WORKING PAPER NO.28

Social Capital and Education Outcomes in Urban and Rural Peru

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Preface

This paper is one of a series of working papers published by the Young Lives project, an innovative longitudinal study of childhood poverty in Ethiopia, India (Andhra Pradesh State), Peru and Vietnam. Between 2002 and 2015, some 2,000 children in each country are being tracked and surveyed at 3–4 year intervals from when they are 1 until 14 years of age. Also, 1,000 older children in each country are being followed from when they are aged 8 years.

Young Lives is a joint research and policy initiative co-ordinated by an academic consortium (composed of the University of Reading, the London School of Hygiene and Tropical Medicine, London South Bank University and the South African Medical Research Council) and Save the Children UK, incorporating both interdisciplinary and North-South collaboration.

Young Lives seeks to:

- produce long-term data on children and poverty in the four research countries
- draw on this data to develop a nuanced and comparative understanding of childhood poverty dynamics to inform national policy agendas
- trace associations between key macro policy trends and child outcomes and use these findings as a basis to advocate for policy choices at macro and meso levels that facilitate the reduction of childhood poverty
- actively engage with ongoing work on poverty alleviation and reduction, involving stakeholders who may use or be impacted by the research throughout the research design, data collection and analyses, and dissemination stages
- foster public concern about, and encourage political motivation to act on, childhood poverty issues through its advocacy and media work at both national and international levels.

In its first phase, Young Lives has investigated three key story lines – the effects on child well-being of i) access to and use of services, ii) social capital, and iii) household livelihoods. This working paper is one of a series which consider an aspect of each of these story lines in each country. As a working paper, it represents work in progress and the authors welcome comments from readers to contribute to further development of these ideas.

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For further information and to download all our publications, visit www.younglives.org.uk.

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Abstract

Although enrolment in primary schools in Peru is very high, more than half of primary school children are one or more grades below the norm for their age. Furthermore, evaluations have shown that, when tested, Peruvian school children score well below the norms expected for their age. Their scores are also below the average levels of countries with similar socio-economic circumstances. The role of social capital[1] in explaining these findings has not been studied, although research in the USA has suggested positive associations between social capital and educational achievement. Social organisations that focus on childcare are one example of strong community networking resources in Peru. The Young Lives study offers an opportunity to investigate whether social capital is associated with educational progress and achievement.

The results of the study confirmed poor educational outcomes for many Peruvian school children. High proportions were unable to master simple tasks and were in a lower school grade than they should have been for their age group. There is a clear negative association between educational achievement and poverty. Overall, rural students are poorer and are thus more prone to low achievement (lower results in tests) and falling behind their expected grade. However, there seem to be no significant differences between boys and girls in these outcomes. The results do not support the hypothesis of a positive association between the social capital available to the family and the educational outcomes of their children, except for the association between cognitive social capital (at the community level) and children being in the correct grade for their age. This means that communities which experience more quality in their social relationships (eg trust) are more likely to have children who are in the correct school grade for their age. This result applies to how children are *progressing* at school (whether they are in the correct grade for their age) but does not extend to children's *achievement* (results in tests).

Perhaps the main interventions to improve the quality of the Peruvian education system are not to be found in the quality and quantity of social relationships within communities, but in improving educational inputs and processes within schools and breaking the strong association found between socio-economic status and educational performance. On the other hand, it might be that the types of instruments (objective questionnaires) and analysis (quantitative) used in this study do not offer the best way to capture the importance of social capital. If this is the case, then qualitative designs and analyses should be used to explore these issues.

1 See Section 1.1 for a discussion of definitions.

Contents

1. Introduction

Even though most children old enough to attend primary education in Peru are going to school, more than half of them are one or more grades below the norm for their age. They are classified as 'overage', resulting from entering school late (after the age of six) or repeating a grade. A second, probably related, problem is with achievement. At least one national and two international evaluations have shown that students score well below the norms expected for their age, or below the averages of countries with similar socio-economic status (eg the UNESCO evaluation, see UMC and GRADE, 2001; PISA, 2003).

Although there have been a few studies that have tried to explain this phenomenon of overage school children (INEI, 1995; Cortez, 2000; Cueto, 2004) and achievement (Benavides, 2002), none has looked at the impact of social capital (at least not using this specific name for the construct). The Young Lives project has included among its instruments a set of questions related to social capital. The study described in this paper has included these social capital variables in the 7.5 to 8.5-year-old cohort to try to explain two dependent variables: (a) school grade (whether or not the child is in the grade corresponding to her/his age), and (b) achievement in mathematics and language. The general hypothesis is that higher levels of social capital will be associated with higher results for both dependent variables.

The paper is divided into the following sections: first there is a definition and discussion of the term social capital, including a review of relevant studies (those relating social capital to education). This is followed by a description of some of the networks and community organisations that could be linked to social capital in Peru (using data taken from national surveys). Even though at present we do not have variables related to these networks and organisations in the Young Lives questionnaire, the description of them will help put the results into context. It is expected that future rounds of the Young Lives project will include variables related specifically to social capital organisations in Peru. Section 2 describes the methods used in the study and Section 3 presents the results. The final section discusses the results and provides an analysis of some implications for future research.

1.1 Social capital

According to Portes, the French sociologist Pierre Bourdieu is responsible for the first contemporary definition of social capital, understanding it as 'the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition' (Bourdieu, 1980, cited in Portes, 1998, p.3). Bourdieu's treatment of the concept is instrumental, as Portes points out. He focused on 'the benefits accruing to individuals by virtue of participation in groups and on the deliberate construction of sociability for the purpose of creating this resource' (*ibid*, p.3).

James Coleman's work is also among the early, modern definitions of social capital. He defines social capital by its function: 'It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors – whether persons or corporate actors – within the structure' (Coleman, 1988, p.S98). Coleman identified three forms of social capital: (a) obligations, expectations and trustworthiness of structures,

(b) information channels, and (c) norms and effective sanctions. The problem with this classification is that it includes, under the term social capital, both the mechanisms that generate it (reciprocity expectations and group enforcement of norms, for instance) and the consequences of possessing it (such as access to information).

Despite this fact, Coleman's work is very important and has the merit of describing some of the mechanisms through which social capital is generated. He pointed out how certain types of social structure are especially important in facilitating certain forms of social capital. Among these, he distinguished structures with 'closure'. This is the existence of enough links between a certain number of people to guarantee the observance of norms and the reward of good actions (Coleman, 1988). Also important in providing social capital is what Coleman refers to as 'appropriable social organisation'. The general idea is that an organisation 'once brought into existence for one set of purposes, can also aid others, thus constituting social capital available for use' (*ibid*, p.S108). Putnam (1995) has suggested that Western democracies, especially the USA, have seen a decline in recent years in the civil society movement ('civic engagement'), and thus in social capital. He bases this statement on the decline of activities such as voting, participating in public or political events and, rather famously, bowling: 'The most whimsical yet discomfiting bit of evidence of social disengagement in contemporary America that I have discovered is this: more Americans are bowling today than ever before, but bowling in organized leagues has plummeted in the last decade or so. Whether or not bowling beats balloting in the eyes of most Americans, bowling teams illustrate yet another form of social capital' (*ibid,* p.70). Putnam states that life is 'easier in a community blessed with a substantial stock of social capital' (*ibid,* p.67).

In a more recent development of the concept, Jack and Jordan (1999) understand social capital as the 'cultural practices, norms, networks, links, know-how and tradition through which people conduct informal interactions of all kinds. For instance, social capital is the trust that enables people to make contracts, rather than the contracts themselves; the teamwork that makes groups function effectively, rather than the roles and structures of the groups' (p.243).

Harpham, Grant and Thomas (2002) complement this definition by highlighting the importance of the quality of social relations in defining social capital, understanding it as 'the degree of connectedness and the quality and quantity of social relations in a given population' (p.106).

As can be seen, there is no set definition of the concept, and authors often define it slightly differently. Perhaps the common feature of all the definitions is the intangible character of social capital. As Portes (1998, p.7) states: 'whereas economic capital is in people's bank accounts and human capital is inside their heads, social capital inheres in the structure of their relationships. To possess social capital, a person must be related to others, and it is those others, not himself, who are the actual source of his or her advantage'. It is because of this fact that social capital is considered a public good that 'exists only when it is shared' (Narayan, 1999, p.6).

Different models of social capital have appeared in recent years. In 1998, Bain and Hicks proposed a model of social capital considering two components: structural and cognitive (Harpham, Grant and Thomas, 2002). The structural component refers to the extent and intensity of associational links or activities, citizenship and social support, while the cognitive component includes trust, reciprocity and

sharing. Structural social capital is sometimes referred to as the quantity of social relationships, while cognitive social capital is referred to as the quality of these (De Silva *et al*, 2004a).

Narayan (1999) describes an important additional classification: the difference between 'bonding' and 'bridging' social capital. Bonding social capital refers to the social cohesion within the group structure, while bridging capital is described as the type of social capital that connects different communities or groups. According to Harpham, Grant and Thomas (2002) the bonding and bridging construct partially overlaps with the horizontal/vertical construct of social capital, which understands social capital as either horizontally based, because it is based on the relationships between similar individuals or groups in the same social context (eg between communities), or vertically based, meaning it is based on the relationships between different levels of society (eg community, local government).

As Harpham, Grant and Thomas (*ibid*) point out, the bonding/bridging distinction is an important one since it highlights the role of government and the state within social capital – and therefore the importance of political context – and demonstrates the need to balance both components. Without links between communities and local government or groups with resources (vertical social capital), social networks, norms and trust may not actually be able to improve any aspect of a community's well-being. Likewise, without horizontal links between groups or communities, important information sources, support channels or other advantages of solidarity will be lost.

Finally, it is important to differentiate individual and ecological social capital. Individual social capital refers to the social capital available to one individual, while ecological social capital refers to the relationships at the community level where the individuals are gathered (De Silva *et al*, 2004b). Ecological social capital is usually estimated by aggregating individual social capital to the community level. In Peru, De Silva *et al* (*ibid*) identified nine papers that explicitly included some form of individual social capital,[2] but none analysed ecological social capital. Theoretically, there has been a recent trend in the social sciences to analyse social processes at hierarchical levels, such as individual, community, province and country levels. In the field of education, several studies have found that the individual-level variables are correlated when the individuals come from the same community (Bryk and Raudenbush, 1992). Hierarchical analysis allows the importance of the variables at different levels to be estimated, and we plan to adopt such a framework in this study by measuring both individual and ecological social capital.

In the past 15 to 20 years, social capital has become an important concept in international research, being linked to child and youth welfare (Jack and Jordan, 1999; Runyan *et al*, 1998; Furstenberg and Hughes, 1995) and self-reported health (Lindstrom, 2004). But not all social capital is good. Authors frequently cite criminal networks, such as the mafia, as examples of negative forms of social capital. In the next section there is a brief description of the studies relating social capital and education in the international literature, though none were found for Peru.

1.2 Social capital and education

We identified six papers that have explored the relationship between social capital and education. Teachman, Paasch and Carver (1996) used the National Education Longitudinal Survey from the USA to explore the links between social capital and dropping out of school. They found that having

2 Since social capital is a relatively new construct, it is not surprising that there are only a few studies about it. However, there is a long tradition of research in Peru and other Latin American countries about social movements and networks, which would include what is now called social capital. See, for example, Escobar and Alvarez (1992) for studies in Latin America, including Peru, and Blondet (1986) for a case study in Lima.

a divorced mother, having a stepfather or frequently changing school increased the chances of a child dropping out of school, while a higher level of child-parent connectivity decreased the probability of dropping out. This study shows an interesting characteristic common in several of the studies mentioned below: they refer to social capital as their main construct, but only measure some aspects of it. Furthermore, it could be argued that they are not measuring social capital at all, but potential determinants of social capital, such as having a divorced mother.

Pong (1997) related family structure, school context and eighth-grade mathematics and reading achievement in a random national US sample (using data from 1988). She found a negative association between mathematics and reading achievement and having a stepfather or a single parent, and a positive association with the number of acquainted relatives. Again, it could be argued that the variables included in Pong's analysis are not strictly what the literature would define as social capital but are instead determinants of social capital.

Israel, Beaulieu and Hartless (2001) used the US National Education Longitudinal Survey to explore the influence of family and community social capital on educational achievement. Family social capital was estimated through an analysis of the number of parents present in the household, the number of siblings, and the number of siblings who had dropped out of secondary school. They also estimated family processes through parental expectations for their child's education, discussion of school matters between parents and children (referred to as nurturing activities), parental checking of homework, parental limits for watching TV, and the amount of time the child spent at home with no parental supervision (referred to as monitoring efforts). Community social capital was estimated through an analysis of the socio-economic capacity of the community, measured through six indicators: community isolation (location); instability of the population (ie percentage who had moved in the past five years); percentage of the student population from a minority ethnic community; voter participation rate (to measure inequality and disaffection in the community); and extent of social integration in the community; and the degree to which parents know the parents of their child's closest friend. They used a multilevel model to analyse achievement in mathematics and reading comprehension (combining them into a single score) and dropping out of school. Their general conclusion is that both family and community social capital have an influence on educational achievement, although the impact of family social capital is greater than that of community social capital.

Horvat, Weininger and Lareau (2003) analysed the relationships between families and schools in different socio-economic groups in the USA. This study is different from the previous one in that the authors used an ethnographic approach. Their conclusions point out the positive impact of the quantity and quality of family networks on educational achievement. Parents from middle-class families were more likely than working-class parents to use these networks to their advantage when conflicts arose in school. Also, they were more likely to use these networks in a collective way. The authors found no differences related to race. Goddard (2003) analysed the social capital in a sample of US school students. Social capital was defined at the school level based on 11 items administered to the teachers. The items were aimed at measuring: relational networks that connect parents, community and students; trusting relationships between students and parents; and norms that support student learning. It was found in the multilevel analysis that fourth-grade students in schools with higher levels of social capital were more likely to pass mathematics and writing assessments that were mandatory

at the state level, even though these were schools with a high concentration of poor students. This analysis is interesting because the author conceptualised social capital at the school level, but also included individual variables in the analysis. The author suggests further studies to analyse whether social capital is independent of socio-economic status and whether it can be developed in schools serving poor populations.

Ream (2003) used a mixed-methods approach (ie quantitative, using longitudinal data, and qualitative, performing semi-structured field interviews with students) to analyse the impact of the social mobility of Mexican-Americans on educational achievement. The author used school-level social capital variables: academically relevant teacher/student interaction (four items) and school-initiated interaction with students' parents (three items). He found that Mexican-American students tend to move house more often than non-Latino/white students, and this has a negative impact on twelfth-grade mathematics performance. Furthermore, the author found that while Mexican-Americans had a slight advantage on academically relevant teacher-student interactions, this measure had a negative impact on reading performance, while the same variable had a positive impact for white students. Hence Ream suggests that there might be some form of 'counterfeit social capital' for Mexican-Americans. The author recognises that there might be other explanations for this finding, such as differences in perception between white and Mexican-American students, or the fact that the two groups might have different teachers. Nevertheless, the study suggests interesting theoretical possibilities for interactions between culture and the relevance of social capital.

In conclusion, it could be said that most studies that have analysed the relationship between social capital (at the family, community or school level) and educational achievement have found a positive association. However, none of the studies uses more widely accepted measures of social capital such as civic participation, trust and reciprocity, which are used in the Young Lives study. Instead, measures relating to family structure and the quality of parent-child and teacher-child interaction are commonly used – reflecting the work of Coleman (1988) – which many researchers would argue are not social capital measures at all.

The studies reviewed here have all been performed in the USA. It is not known, therefore, whether the same conclusion would be true in developing countries such as Peru. Furthermore, no experimental designs were used in these studies (such designs would make for a stronger cause-effect argument). Some of the studies also suggest that the effect of social capital might be different according to the environment in which the students live and study (see for example Blackwell and McLaughlin, 1999, for urban/rural differences). Before turning to methods and results, the following section presents some background on community organisations in Peru, which will provide a general framework for understanding the social capital data presented later.

1.3 Community organisations in Peru

In recent decades, several community organisations have appeared and have solidified their work in Peru, mostly in impoverished communities and often run by local mothers. Yet there is very little research on the impact these may have outside their specific range of objectives (which are usually related to local feeding or governance programmes). This section provides a brief description of the situation of these organisations around the country.

At the beginning of the 1980s, due to the serious economic and social crisis, diverse social grass-roots organisations began to emerge. These organisations were formed by individuals or groups with the general goal of fighting poverty, but each had specific aims. Most of these organisations are composed of and run by local women, with the purpose of meeting their families' feeding needs. There are three types of organisations related to feeding – communal kitchens, glass-of-milk committees and mothers' clubs – and they emerged in both rural and urban areas of Peru. In addition, neighbourhood organisations appeared, aimed at improving local living conditions, such as electricity and water supplies, and schools. Finally, self-defence committees were created, in both rural and urban areas, devoted to defending the community from the threat of terrorism that has affected the country since 1980.[3]

The community organisations aimed at feeding – mothers' clubs, glass-of-milk committees and communal kitchens – are the most numerous. Blondet and Montero (1995) defined such community organisations as organisations that have in common the collective action of the daily purchase, preparation and distribution of food, with the purpose of reducing the cost of family feeding. The authors also point out that these organisations reduce the time women invest in domestic activities and constitute a source of socialisation, training and, eventually, income generation.

Communal kitchens emerged in the 1980s as an initiative of groups of mothers (on average 20 to 30 women per group) who organised themselves jointly to prepare the meals for their community. The meals were then sold at low prices, making them available to everybody. Low prices were possible because of the donation of some of the supplies, the wholesale purchase of the rest, and the unpaid work of the mothers (Cueva and Millán, 2000). Communal kitchens emerged as a women's initiative to deal with the severe economic crisis suffered by low-income families. In addition, this type of organisation allowed the members to save time on cooking which they could then invest in other activities (studying, working, etc).

Glass-of-milk committees are also an important source of social capital among communities. The Glass-of-Milk Programme is a welfare programme with the objective of delivering milk and oats to children, senior citizens, and pregnant and nursing mothers. The committees, encouraged by the local councils and composed of mothers from the community, are in charge of the daily preparation and delivery of the milk to the beneficiaries. It is important to point out that the committees receive powdered milk and have to prepare it before delivery, a condition that guarantees the continuity of the collective work.

Mothers' clubs are the third type of women's organisation devoted to feeding. They are defined as groups of mothers who organise themselves to channel the benefits from charities and from welfare activities organised by religious institutions and wealthy persons, and by political parties interested in expanding their grass-roots organisations.

Another important social organisation worth comment is the *Wawa Wasi* daycare programme. It began as a local mothers' initiative, and because of its success the Peruvian Government decided to turn it into a social programme. For a small fee, working parents leave their under-threes in a daycare centre, where there is a 'mother-in-charge' who is trained in healthcare, early childhood stimulation and

3 In the 1980s and the first half of the 1990s terrorism was a serious problem in Peru. There were at least two major armed groups: Shining Path (*Sendero Luminoso*) and MRTA (*Movimiento Revolucionario Tupac Amaru*). The number of deaths after two decades of terrorism was recently estimated to be 69,000 (CVR, 2003). Nowadays, terrorist activity has declined considerably.

basic nutrition. Meals in the *Wawa Wasi* are organised through communal kitchens or glass-of-milk committees, which takes the burden of cooking away from the main caregivers.

There are other important social organisations at the community level, for instance peasant communities, especially in rural areas such as Cusco and Puno, in the Peruvian highlands. Peasant communities are 'territorial units' of clans or groups related by kinship or historical neighbourhood, who seek the well-being of all their members. The community is the owner of the land on which it is located and must be registered in order to have legal recognition. Peasant communities are important because they enable the social, cultural and economic development of a large sector of the population, usually marginalised by state policies. For instance, in some rural areas communities have built more schools and rural roads with their own resources, than the state.

The two other social organisations devoted to improving community well-being are neighbourhood organisations and self-defence committees. The former is devoted to improving the quality of the services offered in the community, such as electricity and water, and also the quality of the schools and other important institutions within the community. Self-defence committees emerged within communities with the purpose of protecting their land and fighting against violence, especially terrorism. These social organisations contribute to the development of their communities, and provide security for their members.

Table 1 shows the percentage of households that have at least one member who belongs to, participates in, or is registered in a group, organisation, association and/or social programme. Twenty-three per cent of households have a member who participates in the Glass-of-Milk Programme. It is important to note that participation in this programme is more frequent in rural areas (34.8 per cent) than in urban areas (17.4 per cent), and that most of the households with members who participate are 'extremely poor' or 'non-extremely poor'.[4]

Table 1: Percentage of households that have at least one member who belongs to, participates in, or is registered in a group, organisation, association and/or social programme

Group, organisation, association and/or social programme	Rural				Urban				National
	EP	NEP	NP	Total	EP	NEP	NP	Total	
Sports club and associations	5.4	6.3	8.6	6.6	5.3	3.8	7.9	6.6	6.6
Cultural associations (dance, music etc)	0.6	0.6	0.4	0.6	0.6	0.7	2.2	1.7	1.3
Neighbourhood associations	3.9	4.0	4.3	4.0	2.4	3.8	3.5	3.5	3.7
Peasant groups (peasant self-defence organisations)	12.2	10.3	7.0	10.1	1.1	0.6	0.5	0.6	3.9
Irrigation associations	5.7	8.3	13.6	8.9	0.8	1.8	1.0	1.2	3.9
Professional associations	0.1	0.1	0.7	0.3	0.1	0.2	4.4	2.9	2.0
Labour unions	0.3	1.1	2.8	1.3	1.0	2.1	4.5	1.2	2.8
Mothers' clubs	7.9	7.2	4.7	6.7	4.8	3.2	1.1	1.9	3.6
Parents association	4.8	3.3	2.1	3.6	1.9	1.1	1.2	1.2	2.0
Glass of milk	44.2	35.9	21.0	34.8	35.3	28.9	10.6	17.4	23.5

4 The poverty variable was constructed according to households' per capita expenditure. Extremely poor households are those that cannot afford a basic food bundle (or requirements), and non-extremely poor are those that cannot afford a basic consumption bundle.

Group, organisation, association and/or social programme	Rural				Urban				National
	EP	NEP	NP	Total	EP	NEP	NP	Total	
Communal kitchen	5.9	7.0	5.3	6.0	5.8	6.2	2.1	3.5	4.4
Participative roundtable (mesa de concertación)	0.1	0.4	0.4	0.3	0.0	0.0	0.2	0.1	0.2
Local Administrative Health Committee	0.1	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.1
Temporary (urban) employment *A Trabajar Urbano*	0.2	0.2	0.1	0.1	1.7	0.8	0.3	0.5	0.4
Temporary (rural) employment *A Trabajar Rural*	4.4	3.5	1.8	3.4	0.2	0.1	0.1	0.1	1.2
Other	28.0	21.0	14.9	22.0	13.5	7.0	6.6	7.2	12.3

Source: ENAHO, 2002 (national survey of homes, database) – IV trimester
Note: EP = extremely poor; NEP = non-extremely poor; NP = non-poor

There are some forms of social organisation, such as peasant self-defence organisations and irrigation associations, that are considerably more common in rural areas. However, participation in peasant self-defence committees is greater among the extremely poor, while participation in irrigation associations is greater among the non-poor (in rural areas). In general, participation in most of the social programmes or organisations listed in Table 1 is more common in rural areas. This might be related to the fact that there is a long history of collective work among the Peruvian rural population, and poverty is more prevalent in rural areas. Participation in community organisations aimed at feeding is greater among the extremely poor and the non-extremely poor, especially in urban areas.

Finally, it is important to note that most households do not have a member who participates in professional associations or labour unions, especially among the extremely poor and the non-extremely poor, both in rural and urban areas. Only the non-poor from urban areas have a relatively high level of participation in this kind of social organisation, possibly because they have formal jobs whereas the extremely poor and non-extremely poor are informal workers.

So far we have reviewed the current situation of some of the most important social organisations in Peru and provided a brief description of them. As we have seen, community organisations aimed at feeding are important sources of networking, especially in rural areas and among the extremely poor. Since these types of organisations can enable members of the community to improve their quality of life, for instance, by improving their nutrition, it would be interesting to find out if these organisations also have an impact on specific educational outcomes, such as achievement and the problem of overage students. None of the above-mentioned organisations, however, has an objective to improve the educational outcomes of the community's children who are enrolled in primary or secondary education. The Young Lives questionnaire, for the first round, included some questions on social capital. In the current study we will take into account whether the individual lives in an urban or a rural area, given that there are large socio-economic, language and cultural differences between urban and rural areas in Peru.

How could social capital affect educational outcomes for Peruvian students? Even though this is the first study we are aware of that uses the social capital construct in Peru in relation to education, international literature suggests some possible mechanisms. Harpham (2002) proposes a theoretical model, where social capital inside and outside the family (such as the extent of networks, support

received from networks, perceived trust, reciprocity and shared norms) would have an impact on intermediate variables. These would include the parents, such as an increase in resources to invest in the child, parental decisions to invest in the child, and the value parents give to education. In turn, intermediate variables would have an impact on child welfare outcomes, such as those studied here. The current study, however, will not test these processes, only the associations between social capital and educational outcomes. There is strong evidence in Peru to support the idea that education is highly valued by the population, even in impoverished areas (see for example Ansión *et al*, 1998). In this context it is reasonable to assume that more close-knit communities (ie those with higher levels of social capital) would care more for the education of all local children than communities where social ties are more loose. Again, however, the specific processes by which this would occur were not looked at in the current study.

2. Methods

2.1 Design

The data presented here was gathered in the first round of the Young Lives project in Peru, between August and December 2002. There were two cohorts in the project; the current report refers to the children who, at the time of data collection, were aged 7.5–8.5 years. As mentioned before, the Young Lives project is planned as a longitudinal study that should last until 2015; the second round of data collection should occur in 2006. Thus, the data presented here is cross-sectional and the analysis should be interpreted in terms of associations between variables and not cause-effect relationships. Most of the analysis separates out the data for urban and rural children, and, within these groups, separates boys from girls.

2.2 Sample characteristics

The Peru Young Lives data set used here consists of a nationwide sample of 704 children aged between 7.5 and 8.5 years at enrolment. Children were enrolled for the first phase of the project between August and December 2002. The sample was distributed between 20 sentinel sites in urban and rural districts. All 1,818 districts of Peru were ranked according to their poverty level. Eliminating the wealthiest five per cent, a sample of districts was taken across the poverty spectrum. Within each district sampled, a random dwelling was selected and then all dwellings nearby were systematically checked to identify children of the relevant age. In a few cases, after covering the whole community or even the whole district, there were fewer children than required, so children living in contiguous communities and districts were surveyed. A detailed description of the data set and sampling procedure can be found in Escobal *et al* (2003). Table 2 presents some characteristics of the sample.

Table 2: Number and percentage of children in the sample, by school grade and area

	Area		Total
	Rural	Urban	
First grade	26 (14%)	27 (5%)	53 (8%)
Second grade	119 (66%)	271 (52%)	390 (55%)
Third grade	34 (19%)	215 (41%)	249 (35%)
Fourth grade	2 (1%)	10 (2%)	12 (2%)
Total	181 (100%)	523 (100%)	704 (100%)

As would be expected from national statistics, it is more likely that rural children will be in a lower grade for their age (ie overage). In Peru it is compulsory for six-year-olds to attend first grade, but there are no legal consequences for anybody if a child fails to do so. The school year in Peru runs from mid-March or early April to early or mid-December; children should be at least six years of age by 30 June to enrol in first grade in a given year. Using the above information, we estimated the grade in which the child should have been studying. This information is presented in Table 3.

Table 3: Students' status by sex and area (number and percentage)

		Students' status			Total
		Overage	On-age	Below the age for their grade	
Rural	Female	23 (28%)	51 (61%)	9 (11%)	83 (100%)
	Male	30 (31%)	60 (61%)	8 (8%)	98 (100%)
	Total	53 (29%)	111 (61%)	17 (9%)	181 (100%)
Urban	Female	35 (15%)	174 (73%)	30 (13%)	239 (100%)
	Male	54 (19%)	181 (64%)	49 (17%)	284 (100%)
	Total	89 (17%)	355 (68%)	79 (15%)	523 (100%)
All children	Female	58 (18%)	225 (70%)	39 (12%)	322 (100%)
	Male	84 (22%)	241 (63%)	57 (15%)	382 (100%)
	Total	142 (20%)	466 (66%)	96 (14%)	704 (100%)

A relatively small group of children are below the age for their grade. This is because, in some cases, schools will allow younger children to enrol in first grade. Table 3 shows a slightly higher percentage of 'on-age' girls than boys. This is an interesting trend also found in other studies. While among the older population in Peru most non-educated people are women, the younger generations seem to be moving towards educational equality for boys and girls (at least in terms of enrolment and school grade). In further analysis, the on-age and below-age groups will be combined and called 'on-age'.

Table 4 presents some of the general characteristics of the sample (it was tested whether there were statistically significant differences between on-age and overage children in each group).

Table 4: On-age and overage children's characteristics by area

	Rural (N = 181)		Urban (N = 523)		All children (N = 704)	
	Overage	On-age	Overage	On-age	Overage	On-age
Height-for-age (z-score)	-2.3**	-2.0**	-1.7**	-1.3**	-1.9**	-1.4**
Weight-for-age (z-score)	-1.4**	-1.0**	-0.8**	-0.4**	-1.0**	-0.5**
Body mass index	16.2	16.3	16.8	17.1	16.6	16.9
The child attended school in 2001 (%)	88**	98**	86**	99**	87**	99**
Family size	5.5*	4.9*	4.9	4.5	5.1**	4.6**
Student's age when he/she first went to school	6.2**	6.0**	6.2**	5.7**	6.2**	5.8**
He/she goes to public school (%)	98	99	97**	87**	97**	90**
The child attended preschool (%)	81	88	79**	91**	80**	90**
Mother speaks indigenous language (%)	42*	28*	9**	3**	21**	9**
Mothers with at least secondary education (%)	16	22	44**	69**	33**	58**

* significant at 10%; ** significant at 5%

The information above shows that most children old enough to attend primary school do so. The problem is that about half of them will not finish secondary education (Guadalupe, 2002). This is something that could be studied in future rounds of the Young Lives project.

Table 4 shows, in general terms, that children from rural environments are poorer (as shown by the anthropometric and mothers' education variables) than children in urban environments. Within each group, overage children in general come from poorer environments than on-age children. On-age children were younger when they started school. Overage children are most likely to have mothers who speak an indigenous language. On-age children in urban environments are more likely to attend private schools than any other group (around 87 per cent of the national population attends public school: Guadalupe, 2002).

The anthropometric indicators show, as expected, that rural children tend to have poorer nutritional status than urban children. In both rural and urban areas, overage children show poorer mean height-for-age and weight-for-age z-scores than on-age children. However, no differences between groups were found for body mass index, an indicator of acute malnutrition.

Table 5 presents information on the characteristics of the child's home and household assets, producing a similar pattern to Table 4. Urban children show generally higher indicators, and, within each group, on-age children show higher indicators (although the pattern is clearer in urban children).

Table 5: Fixed household assets and house infrastructure (percentage)

	Rural (N = 181)		Urban (N = 523)		All children (N = 704)	
	Overage	On-age	Overage	On-age	Overage	On-age
Has a television	40	36	69**	83**	58**	72**
Has an iron	9	16	28**	61**	21**	51**
Has a gas stove	9	15	38**	66**	27**	55**
Has a plough	47	52	17**	8**	29**	18**
Has a machete	94	91	36**	24**	58**	39**
Has an axe	92	85	39**	25**	59**	39**
Wall material: brick/concrete	2	5	28**	53**	18**	42**
Roof material: concrete/cement/tiles/slates	25	20	21**	41**	23**	36**
Floor material: cement/laminated material	4	9	31**	58**	21**	47**
Has piped water into dwelling/yard/plot	64	67	69**	86**	67**	82**
Uses gas/electricity for cooking	0*	6*	31**	54**	20**	43**

* significant at 10%; ** significant at 5%

2.3 Variables and procedures

The variables were obtained from the questionnaires administered to the children, their parents and community leaders. Achievement was measured through the reading, writing and numeracy items described below. Social capital variables were analysed according to the framework developed for this study. This framework used the distinction between structural and cognitive social capital described above (Harpham, Grant and Thomas, 2002). The distinction between bonding and bridging social capital (Narayan, 1999) was not introduced, given that all questions were related to intra-community relationships (bonding social capital), and not inter-community relationships (bridging social capital). The specific questions (to be found in the 7.5-8.5 year-old questionnaire, available on the Young Lives website http://www.younglives.org.uk/) used to measure the structural and cognitive social capital are described below. Fieldwork included several verification procedures to assure the validity of the information.

The instrument used is a shortened version of the Adapted Social Capital Assessment Tool (A-SCAT). De Silva *et al* (2004b) conducted a study on the validity of this instrument in the Peruvian context. For this, they analysed the data from the Young Lives project (specifically checking for criterion-related validity) and also conducted in-depth qualitative interviews with respondents who were representative of those enrolled in the Young Lives project. In general, the results support the validity of the questionnaire, although problems with the interpretation of specific questions were found (see Section 4 for more details). The study also showed, through a factor analysis, that the individual items were captured by summary items representing structural social capital (including measures for group membership, social support and citizenship) and cognitive social capital (ie measures of trust). These factors will be described later in this analysis.

3. Results

3.1 Social capital in Peru

The social capital questions were divided into questions on cognitive social capital and questions on structural social capital. The first results present bivariate analysis, to show a first level of associations. An important issue to consider in all analysis is who responded to the social capital questions. The procedures specified that the mother should respond, but if she was not available the questions were directed to another member of the family. This distinction is important since the results for a particular family regarding social capital might vary depending on the informant. Table 6 gives details of who the respondents were.

Table 6: Person providing information in response to social capital questions

	Frequency	Percentage
Father	53	8
Mother	602	86
Stepfather	1	0
Stepmother	7	1
Grandfather	6	1
Grandmother	19	3
Other	15	2
Total	703	100

While the majority of respondents were the mothers of the children (as expected), just over 14 per cent of the respondents were other family members (mostly fathers). In the next sections we present results for all respondents together, but in the multivariate analysis we present results both for situations where only the mothers are considered as respondents, and where we included all respondents. Table 7 presents the results for cognitive social capital questions.

Table 7: Cognitive social capital in Peru by area and child's status (percentage)

	Rural (N = 181)		Urban (N = 523)		All children (N = 704)	
	Overage	On-age	Overage	On-age	Overage	On-age
Can the majority of people in this community be trusted?	51	47	44**	26**	47**	31**
Do you consider yourself similar to most other households in this community?	29**	63**	56**	69**	46**	67**
Do the majority of people in this community generally get along with each other?	88**	73**	72**	60**	78**	63**
Do you feel as though you are part of this community?	91	90	88*	79*	89**	81**
Would the majority of people in this community try to take advantage of you if they got the chance?	38	42	47	50	44	48

* significant at 10%; ** significant at 5%

There is an interesting trend: caregivers of on-age children, in both contexts, consider themselves more similar to other members of the community than caregivers of overage children do. On the other hand, the caregivers of overage children are more likely to believe that the majority of people in the community get along with each other. Table 8 presents the results for structural social capital questions.

Table 8: Structural social capital (participation in community-level organisations) in Peru, by area and child's status (percentage)

	Rural (N = 179)		Urban (N = 512)		All children (N = 691)	
Respondent belongs to:	**Overage**	**On-age**	**Overage**	**On-age**	**Overage**	**On-age**
Labour union/trade union	2	4	1	2	1	3
Community association[a]/co-op	11	5	6**	1**	8**	2**
Women's group	11	13	16	10	14	11
Political group	4	1	1	2	2	1
Religious group	17	13	9	8	12	9
Credit/funeral group	0	0	0	0	0	0
Clubs/sport association	0	2	2	4	1	3
Health, water, school association or committee	2**	11**	8	8	6	9
Other	11	5	4	4	7	4

** significant at 5%
[a] Community group or association

Overall, participation in community associations is quite low. Table 9 presents the data for the structural social capital questions related to support.

Table 9: Structural social capital (support), by area and child's status (percentage)

	Rural (N = 179)		Urban (N = 513)		All children (N = 692)	
	Overage	On-age	Overage	On-age	Overage	On-age
Received support from family and relatives	30	29	52	46	44	42
Received support from household members	42	36	53	47	49	45
Received support from neighbours	19	17	22	18	21	18
Received support from friends who are not neighbours	11	17	20	22	16	21
Received support from community leaders	4	6	8**	2**	6**	3**
Received support from religious leader	15	12	16*	10*	16*	10*
Received support from politicians	0	3	5*	2*	3	2
Received support from government officials/civil servants	2	6	5	2	4	3
Received support from charitable organisation/NGO	2	2	1	2	1	2
Received support from other groups	0	2	1	1	1	2

* significant at 10%; ** significant at 5%

There are three significant differences in support, all in urban areas. Overage children are more likely than on-age children to receive support from community members, religious leaders or politicians. Overall, support seems to come mostly from relatives (including members of the household), followed by neighbours, friends and religious groups.

Table 10 presents the results for a different set of questions in the structural support category: citizenship.

Table 10: Structural social capital (citizenship), by area and child's status (percentage)

	Rural (N = 181)		Urban (N = 523)		All children (N = 704)	
	Overage	On-age	Overage	On-age	Overage	On-age
You have joined with other community members to address a problem of common concern	34	34	19	19	25	22
You have talked with a local authority or governmental organisation about problems in this community	30	30	13	14	20	18

There are no statistically significant differences between the citizenship levels of caregivers of on-age and overage children.

3.2 Achievement

As already mentioned, reading, writing and numeracy assessment items were administered to the children. The reading items required the children to read three letters (N, A, P); one word (*'pan'*, which is Spanish for 'bread'); and one sentence (*'El pan es rico'*, which is Spanish for 'the bread is delicious'). The results are presented in Table 11.

Table 11: Reading achievement by child's status, area and sex

	Overage (%)	On-age (%)	Total
Rural			
Female			
Cannot read or reads only letters	**65**	**28**	**36**
Reads words	**0**	**0**	**0**
Reads sentences	**35**	**72**	**64**
Total	**100**	**100**	**100**
Male			
Cannot read or reads only letters	**54**	**23**	**32**
Reads words	**0**	**5**	**4**
Reads sentences	**46**	**72**	**64**
Total	**100**	**100**	**100**
Urban			
Female			
Cannot read or reads only letters	**27**	**9**	**11**
Reads words	**0**	**1**	**0**
Reads sentences	**73**	**91**	**88**
Total	**100**	**100**	**100**
Male			
Cannot read or reads only letters	**31**	**4**	**9**
Reads words	**2**	**3**	**2**
Reads sentences	**67**	**93**	**89**
Total	**100**	**100**	**100**

The percentage of students who could read words and sentences is much lower for rural students. This is a common pattern in all Peruvian evaluations. The results are also poorer for overage children than for on-age children. Results for boys and girls are very similar.

Table 12 presents the results of the writing assessment. This item required children to write the sentence *'me gustan los perros'* (which is Spanish for 'I like dogs').

Table 12: Writing achievement by child's status, area and sex

	Overage (%)	On-age (%)	Total
Rural			
Female			
Cannot write or writes with difficulty	**81**	**55**	**62**
Writes without difficulty	**19**	**45**	**38**
Total	**100**	**100**	**100**
Male			
Cannot write or writes with difficulty	**78**	**66**	**70**
Writes without difficulty	**22**	**34**	**30**
Total	**100**	**100**	**100**
Urban			
Female			
Cannot write or writes with difficulty	**61**	**28**	**33**
Writes without difficulty	**39**	**72**	**67**
Total	**100**	**100**	**100**
Male			
Cannot write or writes with difficulty	**62**	**33**	**39**
Writes without difficulty	**38**	**67**	**61**
Total	**100**	**100**	**100**

The above shows better results for urban than for rural children, for on-age than for overage children, and for female than for male children.

Table 13 presents the results for the numeracy assessment item. This item required children to solve a basic multiplication (2 x 4).

Table 13: Numeracy achievement by child's status, area and sex

	Overage (%)	On-age (%)	Total
Rural			
Female			
Cannot solve or incorrect	**95**	**57**	**67**
Correct	**5**	**43**	**33**
Total	**100**	**100**	**100**
Male			
Cannot solve or incorrect	**79**	**47**	**56**
Correct	**21**	**53**	**44**
Total	**100**	**100**	**100**
Urban			
Female			
Cannot solve or incorrect	**83**	**31**	**38**
Correct	**17**	**69**	**62**
Total	**100**	**100**	**100**
Male			
Cannot solve or incorrect	**73**	**23**	**32**
Correct	**27**	**77**	**68**
Total	**100**	**100**	**100**

The results show better performance for urban than for rural children, for on-age than for overage children, and for male than for female children.

Table 14 presents the correlations among the dependent variables.

Table 14: Spearman correlations between dependent variables

	Reading	Numeracy	Writing
Numeracy	**0.366**		
N	**599**		
Writing	**0.405**	**0.356**	
N	**612**	**655**	
Overage	**-0.284**	**-0.521**	**-0.254**
N	**611**	**653**	**666**
All correlations significant at 1% (two-tailed)			

The highest correlation is between numeracy and overage, followed by reading and writing (for the strength of the correlation the sign does not matter, the sign only indicates direction). Overall, given that each achievement area had only one item, and the correlations between them were positive as expected, a factor analysis was performed to generate a single achievement score, composed of the three areas tested. More information on this is presented below.

3.3 Multivariate analysis

The results presented so far have come from bivariate analysis only. The multivariate analysis presented below introduces several predictors, including cognitive and structural social capital variables, to establish the unique association of each with the dependent variables (achievement, and on-age versus overage). For the analysis of social capital we combined variables by using a factor analysis (see Appendix for details). The literature on this topic suggests that the effect of social capital might not come from several independent variables, but from a combined effect.

Three factors were identified, broadly concurring with what theoretical considerations would predict. Factor 1 groups the questions related to cognitive social capital; factor 2 refers to structural social capital, specifically citizenship; and factor 3 also refers to structural social capital, specifically participation.

The multivariate analysis included information at the individual level (child or child's family) and at the community level.[5] The models used to explore the relationship between educational success and social capital variables were ordinary least squares (for child achievement results) and logistic regression (for on-age results). This option allows us to obtain robust standard errors and to indicate that observations are clustered into communities. In this case, we assume that the observations can be correlated within communities and are independent between communities. The number of children per location (community) was not large enough for a hierarchical linear model. It is important to note the number of children from the same location (community[6]) in the sample. Overall, the sample included 75 communities. The analysis presented in the previous section included all children, but the multivariate analysis includes only children who lived in a community where at least two children lived, so that the average for the community had some sense. This procedure resulted in the exclusion from the analysis of 20 children, from as many communities (see Table 15 for the distribution of numbers of children per community).

Table 15: Number of children per community

Number of children	Communities	Percentage of communities
One	**20**	**27**
Two	**10**	**13**
Three	**9**	**12**
Four	**7**	**9**
Five	**3**	**4**
Six or more	**26**	**35**
Total	**75**	**100**

5 The community level refers to the average of responses of children within the same locality. Entered as a cluster into the regressions, the Stata software allows the cluster option to be introduced into the estimation. This option allows the identification of groups – communities – of correlated observations and gives the adjustment for this level.

6 Communities correspond to administrative areas. For details see the Young Lives community questionnaire, which contains the definition of 'community' (available from www.younglives.org.uk).

The covariates in the model were selected based on the literature review presented in this paper.

Ordinary least squares

Child achievement could be associated with child characteristics (eg sex, height-for-age, school grade); family characteristics (eg parents' education, number of persons per room at home); socio-economic characteristics (eg number of possessions at home, agricultural tools, house material); and social capital (eg number of groups that the household participates in).

$$Y_j = B_o + B_1X_j + B_2C_j + B_3\hat{C} + E_j \quad E_j \sim N(0, \sigma^2)$$

Y_j = child achievement

X_j = child and family background

C_j = household social capital

$\hat{C}$ = community social capital (aggregated from individual level)

E_j = random component

Logistic regression

Since the outcome variable on-age/overage is binary, logistic regression was used for this multivariate analysis.

$$\ln [p/(1-p)] = B_o + B_1 X_j + B_2C_j + B_3\hat{C}$$

p = probability that the event Y occurs, $p(Y=1)$

$p/(1-p)$ = odds ratio

$\ln [p/(1-p)]$ = log-odds ratio (logit)

X_j = child and family background

C_j = household social capital

$\hat{C}$ = community social capital (aggregated from individual level)

Variables included in the analysis

Dependent variables

a) ***Achievement:*** this variable was created using three scores. The first one refers to the child's reading level. The scores assigned were 1 if the child could read sentences and 0 if they could not. The second refers to the child's writing level. The scores were 1 if the child could write correctly and 0 if the child could not write, or wrote the specified text incorrectly. The last one refers to numeracy. The score was 1 if the exercise was completed correctly and 0 if incorrect or blank. The achievement variable was built through a factor analysis that combined these scores and provided a standardised score that combined achievement in reading, writing and numeracy. The single factor accounted for 58 per cent

of the total variance. The weights of the variables were 0.45 for reading, 0.44 for writing and 0.43 for numeracy.

b) ***On-age:*** this variable was coded 1 if the child was the correct age or younger for their grade, and 0 if they were older.

Predictor variables

a) ***Sex:*** this was coded 1 for males and 0 for females.

b) ***Height-for-age:*** this variable is the standardised z-score. It is an indicator of chronic malnutrition.

c) ***Child works:*** this variable was coded 1 if the child was involved in any activity aimed at obtaining money or other commodities and 0 if not. This data was gathered through the child questionnaire.

d) ***Crowding index:*** this variable refers to the ratio of the number of people per room at home.

e) ***The mother has at least secondary education:*** this data was gathered in the household survey and was coded 1 if the mother had at least secondary education and 0 if she had a lower level of education.

f) ***Mother speaks an indigenous language:*** this variable was coded 1 if the mother spoke an indigenous language as her mother tongue,[7] and 0 if she only spoke Spanish.

g) ***Child's age when she/he first went to school:*** this refers to the caregiver's answer when asked the age at which the child began her/his primary education.

h) ***Type of school:*** this was coded 1 for public schools and 0 for private schools. In Peru, most studies have found higher achievement for students in private schools (eg UMC and GRADE, 2001).

i) ***Both biological parents present at home:*** this variable was coded 1 if the biological parents lived with the child and 0 if only one or no parents lived at home.

j) ***Parents help with the child's homework:*** this variable was coded 1 if at least one of the parents helped with the homework and 0 if not.

k) ***The child attended preschool:*** this was coded 1 for children who had attended preschool and 0 for children who had not.

l) ***Socio-economic indices:*** these are variables constructed from several indicators, including household possessions, agricultural tools and house materials. This information was provided by the individuals listed in Table 6. The variables were included in a factor analysis with varimax rotation. Four factors resulted from this analysis, which accounted for 62 per cent of the variance. The resulting factors were:

7 In Peru, Quechua and Aymara are the most widely spoken indigenous languages, but there are over 40 across the country (Pozzi-Escot, 1998).

- *Household assets index:* this factor grouped several indicators related to household possessions – radio, bicycle, television, iron, blender and gas stove. It accounted for 20 per cent of the total variance.
- *Agricultural index:* this factor grouped several indicators related to the household's agricultural tools – plough, wheelbarrow, spade, rake, machete and axe. It also accounted for 20 per cent of the total variance.
- *House infrastructure index:* this factor grouped several indicators related to house materials – brick or concrete wall, cement or tiled roof, and cement or laminated floor (we assigned a score of 1 for the more expensive material and 0 for the cheaper). This factor accounted for 12 per cent of the total variance.
- *Basic services index:* this factor grouped two variables – whether the house had electricity, and whether the house had piped water in the dwelling. It accounted for 10 per cent of the total variance.

Social capital

As noted before, the household survey included a section relating to structural and cognitive social capital. For each variable, a specific hypothesis of association is raised, based on the general hypothesis that the higher the quantity and quality of social capital available to the family and the community, the higher the educational outcomes.

The structural social capital variables addressed were:

a) ***You have joined with other community members to address a problem of common concern:*** this variable was coded 1 for yes and 0 for no. It is hypothesised to have a positive relationship with educational outcomes.

b) ***You have talked with a local authority or governmental organisation about problems in this community:*** this variable was coded 1 for yes and 0 for no. This variable is hypothesised to have a positive relationship with educational outcomes.

c) ***Number of groups the respondent/primary caregiver participated in:*** the organisations included were: labour union, community association, women's group, political group, religious group, credit or funeral group, clubs or sport association, health/water/school association or committee, and other type of organisation. Each was scored with 1 for yes and 0 for no, thus producing a sum score. This variable is hypothesised to have a positive relationship with educational outcomes.

d) ***Number of persons or institutions that give support to the household:*** this variable represents the number of persons or institutions (family, neighbours, friends, community leaders, religious leaders, politicians, government officials and charitable organisation) that give some type of support to the household. This variable is hypothesised to have a positive association with educational outcomes.

The cognitive social capital variables were:

a) ***The majority of people in this community can be trusted:*** this variable was coded 1 for yes and 0 for no. It is hypothesised to have a positive relationship with educational outcomes.

b) ***You consider yourself similar to most other households in this community:*** this variable was coded 1 for yes and 0 for no. It is hypothesised to have a positive relationship with educational outcomes.

c) ***The majority of people in this community generally get along with each other:*** this variable was coded 1 for yes and 0 for no. This variable is hypothesised to have a positive relationship with educational outcomes.

d) ***You feel you are a part of this community:*** this variable was coded 1 for yes and 0 for no. Again, the relationship is hypothesised to be positive.

e) ***The majority of people in this community would try to take advantage of you if they got the chance:*** this variable was coded 1 for yes and 0 for no. It is hypothesised to have a negative relationship with educational outcomes.

Based on the factor loadings presented in Table A1 in the Appendix, three social capital variables were generated for each individual:

- ***Factor 1:*** this factor groups the variables related with cognitive social capital.
- ***Factor 2:*** this factor groups the variables related with structural social capital, specifically citizenship.
- ***Factor 3:*** this factor groups the variables related with structural social capital, specifically the groups that the caregiver is a member of and the number of individuals or institutions that give her/him support.

All are hypothesised to have a positive association with educational outcomes.

The regressions present the results for all respondents and also for mothers' responses only. The justification for this is that results might differ depending on the social capital of the family member responding (for instance, the respondent may have provided information on social capital available for him or herself, not for the whole family). The analysis is performed first for the individual level only, adjusting then for the community level (Table 16).

Table 16: Coefficients in linear regressions for social capital variables, at individual and community level, for children's achievement[a]

	Whole sample (individual level only)			Whole sample (adding community variables)			Mother[b] (individual level only)			Mother (adding community variables)		
	Coef.	CI		Coef.	CI		Coef.	CI		Coef.	CI	
		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Social capital variables (individual level)												
Factor 1 (cognitive)	-0.035	-0.114	0.044	-0.045	-0.127	0.037	-0.043	-0.125	0.039	-0.051	-0.136	0.033
Factor 2 (structural – citizenship)	-0.065*	-0.136	0.006	-0.031	-0.120	0.058	-0.053	-0.133	0.027	-0.017	-0.123	0.090
Factor 3 (structural – membership)	0.024	-0.049	0.097	-0.006	-0.084	0.072	0.049	-0.033	0.131	0.027	-0.050	0.104
Social capital variables (community level)												
Factor 1 (cognitive)				0.133	-0.170	0.436				0.137	-0.187	0.461
Factor 2 (structural – citizenship)				-0.202	-0.549	0.145				-0.224	-0.611	0.163
Factor 3 (structural – membership)				0.177	-0.051	0.404				0.134	-0.098	0.366
Constant	-1.745***	-2.916	-0.573	-1.771***	-2.974	-0.567	-1.804***	-3.029	-0.579	-1.880***	-3.207	-0.554
Number of observations	463			463			420			420		
R-squared	0.36			0.37			0.34			0.35		
Number of communities	53			53			51			51		

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes

a The regression controlled for the following variables at the individual level: sex, grade, height-for-age, child works, crowding index, mother's education, mother's language, child's age when he/she first went to school, living with biological parents, parents help with child's homework at home, attended preschool, type of school, area and socio-economic status.

b The sample for these regressions only included observations for children whose *mothers* responded to the social capital section in the Young Lives questionnaire.

Only structural social capital (citizenship) was found to be significant at the individual level (at the ten per cent significance level). The effect disappeared when the community level was introduced, and was not seen at all when responses were confined to mothers. The models accounted for between 34 and 37 per cent of the variance in the dependent variable.

Table 17 presents the results for the model explaining the odds of a child being on-age at school. No variables were found significant at the individual level, but at the community level cognitive social capital had a positive relationship with being on-age, as predicted. This seems like a robust effect, given that it appears both for the whole sample and for the mothers as respondents only, and is significant at the five per cent level.

Table 17: Log-odds coefficients for social capital variables in logistic regression for on-age (=1) versus overage (=0) children[a]

	Whole sample (individual level only)			Whole sample (adding community variables)			Motherb (individual level only)			Mother (adding community variables)		
	Coef.	CI		Coef.	CI		Coef.	CI		Coef.	CI	
		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Social capital variables (individual level)												
Factor 1 (cognitive)	-0.039	-0.340	0.261	-0.158	-0.503	0.187	-0.011	-0.315	0.294	-0.118	-0.466	0.230
Factor 2 (structural – citizenship)	0.106	-0.177	0.390	0.173	-0.139	0.484	0.119	-0.177	0.415	0.193	-0.131	0.517
Factor 3 (structural – membership)	-0.154	-0.382	0.074	-0.161	-0.415	0.093	-0.114	-0.367	0.140	-0.127	-0.399	0.144
Social capital variables (community level)												
Factor 1 (cognitive)				0.682**	0.066	1.298				0.683**	0.038	1.328
Factor 2 (structural – citizenship)				-0.333	-0.824	0.158				-0.354	-0.885	0.177
Factor 3 (structural – membership)				-0.006	-0.466	0.453				0.029	-0.483	0.542
Constant	12.183***	7.426	16.940	12.195***	7.556	16.833	10.959***	6.417	15.502	10.984***	6.530	15.437
Number of observations	534			534			488			488		
Pseudo r–square	0.19			0.20			0.17			0.18		
Log likelihood	-208.21			-205.73			-196.39			-194.05		

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes

a The regression controlled for the following variables at the individual level: sex, height-for-age, child works, crowding index, mother's education, mother's language, child's age when he/she first went to school, living with biological parents, parents help with child's homework at home, attended preschool, type of school, area and socio-economic status.

b The sample for these regressions only included observations for children whose *mothers* responded to the social capital section in the Young Lives questionnaire.

4. Discussion

Education in Peru is indeed a source of great concern. In 2003, the Peruvian Government declared education to be in a state of emergency, due mostly to the fact that the Programme for International Student Assessment study in that year showed around 80 per cent of 15-year-olds in school in Peru were at the lowest or next to lowest reading level (ie they experienced difficulty interpreting even very simple texts). This result was in perfect agreement with the national evaluation carried out in 2001 and the international evaluation carried out by UNESCO (UMC and GRADE, 2001) which showed very poor achievement for students at different grade levels. Yet the success of the measures derived from this emergency is still unknown, more than two years after it was declared. To begin with, the emergency did not result in specific actions for over a year. Later, 2,500 schools in impoverished areas (100 in each of the 25 departments of Peru) were declared as priorities for intervention. The intervention consisted of training teachers on reading and mathematics techniques. It is unclear, though, whether the programme has indeed been implemented in all schools or has had any impact.

The results of this study show poor educational outcomes for many Peruvian students, who cannot master simple tasks and are behind the grade for their age. Many Peruvian students in second, third or fourth grade cannot solve a simple mathematics computation, or read or write a sentence. This finding is consistent among several studies. Most children in Peru do attend school, but it is obvious that they do not learn what is prescribed in the curriculum nor advance through the grade levels at the pace they should. The current study also shows that there is a clear negative association between educational achievement and poverty. Overall, rural students are poorer, and thus more prone to low achievement and falling behind their expected grade. Within urban and rural areas, there seem to be no strong differences between boys and girls with regard to enrolment or achievement in literacy, but there are some differences with numeracy, in favour of boys. Nevertheless, the main problems within education in Peru are low achievement by students in standardised evaluations and high inequality, associated with socio-economic indicators, for both boys and girls.

This paper analysed the relationship between structural and cognitive social capital and educational outcomes. The results do not support the hypothesis that there is a positive association between the quality and quantity of social capital available to the family and educational results, except for the association between cognitive social capital (at the community level) and being on-age in school. This means that communities with more quality in their social relationships (eg trust) are more likely to have children who are on-age in school. This result applies to how children are progressing at school but does not extend to children's achievement.

We will now return to the question of how social capital variables could affect educational outcomes. In Peru, parents may choose to send their children to any school (public or private), but private schools regarded as 'high quality' are also expensive (charging US$300 per month or more). Public schools are mostly free (except for a fee for the parents' association, around US$14 per year, which may be waived), but there are other costs in attending school, such as transportation, uniforms, extra books, English lessons, etc. Thus, when parents decide where to send their children to school, they tend to choose a school that fits the family's socio-economic characteristics. For instance, in urban areas some public schools may demand more work or additional resources from parents, and in rural areas usually

there is only one school the child may go to (the next school being several kilometres away, with no public transportation available). Overall, schools are run by teachers, with very little or no participation from the parents or parents' representatives. There tends to be less intra-school variability than inter-school variability, hence the strong association between the socio-economic status of the student and his/her educational outcomes. (For a review of the Peruvian literature on determinants of achievement in Peru see Cueto and Rodriguez, 2003.) A recent study (Agüero and Cueto, 2004) showed strong peer effects in achievement in Peruvian classrooms (peer effects were defined as the achievement results of any given student's classmates). This study suggests that the average achievement could be increased by mixing students of high and low educational achievement in the same classrooms.

In the Peruvian system there are no publicly provided programmes to help students coming from poorer educational environments, nor programmes targeted at students who, for whatever reason, fall behind their peers. In fact, students who fail a given course and want to take remedial coursework over the summer must pay for it. Some studies (eg Cueto, Ramirez and Leon, in press) suggest that the opportunities to learn inside the classroom are also marked by socio-economic differences (for instance, children from poorer families solve fewer mathematics exercises and receive less feedback from their teachers). The system is set up so that the poorer students are more prone to low achievement and eventually to dropping out of school. It has been dubbed a 'Darwinian' system, in that only the 'fittest' will survive by adapting to the environment in the schools, which are more or less inflexible institutions (Cueto, 2004). Thus it would seem that the possibilities of social capital variables having a marked influence on educational outcomes are, indeed, limited by the characteristics of an education system that is marked by low quality and high inequality. It must also be remembered that none of the community-based organisations, described earlier in this paper, has as one of its goals the improvement of educational outcomes for primary school aged children. The emergency in education declared by the Government in 2003 did not include the participation of community-based organisations or families in any way; it was designed as a purely educational intervention (ie focusing on teacher training). On the other hand, it might be that social capital does impact on some outcomes (eg nutrition, local security, daycare), but not on education, which may be perceived as a family, not a social, concern.

From our review of the literature of determinants of education in Peru and other Latin American countries (eg Murillo, 2003), interventions for improving the quality of the systems themselves are mostly coming from within the education systems, and the biggest challenges are about breaking the strong association between education level and socio-economic status. In different contexts, interventions aimed at improving the quality of teaching, educational materials, active learning time and school autonomy (under the leadership of the school principal) have proven effective. This is not to say that interventions at the community level, including social capital, could not have an impact on poor educational outcomes. However, it is hard to imagine that social capital *per se* would result in, say, an improvement in educational achievement among the students, if teachers did not also improve their teaching methods or increase the time spent on active learning within the classroom. For example, Cueto *et al* (2004) have shown that students from poorer contexts have fewer opportunities to learn mathematics than children in richer contexts (both in public schools). A longitudinal analysis showed that the achievement gap between poorer and richer students tended to increase over time, and opportunities to learn was an explanatory variable for higher achievement.

A number of issues to consider regarding the analysis performed here and the possibilities for future rounds of the Young Lives project are now explored.

1. The design in this first round was cross-sectional, not longitudinal

The covariates, therefore, might not have been sufficient to control for the poverty level of the family. In other words, it might be that families are indeed getting better educational outcomes because of their social capital, but the design and analysis was not strong enough to capture this.

2. Validity of the social capital questions in the questionnaire

The questions belong to the A-SCAT instrument, developed by the World Bank. However, the instrument was not used in its complete form. De Silva *et al* (2004b) carried out a validity study of the instrument and found that, in general, it presented acceptable face validity. However, some items might have been misunderstood. For instance, De Silva *et al* found that when asked about 'their community' respondents had different interpretations of what this meant. In addition, group membership might have been under-reported because people would not consider some of their groups to belong to the specific categories posed by the questionnaire. Social support may also have been underestimated because, when asked, people apparently thought mostly of economic support, although it was intended that emotional and instrumental support would also be considered. Finally the questions regarding trust were difficult for people to answer, because they were not willing to comment on members of their community whom they did not know personally. De Silva *et al* make several suggestions to be considered in future rounds of the study. It might be that objective questions, such as those posed by the instrument used, are not the best way to explore social capital – due to differences in interpretations – or at least that more qualitative methods should be used *with* the questionnaire to explore the importance of social capital in Peru. As mentioned in the literature review, the studies that did find associations between social capital and education in the USA did not apply the instrument used in the current study, but used limited definitions of social capital (eg presence of both biological parents at home).

3. The questionnaires did not include questions about social capital at school

There is international evidence showing the importance of schools in explaining educational outcomes, and there is some literature that suggests that social capital at school is important (Goddard, 2003). Social capital at school may be more relevant than family social capital, especially in earlier grades when the basic skills of reading, writing and mathematics are being learned.

4. There is no exploration of the mechanisms by which social capital could explain educational outcomes

Is it additional resources, family values, or the collaboration of community members in the education of local children that would explain educational outcomes? Based on the theoretical model presented by Harpham (2002) and others, we suggest performing qualitative interviews to explore how it is that social capital (especially social capital at the community level) might have an influence on educational outcomes, before embarking on further research on this issue.

From the results of a single study it would be careless to affirm that social capital should not be among the potentially beneficial policy interventions in education – especially since social capital appears to be

important in improving the quality of life of children in other countries, and given the importance of networking among poor communities in urban and rural Peru. We do suggest, however, that different instruments and designs be used, in addition to analysis based purely on objective data coming from questionnaires.

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Appendix: Factor analysis for derivation of summary social capital variables

The factor analysis describes the covariance relationship among all the social capital questions. The results of the factor analysis show that there are three factors describing different dimensions of social capital. The first factor describes cognitive social capital; the majority of loadings are positive except for the variable that is a negative item and it explains almost 23 per cent of the variance. The second factor groups together variables related to citizenship, and all the loadings are positive. The last factor brings together variables related to the number of groups or institutions of which the caregiver is a member and the support the caregiver receives from individuals or institutions. All the loadings are positive. For the rotation of the factors we used the varimax rotation, and the method of extraction used was principal components. The variance accounted for by the three factors was 57.42 per cent of the total variance. Table A1 presents the rotated loading factors higher than 0.4 or lower than -0.4 from the factor analysis and the variance accounted for by each factor.

Table A1: Estimated rotated factor loadings

	Components		
	Factor 1	**Factor 2**	**Factor 3**
You have joined with other community members to address a problem of common concern		**0.82**	
You have talked with a local authority or governmental organisation about problems in this community		**0.85**	
Can the majority of people in this community be trusted?	**0.71**		
Do the majority of people in this community generally get along with each other?	**0.76**		
Do you feel as though you are part of this community?	**0.61**		
Would the majority of people in this community try to take advantage of you if they got the chance?	**-0.61**		
Number of groups the respondent/primary caregiver participated in			**0.71**
Number of persons or institutions that give support to the household			**0.83**
Total variance explained	**22.92**	**18.97**	**15.53**

The Young Lives Partners

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Young Lives is an international longitudinal study of childhood poverty, taking place in Ethiopia, India, Peru and Vietnam, and funded by DFID. The project aims to improve our understanding of the causes and consequences of childhood poverty in the developing world by following the lives of a group of 8,000 children and their families over a 15-year period. Through the involvement of academic, government and NGO partners in the aforementioned countries, South Africa and the UK, the Young Lives project will highlight ways in which policy can be improved to more effectively tackle child poverty.

Although enrolment in primary schools in Peru is very high, more than half of primary school children are one or more grades below the norm for their age. Furthermore, evaluations have shown that, when tested, Peruvian school children score well below the norms expected for their age. Their scores are also below the average levels of countries with similar socio-economic circumstances. The role of social capital in explaining these findings has not been studied, although research in the USA has suggested positive associations between social capital and educational achievement. Social organisations that focus on childcare are one example of strong community networking resources in Peru. The Young Lives study offers an opportunity to investigate whether social capital is associated with educational progress and achievement.

The results of the study confirmed poor educational outcomes for many Peruvian school children. High proportions were unable to master simple tasks and were in a lower school grade than they should have been for their age group. There is a clear negative association between educational achievement and poverty. Overall, rural students are poorer and are thus more prone to low achievement (lower results in tests) and falling behind their expected grade. However, there seem to be no significant differences between boys and girls in these outcomes.

The results do not support the hypothesis of a positive association between the social capital available to the family and the educational outcomes of their children, except for the association between cognitive social capital (at the community level) and children being in the correct grade for their age. This means that communities which experience more quality in their social relationships (e.g. trust) are more likely to have children who are in the correct school grade for their age. This result applies to how children are *progressing* at school (whether they are in the correct grade for age) but does not extend to children's *achievement* (results in tests).

Perhaps the main interventions to improve the quality of the Peruvian education system are not to be found in the quality and quantity of social relationships within communities, but in improving educational inputs and processes within schools and breaking the strong association found between socio-economic status and educational performance. On the other hand, it might be that the types of instruments (objective questionnaires) and analysis (quantitative) used in this study do not offer the best way to capture the importance of social capital. If this is the case, then qualitative designs and analyses should be used to explore these issues.

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