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The Contribution of Volunteering, Trust, and Networks to Educational Performance

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Social capital can have a beneficial effect on public policy outcomes by helping to solve collective action problems and by providing individuals and communities with efficient social networks. In education, it also assists students' self-confidence, which can foster motivation and academic success. To investigate the social capital-outcome link, this article analyzes a panel survey of 15–16 and 16–17 year olds in 27 English schools, testing whether social capital, both at the individual and at the school levels, tends to increase grades and examination performance. The analysis concludes that individual-level trust and voluntary action improve pupil performance, but that the parental networks of some young people, particularly those from low socioeconomic status families, have negative rather than positive consequences. The findings add to a debate about the differential impact of social capital and the relative importance of its bridging and its bonding elements.

KEY WORDS: education, social capital, trust, volunteering, parental networks

Introduction

It is rare for policymakers and experts to desire social capital for its intrinsic qualities. Although some desire to return to a "golden age" of high levels of public trust and greater participation in public affairs, most elites and experts think that social capital is desirable because of its effects on the outcomes that citizens and governments care about—making what counts as "what works." So in *Making Democracy Work* (1993) Putnam argues that social capital, in the form of associational memberships, improves the innovation and efficiency of regional governments. This stimulates a burst of commentary and research on the impact of social capital on the workings of democracy. Then in *Bowling Alone* (2000), in answer to the question "so what?", Putnam uses a broader definition of social capital—including networks and social trust—to highlight its positive effects on education, children's welfare, safety, economic prosperity, health, and happiness. In addition to Putnam's work, a battery of evidence now shows the links between social capital and public policy outcomes (see the reviews by Halpern, 2004; Organisation for Economic Cooperation and Development, 2002; Performance and Innovation Unit, 2002), such as lower crime (Halpern, 2001), economic growth (Knack & Keefer, 1997; Whiteley, 2000), and the performance of U.S. states (Rice & Sumberg, 1997). These accounts set out a

complex causal story through which social capital improves individual well-being, reduces personal stress, and improves collective action through facilitating communication and the more efficient exchange of resources, and where these beneficial actions reinforce each other. But in spite of the positive research literature, there is still a need for more concrete evidence about what exactly it is about social capital that works. A recent academic review of the state of social capital research laments the lack of social science evidence upon which policymakers can build (Sobel, 2002). Moreover, recently there has been more attention paid to the differential effects of social capital, such as by ethnic group; processes that are not yet clearly understood (see Hero, 2003; Uslaner, 2004).

This article seeks to fill just such a gap in the research literature and offers findings about the differential impact of social capital with clear lessons for policymakers. It extends the research field by examining a crucial site for the creation of public values—the school. Education’s importance is underlined by the link between educational performance and a range of other desirable outcomes, such as economic growth and high employment. Moreover, schools can create or foster social capital directly, particularly because education is about the transmission of values and norms, as well as the inculcation of skills. If a clear link exists between social capital and policy performance, it would be tempting for policymakers to alter aspects of school provision and management to foster the accumulation of social capital, perhaps as part of a program to increase public values and the practice of good citizenship, while recognizing that families and communities are the main drivers. The social capital pathway may be seen to be an alternative or complement to other explanations of student performance, such as the strength of bureaucracy (Bohte, forthcoming; Meier, Wrinkle, & Polinard, 2000; Smith & Larimer, 2004), the span of control (Bohte & Meier, 2001), or more school choice (Schneider, Teske, & Marschall, 2000).

Theory

So why does social capital matter in schools? Group membership is often thought to generate psychological benefits and to enhance the social skills students get from education. Typically, group members have an extensive input in the running and choices of their group (Beck & Jennings, 1982). This experience yields psychological benefits: Adolescents gain self-esteem and feelings of control over their environment, which affects their motivation and hence their academic performance (Smith, 1999; Steinberg, Brown, & Dornbusch, 1996). Associational activities are generally thought to be a bridging form of social capital as members tend to meet others who are not like them, which have positive payoffs for personal development. More generally, voluntary memberships are thought to foster a sense of obligation and responsibility, which may affect educational outcomes as students apply themselves more effectively in homework and in class.

The second aspect of social capital is trust, which can sustain interactions in the wider society, assist social cooperation, and help provide local solutions to collective action dilemmas. It has beneficial consequences because it lowers the costs of

transactions in society and in the economy. In the context of the school, more trusting students may be more willing to take cues and information from their instructors, may have a more positive orientation to academic study, and be able to solve learning problems collectively.

Linked to these causal pathways, but involving a separate process, is the operation of networks that confer advantages on those in them by the enforcement of helpful norms and transmission of useful information. Researchers across many fields of public policy believe networks are highly useful in the production of public goods (Milward & Provan, 2000). They deliver a range of useful outcomes, usually to do with coordination and information transfer, but also trust and faith in procedural fairness (Schneider et al., 2003). Network benefits have particular application to the education sector, as shown by analysis of the Texas school district data in a series of important studies (O'Toole & Meier, 2003, 2004; Meier & O'Toole, 2001).

At the student level, there is a line of research that examines the impact of peer groups on performance, with some studies finding a positive impact for students in class-based networks whereas more isolated students perform less well (Nichols & White, 2001). Many studies of social capital and education focus on the family and the way in which supportive relationships that surround parents and children, in the form of family social capital, assist performance (Valenzuela & Dornbusch, 1994). In the classic formulation of Coleman and his co-researchers (Coleman & Hoffer, 1987; Coleman, Hoffer, & Kilgore, 1982a), the different rates of success for minorities in the United States are attributed to the higher levels of social capital in the communities of Catholic schools, largely because of close social networks and shared values. Although supported by studies of U.S. schools (e.g., Sander, 1996), subsequent research questions whether these networks translate into improved outcomes and considers the impact of other factors associated with Catholic schools (Morgan & Sørensen, 1999). It may be the case that the networks around schools are based on close associations of parents who are like each other and where positive ideas about learning are not transmitted. The question these two literatures pose is whether networks are a form of bonding social capital, which is a dense set of relationships that have psychological benefits for their members, which may turn into good performance; or are in fact the more desirable bridging form. Bridging social capital involves links between social groups and promotes the exchange of information and learning from others. What Granovetter (1973) terms "weak" ties matter—or add "strength"—because they allow individuals to access resources outside their immediate and close networks. The data in one Dutch study examining peer groups and delinquent behavior, however, do not support this finding, with adolescents with wider networks having a greater tendency to be delinquent (Baerveldt, Van Rossem, & Vermande, 2003).

To investigate the effects of social capital upon performance, the analysis needs theory and prior empirical evidence to produce suitable controls in statistical models. There are several "usual suspects" to include: Individual socioeconomic status (SES), because education performance is transmitted across the generations through the family and local environments (Coleman et al., 1966); similarly, students' attitudes to education, such as their willingness to stay on in it, are drawn

from their parents, who may encourage their children and provide role models; ethnicity and gender are also essential controls, although the literature disagrees as to the extent of the effects and, for gender, in which direction (e.g., see Arnot, 1998; Linn & Hyde, 1989). Another background variable, which is part parental, part school-influenced, and part individual, is religious background (Lehrer, 1999; Regnerus & Elder, 2003).

Performance may also be predicted by the cognitive styles of young people. The hypothesis is that adolescents may discount the future in different ways, that is, some are prepared to wait for future benefits (Mischel, 1958, 1961), which, in the context of academic performance, is the recognition that the benefits from hard work in school are some way off. It is also important to take account of parental involvement (Ho Sui-Chu & Willms, 1996) and the climate of schools, such as the extent of teacher cooperation (Ashworth, 1995; Kreft, 1993). In addition, it is correct to assume that the type of school affects performance, in particular to draw on Coleman, Hoffer, and Kilgore's (1982b) inference that private schools increase performance because of their ethos and/or particular selection criteria. Finally, television watching can worsen performance because it affects cognitive development (Anderson & Collins, 1988).

Measurement and Conceptual Issues

Social capital presents a number of challenges in survey research. The first is the familiar one of definition. Researchers may follow the Tocquevillian route of regarding associations as the key mechanism at work; others may choose trust or social networks. These elements are often contained in the same literature, although authors tend to concentrate on one, without losing sight of the others, such as Putnam's (2000) focus on group membership and networks. But the researcher faces the problem of which measure to use, especially as the mechanism for affecting outcomes is rather different in each one. Fortunately, in the case of the open concept of social capital, it is better to be pluralistic and use several definitions and measurements, and let hypothesis testing find out which are the significant factors, focusing the research question on what kinds of social capital promote better outcomes rather than assuming it is the totality of it that matters. In any case, the differential impact has been noted in some research, with some studies finding that trust causes better outcomes, such as economic growth (Whiteley, 2000), and others concluding that membership of organizations is not efficacious (Knack & Keefer, 1997). A strategy of combining these measures or concentrating on one would preclude the possibility of adjudicating between different types of social capital, such as between bridging and bonding. The measures are also highly connected, as association membership and networks are linked to (although they do not necessarily cause) social trust (Hooghe & Stolle, 2002; Stolle, 2001), with networks and associations needing some trust at the outset (Uslaner, 2001). Thus it is possible to test hypotheses about the relationship between different sorts of social capital and academic performance.

The second problem is understanding how social capital operates at the individual and collective levels. Some writers, such as Coleman and Putnam, argue that

social capital is a property of social structures, which societies have developed, usually through social institutions, over many decades. It is not individuals on their own who develop socially productive goods that help them, but individuals acting together who create social clusters of activity to produce social goods. Yet the collective dimension is generated individually, and can be partly consumed individually too. Thus academic performance may be generated by the activities of students and their families, enhanced by the characteristics of the school and the collective actions of parents, and consumed partly individually and partly collectively because improved educational outcomes benefit societies as well as, if differentially, the individuals. Recent research takes on board the different levels of analysis, such as Sun's (1999) deployment of an aggregate measure—community-based social capital—to predict educational performance, used alongside the individual-level variables. Thus by creating a measure for a larger unit, such as a school, data analysis can test the hypothesis that performance may be affected by a peer effect of social capital as well as the individual impact.

Third, there is a large debate as to whether the impact of social capital is necessarily positive. Critics of social capital sometimes say that social capital may lead to negative outcomes, such as the dense networks and trust that operate among the Mafia for example (Gambetta, 1993). This finding does not pose a problem with research, however, as social capital is not a truism, but a hypothesis. Researchers can hypothesize that in certain circumstances, such as among certain social groups, the effects of bonding social capital can be negative without undermining the claims that in other circumstances the effects are positive.

Finally, educational performance itself presents problems of definition and measurement. Educational outcomes extend from the role of schools in raising attainment levels, to enhancing individual capacity in a variety of nonacademic areas, to giving benefits to the wider society and economy, and may be observed at the individual, school, and community levels. This article mainly focuses on academic attainment at the individual level, while paying attention to school-level effects.

Data, Variable Definitions, and Methods

Sampling

During the fall of 2000 the project surveyed 15–16 year olds at the start of their final year before a key set of examinations—the General Certificate of Secondary Education (GCSE).¹ GCSEs are the main qualifications for 15–16 year olds in England, a set of separate subject-related examinations on mathematics, biology, English language, and so graded A to E, with A–C being the passes. These qualifications are essential for the skilled and semiskilled job markets or to pass to the next stage of education. The age group is important because 16 is the last year of compulsory school education in the United Kingdom, so these students face important choices about what to do next in their lives. The sample schools are chosen from the subnational government area of Hertfordshire because of its large size, with just

over a million inhabitants. The area offered a range of neighborhoods—from scattered villages to the urban outer-London—and a variety of social environments, including some of the most deprived areas in Britain. After identifying the study site, the next task is to choose the sample. The project recruits 24 state schools selected according to a stratified sample based on social intake, quality (examination performance), and according to the extent of provision of “citizenship-type” activities and how much citizenship is taught.² The schools are sorted into eight groups on each of the criteria and those at the top, bottom, and middle of each group are chosen. The study also includes three fee-paying or private schools, which are selected by the same process, except that the level of fees is substituted as one of the selection criteria.

Project Administration

The research team sought permission to administer a self-completion questionnaire to 1,249 students who are in year 11 of their schooling in the sample schools. After extensive piloting and local educational authority input, the questionnaire was made appropriate for all ability groups and depended mostly on tick-box responses. It took around 20 minutes to complete and was conducted in general studies classes or their equivalent. As the whole of the year is present, the study achieved a near 100 percent response rate. In all but one case, a member of the research team was present to answer questions and to ensure that responses were not seen or guided by teachers. The researchers assured all respondents that their responses were confidential to the project. Approximately one year after the first wave, the project surveyed the young people again by a postal questionnaire sent to their home addresses, which had been gathered in the first phase, which achieved a 60 percent response rate from year one. The panel data allow the exploration of changes in attitudes and behavior over time, but also gave outcome data relevant to social capital and education. Specifically, wave two gathered the GCSE examination results.

The Measurement of Academic Performance

Wave one of the survey measured academic proficiency as reported by the students on a scale from low (1) to high (5) as the first survey took place before the main examinations students take at age 16. The following year’s survey was able to pose questions on these examination results—passes at GCSE—rather than reported grades. These measures were the response variables, both for each wave and for the panel. The number of passes correlated highly with the self-reported grades (Pearson = 0.69, significance at $p < 0.001$). The school average of this survey report had a good relationship (Pearson = 0.431, $p < 0.05$) to the officially measured school-level examination results, the percent of year 11 students with GCSE passes.³ It was also assured that the students did not overreport their exam results, as the school average from the survey is lower than the official school average. In addition, the analysis carried out a separate set of regressions on the school data (aggregating the

Table 1. Descriptive Statistics

Variable	n	Mean	Standard Deviation	Minimum	Maximum
Wave one					
Academic proficiency	1,220	3.3115	0.9288	1	5
Socioeconomic status	1,249	1.1789	0.4167	0	2
Parental education	1,004	0.4203	0.4938	0	1
Gender	1,247	0.4627	0.4988	0	1
Ethnicity	1,226	0.1378	0.3449	0	1
Hours watching television	1,242	2.6738	0.9771	1	4
Discount rate	1,245	0.1590	0.3658	0	1
Parental involvement	1,240	2.2016	0.9495	0	4
Private school	1,249	0.0777	0.2677	0	1
School climate	1,247	2.2377	0.6801	0	4
Friends' parents socialize	1,216	2.2582	1.1313	0	4
Religious	1,236	0.6019	0.4897	0	1
Trust	1,064	4.9342	1.9590	0	9
Voluntary action	1,248	1.8173	1.6576	0	8
Wave Two					
Academic proficiency	682	5.946	2.988	0	12
Hours watching television	672	2.251	0.9906	1	4
Friends' parents socialize	672	2.2514	0.9906	1	4
Trust	615	5.6488	1.7217	0	9
Voluntary action	678	1.3378	1.3031	0	8

social capital variables and plotting and regressing them on the officially measured results) to confirm the individual-level results (see below).

It is not possible to combine the raw self-report scores in the panel models because they were measured differently in each wave, so both were standardized before amalgamating. The descriptive statistics of these and the control variables are contained in Table 1. More detail about these and other variables' coding appears in the appendix.

Social Capital

Social capital is measured in three ways: networks amongst the parents; networks/associational activity of students; and trust. The parental network term is the students' response to a question that asked about the extent to which they perceive their parents socializing with their friend's parents, which ranges from zero to "very occasionally" (2), "not very often" (3), and "very often" (4), which may be regarded as a bonding form of social capital. The trust variable adds together the responses to questions that ascribe trust of neighbors, adults in the school, and students in their class, each of which takes the values of "not at all" (0), "not very much" (1), "quite a lot" (3), and "a great deal" (4). This variable indicates bridging social capital, as its components ask students to say how they trust others outside their group. A summary score is not used here as the measurement is of the level of trust rather than an underlying measure.⁴ Group membership takes values from

0 to 8 by adding the yes scores to 10 questions about whether students have carried out a range of different kinds of voluntary activity: fundraising, petitions, rangers, religious projects, election campaigns, helping elderly, environmental projects, charities, demonstrations, and other voluntary activities, treating each yes as a score of one. This is again an additive rather than an underlying score because of the real nature of the activities. These questions are asked in both waves, which mean that both performance and social capital vary across the panel. In addition, there are corresponding school-level social capital variables, which are created by aggregating and averaging for each school the individual-level scores for social networks, trust, and volunteering.

Control Variables

SES is measured by the number of cars or vans reported to be in the household and a dummy variable based on whether the place where the student lives is owned by their family or not (most homes in the United Kingdom are owned and if they are not, they are distinctive, such as in council housing estates or housing association blocks and thus well-known to the students while the private rental sector is miniscule). This underlying variable is represented by a summary score—the sum of the unstandardized individual item scores ($\alpha = 0.45$), which is a standard method of scaling variables in education survey research and similar to other methods of representing an underlying variable, such as saving a score from an extraction using principal components. Parental education is measured as a dummy variable based on the students' recollection of whether the parent went to university or to a polytechnic, which is a big social distinction in the United Kingdom and likely to be known by 16–17 year olds. The definition of ethnicity adds together different nonwhite ethnic groups because of the relatively small numbers of the ethnic minorities in the population outside London, which is reflected in the sample. The religion dummy variable measures whether the student is Protestant, Jewish, Catholic, or of another religion, or none is indicated. The discount rate question asks (adjusting to current sums of money) the classic question as to whether the respondent wants £100 right now at value of zero or would rather wait one whole month and get £150 coded at one. In addition, the survey measures the number of hours students report watching television.

The measure of parental involvement is based on students' recollection that their parents come to parents' evenings and fundraising activities, which is the sum of the individual item scores ($\alpha = 0.47$). School management factors are whether students think their teachers work well or badly together, whether teachers invite the expression of opinions, how much say they have in class, and how much they are consulted about school rules. Given the similarity of these variables ($\alpha = 0.48$), another summary variable represents school climate. Finally, a dummy variable indicates the private as opposed to the state schools in the data. Most of these variables do not vary over the waves, so are measured just once in wave one. The exception is the hours watching television, where the same question is posed in both waves one and two. Table 1 contains the descriptive statistics for these variables.

Data Properties

The analysis seeks to determine the impact of these individual-level measures on public policy outcomes. But the data do not just refer to students randomly sampled, but to those who are “nested” within schools. The data are hierarchical, with two levels of analysis—schools and students. Thus multilevel modeling is appropriate to generate the estimates (Goldstein, 1995; Hox, 2002; Kreft & Leeuw, 1998); a procedure that is common in education research (e.g., Goldstein et al., 1993; Kreft, 1993). Multilevel models seek to estimate equations when the units are clustered, usually into spatial locations, which mean there are different distributions of errors at each level. As a result of these data properties, one of the key assumptions of ordinary least squares (OLS) and other forms of regression, independence, may be broken. Multilevel models explicitly model the grouping of individuals into groups. The estimates avoid underestimating the standard errors and creating incorrectly specified models; they also allow the exploration of the unit of interest in this study—in this case the school. The models present here have explanatory variables that define the fixed and random parts of the model, which allow the coefficients for the social capital terms to vary across units at one or more levels, which have the added advantage of reducing the possibility of unobserved heterogeneity and increasing the specification.

The Estimator

The estimates are generated by a modified Newton Raphson algorithm and an adaptive quadrature procedure (Rabe-Hesketh, Pickles, & Skrondal, 2004, <http://www.gllamm.org>). Adaptive quadrature is a numerical procedure for determining density under a curve, developed before the use of hand calculators, which has been speeded up with advanced computing. The algorithm makes an initial calculation of the density, and its accuracy is tested by comparing the results according to the rules. If the test fails, the integration range is split (typically in half) and the rules applied to each section. This process is repeated until convergence is achieved. Experimental research suggests that this procedure is superior to the more standard Gaussian method, such as those used in two-level generalized linear models, especially if there are a large number of level-1 units (Rabe-Hesketh, Skrondal, & Pickles, 2002).

The Panel Design

Of particular importance is the contribution of the panel to making the overall inference as reported in Table 4. A key problem with research on social capital is the effective identification of the causal arrow. It may be the case that individuals who achieve more also join groups and trust more. This problem is caused by selection, which affects social capital research acutely. Social capital is associated with, or is the consequence of, individual characteristics, which also cause socially beneficial outcomes. Typically, researchers use surveys that make observations at one period

of time, where researchers cannot always adjudicate on the direction of causation. But panel data, such as the one used here where the same measures vary over two time periods, can trace the causal processes, as it is less likely to observe selection with both increases in social capital and academic achievement occurring at the same time. The possibility that a hidden variable determines both achievement and social capital is limited, because all the theoretically derived relevant factors are controlled at two time periods. The models predict changes in performance from a data set that stacks the cases over the two waves, allowing the critical variables to vary both within the wave and across the time periods.

In addition, a multilevel research panel research design can help eliminate unobserved heterogeneity at the school level, which also varies across the time period. Controlling for the aggregate level of social capital in each school in both time periods soaks up peer effects as well as being a separate hypothesis. In addition, it is possible to control for exogenous change over the panel through a further variable, time, that takes the value of zero in wave one and one in wave two.

Results and Discussion

Wave One

The first two models in Table 2 produce the estimates of self-reported academic proficiency for wave one: Model 1 uses just the individual-level terms and Model 2 adds in the aggregated scores. Model 1 shows most of the variables performing as expected while others act as necessary controls. The SES term is not significant, but of the hypothesized sign. Parental education is a particularly salient and significant predictor, and young women have better results than young men. In addition, being nonwhite appears to improve reported scores, although the standard error is just outside the 95 percent bounds. This last result may reflect the strong aspirations for high academic performance in the English ethnic minorities, particularly among some groups. In the sample of 192 nonwhite students, 4 are Bangladeshi, 38 are Indian, and 24 are Chinese, whereas 14 are black African and 8 are black Caribbean and 4 are "other black" (72 are of mixed parentage). If the sample is split into two variables representing Asian and black respondents respectively, and the models are re-rerun with the same variables, the coefficient on black is negative where the one on Asian is positive, which corresponds to literature that suggests that Asians differ from other minority groups in both their levels of performance and social capital (Sun, 1998).

The discount factor has a positive sign, although it is not significant, which may show that being able to defer gratification appears to generate higher academic performance, as indicated by the theory. As predicted, the number of hours watching television significantly depresses academic performance—or lower achievers watch more television, which may reflect a background disinclination or lack of incentive to do homework—but this finding adds to the public debate about the impact of television. The school climate variable does not perform well, as it has a negative

Table 2. Predictions of Academic Achievement, Wave One and Wave Two

	Wave 1		Wave 2	
	Model 1	Model 2	Model 3	Model 4
Socioeconomic status	0.0913 (0.0752)	0.0968 (0.0755)	1.3729* (0.2985)	1.1858* (0.2964)
Parental education	0.3268* (0.0602)	0.3280* (0.0597)	0.9144* (0.2223)	0.7940* (0.2236)
Gender	-0.1873* (0.0606)	-0.1773* (0.0602)	-0.7936* (0.2361)	-0.6639* (0.2319)
Ethnicity	0.1662 (0.0864)	0.1460 (0.0879)	-0.1374 (0.3091)	-0.2709 (0.3081)
Discount rate	0.1472 (0.0791)	-0.1429 (0.0792)	0.6924* (0.3236)	0.6162 (0.3243)
Hours watching television	-0.1387* (0.0296)	-0.1344* (0.0300)	-0.3500* (0.1158)	-0.3199* (0.1168)
Parental involvement	0.1434* (0.0323)	0.1404* (0.0324)	0.4084* (0.1275)	0.3986* (0.1280)
Private school	0.1180 (0.1890)	-0.0131 (0.1786)	0.1051 (0.5838)	-0.2928 (0.5306)
School climate	-0.0112 (0.0450)	-0.0136 (0.0449)	-0.1004 (0.1690)	-0.0796 (0.1667)
Religious	0.0400 (0.0600)	0.0392 (0.0601)	0.7036* (0.2354)	0.7425* (0.2327)
Friends' parents socialize	-0.0765* (0.0255)	-0.0770* (0.0258)	-0.2414* (0.0934)	-0.2540* (0.1004)
Trust	0.0543* (0.0185)	0.0553* (0.0178)	0.871 (0.0719)	0.0777 (0.0678)
Voluntary action	0.0606* (0.0197)	0.0546* (0.0215)	0.2411* (0.1163)	0.1407 (0.0842)
Socialize (school)		0.2281* (0.0975)		-0.1696 (0.4450)
Trust (school)		0.0135 (0.0770)		0.9277* (0.3461)
Voluntary action (school)		0.2505* (0.1190)		1.1407 (0.6638)
Constant	3.1203 (0.1853)	2.1542 (0.4579)	2.6473 (0.9622)	-3.1845 (2.1777)
Variance at level 1	0.5452 (0.0283)	0.5456 (0.0283)	4.407e-07 (6.295e-06)	4.5323 (0.3057)
Variances of random effects at level 2:				
(intercept)	0.0003 (0.0011)	0.0006 (0.0014)	4.4524 (0.3079)	0.0252 (0.0519)
(slope)	0.0479 (0.0358)	0.0674 (0.0859)	0.3506 (0.4002)	0.0003 (0.0167)
Log likelihood	-914.6909	-911.5173	-1,041.1653	-1,033.3387
n	797	797	471	471

* $p < 0.05$, standard errors in parentheses.

rather than the hypothesized positive sign, which is also nonsignificant; nor is this an indication that private schools have an impact.

Parental networks do not appear to help children's performance: The negative sign and the significance of the term shows that children with parents who know each other well do not perform so well as others at school. This suggests that not only does the Putnam statement about the relative advantages of bridging versus

bonding social capital hold, but that bonding social capital can worsen individual performance. This factor is explored more and discussed in models below. In this model religion is not a factor either. Trust independently affects academic performance, which shows that social capital can raise self-reported school performance, a factor the article explores and tests out more fully in the following panel analysis. Voluntary action does appear to have an effect, as this variable is of positive sign and is significant. It would be possible to run models with extracurricular activity as a variable. This term counts the number of school-encouraged voluntary activities in a similar fashion to nonschool voluntary activities, and in analysis not reported here, the variable behaves much like volunteering because the two correlate (Pearson = 0.42, significance at $p = 0.001$). As such, for theoretical reasons and for model healthiness, it is not possible to run models with both extracurricular and volunteering. But whether run separately or as a combined variable, the results are much the same as those with just volunteering.

Model 2 controls for school-level measures of social capital in addition to the individual-level scores. The coefficients and standard errors are not greatly changed by the addition of these variables. These results show that the individual measures continue to predict performance even when the average level of performance has been controlled for at the school level. Both aggregate levels of trust and the membership of voluntary organizations do not significantly affect performance, but that school-level networks increase it. Students in schools where friends' parents know each other do well, whereas having more parental friends individually depresses it. On the basis of these wave-one results, a student could be advised to join a school where parents' friends know each other but to ensure that his or her parents did not!

Wave Two

Moving to wave two, Model 3 has many of the same variables as predictors, although with some questions repeated: the numbers of hours watching television, voluntary activities, and trust. Because wave two has a different number of respondents, the summed variables reflecting parental involvement, SES, and school climate have slightly different values. It is not possible to compare the coefficients between waves one and two, because the dependent variables have different scales. Nonetheless, from inspection of the signs of Table 2 Model 3 and the probability levels, there is a similar pattern for SES, gender, the parental factors, the discount rate, and the negative impact of the number of hours watching television. Private schools and school climate are not significant and act as controls on the model. Ethnicity is not significant, but religion is, which might reflect some differences between the reported grades in wave one and the actual scores in wave two: Wave two is the final reward for the hard work put in voluntary action and is significant, although trust only reaches borderline significance. The network term retains its negative sign and significance, showing that the result holds up at the individual level in both waves. As in wave one, Model 4 uses the new school-level variables as additional controls. This time school-level voluntary action is a significant predictor at the school level and the network term retains its negative importance, but with individual-level trust falling out of the statistically acceptance range.

Table 3. Change Model of Academic Achievement

	Model 1	Model 2
Socioeconomic status	0.2683* (0.0780)	0.2815* (0.0784)
Gender	-0.2176* (0.0603)	-0.2050* 0.0605
Parental education	0.3193* (0.0576)	0.3136* 0.0580
Ethnicity	-0.0744 (0.0857)	-0.0614 (0.0857)
Hours watching television	-0.1550* (0.0291)	-0.1583* (0.0291)
Discount rate	0.1804* (0.0846)	0.1736 (0.0847)
Parental involvement	0.1347* (0.0331)	0.1370* (0.0332)
Private	-0.0116 (0.1459)	-0.0351 (0.1380)
Climate	-0.0455 (0.0446)	-0.0427 (0.0446)
Friends' parents socialize	-0.0978 (0.0310)	-0.0951* (0.0314)
Trust	0.0371* (0.0174)	0.0342* (0.0171)
Voluntary action	0.0595* (0.0227)	0.0586* (0.0243)
Religion	0.0235 (0.0123)	0.0247* (0.0123)
Time	0.0227 (0.0560)	-0.0794 (0.1068)
Socialize (school)		-0.0693 (0.1484)
Trust (school)		0.1398 (0.0777)
Voluntary action (school)		-0.0191 (0.1162)
Constant	-0.5991 (0.2787)	-1.003 (0.5510)
Variance at level 1	0.5547 (0.0271)	0.5543 (0.0272)
Variances of random effects at level 2:		
(intercept)	0.0037 (0.0198)	0.0262 (0.0565)
(slope)	0.00005 (0.00003)	0.0007 (0.0004)
Log likelihood	-997.461	-995.829
n	865	865

The Change Model

Table 3 produces estimates of a random-effects "change model." In Model 1 the variables behave as before, with SES improving its probability score, with gender, parental education, television hours, and parental involvement as significant factors. This time the discount factor moves into a statistically acceptable range, with

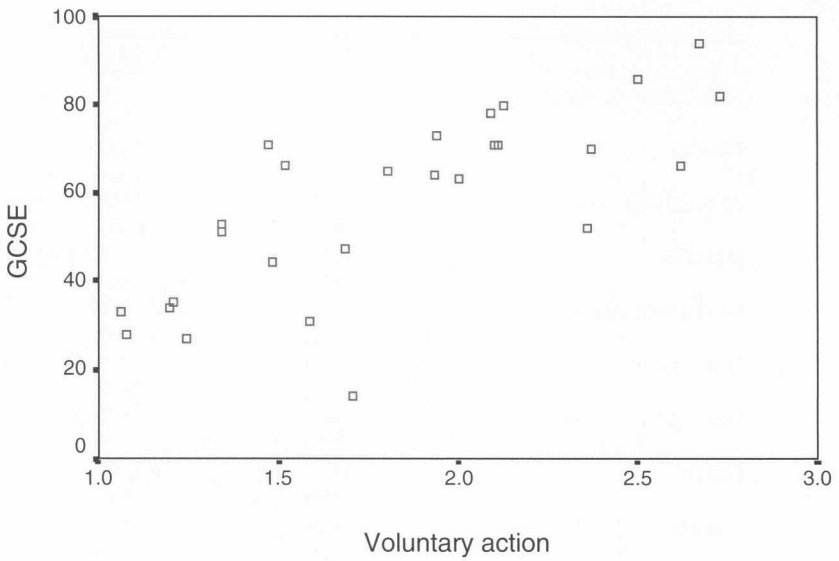


Figure 1. School General Certificate of Secondary Education (GCSE) Results by Mean of Voluntary Action.

ethnicity, school climate, and private schools proving to be nonsignificant. Again social networks are a negative predictor, and trust and voluntary action are positive and significant. As before, the school-level social capital variables are introduced in the second model. These controls only marginally affect impact of the individual-level variables but are not significant factors themselves. Thus the change model supports the basic inferences from the analysis of each wave.

A Comparison with Published Examination Results

To confirm the individual-level results, it is possible to analyze the published examination results available only at the school level, the percentage of students who obtain GCSEs. This part of the analysis uses the average responses of the students for voluntary action, trust, and parental socializing networks and then plots them against the percent of GCSE passes for each school. Figures 1–3 display the results, which show a strong relationship between performance and the average membership of voluntary groups, a weaker relationship with trust, and no observable relationship with networks, which replicate the results found in the survey analysis. Thus joining groups is clearly related to academic performance, which suggests that group membership enhances motivation; and trust seems to have the same effect. Social closure does not seem to have an effect at the school level, perhaps because it acts through different groups of students (see discussion below). Of course, the relationships that do exist may be a function of the social background of students: Those from advantaged backgrounds may both perform and volunteer more. To control for social background, a regression, using OLS as the estimator, takes GCSE results as the dependent variable, with the three social capital variables

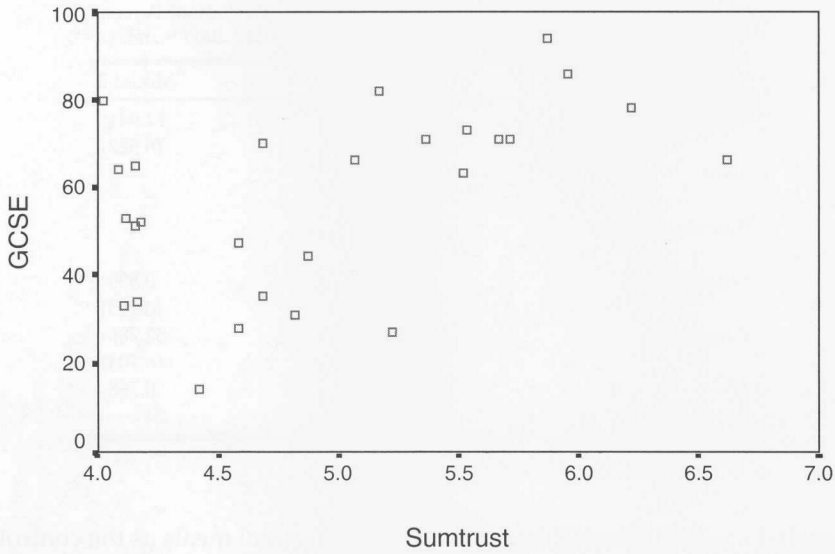


Figure 2. School General Certificate of Secondary Education (GCSE) Results by Mean of Summed Trust.

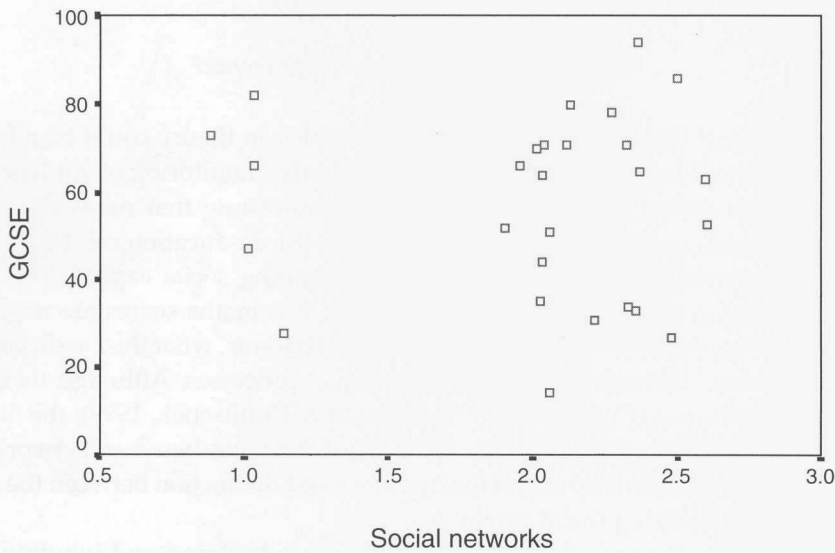


Figure 3. Individual Academic Performance by Proportion of Parents within School with Degrees (Network Academic Ability) Results by Mean of Friends' Parents Socializing with Each Other.

as independents. In addition, it adds a SES variable, which is the school's ranking on its uptake of free school meals funded by the state, which is a powerful indicator of character of the school intake. Table 4 produces the results: Model 1 shows that voluntary action passes the significance test, with trust at near significance while the networks variable is not significant. Model 2 uses voluntary action as the

Table 4. Ordinary Least Squares (OLS) Regression of School Percent General Certificate of Secondary Education (GCSE) 2000 Scores

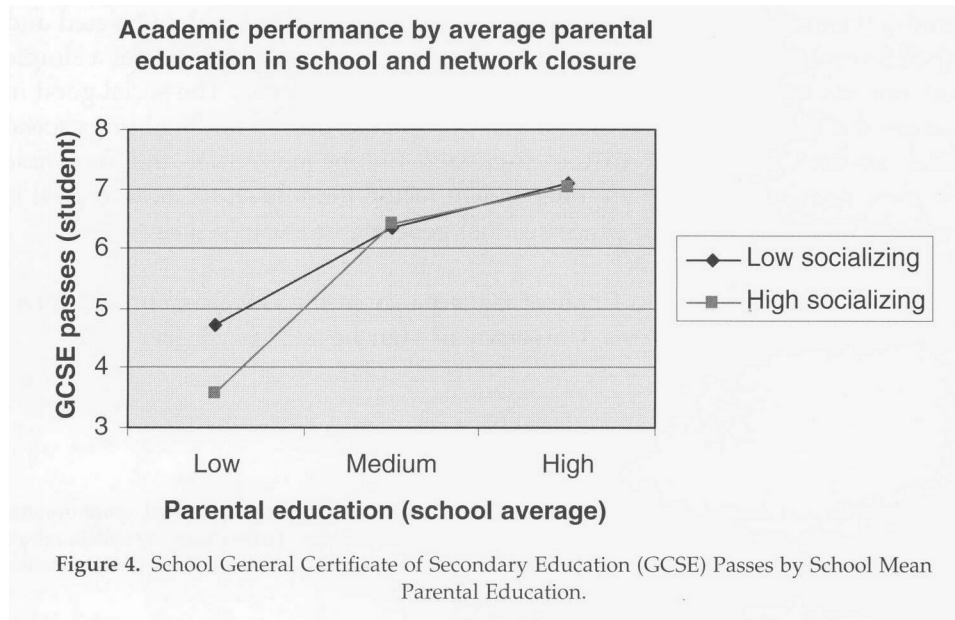
	Model 1	Model 2 ⁵
Voluntary action	29.980* (5.567)	14.941* (6.527)
Trust	7.267 (3.724)	—
Parents socialize	3.749 (5.177)	—
School meals	—	0.539* (0.143)
Constant	37.167 (20.843)	52.786 (16.704)
R ²	0.643	0.768
n	27	24

social capital variable selected from Model 1, with school meals as the control. Here both variables have the hypothesized signs and are significant in a model where these two variables explain most of the variation in the dependent term. Social capital, in the form of volunteering, remains as a determinant of school performance when accounting for the SES of the school intake.

Why Do Networks Depress Performance?

The puzzle of this article is that networks, which in theory could be a form of support for school-based work and a form of parental monitoring of student learning, are in this data a hindrance. This could demonstrate that networks are not always beneficial, revealing how poor attitudes toward education can be transmitted among parents through their networks or bonding social capital. This result replicates Morgan and Sørensen's (1999) finding that maths scores are negatively predicted by the strength of social closure amongst parents, what they associate with "norm enforcing" instead of "horizon-expanding" processes. Although their findings are controversial (Carbonaro, 1999; Hallinan & Kubitschek, 1999), the analysis here has replicated their results. Moreover, the differences between networks and trust and group membership reveal the hypothesized distinction between the effects of bonding and bridging social capital.

But it may be the case that different groups use bridging and bonding social capital in different ways. Families with lower SES may have less access to knowledge about academic performance and may not be able to transmit good education practice in their networks; whereas wealthier families may be able to transmit motivation and good practice in theirs. Thus the argument is that the impact of networks is mediated by SES. A reestimated Table 2 Model 2 can test this by adding to the existing model the interaction term SES*social networks, which is positive and significant (0.1691, SE = 0.0561, $p = 0.003$), which means that there is a positive interaction between higher SES and social networks over and above the individual impact of SES. The relationship is also captured by the graph in Figure 4, which



shows the negative relationship for parental socializing in schools with low parental education students and the lack of a relationship for those with higher levels of parental education. It would seem that social networks do not on average benefit students, but they can be beneficial for higher SES or more highly educated families. It appears that the worse-off parents with dense networks manage to worsen the performance of their offspring compared to similar parents without those networks and even the better-off parents who have these networks.

Conclusion

It would be unwise for reformers to expect social capital to be a panacea for social ills, which may be applied liberally as an alternative or complement to market and New Public Management reforms. If it were such a simple relationship between performance and social factors, reformers would have latched onto the idea many years ago. Instead, there are several aspects to social capital, which takes different forms according to the context in which it operates. Thus the central finding of this research is that some elements of social capital predict academic success, but that not all aspects of bonding and networks are good for students. There are particular social pathways that affect student performance.

Parental networks can have a negative impact on performance; which extends a controversy begun in 1999, by including a different country, England, for the testing of the hypothesis, as well as an original measure of parental networks. Following Putnam and others, the research identifies the positive and negative aspects of social capital, and in particular the negative aspects of bonding social capital. In education, closed networks are only advantageous if combined with positive

attitudes towards study, perhaps through the norms of more highly educated and high SES families. The conclusion to draw is that social capital is thus not a simple good, nor has universal benefit—much depends on the context: The social good in question and the type of social capital that is available. Such a finding brings social capital research back closer to the discussion of unequal social and economic processes. Rather than being an independent factor, the impact of social capital is intimately bound up with the processes that generate inequalities in societies.

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Notes

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1. The data has been archived at the University of Essex, <http://www.data-archive.ac.uk/>, Study Number 4982.
2. Proportion of pupils in receipt of free school meals, ranked provided by the education authority. Examination (GCSE) data are gathered from Secondary School Performance Tables for 1999. Citizenship practice data are gathered from all schools (that is secondary, special, pupil referral units, and independent schools) by means of a two-sided A4 questionnaire, which is sent to head teachers in the summer term of 2000.
3. English individual-level results are not available for most researchers.
4. Alternative methods of scaling the variable do not substantively affect the results.
5. The number of cases in model two reduces by three because data are not available for private school.

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Appendix: Coding of the Variables

- Academic Proficiency*—1 = Es or below, 2 = Ds, 3 = Cs, 4 = Bs 5 = As; too varied to say = 3 (v4)
- Cars* 0 = none, 1 = one; 2 = 2 + dk = missing (v3)
- Consult*—Consulted about school rules 0 = none; 1 = not much; 2 = a little; 3 = quite a bit; 4 = a lot (v33)
- Discount Rate*—discount rate 0 = I would rather get £100 right now; 1 = I would rather wait one whole month and get £150.
- Ethnicity*—1 = non white; 0 = white.
- Express*—Teachers invite the expression of opinions 0 = never; 1 = very occasionally; 2 = not very often; 3 = often; 4 = very often.
- Friends Parents Socialize*—parents socialize with friends' parents 0 = never; 1 = very occasionally; 2 = not very often; 3 = often; 4 = very often.
- Gender*—0 = girl 1 = boy.
- Hobby*—taken part in school hobby or interest clubs.
- Owner* 1 = own own home; 0 = if not.
- Parental Education* 1 = if parents went to university or higher education; 0 = did not go to university or polytechnic.
- Pareve*—parents come to school for parents' evening—0 = never; 1 = very occasionally; 2 = not very often; 3 = often; 4 = very often, dk = 0.
- Parfund*—parents come to school for fundraising activities 0 = never, 1 = very occasionally, 2 = not very often; 3 = often; 4 = very often dk = 0.
- Parental involvement*—underlying variable saved from alpha of *pareve* and *parfund*.
- Parttime*—have part-time employment 0 = no; 1 = yes.
- Private school*—school type 0 = state funded school; 1 = privately funded school.
- Voluntary action*—participation in voluntary projects—adds together scores for participation in fundraising, petitions, rangers, religious projects, election campaigns, helping elderly, environmental projects, charities, demonstrations and other voluntary activities.
- Religion*—1 = religious; 0 = not religious.
- Sayclass* Say in what you do in class 0 = none at all; 1 = not much; 2 = some; 3 = quite a bit; 4 = a lot.
- School climate*—summary variable from *teachers*, *express*, *sayclass*, *consult*.
- Socio economic status*—summary variable from *cars* and *owner*.
- Socialize*—parents socialize with friends' parents 0 = never; 1 = very occasionally; 2 = not very often; 3 = often; 4 = very often.
- Sports* Taken part in school sport team 0 = no; 1 = yes.
- Trust*—adds together positive scores (1) for trust in school, neighbors and adults.

Hours Watching TV—numbers of hours of television watched per day 1 = 0–1 hours a day; 2 = 1–2 hours a day; 3 = 2–3 hours a day; 4 = more than three hours a day.

Teachers—teachers work well or badly –2 = very badly; –1 = badly; 0 = neither; 1 = well; 2 = very well.

Trust in School—How much students trust others in school class 0 = not at all; 1 = not very much; 2 = quite a lot; 3 = a great deal.

Trust in Neighbors—How much students trust most of your neighbors 0 = not at all; 1 = not very much; 2 = quite a lot; 3 = a great deal.

Trust in Adults In School—How much students trust 0 = not at all; 1 = not very much; 2 = quite a lot; 3 = a great deal.