

CHEATING AS A MEASURE OF SOCIAL CAPITAL

Marco Paccagnella Paolo Sestito

Bank of Italy

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- ⇒ cheating can be interpreted as a sign of low trust towards a centralized authority

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 - “validate” cheating as a measure of social capital, by showing it correlates with more traditional measures

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 - Bertoni, Brunello and Rocco (2012) look at the effect of external supervision (supposed to make cheating more difficult)
 - Lucifora and Tonello (2012) estimate an endogenous social multiplier in cheating (and show it is higher in low social capital areas)

THE DATA - INVALSI

- Assessments conducted by Invalsi in the school year 2009-10
- Tests on Math and Italian
- Measure of cheating at the class level on the $[0,1]$ interval [Castellano et al., 2009]
- Individual data on students' socio-economic background
- 2nd, 5th, 6th and 8th grade
 - For 8th graders the test is high-stake;
 - For 2nd graders we lack data on students' socio-economic background.

THE DATA - SOCIAL CAPITAL

- At the municipal level:
 - Voters' turnout at national elections (1946-2008)
- At the provincial level:
 - Voters' turnout at national elections (1946-2008);
 - Voters' turnout at referenda;
 - Voters' turnout at the referendum on divorce;
 - Blood donations;
 - Measure of trust from WVS
 - Civic awareness and social participation - universalistic vs particularistic (De Blasio, Scalise and Sestito, 2012)
- Administrative data on demographic and geographic characteristics

METHODOLOGY

- Important to keep Math and Italian tests separate
- Three main specifications:
 - Separate OLS regressions
 - Pooled regression, allowing for a different intercept
 - Seemingly Unrelated Regression (SUR)

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 - How skewed is the grade distribution?
 - Gap between actual and predicted grades
- Universalistic vs. particularistic social capital
 - e.g. for civic awareness: distance in the degree people rely on family/friends versus mass media to gather information

DESCRIPTIVE STATISTICS

	2nd grade		5th grade		6th grade		8th grade	
	Ita	Math	Ita	Math	Ita	Math	Ita	Math
Cheating	0.064 (0.190)	0.074 (0.211)	0.070 (0.201)	0.069 (0.199)	0.080 (0.185)	0.024 (0.093)	0.067 (0.169)	0.066 (0.166)
School mark	7.78 (0.618)	7.90 (0.618)	7.46 (0.597)	7.56 (0.593)	6.54 (0.591)	6.61 (0.636)	-	-
Raw test scores	65.73 (13.00)	62.61 (14.13)	69.84 (10.31)	64.89 (12.27)	60.85 (7.41)	51.47 (9.11)	64.65 (8.79)	55.66 (10.36)
No. schools	7,558	7,554	7,542	7,541	5,825	5,824	5,733	5,734
No. classes	29,527	29,502	29,830	29,811	26,725	26,716	25,923	25,923
Avg. Class size		17.41 (5.348)		17.24 (5.435)		19.55 (4.490)		19.33 (4.530)
Turnover (1946-2008)		88.76 (5.178)		88.64 (5.203)		88.78 (5.115)		88.63 (5.163)

MAIN RESULTS - 5TH GRADE

		Italian			Mathematics	
	[1]	[2]	[3]	[4]	[5]	[6]
Turnover	-0.007*** (0.000)	-0.005*** (0.000)	-0.005*** (0.000)	-0.008*** (0.000)	-0.006*** (0.001)	-0.006*** (0.000)
Gap mark-score	-	-	0.024*** (0.003)	-	-	0.027*** (0.003)
Skewness marks	-	-0.007*** (0.003)	-	-	-0.010*** (0.003)	-
Escs	-	0.006* (0.003)	0.020*** (0.004)	-	0.001 (0.004)	0.018*** (0.005)
Monitoring (class)	-	-0.026*** (0.003)	-0.027*** (0.003)	-	-0.023*** (0.003)	-0.024*** (0.003)
Monitoring (school)	-	-0.018*** (0.003)	-0.018*** (0.003)	-	-0.018*** (0.003)	-0.018*** (0.003)
Share females	-	0.030*** (0.010)	0.032*** (0.010)	-	0.024*** (0.010)	0.005 (0.009)
Share italians	-	0.063*** (0.009)	-0.084*** (0.030)	-	0.063*** (0.009)	-0.083*** (0.029)
Ethnic fract.	-	-	-0.128*** (0.023)	-	-	-0.122*** (0.024)
R-squared	0.034	0.054	0.058	0.052	0.078	0.082
N	29,468	27,651	28,036	29,751	27,641	28,004

MAIN RESULTS - 5TH GRADE (POOLED REGRESSION)

	[1]	[2]	[3]
Turnover	-0.008*** (0.000)	-0.006*** (0.000)	-0.006*** (0.000)
Mathematics	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Gap mark-score	-	-	0.025*** (0.003)
Skewness marks	-	-0.008*** (0.003)	-
Escs	-	0.004 (0.003)	0.019*** (0.004)
Monitoring (class)	-	-0.024*** (0.003)	-0.025*** (0.003)
Monitoring (school)	-	-0.018*** (0.003)	-0.018*** (0.003)
Share females	-	0.027*** (0.009)	0.019** (0.009)
Share italians	-	0.063*** (0.009)	-0.083*** (0.028)
Ethnic frac.	-	-	-0.125*** (0.022)
R-squared	0.044	0.065	0.069
N	59,521	55,292	56,028

MAIN RESULTS - 5TH GRADE (SUR)

	[Ita]	[Math]	[Ita]	[Math]
Turnover	-0.005*** (0.000)	-0.006*** (0.000)	-0.005*** (0.000)	-0.006*** (0.000)
Gap mark-score	-	-	0.022*** (0.002)	0.022*** (0.002)
Skewness marks	-0.005*** (0.002)	-0.007*** (0.002)	-	-
Escs	0.006** (0.003)	0.002 (0.002)	0.018*** (0.003)	0.016*** (0.003)
Monitoring (class)	-0.025*** (0.005)	-0.022*** (0.005)	-0.026*** (0.005)	-0.024*** (0.004)
Monitoring (school)	-0.018*** (0.003)	-0.018*** (0.003)	-0.019*** (0.003)	-0.018*** (0.003)
Share females	0.031*** (0.009)	0.025*** (0.009)	0.032*** (0.009)	0.009 (0.009)
Share italians	0.063*** (0.011)	0.063*** (0.009)	0.084** (0.035)	-0.085** (0.035)
Etnic frac	-	-	-0.126*** (0.026)	-0.122*** (0.25)
R-squared	0.054	0.078	0.058	0.082
N		27,538		27,958
Rho		0.560		0.559
BP test		0.000		0.000
b1(ita)=b1(math)		0.000		0.000



MAIN RESULTS - 6TH GRADE

		Italian			Mathematics	
	[1]	[2]	[3]	[4]	[5]	[6]
Turnover	-0.000 (0.000)	-0.000 (0.000)	-0.001 (0.000)	-0.003*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Gap mark-score	-	-	0.041*** (0.003)	-	-	0.010*** (0.002)
Skewness marks	-	-0.007** (0.003)	-	-	-0.007*** (0.002)	-
Escs	-	0.086*** (0.007)	0.103*** (0.006)	-	0.000 (0.002)	0.007*** (0.003)
Monitoring (class)	-	-0.011*** (0.004)	-0.012*** (0.004)	-	-0.007*** (0.002)	-0.007*** (0.002)
Monitoring (school)	-	-0.005*** (0.003)	-0.003 (0.003)	-	-0.002 (0.002)	-0.002 (0.002)
Share females	-	0.055*** (0.010)	0.055*** (0.010)	-	0.015*** (0.006)	0.010* (0.006)
Share italians	-	0.210*** (0.013)	-0.019 (0.037)	-	0.031*** (0.005)	-0.038** (0.021)
Ethnic frac.	-	-	-0.223*** (0.030)	-	-	-0.060*** ((0.015))
R-squared	0.000	0.095	0.107	0.021	0.032	0.033
N	26,663	24,743	24,863	26,654	24,724	24,844

MAIN RESULTS - 6TH GRADE (POOLED REGRESSION)

	[1]	[2]	[3]
Turnover	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Mathematics	-0.058*** (0.003)	-0.058*** (0.004)	-0.058*** (0.004)
Gap mark-score	-	-	0.032*** (0.002)
Skewness marks	-	-0.005*** (0.002)	-
Escs	-	0.043*** (0.004)	0.060*** (0.004)
Monitoring (class)	-	-0.009*** (0.003)	-0.010*** (0.003)
Monitoring (school)	-	-0.003* (0.002)	-0.003* (0.002)
Share females	-	0.035*** (0.006)	0.026*** (0.006)
Share italians	-	0.121*** (0.007)	-0.028 (0.026)
Ethnic frac.	-	-	-0.142*** (0.020)
R-squared	0.041	0.082	0.092
N	53,317	49,467	49,673

MAIN RESULTS - 6TH GRADE (SUR)

	[Ita]	[Math]	[Ita]	[Math]
Turnover	-0.000 (0.000)	-0.002*** (0.000)	-0.001** (0.000)	-0.002*** (0.000)
Gap mark-score	-	-	0.042*** (0.002)	0.006*** (0.001)
Skewness marks	-0.005*** (0.002)	-0.005*** (0.001)	-	-
Escs	0.086*** (0.003)	0.000 (0.001)	0.104*** (0.006)	0.005*** (0.002)
Monitoring (class)	-0.011*** (0.005)	-0.007*** (0.002)	-0.012*** (0.005)	-0.007*** (0.002)
Monitoring (school)	-0.005* (0.003)	-0.002* (0.001)	-0.004 (0.002)	-0.002* (0.001)
Share females	0.055*** (0.010)	0.015*** (0.005)	0.055*** (0.009)	0.012** (0.005)
Share italians	0.211*** (0.011)	0.031*** (0.005)	-0.017 (0.030)	-0.040*** (0.014)
Ethnic frac	-	-	-0.223*** (0.023)	-0.061*** (0.011)
R-squared	0.095	0.031	0.109	0.033
N		24,687		24,801
Rho		0.274		0.271
BP test		0.000		0.000
b1(ita)=b1(math)		0.000		0.000



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 - Grading practices - levels and distribution

WHAT ABOUT TEACHERS?

Teachers matter in primary school only?

	2nd grade	5th grade	6th grade	8th grade
Turnover	-0.006*** (0.000)	-0.006*** (0.000)	-0.000 (0.000)	-0.005*** (0.000)
Mathematics	0.012*** (0.002)	0.000 (0.002)	-0.061*** (0.004)	-0.005 (0.003)
Gap mark-score	0.013*** (0.004)	0.028*** (0.004)	0.036*** (0.004)	-
Outside teachers	-0.040*** (0.012)	-0.040*** (0.012)	-0.018 (0.014)	-0.005 (0.014)
Monitoring	-0.030*** (0.004)	-0.028*** (0.004)	-0.005 (0.005)	-0.019*** (0.006)
R-squared	0.062	0.063	0.097	0.058
N	26,471	29,960	15,655	16,320

WHAT ABOUT INTERACTION EFFECTS?

- In high-social capital areas, marginal gains from monitoring are much lower
- In monitored classes, social capital has no effect

	5th grade		6th grade	
Turnover	-0.006*** (0.000)	-0.006*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)
Monitoring	-0.483*** (0.056)	-0.043*** (0.003)	-0.104** (0.005)	-0.018*** (0.004)
Turnover*Monitoring	0.005*** (0.000)	-	0.001** (0.000)	-
Ethnic Frac.	-	-0.134*** (0.022)	-	-0.146***
Turnover*Etn.Frac.	-	0.117*** (0.012)	-	0.051** (0.014)
R-squared	0.070	0.069	0.099	0.093
N	56,028	56,028	49,673	49,673

SOCIAL CAPITAL AT THE PROVINCIAL LEVEL - 5TH GRADE

	Turnover	Turnover (referenda)	Turnover (divorzio)	Blood Donations	Trust (WVS)
Social Capital	-0.003*** [0.001]	-0.530*** [0.085]	-0.628*** [0.077]	-0.602** [0.294]	-0.048 [0.031]
Mathematics	-0.001 [0.002]	-0.000 [0.002]	-0.000 [0.002]	-0.001 [0.002]	0.000 [0.002]
Gap mark-score	0.030*** [0.005]	0.029*** [0.005]	0.030*** [0.005]	0.029*** [0.005]	0.029*** [0.005]
Class characteristics	YES	YES	YES	YES	YES
Province characteristics	YES	YES	YES	YES	YES
R squared	0.079	0.086	0.084	0.077	0.076
N	56,056	55,646	55,484	55,646	50,348

SOCIAL CAPITAL AT THE PROVINCIAL LEVEL - 6TH GRADE

	Turnover	Turnover (referenda)	Turnover (divorzio)	Blood Donations	Trust (WVS)
Social Capital	-0.001** [0.001]	-0.148*** [0.038]	-0.184*** [0.041]	-0.155* [0.294]	-0.023* [0.013]
Mathematics	-0.058*** [0.004]	-0.058*** [0.004]	-0.058*** [0.004]	-0.058*** [0.004]	-0.059*** [0.004]
Gap mark-score	0.034*** [0.002]	0.035*** [0.002]	0.035*** [0.003]	0.034*** [0.002]	0.035*** [0.004]
Class characteristics	YES	YES	YES	YES	YES
Province characteristics	YES	YES	YES	YES	YES
R squared	0.090	0.091	0.091	0.090	0.093
N	49,693	49,420	49,286	49,420	44,743

UNIVERSALISTIC VS. PARTICULARISTIC SOCIAL VALUES - 5TH GRADE

	Participation		Civic Awareness	
	Universalistic	Particularistic	Universalistic	Particularistic
Social Capital	-0.233*** (0.079)	0.053*** (0.091)	-0.218*** (0.063)	0.096*** (0.028)
Mathematics	0.000 (0.002)	0.000 (0.002)	-0.000 (0.002)	0.000 (0.002)
Gap mark-score	0.027*** (0.005)	0.028*** (0.004)	0.029*** (0.005)	0.027*** (0.005)
Ethnic frac.	-0.074*** (0.023)	-0.077*** (0.026)	-0.072*** (0.023)	-0.068*** (0.024)
Monitoring	-0.025*** (0.004)	-0.025*** (0.004)	-0.025*** (0.004)	-0.026*** (0.004)
R-squared	0.078	0.063	0.078	0.077
N	52,508	52,508	52,508	52,508

UNIVERSALISTIC VS. PARTICULARISTIC SOCIAL VALUES - 6TH GRADE

	Participation		Civic Awareness	
	Universalistic	Particularistic	Universalistic	Particularistic
Social Capital	-0.022 (0.025)	0.053 (0.091)	-0.080*** (0.028)	0.027** (0.011)
Mathematics	-0.058*** (0.004)	-0.058*** (0.004)	-0.058*** (0.004)	-0.058*** (0.004)
Gap mark-score	0.034*** (0.002)	0.034*** (0.002)	0.035*** (0.002)	0.034*** (0.002)
Ethnic frac.	-0.139*** (0.019)	-0.139*** (0.019)	-0.138*** (0.019)	-0.137*** (0.019)
Monitoring	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)
R-squared	0.094	0.095	0.095	0.095
N	46,646	46,646	46,646	46,646

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- ...but teachers are important as well
- Future research - cheating over students' lifecourse?