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**The more educated, the more engaged?
An analysis of social capital and education**

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ABSTRACT: Social capital can be understood as network-based civic engagement, based on reciprocity and trust. This sociological approach, however, is faced with problems when assuming network-based social capital as a stock of capital. Any form of capital should have a positive economic payoff, should be measurable, and should define the mechanisms through which social capital can be accumulated and depreciated (Solow, 1995). To meet these criteria, we refer to social capital as “persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities” (Guiso et al., 2010). In this study, we assess the role of education as a potential accumulation mechanism of civic awareness and social trust. We implement a pseudo-panel data approach to identify, specifically in Italy, the effect of education on social capital. The findings show that participation in education is likely to foster higher levels of social capital, understood as a culture-based concept of civic engagement. In Italy, we also observe heterogeneous effects depending on the geographical location along the north-south axis. The Islands and the South, geographical areas in which levels of social capital are typically lower, are the areas where education shows a higher impact on civic awareness and social trust. We discuss and substantiate the results in terms of education policy implications.

JEL Codes: C21, I26, I21, I24, Z13

Keywords: Returns to Education; Civic participation; Social capital; Dynamic models with Repeated Cross-Sectional data

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INTRODUCTION

Social capital has been mainly approached in the social sciences from two distinct perspectives: network-based and culture-based. Bourdieu was the first author to systematically define a network-based social capital as those resources linked to possession of durable networks of relationships. Such relationships were defined as more or less institutionalised and were characterised by mutual acquaintance and recognition. The individual membership to a group would benefit the individual through collective support, since the members are defined by useful and permanent bounds (Bourdieu, 1986). From this approach, networks are understood as social capital to the extent that they are able to mobilise resources – that is, social capital as networks of symbolic and material exchange. In contrast to Putnam's network-based approach (Putnam, 1995, 2000), Bourdieu's definition was intended to explain the legitimation mechanisms for social differentiation and reproduction of the ruling social class. This is the reason why the social capital concept, according to the sociology of struggle, is linked to fundamental social powers such as economic, cultural and symbolic capital, to the extent that social capital is a resource unevenly distributed across social groups or networks, creating and reinforcing asymmetrical social relationships.

Another network-based approach understands social capital as civic engagement based on reciprocity and trust (Gittel & Vidal, 1998; Putnam, 1995, 2000; Woolcock & Narayan, 2000). In a civic community, citizens have a high civic engagement, are politically equal and are capable of solidarity, trust and tolerance, while giving a strong boost to the associations in public life (Putnam, 1993). Here, social capital is understood as a collective *stock* and refers to the moral obligations and norms, social values (such as trust) and networks (such as voluntary associations) that enable people to act collectively (Woolcock & Narayan, 2000) in order to benefit collectively (Portes, 2000). This last feature of collective stock – social capital as a feature of communities – and collective benefits means this conception diverges from the aforementioned sociological conception, according to which ties are established to yield benefits to individuals (Coleman, 1988; Portes, 2000). According to Putnam, the collective accumulation of social capital leads to higher levels of political integration and economic development (Putnam, 1993). Although, here, social capital is a network-based conception, it has a strong cultural base since it is basically understood as a civic culture that can be collectively used (Trigilia, 2011).

There are two main types of social capital according to Putnam's view: the *bonding social capital*, which is established between members of a community with a homogeneous

composition; and the *bridging social capital*, which is set amongst different social groups or socially heterogeneous groups. In both forms of social capital, the networks and the associated norms of reciprocity are valuable in terms of trust, solidarity and mutual support. Both society-based and community-based networks may provide resources to support the most disadvantaged members or groups. Nonetheless, network-based social capital may have negative consequences as well. For instance, *bonding* social capital is potentially *exclusive*, since socially homogeneous groups have self-referenced interests which may diverge from those held by other groups of the same society, or from those of society as a whole. In these cases, this form of social capital may be detrimental to the *bridging* form which by definition is concerned with solidarity, mutual respect and cooperation and values related to the welfare of the society as a whole. Indeed, as pointed out by Portes (1998), the strong ties which bring benefits to members of a group generally restrict access to outsiders.

This definition differs, in turn, with the conception of the sociologist Coleman, according to whom social capital may be approached as ‘power for’, more than the Bourdieu’s ‘power over’ (Smith & Kulynych, 2002: 158). Coleman’s work is particularly interesting as he presents his network-based conception of social capital as one way of introducing social structure into the rational action paradigm or, in other words, as a way of using the economists’ principle of rational action in the analysis of social systems (Coleman, 1988). For Coleman, social capital is defined by its function and is therefore an instrumental conception. There is social capital to the extent that any aspect of the social structure (obligations and expectations, information channels, and social norms) is valuable for actors, as these can be used as resources to achieve their interests (Coleman, 1988). In the same vein as Putnam, and in contrast to Bourdieu, Coleman argues that social capital has mainly positive connotations, since horizontal associations between people may foster cooperation for the mutual benefit of the community. At the same time, he acknowledges negative connotations to the extent that the definition of social capital includes vertical relationships that may be characterized by unequal power distribution.

The potential negative externalities of the network-based approaches to social capital is one of the factors that cast doubt on the suitability of the sociological concept, especially among economists. In fact, Solow (1995) argues that any form of capital should have a positive economic payoff. Moreover, Solow argues that the sociological definition of social capital, to be considered as a stock of capital, should be measurable and should define the mechanisms through which social capital can be accumulated and depreciated. To meet these criteria,

Guiso et al., (2006, 2010) propose another definition of social capital, in this case as *civic capital*: “those persistent and shared beliefs and values that help a group overcome the *free rider* problem in the pursuit of socially valuable activities”.

The authors do not refer to a network-based civic capital but to a culture-based one, where social capital is about values and beliefs which are shared by a community and persist over time. This approach to civic capital is related to all types of economic interactions and not restricted to political participation (Guiso et al., 2010), as in the case of Putnam. The authors point out that relevant direct measures of civic capital may identify values that induce people to be against actions that give private benefits at high social costs. Specifically, they refer to opinions about *free riding* and other behaviours which deviate from the public good (evasion or avoidance of tax, littering etc.). In fact, as mentioned earlier, no form of social capital should have a negative economic pay-off.

In this paper, we adopt the culture-based perspective in which we understand social capital as an accumulated stock of civic engagement, values and beliefs. However, we also endorse the need, argued by De Blasio et al. (2014), to better understand social behaviour by taking into account the dichotomy between *universalism* and *particularism*. In the same vein but unlike Putnam’s network-based distinction between *bonding* and *bridging* social capital, this dichotomy cuts across both the network-based and the values-related dimensions of social capital (Paccagnella & Sestito, 2014). As in the case of De Blasio et al., (2014), to measure both universalism and particularism across different social capital dimensions we rely on the definition proposed by Baumann (2007), who points out how networks should be developed and maintained to make social capital useful for society and the democracy as a whole: “A group is all the more particularistic, the more its networks, its norms of reciprocity and trust and its aims are confined to the members of the group, whereas a group is all the more universalistic, the more its networks, its norms of reciprocity and trust and its aims transgress the confines of the group and encompass other citizens and groups in a society” (Baumann, 2007: 173).

EDUCATION AND CIVIC CAPITAL-RELATED FACTORS

Numerous studies have confirmed the association between different aspects of the so-called (civic) social capital and the investment in human capital, especially regarding formal education. For example, in the field of political science the relationship between education

and several factors related to political engagement, such as political participation or voter turnout (Wolfinger & Rosenstone, 1980) has been widely discussed. In this vein in recent years, there has been a series of studies aimed to empirically test this relationship (Sondheimer & Green, 2010; Dee, 2004; Milligan et al., 2004; Helliwell & Putnam, 2007; Sturgis et al., 2007). These studies have generally shown significant and robust effects of educational attainment on the values of free speech (Dee, 2004), voter turnout (Dee, 2004; Milligan et al., 2004; Sondheimer & Green, 2010), and other variables of civic knowledge (Dee, 2004). Much research has also been devoted to analysing the relationship between education and social capital, understood as trust in others. This research has confirmed how education is one of the most important predictors of tolerance and social trust (Helliwell & Putnam, 2007; Alesina & La Ferrara, 2000; Sturgis et al., 2007): the higher the average level of education in one's environment, the higher the individual's trust in others (Campbell, 2006). Furthermore, this incidence of education on trust does not seem to differ depending on the cultural contexts but holds across countries (Huang et al., 2009; Albanese & De Blasio, 2014).

Research literature has explored the possible channels through which education impacts on political participation, civic knowledge and engagement, and trust and solidarity. Education implies the acquisition of skills required to manage both knowledge and relationships with people (Glaeser et al., 2007). The most obvious channel is the direct teaching of the fundamental values of democracy and pluralism, such as freedom of speech and the separation of powers (Dee, 2004). Education contributes to the cognitive abilities necessary to process complex political information, which in turn promotes decision making and allows the circumvention of technological and administrative obstacles to civic participation. In addition, education can be key to increasing the perceived benefits of participation as well as to shaping individual preferences towards civic activities (Glaeser et al., 2007; Dee, 2004). Education can also be essential to the extent that it teaches people behavioural norms for interaction in such a way that the discussions are more informative and not based on conflict (Glaeser et al., 2007). In other words, an education based on the Dewey's *learning by doing*, which aims to influence student beliefs about cooperation and involvement in civic life by means of collaborative and progressive teaching practices, such as working on projects altogether (Algan et al. 2011).

RESEARCH QUESTIONS

Research in the international context has mainly focused on the association between social capital and economic development and growth (Knack & Keefer, 1997; Algan & Cahuc, 2010; Routledge & von Amsberg, 2003). In Italy, for example, research on social capital has been focused on analysing whether regional disparities in terms of economic development are due to unevenly distributed allocations of social capital (Guiso et al., 2004; Tabellini, 2009). Little research has been done, however, on the association between investment in education and social capital, that is, on education as a predictor of civic engagement and social involvement. The main objective of this paper is to explore the role of the investment in human capital to create and accumulate stocks of social capital. We therefore hypothesise that investment in education contributes to the long term sustainability of aggregated levels of social capital. Here, social capital is defined as a non-cognitive outcome and understood as the set of beliefs and values socially shared that foster social cooperation, such as political participation, civic engagement and awareness, social trust and trust in institutions, which are found to explain long term persistence (Guiso et al., 2007).

DATA AND METHOD

In this paper we assume that education, which is our main explanatory variable, is likely to be endogenous to civic-based social capital as well as correlated to unobserved, omitted variables in the error term. To overcome such limitations we perform a within-country analysis using dynamic models with repeated cross-sectional data.

Data

We use data from the Italian Multipurpose Survey on Households (Multiscopo in Italian), which collects fundamental information on individual and household daily life. The survey provides information on the citizens' habits and the problems they face in everyday life. In the questionnaires, the thematic areas are on different social aspects relating to the quality of life of the individual such as, the degree of satisfaction of their conditions, their economic situation and the area in which they live, among others. School, work, family and social life, spare time, political and social participation, health, life style, access to the services are all investigated. The survey design is partly single-stage and partly two-stage sampling with stratification of primary sampling unit.

Identification strategy: dynamic models with repeated cross-sectional data

The identification approach uses dynamic models with repeated cross-sectional data (RCS), in which we link waves from the Italian Multipurpose Survey on Households. The use of methods for the estimation of dynamic models with RCS data is important to avoid the problem of lack of panel data in some countries. RCS suffer less from typical statistical problems as attrition and nonresponse are usually larger than the panel data, both in number of individuals or households and in the time period that they span (Deaton, 1985; Verbeek, 2008). Deaton (1985), a pioneer of this methodology, proposed estimating fixed effects models using groups with fixed membership (e.g. age cohorts, gender, occupation). Thus, he proposed grouping individuals with common characteristics into cohorts, and using the averages within cohorts as observations in a pseudo panel (Deaton, 1985). Moffitt (1993) extended the proposal to dynamic models, and demonstrated that the parameters of such models can be consistently estimated with the imposition of certain restrictions. For more recent theoretical papers, readers may be referred to McKenzie (2004), Verbeek & Vella (2005), Inoue (2008), Verbeek (2008), Martinez et al., (2013) and Juodis (2015).

We investigate the role of education as determinant of social capital in Italy using proxies of universalistic civic awareness. In order to deal with the cumulative effect of social capital, we employ a pseudo-panel approach to link social attitudes and beliefs in two moments of time to identify variations in current stocks of social capital according to variations in the stocks of human capital. This approach avoids the two main drawbacks of our databases: the high probability of reverse causation in cross-sectional analyses could be slanted, and the nonexistence of a longitudinal database in the Italian case. With this technique we aim to mitigate such identification problems.

As seen in Moffitt (1993) and Verbeek (2008), and as has already been applied in other studies (De Simone, 2013), we define autoregressive models of social capital with repeated cross-sections. The autoregressive linear model of social capital follows this type:

$$Y_{i,t} = \beta Y_{i,t-1} + \theta edu_{i,t} + \alpha X_{i,t} + \delta Z_i + \varepsilon_{i,t} \quad [1]$$

where $Y_{i,t}$ denotes the proxy of social capital of individual i at the moment t and $Y_{i,t-1}$ is the social capital variable of individuals in cross-section t at an anterior stage, which is not observed in the data. Moreover, $edu_{i,t}$ is the educational level of individual, $X_{i,t}$ is a set of individual time-variant variables at time t , while Z_i denote a set of individual time-invariant

determinants and $\varepsilon_{i,t}$ is a residual component, including an intercept term.

According to Moffitt (1993) and Verbeek (2008), as the true value of $Y_{i,t-1}$ is not observed in cross-section t , we estimate a predicted variable $\hat{Y}_{i,t-1}$ with information of other individuals observed in $t-1$. In fact, autoregressive models with RCS data can be estimated with methods similar to the IV methods (Moffitt, 1993). Specifically, we estimate it considering an orthogonal projection of $Y_{i,t}$ upon the set of time-invariant variables included in vector Z_i :

$$\hat{Y}_{i,t-1} = f(\delta Z_i)$$

We then insert this predicted variable $\hat{Y}_{i,t-1}$ into the original equation [1]:

$$Y_{i,t} = \beta \hat{Y}_{i,t-1} + \theta edu_{i,t} + \alpha X_{i,t} + \delta Z_i + u_{i,t} \quad [2]$$

where

$$u_{i,t} = \varepsilon_{i,t} + \beta(Y_{i,t-1} - \hat{Y}_{i,t-1}) \quad [3]$$

We apply a parametric approach for merging the Italian Multipurpose Survey on Households (Multiscopo in Italian) 2007 and 2008 results to the Multiscopo 2011 database. Similar approaches have been used in other fields of study. For instance, two-sample two-stage least squares (TSTSLS) methodology has been widely used in the intergenerational mobility literature.¹

Indicators of social capital, human capital, and explanatory factors

As we said previously, in equations [1] and [2] $Y_{i,t}$ denotes several proxies of social capital for individual i at wave t . As a first approach to social capital, and following Paccagnella and Sestito (2014), we distinguish between universalistic and particularistic values. Universalistic social values typically refers to behaviours aimed at the good of the society as a whole, while particularistic social values would be basically restricted to traditional social structures, like family or the local community. Universalistic civic awareness is approached with a continuous variable related to the frequency with which people get information about politics² (Table 1). Along with Woolcock & Narayan (2000), Putnam (1995), and Baumann (2007), the second approach also refers to the universalistic social capital but is specifically related to social trust. Here, we talk about trust which is not confined to the members of the

¹ Choi et al. (2016) and Jerrim et al. (2016) provide a recent review.

² We use the inverted scale of the question related to the frequency with which people get information about politics (never, a few times a year, a few times a month, once a week, a few days a week, and every day).

own group but embraces other citizens and groups in a society. We use a composite indicator of social trust which is calculated with the first principal component (PCA) of two variables of trust; unknown people, and neighbours³.

As to the explanatory factors, we distinguish between time-variant and time-invariant variables. In the set of individual time-variant variables, we include the educational attainment in formal schooling of individuals (Table 1) as a proxy of human capital. It has been coded in 3 categories: primary and lower secondary education (ISCED 0/1/2), upper secondary (ISCED 3/4), and tertiary education (ISCED 5/6). We then include the vector $X_{i,t}$ of time-variant variables, which includes variables that are likely to be associated with civicness-related values and beliefs, such as the self-perception of criminality risk in the neighbourhood, and the level of internet access at home. We use the time-invariant factors included in the vector Z_i to predict backward the stocks of social capital in former waves. In this vector, we include year of birth, gender, chronic disease, frequency of church attendance and region of residence. Moreover, we include the highest educational level of parents. Such indicator of sociocultural background is fundamental in our research as it is amongst the main factors explaining intergenerational transmission of social values and beliefs.

After selecting individuals between 16 and 34 years of age in 2007, the available databases present few problems of missing values. No variables with missing values above 5% are observed. Moreover, subsequent estimates indicate that the loss of information is always less than 13%. In this case, we do not apply any imputation technique.

RESULTS

Descriptive results

The descriptive analysis of the available databases of the Italian Multipurpose Survey on Households (2007, 2008, 2009, 2010 and 2011) shows some transversal characteristics (see Table 1). First, time-invariant factors remain relatively stable over the time period in all variables: gender, chronic disease, the frequency of church attendance, the region of residence, and the highest educational level of parents.

Only the variable of chronic diseases varies significantly from 2007 to 2008 (6 percentage

³ The composite indicator is calculated from the following question: “Imagine having lost a wallet containing money and documents which is found by someone. What do you think the likelihood is of it being returned with all the money in it if it was found by”: *a neighbour* (most likely / fairly likely / unlikely / very unlikely), and by *unknown people* (most likely / fairly likely / unlikely / very unlikely).

points), although it remains unchanged until 2011. In this research, it becomes particularly relevant to look at time-invariant variables related to the family background of individuals. For instance, we look at the educational profile of parents, among whom there is a predominance of parents with lower secondary (35%-37%) and upper secondary education (34%-36%). There is also a significant proportion of parents with primary education (16%-18%), while parents with higher education qualifications account for only 12% to 14% of the sample. We have also considered the church attendance as a time-invariant variable. Although we can observe that the number of people who never go to church or go a few times a year increases while the number of people who attend church more frequently decreases, such variations are rather limited, ranging between 2% and 4%.

As regards the time-variant factors, our main explanatory variable is the educational level of individuals who were born between 1973 and 1991, which shows a significantly increasing trend from 2007 to 2011. In that period, individuals with both upper secondary and tertiary education increase by 12% and 5%, respectively, while people with primary and lower secondary decrease by 17%. We can also notice how the Internet access at home has increased considerably, from 68% to 84% across all the households. With regard to the perception of insecurity in the local area where people live, we observe two complementary trends. While the perception of total absence of crime risk increases by 8.4% (from 28.5% to 36.9%), the perception of high risk decreases by 5.4% (from 23.9% to 18.5%).

Table 1. Descriptive statistics

VARIABLES	2007					2008					2009				
	N	mean	sd	min	max	N	mean	sd	min	max	N	mean	sd	min	max
Universalistic civic awareness	6,816	3.858	1.946	1	6	6,375	3.850	1.953	1	6	5,895	3.883	1.922	1	6
Particularistic civic awareness	7,037	-0.715	1.068	-3	3	6,567	-0.641	1.046	-3	3	6,123	-0.720	1.059	-3	3
Educational level															
ISCED 1/2 - Primary and lower secondary	7,037	0.382	0.486	0	1	6,567	0.354	0.478	0	1	6,123	0.291	0.454	0	1
ISCED 3/4 - Upper secondary education	7,037	0.485	0.500	0	1	6,567	0.511	0.500	0	1	6,123	0.547	0.498	0	1
ISCED 5/6 - Tertiary education	7,037	0.133	0.340	0	1	6,567	0.135	0.341	0	1	6,123	0.162	0.368	0	1
Age	7,037	23.61	5.164	16	34	6,567	24.38	5.163	17	35	6,123	25.16	5.064	18	36
Year of birth	7,037	1,983	5.164	1,973	1,991	6,567	1,984	5.163	1,973	1,991	6,123	1,984	5.064	1,973	1,991
Female	7,037	0.458	0.498	0	1	6,567	0.452	0.498	0	1	6,123	0.442	0.497	0	1
Chronic disease	6,701	0.0198	0.139	0	1	6,348	0.0813	0.273	0	1	5,900	0.0802	0.272	0	1
Highest level of education of parents															
ISCED 1 - Primary education	7,037	0.176	0.381	0	1	6,567	0.171	0.377	0	1	6,123	0.165	0.371	0	1
ISCED 2 - Lower secondary education	7,037	0.351	0.477	0	1	6,567	0.368	0.482	0	1	6,123	0.353	0.478	0	1
ISCED 3 - Upper secondary education	7,037	0.352	0.478	0	1	6,567	0.342	0.475	0	1	6,123	0.357	0.479	0	1
ISCED 5/6 - Tertiary education	7,037	0.121	0.326	0	1	6,567	0.118	0.323	0	1	6,123	0.125	0.330	0	1
Internet access at home	6,973	0.682	0.466	0	1	6,537	0.705	0.456	0	1	6,089	0.778	0.415	0	1
Frequency of church attendance															
Never	6,799	0.242	0.428	0	1	6,350	0.247	0.431	0	1	5,886	0.255	0.436	0	1
A few times a year	6,799	0.397	0.489	0	1	6,350	0.410	0.492	0	1	5,886	0.407	0.491	0	1
A few times a month	6,799	0.310	0.463	0	1	6,350	0.297	0.457	0	1	5,886	0.290	0.454	0	1
A few times a week and/or everyday	6,799	0.0503	0.219	0	1	6,350	0.0469	0.212	0	1	5,886	0.0474	0.213	0	1
Fear of crime in the neighbourhood															
No fear	6,760	0.285	0.451	0	1	6,291	0.259	0.438	0	1	5,903	0.333	0.471	0	1
Low	6,760	0.396	0.489	0	1	6,291	0.398	0.489	0	1	5,903	0.388	0.487	0	1
High	6,760	0.239	0.426	0	1	6,291	0.246	0.431	0	1	5,903	0.199	0.399	0	1
Very high	6,760	0.0802	0.272	0	1	6,291	0.0978	0.297	0	1	5,903	0.0805	0.272	0	1
Area of residence															
North-West	7,037	0.171	0.376	0	1	6,567	0.172	0.378	0	1	6,123	0.175	0.380	0	1
North-East	7,037	0.179	0.383	0	1	6,567	0.175	0.380	0	1	6,123	0.163	0.370	0	1
Centre	7,037	0.164	0.370	0	1	6,567	0.161	0.368	0	1	6,123	0.167	0.373	0	1
South	7,037	0.360	0.480	0	1	6,567	0.364	0.481	0	1	6,123	0.369	0.483	0	1
Islands	7,037	0.126	0.332	0	1	6,567	0.127	0.333	0	1	6,123	0.126	0.332	0	1

Source: Italian Multipurpose Survey on Households

Table 1. Descriptive statistics

VARIABLES	2010					2011				
	N	mean	sd	min	max	N	mean	sd	min	max
Universalistic civic awareness	5,413	3.789	1.913	1	6	5,119	4.100	1.891	1	6
Particularistic civic awareness	5,616	-0.661	1.038	-3	3	5,275	-0.689	1.068	-3	3
Trust unknown people	5,375	1.582	0.699	1	4	5,100	1.583	0.710	1	4
Trust neighbour	5,392	2.902	0.957	1	4	5,105	2.915	0.938	1	4
Trust (1st principal component)	5,373	-0.076	1.101	-2.03	3.08	5,098	-0.045	1.110	-2.05	3.14
Educational level										
ISCED 1/2 - Primary and lower secondary	5,616	0.228	0.420	0	1	5,275	0.211	0.408	0	1
ISCED 3/4 - Upper secondary education	5,616	0.603	0.489	0	1	5,275	0.606	0.489	0	1
ISCED 5/6 - Tertiary education	5,616	0.169	0.375	0	1	5,275	0.183	0.387	0	1
Age	5,616	25.89	5.027	19	37	5,275	26.78	5.118	20	38
Year of birth	5,616	1,984	5.027	1,973	1,991	5,275	1,984	5.118	1,973	1,991
Female	5,616	0.446	0.497	0	1	5,275	0.442	0.497	0	1
Chronic disease	5,389	0.083	0.275	0	1	5,103	0.086	0.281	0	1
Highest level of education of parents										
ISCED 1 - Primary education	5,616	0.156	0.363	0	1	5,275	0.161	0.367	0	1
ISCED 2 - Lower secondary education	5,616	0.345	0.475	0	1	5,275	0.371	0.483	0	1
ISCED 3 - Upper secondary education	5,616	0.360	0.480	0	1	5,275	0.346	0.476	0	1
ISCED 5/6 - Tertiary education	5,616	0.138	0.345	0	1	5,275	0.123	0.328	0	1
Internet access at home	5,608	0.823	0.382	0	1	5,274	0.841	0.366	0	1
Frequency of church attendance										
Never	5,417	0.254	0.436	0	1	5,119	0.265	0.442	0	1
A few times a year	5,417	0.425	0.494	0	1	5,119	0.431	0.495	0	1
A few times a month	5,417	0.274	0.446	0	1	5,119	0.266	0.442	0	1
A few times a week and/or everyday	5,417	0.047	0.211	0	1	5,119	0.037	0.190	0	1
Fear of crime in the neighbourhood										
No fear	5,420	0.356	0.479	0	1	5,085	0.369	0.483	0	1
Low	5,420	0.400	0.490	0	1	5,085	0.386	0.487	0	1
High	5,420	0.182	0.386	0	1	5,085	0.185	0.388	0	1
Very high	5,420	0.061	0.240	0	1	5,085	0.060	0.237	0	1
Area of residence										
North-West	5,616	0.173	0.378	0	1	5,275	0.163	0.369	0	1
North-East	5,616	0.172	0.377	0	1	5,275	0.164	0.370	0	1
Centre	5,616	0.173	0.378	0	1	5,275	0.186	0.389	0	1
South	5,616	0.355	0.479	0	1	5,275	0.360	0.480	0	1
Islands	5,616	0.128	0.334	0	1	5,275	0.128	0.334	0	1

Source: Italian Multipurpose Survey on Households

First step estimations: prediction of past stocks of social capital

In this research, we want to investigate to what extent the educational time-variant factor is associated with social capital, once past stocks of social capital are accounted for. Since there are no longitudinal datasets available, in the case of the proxy of universalistic civic awareness we estimate the predicted values of social capital for individuals in 2011 on the basis of time-invariant information of other individuals four, three and two years before (in years 2007, 2008 and 2009). Conversely, in the case of social trust, we estimate the predicted values for individuals in 2011 using information of individuals in 2010.

As regards the models of universalistic civic awareness (columns 1 to 3 of Table 2), first results show a significant association between all the variables included in the first step estimations and the stocks of universalistic social capital. Having a chronic disease is the only exception, which shows an erratic behaviour. Both year of birth and gender (being female) are negatively associated with social capital proxies, which means that girls and younger individuals tend to show lower levels of social capital. The main variable of family background is strongly associated with the universalistic social capital proxy. The coefficient of the parents' highest level of education indicates that the more educated the parents, the more social capital individuals show.

With regard to the models of social trust (column 1 of Table 3), and in contrast with the civic awareness proxy, the first step model shows that only two variables are associated with social trust. Living in a family in which parents have a high level of education is associated with having higher levels of trust in people. Also, people who attend church more frequently seem to report higher levels of trust. Nevertheless, social trust does not show a significant association with year of birth, gender or having health problems.

Since we have only accounted for time-invariant variables and the fixed effect of the geographical area of residence, these models only explain a small part of the variation of individuals' social capital stocks. In fact, models only explain between 6% and 10% of the total variation. Much heterogeneity remains unobserved, which could generate serious bias problems for the final estimates. This problem should be addressed in the second step of our analyses.

Table 2. Education and social capital: universalistic civic awareness

	(1) 2007	(2) 2008	(3) 2009	(4) 2011	(5) 2011	(6) 2011	(7) 2011	(8) 2011	(9) 2011
Educational level (ref. ISCED 1/2)									
ISCED 3/4 - Upper secondary education				0.772*** (0.108)	0.553 (0.268)	0.772*** (0.108)	0.553 (0.268)	0.772*** (0.108)	0.553 (0.268)
ISCED 5/6 - Tertiary education				1.152*** (0.069)	0.640* (0.260)	1.152*** (0.069)	0.640* (0.260)	1.152*** (0.069)	0.640* (0.260)
Estimated level of social capital (2007)				0.174*** (0.020)	-0.751 (0.537)				
Estimated level of social capital (2008)						0.278*** (0.031)	-1.003 (0.718)		
Estimated level of social capital (2009)								0.507*** (0.057)	-1.275 (0.913)
Year of birth	-0.083*** (0.008)	-0.076*** (0.007)	-0.059*** (0.005)	-0.030* (0.011)	-0.096 (0.056)	-0.023 (0.012)	-0.110 (0.065)	-0.014 (0.013)	-0.109 (0.064)
Female	-0.242** (0.076)	-0.329*** (0.066)	-0.301*** (0.038)	-0.288*** (0.040)	-0.476* (0.189)	-0.239*** (0.045)	-0.624* (0.272)	-0.178** (0.051)	-0.678* (0.306)
Chronic disease	-0.892*** (0.118)	-0.055 (0.064)	0.071 (0.107)	-0.011 (0.068)	-0.776 (0.365)	-0.152 (0.072)	-0.161 (0.337)	-0.203* (0.075)	-0.015 (0.407)
Highest level of education of parents (ref. ISCED 1)									
ISCED 2 - Lower secondary education	0.330*** (0.044)	0.363*** (0.061)	0.357*** (0.061)	0.079 (0.088)	0.632 (0.610)	0.036 (0.090)	0.748 (0.679)	-0.044 (0.094)	0.839 (0.734)
ISCED 3 - Upper secondary education	0.720*** (0.064)	0.903*** (0.097)	0.805*** (0.134)	0.317** (0.069)	0.962 (0.501)	0.191* (0.079)	1.328 (0.746)	0.034 (0.092)	1.448 (0.829)
ISCED 5/6 - Tertiary education	1.230*** (0.055)	1.161*** (0.100)	0.926*** (0.120)	0.527*** (0.071)	4.085** (1.118)	0.419*** (0.079)	4.510** (1.418)	0.273** (0.091)	4.587** (1.472)
Frequency of church attendance (ref. Never)									
A few times a year	0.231*** (0.045)	0.247** (0.079)	0.110* (0.042)	0.073 (0.073)	0.397 (0.295)	0.045 (0.073)	0.471 (0.322)	0.058 (0.072)	0.363 (0.285)
A few times a month	0.260*** (0.034)	0.270** (0.061)	0.234** (0.052)	-0.045 (0.052)	0.346 (0.497)	-0.075 (0.051)	0.421 (0.522)	-0.118* (0.050)	0.448 (0.532)
A few times a week and/or everyday	0.239*** (0.046)	0.084 (0.198)	0.219 (0.206)	0.169 (0.089)	1.031 (0.955)	0.188* (0.088)	0.937 (0.925)	0.100 (0.094)	1.131 (0.990)
Internet access at home				0.564*** (0.086)	-1.210** (0.276)	0.564*** (0.086)	-1.210** (0.276)	0.564*** (0.086)	-1.210** (0.276)
Fear of crime in the neighbourhood (ref. No fear)									
Low				0.196** (0.054)	-1.838** (0.445)	0.196** (0.054)	-1.838** (0.445)	0.196** (0.054)	-1.838** (0.445)
High				0.255** (0.068)	-3.991*** (0.670)	0.255** (0.068)	-3.991*** (0.670)	0.255** (0.068)	-3.991*** (0.670)
Very high				0.151 (0.091)	-1.770** (0.408)	0.151 (0.091)	-1.770** (0.408)	0.151 (0.091)	-1.770** (0.408)
Area of residence fixed effects	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No
Family fixed effects	No	No	No	No	Yes	No	Yes	No	Yes
Observations	6480	6290	5812	4868	4868	4868	4868	4868	4868
R ²	0.099	0.091	0.061	0.139	0.881	0.139	0.881	0.139	0.881

Source: Italian Multipurpose Survey on Households. Robust standard errors clustered by area of residence in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3. Education and social capital: composite indicator of social trust (trust unknown people and neighbours)

	(1) 2010	(2) 2011	(3) 2011
Educational level (ref. ISCED 1/2)			
ISCED 3/4 - Upper secondary education		0.152*** (0.027)	0.085 (0.073)
ISCED 5/6 - Tertiary education		0.325*** (0.069)	0.286* (0.132)
Estimated level of social capital (2010)		1.139*** (0.013)	8.225*** (0.537)
Year of birth	-0.004 (0.004)	0.004 (0.003)	0.043** (0.014)
Female	-0.062 (0.035)	-0.012 (0.025)	0.492** (0.111)
Chronic disease	-0.026 (0.049)	0.030 (0.043)	0.181 (0.211)
Highest level of education of parents (ref. ISCED 1)			
ISCED 2 - Lower secondary education	0.053 (0.062)	-0.021 (0.027)	-2.859*** (0.403)
ISCED 3 - Upper secondary education	0.184* (0.072)	-0.169*** (0.029)	-1.182** (0.289)
ISCED 5/6 - Tertiary education	0.316*** (0.043)	-0.234** (0.072)	-4.995*** (0.452)
Frequency of church attendance (ref. Never)			
A few times a year	0.090 (0.045)	-0.021 (0.043)	-0.550*** (0.102)
A few times a month	0.238* (0.101)	-0.078 (0.048)	-1.748*** (0.231)
A few times a week and/or everyday	0.310** (0.108)	0.059 (0.042)	-2.311*** (0.138)
Internet access at home		0.160** (0.053)	0.691** (0.169)
Fear of crime in the neighbourhood (ref. No fear)			
Low		-0.095** (0.028)	-1.494*** (0.239)
High		-0.253*** (0.018)	-0.618 (0.368)
Very high		-0.200* (0.073)	-0.531* (0.246)
Area of residence fixed effects	Yes	Yes	No
Family fixed effects	No	No	Yes
Observations	5309	4851	4851
R ²	0.058	0.065	0.877

Source: Italian Multipurpose Survey on Households. Robust standard errors clustered by area of residence in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Second step estimations: education and social capital

In columns 4 to 9 of Table 2, and in columns 2 and 3 of Table 3, we show the results of dynamic models in which we include the predicted values of past stocks of social capital of individuals in 2011, along with time-variant factors. Specifically, in columns 4, 6, and 8 (Table 2), and in column 2 (Table 3), we show dynamic models with time-variant controls

and the area of residence fixed effects, in order to account for the abovementioned territorial divide. All these models indicate a significant association between the estimated level of social capital and the current stocks of social capital. This is true for both proxies of social capital; the universalistic civic awareness and the social trust proxy. Once these *entry levels* are accounted for, we can confirm that variations of the educational level of individuals are strongly associated with their levels of social capital.

Nevertheless, these models only explain between 6% and 14% of the social capital variance. As we said, much heterogeneity remains unobserved, which is likely to lead to problems of omitted variable bias. A way to capture a large part of the unobserved variation is by introducing a family fixed effect, which can potentially account for most of the social capital variation. Certainly, the family fixed effect is a restrictive test of robustness and therefore is expected to allow us to ascertain and confirm the extent to which social capital is effectively associated with education, once the influence of contextual variables is accounted for.

As expected, the models in which we include the family fixed effect are able to account for 88% of the total variation. This means that the fixed effect absorbs any influence of the accumulation mechanisms of social capital that depends on the family background and context. For instance, it is most likely to absorb any effect of intergenerational transmission models of social values and beliefs. Taking into account such restrictive conditions for estimation of model parameters, it is relevant to confirm whether or not the educational capital has an effect on the two proxies of social capital. In columns 5, 7, and 9 (Table 2), we observe that having the highest level of education is positively associated with the universalistic civic awareness proxy of social capital (significant at 10%). Moreover, this result is also observed in column 3 of Table 3. Social trust is positively associated with the accumulation of human capital stocks (significant at 10%).

Heterogeneity effects by geographical macroareas

We can expand the results on the association between social capital and education by making subsample models by geographical areas. Although Italy is typically divided into five geographical areas (North-West, North-East, Centre, South, and Islands), we had to run the models grouping them into three macroareas to work with a large enough sample: North, Centre, and South and Islands. This is relevant to the extent that in Italy a well-documented economic divide exists, following a north-south gradient, which is in turn strongly associated

with lower levels of education, higher rates of inequality in schooling and lower levels of social capital in South and Islands. Results of these models by macroareas will provide relevant insights for policy implications along with different territorial contexts.

In Tables 4 and 5 we show the same models implemented above but run separately by macroareas. In the case of universalistic awareness proxy of social capital, the first step estimations provide similar effects to the general model (columns 1, 4, and 7 of Table 4): there is a significant association between all the time-invariant variables and the stocks of universalistic social capital. In the case of social trust (columns 1, 4, and 7 of Table 5), we observe the same trend indicated above, with only one exception: in the South of Italy, girls seem to show lower levels of trust than boys (significant at 10%), while differences between girls and boys in the North and the Centre are not statistically significant.

We confirm a positive and significant association between education and social capital in all geographical areas, once the *entry levels* of social capital are controlled for (columns 2, 5, and 8, Tables 4 and 5). However, we also report relevant differences along the north-south axis when we account for the family fixed effect (columns 3, 6, and 9, Tables 4 and 5). Education always remains strongly and positively associated with social capital in the Islands and the South of Italy – significant at 1% in the models of universalistic civic awareness, and at 5% in the case of higher education for social trust. In the North, this association is significant in the case of civic awareness, while in the Centre education is positively associated with the proxy of social trust. In any case, coefficients of this association in the North and the Centre of the country are not as robust as they are in the South and the Islands.

CONCLUSION AND DISCUSSION OF POLICY IMPLICATIONS

The main objective of this paper is to explore the social returns of education, that is, to analyse to what extent the investment in human capital is associated with the accumulation of stocks of social capital. The identification approach uses dynamic models with repeated cross-sectional data (RCS), in which we link waves from the Italian Multipurpose Survey on Households. In absence of panel data in Italy, the use of RCS data is important to circumvent problems of reverse causation found when working with cross-sectional surveys and also to deal with endogeneity problems, as our main explanatory variable is likely to be correlated with unobserved variables in the error term.

Firstly, we observe that higher levels of education are positively associated with both proxies

of social capital: social trust and universalistic civic awareness. This result is in line with existing literature that confirms the association between social capital stocks and the investment in human capital. In fact, research has confirmed how education is one of the most important predictors of tolerance and social trust (Helliwell & Putnam, 2007; Alesina & La Ferrara, 2000; Sturgis et al., 2007).

We also find differences along the north-south geographical axis of Italy. Although we find a positive and significant association between education and social capital across all larger territorial aggregates, it is worth noting that education is more robustly associated with social capital in the Islands and the South of Italy, than in the North and the Centre of the country. In the North, the association with education is significant in the case of civic awareness while in the Centre education is positively associated with the proxy of social trust.

These results are relevant in terms of policy implications. Firstly, we show that formal schooling makes the difference: to have a socially healthy society, educational attainment should be raised beyond compulsory education. Secondly, we observe heterogeneous effects depending on the geographical location along the north-south axis. The Islands and the South, geographical areas in which levels of social capital are typically lower, are the areas where education shows a higher impact on civic awareness and social trust. Such results are relevant in light of the investment in educational policies required in order to compensate for the north-south divide that exists historically in Italy.

Table 4. Education and social capital: universalistic civic awareness (subsampling regressions by area of residence)

	North			Centre			South and Islands		
	(1) 2007	(2) 2011	(3) 2011	(4) 2007	(5) 2011	(6) 2011	(7) 2007	(8) 2011	(9) 2011
Educational level (ref. ISCED 1/2)									
ISCED 3/4 - Upper secondary education		0.510*** (0.113)	0.499** (0.251)		0.762*** (0.158)	0.143 (0.281)		0.947*** (0.107)	0.745*** (0.215)
ISCED 5/6 - Tertiary education		1.093*** (0.144)	0.670** (0.313)		1.102*** (0.200)	0.234 (0.340)		1.207*** (0.144)	0.810*** (0.263)
Estimated level of social capital (2007)		0.611*** (0.147)	2.976 (2.324)		0.732*** (0.200)	0.590 (2.175)		0.538*** (0.128)	4.497*** (1.404)
Year of birth	-0.073*** (0.007)	0.022* (0.012)	0.183 (0.172)	-0.113*** (0.011)	0.047** (0.022)	0.055 (0.246)	-0.080*** (0.007)	-0.017 (0.012)	0.318*** (0.114)
Female	-0.170** (0.075)	-0.117 (0.091)	0.228 (0.425)	-0.035 (0.114)	-0.359*** (0.113)	-0.098 (0.170)	-0.362*** (0.071)	-0.170* (0.094)	1.239** (0.499)
Chronic disease	-0.953*** (0.259)	0.318 (0.193)	2.361 (2.234)	-0.955*** (0.358)	0.847*** (0.277)	0.975 (2.133)	-0.725*** (0.274)	0.220 (0.177)	3.165*** (1.060)
Highest level of education of parents (ref. ISCED 1)									
ISCED 2 - Lower secondary education	0.277** (0.115)	0.031 (0.123)	3.740 (3.072)	0.560*** (0.182)	-0.199 (0.138)	-1.102 (1.892)	0.306*** (0.097)	-0.093 (0.096)	-1.143 (2.600)
ISCED 3 - Upper secondary education	0.648*** (0.115)	0.024 (0.110)	2.275 (3.068)	1.008*** (0.179)	-0.132 (0.157)	-5.161 (3.485)	0.680*** (0.101)	0.017 (0.103)	-2.812 (1.944)
ISCED 5/6 - Tertiary education	1.266*** (0.144)	0.000 (.)	1.372 (3.511)	1.171*** (0.224)	0.000 (.)	-1.140 (3.855)	1.240*** (0.131)	0.000 (.)	-3.098 (2.534)
Frequency of church attendance (ref. Never)									
A few times a year	0.144 (0.088)	-0.005 (0.100)	-0.207 (0.353)	0.317** (0.134)	0.125 (0.139)	-0.412 (0.625)	0.251** (0.099)	-0.134 (0.106)	-0.724** (0.308)
A few times a month	0.206** (0.100)	-0.085 (0.120)	-0.560 (0.483)	0.259* (0.155)	-0.019 (0.163)	-0.626 (0.478)	0.305*** (0.101)	-0.294** (0.116)	-0.939*** (0.362)
A few times a week and/or everyday	0.232 (0.204)	0.078 (0.269)	0.000 (.)	0.309 (0.326)	0.043 (0.358)	0.000 (.)	0.251 (0.157)	0.005 (0.198)	0.000 (.)
Internet access at home		0.308** (0.145)	0.062 (1.906)		0.772*** (0.182)	1.594 (1.635)		0.589*** (0.104)	-1.290 (1.677)
Fear of crime in the neighbourhood (ref. No fear)									
Low		0.104 (0.096)	-1.942 (1.566)		0.224* (0.128)	0.290 (1.620)		0.241*** (0.089)	-1.898 (1.677)
High		0.300** (0.121)	-0.124 (2.257)		0.108 (0.156)	-0.046 (1.646)		0.251** (0.109)	-5.596** (2.568)
Very high		0.048 (0.208)	-0.577 (2.945)		0.606** (0.272)	-2.246 (2.219)		0.063 (0.153)	-1.812 (2.548)
Family fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Observations	2282	1605	1605	1070	917	917	3128	2346	2346
R ²	0.073	0.089	0.886	0.111	0.144	0.907	0.075	0.140	0.868

Source: Italian Multipurpose Survey on Households. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Education and social capital. Composite indicator of social trust (subsample regressions by area of residence)

	North			Centre			South and Islands		
	(1) 2010	(2) 2011	(3) 2011	(4) 2010	(5) 2011	(6) 2011	(7) 2010	(8) 2011	(9) 2011
Educational level (ref. ISCED 1/2)									
ISCED 3/4 - Upper secondary education		0.231*** (0.075)	0.010 (0.146)		0.094 (0.103)	0.120 (0.199)		0.135** (0.062)	0.135 (0.127)
ISCED 5/6 - Tertiary education		0.440*** (0.095)	0.155 (0.182)		0.302** (0.130)	0.418* (0.238)		0.259*** (0.084)	0.349** (0.155)
Estimated level of social capital (2010)		0.000 (.)	-0.087 (0.724)		0.000 (.)	1.086 (1.080)		0.000 (.)	1.493 (1.247)
Year of birth	-0.005 (0.005)	0.004 (0.006)	-0.006 (0.013)	0.005 (0.008)	-0.005 (0.008)	-0.001 (0.017)	-0.006 (0.005)	-0.003 (0.005)	0.029** (0.012)
Female	-0.029 (0.051)	-0.050 (0.057)	-0.092 (0.096)	-0.040 (0.073)	-0.091 (0.074)	-0.034 (0.115)	-0.077* (0.044)	-0.103** (0.046)	0.151 (0.107)
Chronic disease	-0.051 (0.086)	-0.023 (0.092)	0.152 (0.168)	0.091 (0.124)	0.181 (0.135)	-0.426* (0.242)	-0.030 (0.083)	-0.027 (0.084)	-0.023 (0.139)
Highest level of education of parents (ref. ISCED 1)									
ISCED 2 - Lower secondary education	0.140* (0.085)	0.061 (0.096)	2.316 (1.738)	-0.032 (0.127)	-0.029 (0.120)	0.343 (0.998)	0.049 (0.063)	0.051 (0.065)	-2.703* (1.507)
ISCED 3 - Upper secondary education	0.224*** (0.085)	0.086 (0.099)	1.923 (1.573)	0.164 (0.127)	-0.082 (0.127)	1.620 (1.906)	0.171*** (0.064)	0.049 (0.073)	-0.071 (1.014)
ISCED 5/6 - Tertiary education	0.289*** (0.101)	0.150 (0.123)	1.495 (1.131)	0.249* (0.141)	-0.018 (0.153)	1.120 (1.958)	0.355*** (0.079)	0.156* (0.092)	0.237 (1.202)
Frequency of church attendance (ref. Never)									
A few times a year	0.095 (0.059)	0.126* (0.065)	0.262** (0.126)	0.127 (0.083)	0.062 (0.083)	0.031 (0.191)	0.037 (0.060)	0.058 (0.059)	0.097 (0.101)
A few times a month	0.509*** (0.068)	0.167** (0.078)	0.228 (0.360)	0.101 (0.102)	0.138 (0.103)	0.162 (0.225)	0.075 (0.064)	0.226*** (0.064)	0.046 (0.118)
A few times a week and/or everyday	0.435*** (0.146)	0.535*** (0.179)	0.000 (.)	0.455** (0.197)	0.287 (0.233)	0.000 (.)	0.165* (0.100)	0.399*** (0.114)	0.000 (.)
Internet access at home		0.083 (0.096)	-2.509** (1.113)		0.425*** (0.119)	0.163 (1.138)		0.133** (0.060)	0.690 (0.985)
Fear of crime in the neighbourhood (ref. No fear)									
Low		-0.102 (0.063)	2.797*** (0.914)		-0.144* (0.084)	-0.735 (1.127)		-0.087* (0.051)	-1.472 (0.985)
High		-0.309*** (0.080)	2.443* (1.318)		-0.234** (0.103)	-1.405 (1.145)		-0.246*** (0.063)	1.180 (1.508)
Very high		-0.387*** (0.138)	3.072* (1.719)		-0.360** (0.177)	0.222 (1.543)		-0.100 (0.089)	-0.530 (1.496)
Family fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1833	1598	1598	924	909	909	2552	2344	2344
R ²	0.040	0.042	0.906	0.018	0.037	0.880	0.012	0.032	0.847

Source: Italian Multipurpose Survey on Households. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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