Human Capital in the Creation of Social Capital: Evidence from Diplomatic Parking Tickets

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Abstract

We provide evidence that individuals selected from societies with high human capital are more likely to cooperate when placed in an environment comparable to the state of nature: The world of New York City diplomatic parking. National average IQ, a robust predictor of economic growth, is found to be a robust (negative) predictor of the number of unpaid parking tickets issued to a country's diplomatic delegation at the United Nations. Average years of education has a similarly strong relationship with civil behavior. Results hold after controlling for GDP per capita and corruption in the diplomat's home-country. We integrate this result into the experimental game theory literature on cognitive skills and pro-social behavior.

We thank Omar al-Ubaydli for extremely helpful comments. The usual disclaimer applies.

A recent literature demonstrates that intelligence[1] promotes social capital. Jones (2008) showed that students at high-SAT schools cooperated more often in repeated prisoner's dilemma experiments; Burks et al. (2009) showed that the IQ of truck drivers predicted both trust and trustworthiness in a one-round, sequential prisoner's dilemma; and Putterman et al. (2010) found that high-IQ students at Brown University contributed more in a repeated public goods game (see also al-Ubaydli et al. (2011)). In all of these settings, the best outcome occurs when players behave according to Kant's categorical imperative; highly intelligent players appear to follow his imperative more often.

Regression-based studies find a similar relationship between education and social capital. Glaeser et al. (2002) found that in the U.S. General Social Survey, years of education, an admittedly crude measure of human capital, predicted the number of organizations to which one belonged, controlling for income, age, and other conventional covariates. A seminal paper in the social capital literature, Coleman (1998), explained the correlation between social capital and education by claiming that social capital creates human capital. The observational literature on social capital has been methodologically critiqued in Durlauf (2002).

The decision to obey the rule of law, especially in an environment where laws can be enforced only indirectly or weakly, may implicitly draw upon a stock of social capital. Shall I follow the rules, even though there is little reason to think I'll get caught? Or shall I take advantage of the occasional opportunity to defect as in some of the more sophisticated repeated prisoner's dilemma strategies tested in Axelrod's (1984) classic tome? Will I make sacrifices that help the group, like the reciprocator in the Berg et al. (1995) trust game? Or am I instead looking out for number one? All of these settings are opportunities to create or destroy social capital. In the laboratory, high intelligence predicts high social capital creation, and outside the lab, high education predicts high social capital creation.

A separate literature shows that national average IQ, estimated by psychologist Richard Lynn and coauthors (Lynn and Vanhanen (2002, 2006); Lynn and Meisenberg (2010)) from decades of intelligence tests run by private psychological testing firms, from international agencies, and from individual scholars, is a robust predictor of national economic performance (Weede and Kampf (2002), Ram (2007), Jones and Schneider (2006)). Rindermann (2007a,b) has demonstrated that the Lynn et al. IQ estimates, which are available for many more countries than other cross-country cognitive measures such as international math and science tests, are strongly correlated with these international tests. The Lynn IQ data have been used in the medical literature (Eppig, et al.(2010)) to argue that cross-country differences in infectious disease prevalence may explain these persistent differences in national average IQ. We use Lynn's data along with a more conventional average education measure to predict the size of the social capital stock in a unique setting: The world of diplomatic parking in New York City.

Because of diplomatic immunity, UN diplomats were long cavalier about paying New York City parking tickets; this insouciance largely ended in late 2002, when, as documented in Fisman and Miguel (2007), the city government began removing diplomatic license plates from vehicles with too many unpaid tickets. In the pre-2003 period, diplomatic delegations differed widely in their scofflaw tendencies: The median diplomat averaged 8 unpaid tickets per year, the standard deviation was 33 tickets per year, and the maximum was 250 per year (from the Kuwaiti delegation).

But what drives these vast differences in behavior across delegations? Fisman and Miguel (2007) showed that diplomats appeared to bring their social norms with them when they came to New York to work at the United Nations: The corruption level in a diplomat's home country was a modestly reliable predictor of unpaid parking tickets.[2] We demonstrate two facts in this paper: First, that national average IQ and education levels predict home country corruption,

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[1] For a brief survey of modern intelligence research which discusses IQ correlates such as brain volume and brain wave response, we recommend Deary (2001), written by a leader in the field; for a longer, more comprehensive survey, Jensen (1998) is invaluable.

[2] In every specification where the authors controlled for the Pew survey measures of home-country anti-American attitudes, the anti-American sentiment measure was a statistically significant positive predictor of unpaid tickets, and

consistent with the view that human capital creates social capital, and second, that national average IQ and education predict unpaid diplomatic parking tickets even when we control for the diplomat's home-country corruption and GDP per capita.

Why should one expect a *nation's* stock of human capital to predict the behavior of a small group of diplomats in New York City? One reason would be drawn from conventional political economy theories: Politicians and bureaucrats are drawn from the population distribution in their home country. Therefore, unless low-human-capital countries select their diplomats much more strongly for human capital than high-human-capital countries, national averages of human capital stocks should be positively correlated with the human capital of an average diplomatic delegation. This conjecture could be tested in future research.

In addition, there is some evidence in the economics literature (Fernández and Fogli (2009), Giulano (2007); but see Carroll, Rhee and Rhee (1994)), *inter alia*.) that cultural practices are developed early in life and persist quite strongly into adulthood: So people who have been playing tacit cooperation games in their daily lives in their home country for decades are likely to bring those norms with them to the UN Assembly. If reciprocation is rare in Berg-style trust games in their home country, these diplomats may well import those norms when they move to Manhattan. After all, taking advantage of a generous player (or city) is individually rational.

In the results below, we find that national average IQ and education are both predictors of one index of social capital, Fisman and Miguel's corruption measure; further, they provide independent ability to predict social capital, above and beyond their corruption index. If one wants to know whether a nation's government officials will obey the rule of law when few are watching, one would be well-advised to learn that nation's national average IQ and average years of education.

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home-country corruption was statistically insignificant. These results, circulated in the working paper, were omitted in the published version because the Pew measures constrained the sample size to 42 countries.

Data

IQ data are from Lynn and Meisenberg's (2010) most recent update of their national IQ database. National average IQ is normed with the UK at a value of 100; the span of scores run from 60 (Malawi) to 108 (Singapore), with mean of 89, a median of 91, and a standard deviation of 11. For comparison, the IQ standard deviation within a typical country is normed to 15. Our sample of 85 countries–all those that overlap with the Fisman/Miguel data–includes 13 countries whose national average IQs are interpolated from PISA, TIMMS, and SACMEQ (Southern and Eastern Africa Consortium for Monitoring Educational Quality); as noted above, Rindermann (2007a,b) showed that the positive relationships across these various cognitive tests are quite robust. With a smaller, non-interpolated sample, our results hold quantitatively and qualitatively but fall modestly in statistical significance; such results are available upon request.

In the psychological literature, Wicherts et al. (2009, 2010a,b) in a series of papers in the psychological literature have argued that Lynn's estimates of national average IQ in sub-Saharan Africa are too low, although these critics note that "[t]here can be little doubt that Africans average lower IQs than do westerners"(Wicherts et al., 2010a, 17). To address the possible concern of African IQ estimates that are "too low" we rerun our key estimates, Winsorizing the lowest IQ scores in our sample to a minimum of 75 and again at 80; our results are not affected. This robustness to Winsorizing of National Average IQ was also found in Jones and Schneider (2010).

As one researcher recently noted, "Where official national data are available for developing countries, fundamental problems of measurement produce a considerable amount of unquantified uncertainty." This is a statement not about developing-country IQ estimates, but about developing-country GDP and income measures (Young, 2010, Africa's growth miracle, p.1). Alwyn Young notes: "Thus, for example, while the popular Penn World Tables purchasing power parity data set version 6.1 provides real income estimates for 45 sub-Saharan African countries, in 24 of those countries there has actually never been any benchmark study of prices." (Young, p. 1). There is additional evidence for systematic weaknesses in developing country GDP data: Nye and Moul (2007) found that GDP data from less-developed countries systematically failed Benford's law, the tendency of a number's first digit to follow a particular

statistical distribution (see also Judge and Schechter (2009)). So while there is likely some noise in the national average IQ estimates, it is likely similar to the level of noise in other macroeconomic data.

Our second, more familiar human capital measure requires less discussion: Average years of education measures for the year 1999 are from Barro and Lee (2010); we use near-contemporaneous education estimates in order to match Fisman and Miguel's practice of controlling for near-contemporaneous measures of corruption and GDP per capita.

All other data come from Fisman and Miguel (2007), whom we thank for presenting their data in such a readily usable format on the *Journal of Political Economy* website. We refer readers to their original paper for a discussion of their data. Note that their unpaid ticket data come from the City of New York, and their corruption measure is, as they say, "essentially the first principal component of a number of commonly used corruption indices," correlating 0.97 with the Transparency International country-level corruption measure (p. 9). Until our last, short section, we only use their pre-2003 data, before the City began removing diplomatic license plates from vehicles with too many unpaid tickets; this is because we wish to focus on law-abiding, norm-following behavior in settings where legal enforcement is difficult if not impossible.

Descriptive statistics are in Table 1; a correlation matrix is in Table 2. Correlation sample sizes vary widely, from a high of 152 (between corruption and GDP) to a low of 57 (between IQ and education).

We use Miguel and Fisman's transformation of the unpaid ticket data, which is bounded below at zero for 18 countries in our sample, and which appears exponentially explosive. Their transformation is the logarithm of (1+total unpaid tickets). Plots of national IQ against log-transformed unpaid tickets per diplomat per year are in Figure 1.

Results

We begin with a discussion of national IQ. The simple correlation matrix in Table 2 tells much of the story: national IQ strongly correlates with log GDP per capita (0.7) and with the

Miguel/Fisman national corruption index (0.6); the correlation with log violations per diplomat is somewhat smaller, -0.5.

Multivariate regressions confirm that the relationship between national average IQ and log violations per diplomat is robust and significant at conventional levels. In the simplest regression–log violations per diplomat on national average IQ–we see that one IQ point is associated with 6.2% fewer tickets per year, quite close to the absolute value of the steady-state relationship between IQ and GDP in Jones and Schneider (2006), where 1 IQ point is associated with 6% higher GDP per capita.

In the horse-race between IQ and log GDP per capita, the latter falls below conventional statistical significance when predicting unpaid tickets. We then include corruption and IQ, and both are significant at the 1% level; the IQ coefficient drops by less than half compared to the IQ-only regression. Including all three variables at once, the GDP measure is again insignificant, while IQ and corruption are both significant at the 5% level. For comparison, we also include a specification that excludes IQ: Together, they explain 23.8% of the variance in parking tickets, only 1% more than IQ alone. Further, IQ adds substantial predictive power when included in a regression with corruption and GDP controls, raising R^2 by 4.9%, a 20% increase in variance explained.[3]

These are the core results for national IQ, which we also replicated using log unpaid tickets (not per capita) as the dependent variable, while also including log number of diplomats as a control. Fisman and Miguel ran most of their specifications with total tickets (not per capita) as the dependent variable, due to the concern that there could be a nation-level factor driving the number of tickets–perhaps the national government places some pressure on the diplomatic mission to control the overall number of tickets, for instance. Such pressure could be correlated with the national level of corruption. In any event, our results differ little from the per-capita

[3] Interaction effects between IQ and corruption are little in evidence. When an IQ*corruption explanatory variable is included, both the interaction term and the corruption variable fall below the 0.3 significance level, and the corruption variable has an anomalous negative sign; meanwhile, IQ remains significant in this specification at the 1% level with little change in magnitude (1 IQ point predicts 4% fewer tickets). Perhaps surprisingly, there is no significant interaction effect between GDP and national IQ.

specifications; these results are available upon request. Likewise, using a Tobit specification due to the censoring problem at zero tickets had no noticeable impact on our results.

In Table 4, we control for two additional variables that were significant in the Miguel/Fisman regressions–the log distance between countries and percent of the population of the Islamic faith. The former is marginally significant, and in both cases, national average IQ remains significant at conventional levels with a large coefficient. Taking the 3.8% coefficient as a lower bound, our results suggest that a two standard deviation decrease in national average IQ–the gap between South Korea (106) and Venezeula (84)–would predict at least a 130% increase in violations of parking norms. In a simple forecasting exercise where we knew only a nation's average IQ, we would predict a 300% increase for the same 22-point IQ decline.

Turning to average years of education, the correlation with violations per diplomat is -0.6 and with corruption is -0.8, and with log GDP per capita is 0.9; so across the board, the correlations are slightly stronger for education than for IQ. Table 5 reports unpaid ticket regression results that control for national average years of education in 1999; the major result is that GDP and corruption are never statistically significant at the 5% level. When controlling simultaneously for IQ and education, the sample size plummets to 57 observations; in this case, IQ drops just below 10% significance, but is still substantially closer to significance than either corruption or GDP.

When percent Muslim is controlled for, education is significant at the 10% but not the 5% level; percent Muslim has stronger predictive power in this case than when one controls for national average IQ. Taking these regression results together, both human capital measures are substantially better for predicting unpaid parking tickets than GDP per capita, and are at least as predictive as Miguel and Fisman's corruption measure.

We also employ a two-stage least squares estimation to see how much of the corruption-ticket relationship could be predicted from knowing only a nation's average IQ or only its education level. Since national corruption, like national IQ or education, is surely measured with error, one can interpret this use of 2SLS as an attempt to reduce the errors-in-variables inherent in the

estimated corruption-tickets relationship. But our preferred interpretation is that of forecasting: We would like to know if corruption is a better predictor of parking tickets when we only look at differences in corruption that can be predicted by either IQ or by education.

We begin by discussing IQ: From the perspective of institutional economic theory and experimental results, it is not clear whether one should think of IQ as merely a driver of the corruption index (an instrument) or as an additional index of social capital (a control). This is an empirical question, and the data offer evidence for both channels: If we instrument corruption with national average IQ in a univariate regression of unpaid tickets per diplomat on corruption, as in Table 6, the coefficient on corruption almost doubles in size and is highly statistically significant. Thus, IQ-instrumented corruption has a substantially bigger influence on parking tickets than corruption alone.

Since high national IQ is strongly correlated with low corruption, this may come as little surprise–although the result is far from axiomatic. We find a similarly strong result when attempting to predict the corruption-ticket relationship via education alone; but the relationship is weaker when we use log GDP per capita to predict the corruption-ticket relationship. If one knows the relationship between a nation's human capital stock and its level of corruption, one can do quite a good job predicting how its diplomats behave.

2003: The end of tacit cooperation by the intelligent

After 2002, diplomatic immunity for parking tickets ended, as a practical matter. Senators Schumer and Clinton cosponsored a bill that gave local governments the authority to remove diplomatic license plates from cars with too many tickets. Fisman and Miguel show that diplomats from corrupt countries still tended to get more parking tickets, though the number of parking tickets per diplomat dropped by an average of 90%. Did the national IQ-parking ticket relationship remain negative after 2002?

Overall, no. Rerunning the regressions from Table 3 in the post-immunity era, we find that national average IQ is only statistically significant in the IQ-only specification, and its

coefficient dramatically shrinks in size, always shrinks by at least 90%. Thus, once the force of law came to bear on the parking issue, national IQ largely lost its ability to predict conformity to social norms.[4] Similar results hold for education in the post-2002 period.

This result is not surprising if we consider the experimental results of Putterman et al. (2010): They found that in a repeated voluntary public goods game, IQ positively predicted pro-social behavior. But once a round was added to the game where the players could vote to punish defectors, the positive effect of IQ on contributions vanished. Putterman and his coauthors found that punishment was often fierce and usually effective.

While further explorations of this phenomenon are welcome, it appears that high IQ is a predictor of voluntary pro-social behavior. But if high intelligence isn't in great abundance, then state enforcement of social norms appears to be a possible alternative. Intelligence appears to enter positively into the voluntary social capital production function, and negatively into the corruption function.

Conclusion

It appears that intelligence is a form of social intelligence, and that education helps create social capital. Contrary to what one might expect from simple versions of the Machiavellian intelligence hypothesis (*inter alia*, Byrne (1996)), diplomats from more intelligent, better-educated nations do *not* attempt to exploit the rules to the maximum extent possible. Instead, they are more likely to cooperate with the local norms, to "go along to get along." The negative relationship between human capital and diplomatic parking tickets fits in better with hypothesis that human capital is typically used for cooperation, not exploitation (*inter alia*, Moll and Tomasello (2007). For those familiar with the experimental literature on intelligence and pro-social cooperation, our results should be unsurprising.

[4] Results were little changed if data were pooled pre- and post-diplomatic immunity: IQ's coefficient fell dramatically post-immunity, as did the corruption coefficient. As usual, the GDP coefficient was never significant.

Further, if the norm-following tendencies of UN diplomats can be predicted from national average IQ and national average education levels, then the field of international politics should take this fact into account when investigating the correlates of successful international negotiations. The world of diplomatic parking is a microcosm of the world of international law: Weak enforcement mechanisms, shame as a one of the few tools available, in a world where tacit cooperation in a repeated game usually offers the greatest hope for success. In such a world, the experimental evidence supports the hypothesis that human capital creates social capital; further work can determine how far these results extend outside the lab.

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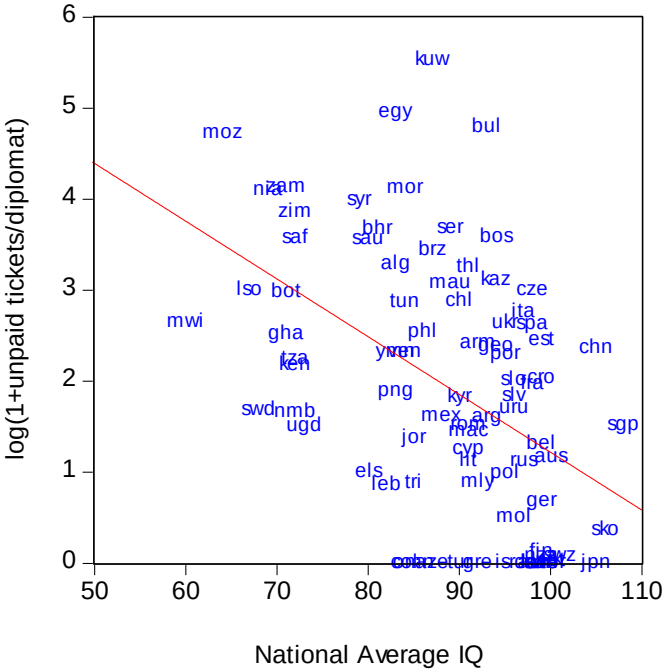
Figure 1
National Average IQ and Log(1+unpaid tickets per diplomat)



Notes: IQ data from Lynn and Meisenberg (2010); parking tickets per diplomat from Fisman and Miguel (2007). Least-squares regression line also included. N=86; Raw correlation: 0.48 (t=-4.8); Rank correlation: 0.50 (t=5.3).

Table 1
Summary Statistics

	Log (1+Tickets/Diplomat)	IQ	Educ99	Corruption	$Log(Y/L)_{1998}$
Mean	2.08	88.9	5.88	-0.01	7.40
Median	2.17	91	5.61	0.31	7.28
Max	5.52	108	11.86	1.58	10.50
Min	0.00	60	0.76	-2.58	4.56
Std. Dev.	1.41	10.8	2.82	1.02	1.59
Skewness	0.11	-0.69	0.18	-1.17	0.28
N	149	86	95	152	171

Table 2
Correlation Matrix

	Log(1+Tick/Dipl)	IQ	Educ99	Corrupt	$Log(Y/L)_{1998}$
Log(1+Tick/Dipl)	--	-4.99	-6.45	5.84	-6.17
IQ	-0.48	--	8.71	5.99	7.97
Educ99	-0.55	0.76	–	13.18	17.36
Corrupt	0.43	-0.55	-0.81	–	-17.45
$Log(Y/L)_{1998}$	-0.45	0.66	0.87	-0.82	–

Notes: Values above the diagonal are t-statistics.

Table 3
Regression Results
Dependent Variable: Log(1+Unpaid Tickets/Diplomat)

Control					
National IQ	-0.063***	-0.041*	-0.40**	-0.42*	
	(-5.87)	(-2.48)	(-3.17)	(-2.58)	
Corruption			0.41**	0.44*	0.42*
			(3.21)	(2.27)	(2.10)
$Log(Y/L)_{1998}$		-0.24		0.04	-0.17*
		(-1.82)		(0.20)	(-1.00)
R^2	22.8%	26.5%	29.6%	29.7%	23.8%

Notes: Sample size is 86 country-level observations. Constant not reported, t-statistics in parentheses, estimated with White (1980) heteroskedasticity correction. *=.05, **=.01, ***=.001 levels of significance.

Table 4
Additional Controls
Dependent Variable: Log(1+Unpaid Tickets/Diplomat)

Control		
National IQ	-0.038*	-0.042**
	(-2.47)	(-2.64)
Corruption	0.54**	0.40*
	(2.75)	(2.17)
$Log(Y/L)_{1998}$	0.14	0.04
	(0.67)	(0.21)
Log Distance between countries	0.66*	
	(1.99)	
Percent Muslim		0.46
		(0.86)
N	86	85
R^2	32.1%	31.1%

Notes: t-statistics in parentheses, estimated with White (1980) heteroskedasticity correction. *=.05, **=.01, ***=.001 levels of significance.

Table 5
Average 1999 Education as Human Capital Measure
Dependent Variable: Log(1+Unpaid Tickets/Diplomat)

Control					
Educ99	-0.29***	-0.27**	-0.30**	-0.32***	-0.17
	(-7.86)	(-3.11)	(-2.89)	(-3.66)	(-1.76)
National IQ		-0.029	-0.040		
		(-1.59)	(-1.55)		
Corruption			0.14	0.33	0.06
			(0.74)	(1.79)	(0.33)
$Log(Y/L)_{1998}$			0.23	0.33	-0.08
			(0.85)	(1.60)	(-0.40)
Log Distance				1.29***	
				(4.69)	
Percent Muslim					1.22*
					(2.50)
R^2	31.0%	42.5%	43.6%	46.9%	38.4%
N	94	57	57	94	93

Notes: Constant not reported, t-statistics in parentheses, estimated with White (1980) heteroskedasticity correction. *=.05, **=.01, ***=.001 levels of significance.

Table 6
Corruption without and with IQ instrument
Dependent Variable: Log(1+Unpaid Tickets/Diplomat)

Control				
Corruption	0.63***			
	(6.30)			
Corruption w/IQ instrument		1.09***		
		(5.63)		
Corruption w/Educ99 instrument			0.90***	
			(7.76)	
Corruption w/GDP instrument				0.77***
				(6.27)
N	86	85	94	149
R^2	23.0%	21.8%	31.1%	20.6%

Notes: t-statistics in parentheses, estimated with White (1980) heteroskedasticity correction.
*=.05, **=.01, ***=.001 levels of significance.

Table 7
Regression Results: Era of Enforcement
Dependent Variable: Log(1+Unpaid Tickets/Diplomat)

Control					
National IQ	-0.005*	-0.001	-0.01	-0.02	
	(-2.26)	(-0.45)	(-0.42)	(-0.52)	
Corruption			0.06*	0.07	0.07
			(2.57)	(1.88)	(1.89)
$Log(Y/L)_{1998}$		-0.37		0.09	-0.01
		(-1.61)		(0.25)	(0.04)
R^2	4.4%	7.4%	10.3%	10.4%	10.1%

Notes: Sample size is 86 country-level observations. Constant not reported, t-statistics in parentheses, estimated with White (1980) heteroskedasticity correction. *=.05, **=.01, ***=.001 levels of significance.