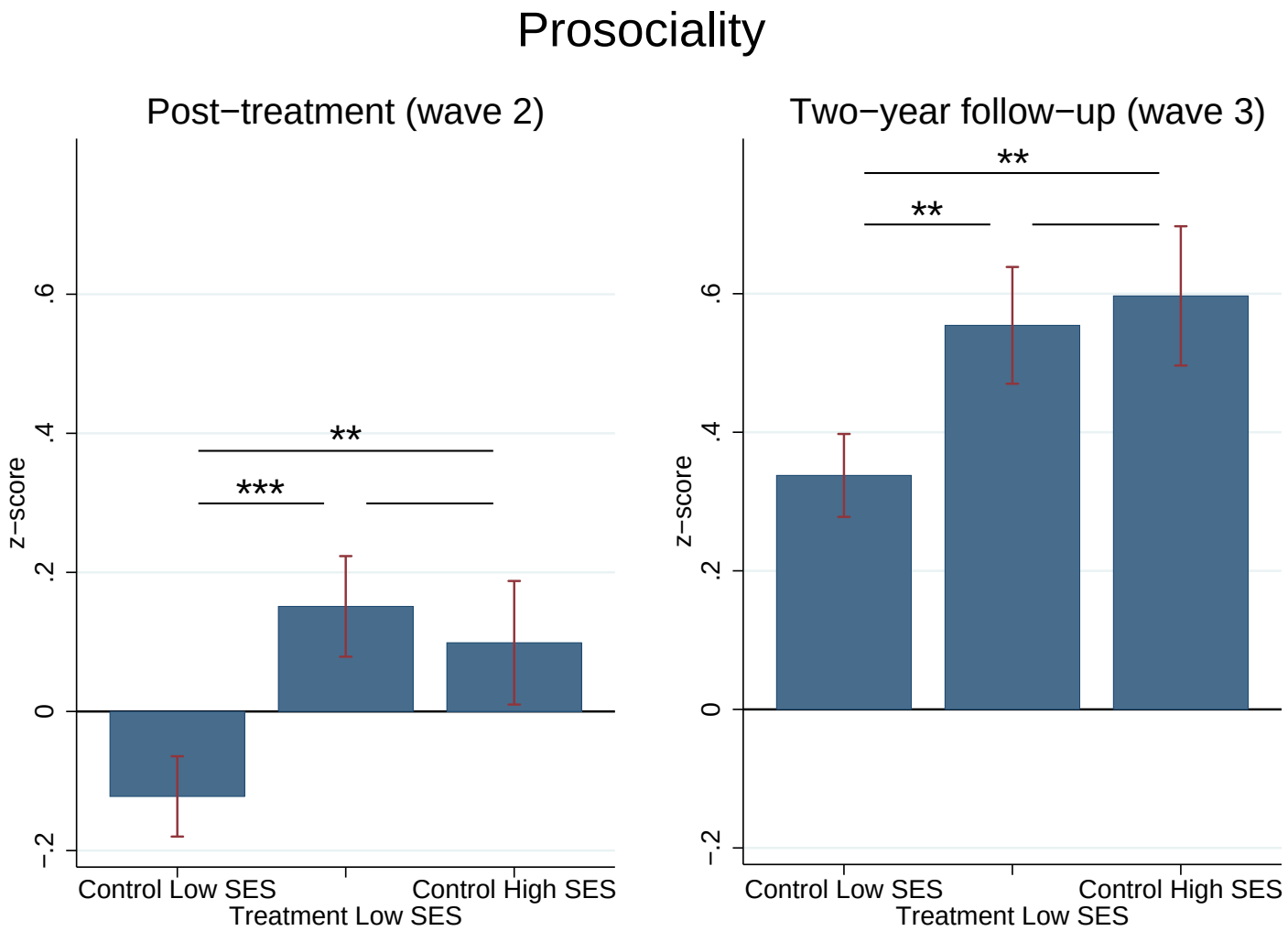


Income premia of prosociality (in percent of household income) around the world.

Kosse & Tincani (2020, Nature Comm.)

The effect of mentoring ("Baloo and you")

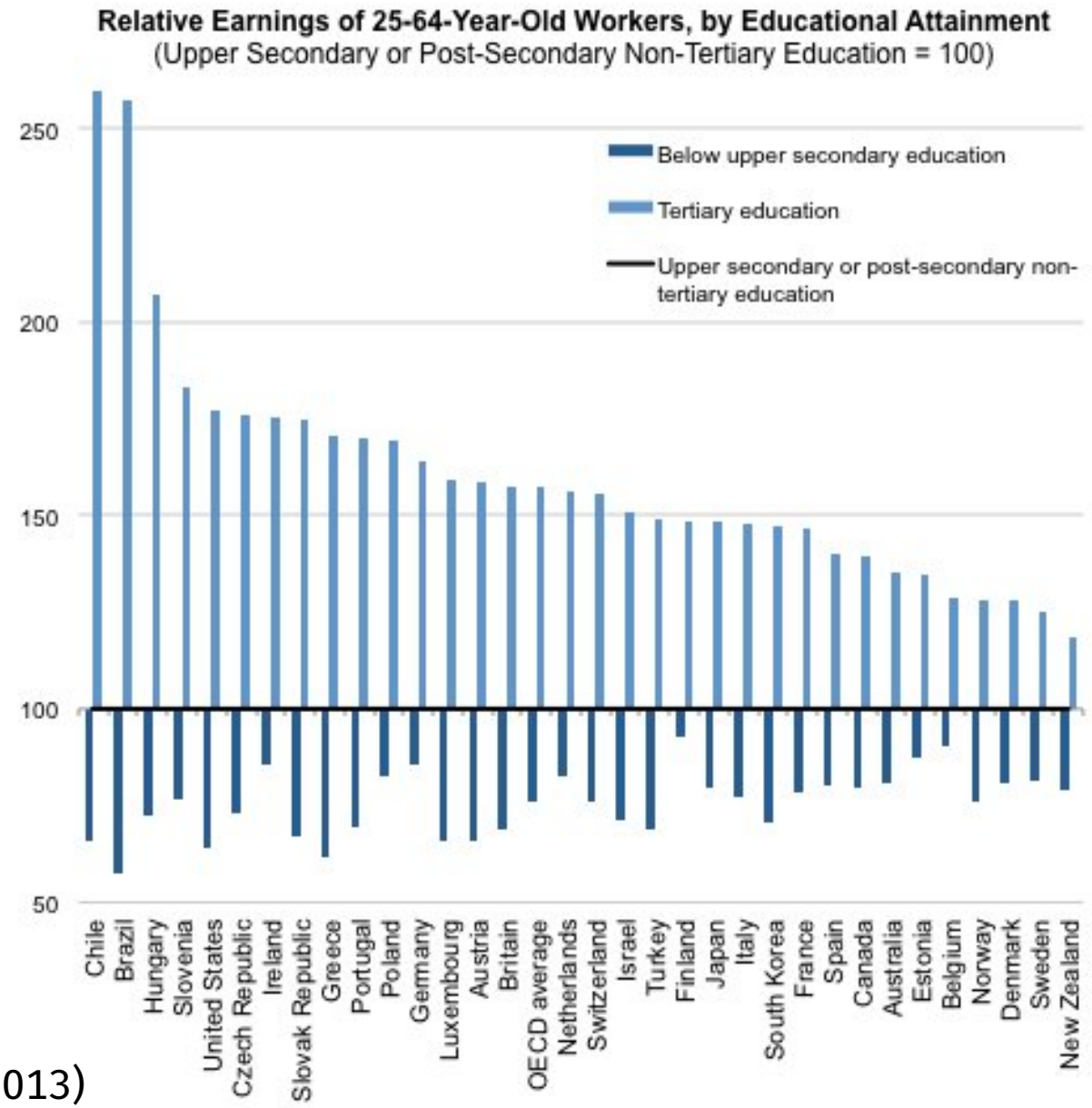
Back



Kosse, Deckers, Pinger, Schildberg-Hörisch and Falk (2020, JPE)

Importance of University education in Chile

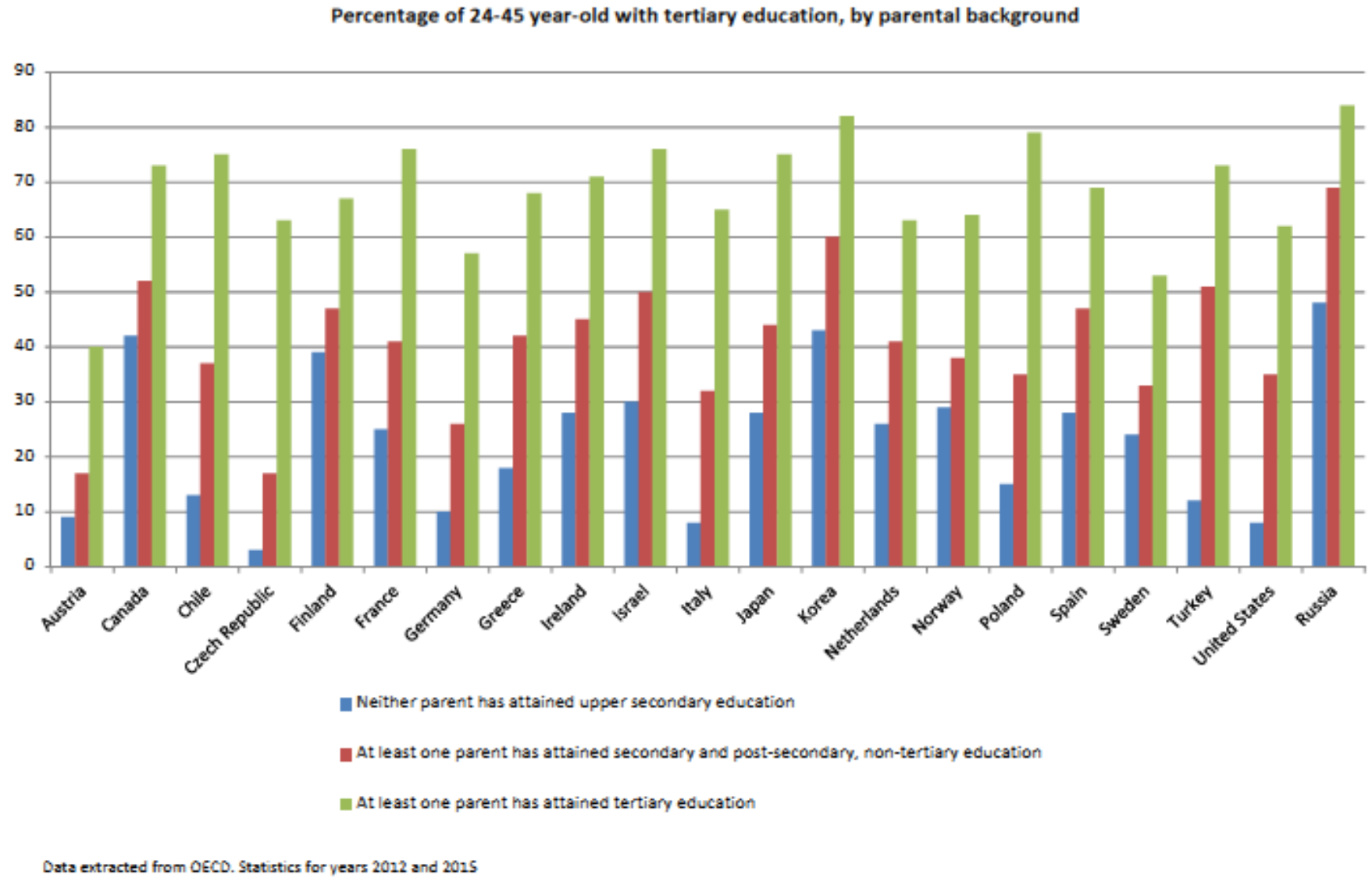
Back



Source: OECD (2013)

Intergenerational persistence in Chile

Back



Data extracted from OECD. Statistics for years 2012 and 2015

Characteristics of the study population

	All students	Study population
Prioritario student	0.40	0.61
Mother's education	11.49	9.60
Father's education	11.43	9.38
HH income in 1000 CLP	600.10	291.66
SIMCE score (standardized)	0.00	-0.62
Rural	0.03	0.03
Santiago	0.30	0.17
Observations	194,377	8,944

Back

Descriptive statistics and balancing tests

Baseline variables	Mean of Control group	Difference Treatment - Control	*N*
Female	0.476	0.001 (0.054)	9,006
Age	17.54	0.031 (0.052)	9,006
SIMCE score	221.4	7.600 (5.256)	8,944
GPA (grade 10)	5.438	0.013 (0.035)	8,944
Very low SES	0.602	0.014 (0.020)	9,006
Mother's education (years)	9.553	0.081 (0.168)	6,000
Father's education (years)	9.320	0.115 (0.178)	5,722
HH income (in 1000 CLP)	284.0	14.33 (12.79)	6,018

SE clustered at school level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Back

Attrition analysis

	Available at endline (= 1 if yes) (Outcome mean: 0.597)		
	(1)	(2)	(3)
Treatment dummy	-0.044	-0.051	-0.011
	(0.036)	(0.036)	(0.038)
Achievement (at baseline, std)		0.048***	0.067***
		(0.013)	(0.010)
Female		-0.027	0.011
		(0.023)	(0.025)
Very low SES dummy		-0.031**	-0.025
		(0.012)	(0.017)
Treatment x achievement			-0.031
			(0.022)
Treatment x female			-0.070
			(0.043)
Treatment x very low SES dummy			-0.013
			(0.024)
Observations	9,006	8,944	8,944
R-squared	0.002	0.013	0.015

Standard errors clustered at the school level. ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Back

Attrition analysis

	Available at follow-up (= 1 if yes) (Outcome mean: 0.114)		
	(1)	(2)	(3)
Treatment dummy	0.010	0.003	0.013
	(0.012)	(0.012)	(0.018)
Achievement (at baseline, std)		0.039***	0.044***
		(0.006)	(0.007)
Female		0.016**	0.015*
		(0.007)	(0.009)
Very low SES dummy		-0.028***	-0.018
		(0.008)	(0.013)
Treatment x achievement			-0.008
			(0.011)
Treatment x female			0.003
			(0.015)
Treatment x very low SES dummy			-0.019
			(0.016)
Observations	9,006	8,944	8,944
R-squared	0.000	0.019	0.019

Standard errors clustered at the school level. ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Back

Implementation of endline data collection back

- MinEduc sent letters of support $\rightarrow$ all schools participated
- Project financed by a grant independently from MinEduc
- Data collection conducted by trained interviewers
- Paper & Pencil survey conducted in standardized seating order

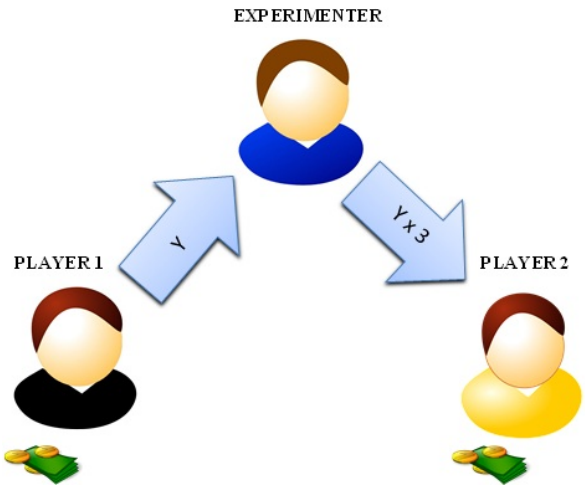
Implementation of follow-up data collection back

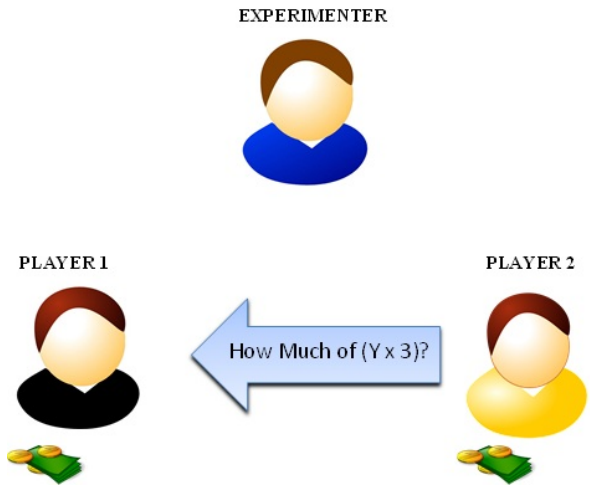
- Implemented by a Chilean data collection agency
- Agreement to be contacted and contact data provided at endline
- Three step procedure
  1. Invitation via email/WhatsApp $\rightarrow$ online survey
  2. Phone interview
  3. Contact via social media $\rightarrow$ online survey (data collection still ongoing)

Validation of the GPS (Falk et al. 2016): trust & reciprocity

Step 1: participants ($N > 400$) answer a large battery of survey items on trust and reciprocity

Step 2: "investment game" (Berg et al. 1995) is played (one week apart)





Step 3: selection of items which best predict behavior

Step 4: cultural translations in 111 languages and dialects

Implemented GPS questions: ”qualitative items”

“How well does each of the following statements describe you as a person?” (11-point Likert scale, see Falk et al. (2016, 2018) for details

- “I assume that people have only the best intentions” (**trust**)
  - Correlation with choice in experiment (1 week apart): 0.283
  - Test-retest-stability of choice in experiment (1 week apart): 0.599
- “When someone does me a favor, I am willing to return it” (**pos. reciprocity)**
  - Correlation with choice in experiment (1 week apart): 0.269
  - Test-retest-stability of choice in experiment (1 week apart): 0.434

Note: items are not framed in school context $\rightarrow$ general instead of just in school behavior Back

Manipulation check

	Competition in school (standardized)	
	Perceived by students	Perceived by teachers
	(1)	(2)
Treatment dummy	0.093**	0.264*
	(0.045)	(0.158)
Observations	4,246	165

Table: Coefficients are ordinary least squares estimates. Standard errors clustered at school level are shown in parentheses. The dependent variables are standardized. The regression in Column 1 includes the standard baseline controls from Tincani et al (2023): achievement, female, age, very low SES, never failed a grade and high school type. The regression in Column 2 includes controls for the following student and teacher characteristics: shares of female and very low SES students, school-cohort average achievement scores (at baseline), teachers' gender and age. ***, **, * indicate significance at the 1%, 5% and 10% level, respectively. Back

Robustness check: Lee bounds

	Standardized prosociality	
	Lower bound	Upper bound
Treatment dummy	-0.272	-0.015
Number of obs.	8,944	8,944
Number of selected obs.	5,343	5,343

The bounds are estimated using the trimming procedure suggested by Lee (2009). Instead of correcting point estimates, this approach yields interval estimates of effect sizes based on extreme assumptions about selection. Back

Results: heterogeneity by baseline rank

Back

See also Gürtler & Münster (2010) and Gürtler, Münster & Nieken (2013)

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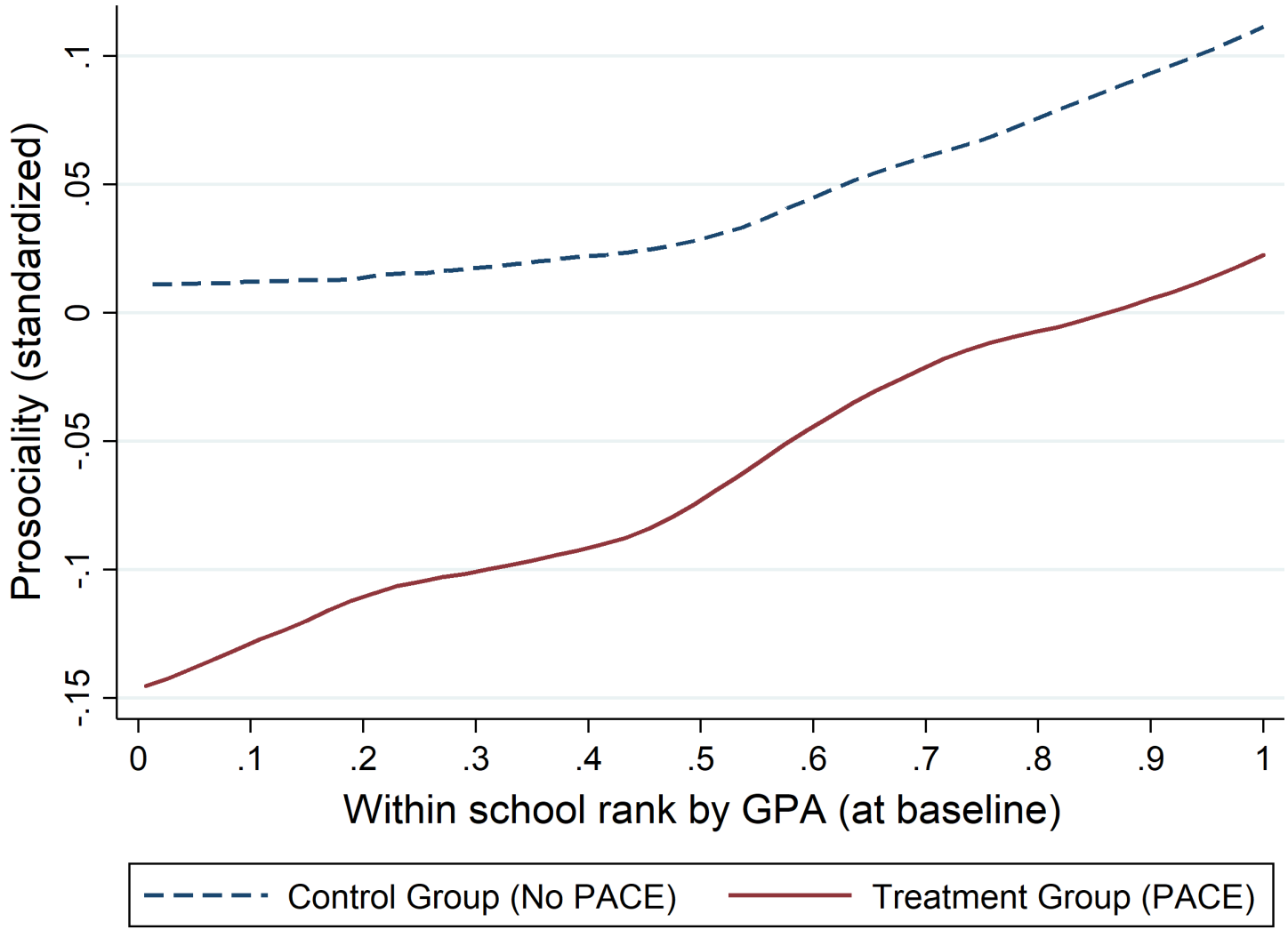

→ Evolution of cooperative behavior (Fehr & Fischbacher 2003)