

Social capital and Health status: a protective impact among elderly or inactive but not among active ?

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1. Introduction:

The recent report of the World Health Organization's Commission on Social Determinants of Health presents a wealth of evidence identifying social determinants as the most important determinants of health, beyond the traditional boundaries of the health-care sector. Therefore, they constitute some good candidates for public health policies in order to "close the gap" in various health inequities (CSDH, 2008). According to Epstein and al. (2009), one important issue addressed to economists in order to build policy implications on the work of the Commission is the assessment of the causal impact of social determinants of health and health inequalities. In fact, those recommendations are supported by a large set of researches documenting the existence of differences in health according to socio-economic conditions, but only few studies provide evidence of a causal impact of social determinants of health, and as a consequence, there is a lack of study identifying potential tools for tackling health inequities (Marmot & al., 2008 ; Epstein & al., 2009).

Apart from usual socioeconomic characteristics, such as education, income, occupational activity, housing and working conditions, some studies have recently stressed the importance of factors relating to social ties, social cohesiveness or social exclusion to explain individual health (Golberg & al., 2002 ; Marmot & Wilkinson, 2006). These determinants, which refer to social integration and social interaction, are closely related to the concept of social capital. In the past decade, a number of evidence from many countries associates health status to social capital, measured most often by social participation (Debrand & Sirven, 2008 ; Jusot & al., 2009 ; Scheffler & Brown, 2008 , d'Hombres & al., 2007 ; Islam, 2007) and it is now considered as potential explanatory factors of health status. Actually, social capital seems to be a particularly relevant health determinant since, strong relationships between individuals in a community may reduce stress and provide support for community members which in turn provide an informal insurance against health risk. Social capital enables also to reduce informational cost on health care system, to spread health norms or may invite responsibilities to oneself and others (Putnam, 1993, 2000; Folland, 2007).

However, only few studies have provided evidence of the causal impact of social capital on health status (d'Hombres & al, 2007) and it is not well established whether social capital is the result of good health whether good health is the result of social capital because of the

endogeneity issue of social capital. (Kawachi, 2007). Another issue recently arisen in the literature (Veenstra, 2000 ; Kondo & al., 2007 ; Debrand & Sirven, 2008) is to assess if social capital has a protective effect on health in all sub-populations. Considering that older people have more time to take part in social activities due to retirement (Christoforu, 2005) or fewer familial constraints (Bolin & al., 2003), it can be argued that social capital is a stronger health determinant in older people. Conversely, it can be hypothesized that social participation is less protective among active population or homemakers, due to the role strain resulting from the many demands placed on individuals, thus emphasizing the cost associated with occupying multiple roles (Moen & al, 1995; Khlal & al, 2000 ; Rozario & al, 2004).

Using a representative survey of the French population, the “Health, Health Care and Insurance Survey” (ESPS: “Enquête sur la santé et la protection sociale”), this study proposes to assess the causal effect of social participation on health status in a multiple activity perspective. In a first step of the analysis, we intend to compare among active and inactive population the association between social participation and self-assessed health status. Since the correlation that we may expect between social capital and self-assessed health status should not be considered as causality, we secondly attempt to resolve the identification issue of social participation using instrumental variables, in order to establish a causal pathway between social capital and health status. To perform this work we propose to use the language spoken during childhood as an instrument to social capital.

The paper is structured as followed: the next section presents a theoretical background concerning the concept of social capital and some empirical evidences which associate social capital to individual health. Section 3 introduces the data and variables used in the regression analyses. The methodology and the estimation strategy are also presented in this section. The results are presented in section 4, followed by a conclusion in section 5.

II. Theoretical Background and empirical evidences on Social Capital:

From a historical perspective, social capital has been introduced in social science researches. It was then used across disciplines to explain a wide range of phenomenon. Bourdieu (1980) is one of the first authors to give a definition of the concept of social capital alongside Coleman (1988). Putnam (1993, 2000) is the most influential researcher on social capital and especially because the concept of social capital was introduced to the economic field. According to Putnam, social capital “refers to features of social organisation, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions”.

In his first work on social capital (1993), Putnam has proved that social capital, through interaction with others, creates and develops social norms, generalised reciprocity and social trust, which in turn foster communication and cooperation among members. In this

perspective, social trust is assumed to enhance the responsiveness of formal institution and is required for the efficiency of government and for the economic development. Putnam's conception of social capital is in line with the neo-institutional approach which proved that institution must be integrated to explain economic growth. North (1990) argued that formal and informal institutions shape social structure and enable to foster economic performance. In this perspective, social and political environments are included to the concept of social capital in addition to informal relationships. Formal institution refers to economic, political and judiciary rules whereas informal institutions encompass behavioural norms and conventions which are defined thanks to social network, home ties or business contact (North, 1990). The concept of social capital, therefore, encompass a wide rang of social phenomenon related to social structure and institution. From this perspective, formal and informal institutions are considered as complementary in fostering economic performance. The creation and the used of social capital depend not only on the social environment but also on the institutional context. Therefore, mutual trust is both the result of institutional context and of social network (Sobel, 2002; Putnam, 1993, 2000).

Through all definitions proposed by literature, researchers tend to clarify the concept of social capital but there is still no consensus. As Grootaert and Seragelgin (2000) have noticed, "social capital means different things to different people". The Social Capital Initiative carried out by the World Bank from 1996 has associated the concept of social capital to institution and in this way, it embraces all social organisations that compose the society (which refers to structural social capital) and all the shared norms, values or beliefs of the social structure (which is considered as cognitive social capital). On the other hand, Dasgupta (2005) has defined social capital in term of interpersonal network which facilitates mutual trust because of interrelated individual utility. Through interpersonal network, individuals will invest in reputation for future benefits and the associated social norms and social trust are considered as incentives to enforce and to respect commitment. Thus, the creation of social capital involves an opportunity cost since it constitutes an investment in time and a sacrifice in the present for future benefit (Stiglitz, 2000, Grootaert, 1998, Dasgupta, 2005). Sirven (2008) supports this conception and suggests that social capital should be considered as a genuine form of capital, he defined the concept as a "set of rights an agent can exercise over the members of his social network so as to access their personal resources". Social capital is thus considered as productive and it offers to individual access to some resources through expectations and obligations.

In spite of this clarification attempt, the definition, the causal mechanism linking mutual trust, social network and institution remain elusive. From an empirical perspective most studies focus on social network or social trust to measure social capital trough indicators such as civic engagement (which refers to social participation), social support or the extent of trust (Islam & al, 2006).

From an economic point of view, it is well established that social capital produces positive externalities for the member of a particular network (Sobel, 2002; North, 1990; Fafchamps & Durlauf, 2004; Grootaert & Serageldin, 2000; Dasgupta, 2005, Naraya & Pritchett, 1997; Putnam 1993; Stiglitz, 2000; Solow, 2000). Social capital provides a legal setting to organise the information sharing, the coordination of activity and the process of collective decision.

Through the introduction of social norms and sanctions, social network and institutions introduce a social control which seems to be a relevant determinant for economic performance. Social capital fosters information sharing and, in this sense, it decreases market inefficiency related to information asymmetry (Fafchamps & Durlauf, 2004; Grootaert & Serageldin, 2000, Grootaert, 1998). The transmitted information is more accurate and appropriate which enables people to take more efficient decisions. Social capital can be thus considered as a powerful mean to foster the spread of information, which in turn, leads to a decrease of uncertainty and a decrease in transaction cost (North, 1990; Fafchamps & Durlauf, 2004; Grootaert & Serageldin, 2000; Dasgupta, 2005, Putnam 1993; Solow, 2000). Association and social network create a mutual knowledge about everyone's behaviour; it introduces a certain enforcement which ensures the respect of rights and obligations. Furthermore, identification to a particular group can change the individual choice and preference which may encourage altruism behaviour and resolve the problem of collective action in a game theory perspective (Fafchamps & Durlauf, 2004; Grootaert & Serageldin, 2000, Grootaert, 1998). When the social environment is rich of participation, it allows people to meet frequently and it increases the likelihood of repeated action which in turns lead to an enhancement of reputation's relevance. Reputation may remove some barriers to entry in a variety of production and exchange relation. In creating interactions between individuals, social capital increases the cost of opportunism and free riding, moral hazard is limited and economic transactions grow. Moreover, it has been noticed that norms of cooperation and social trust restrict individual interest, which enable people to be more willing to contribute to the public good provision (Putnam, 93; Knack & Keefer, 1997; Fafchamps & Durlauf, 2004; Grootaert & Serageldin, 2000, Grootaert, 1998).

Finally, some authors consider that social capital implies large social multiplier which influences preferences and consumption choices (Glaeser & al, 2002). Actually, social interaction literature stressed that an action chosen by one agent may affect the action of other agents belonging to the same social network through social norms (Manski, 2000). Some authors have found large social multipliers related to social interaction in education, crime or wage areas (Glaeser & al, 2002).

As noticed previously, the concept of social capital was also applied to public health to explain health disparities. Social capital is actually considered as a potential explanatory factor of an individual's health status since social interaction, trust and reciprocity facilitate people to access resources. Numerous studies have therefore suggested that a high level of social capital enhances population health outcomes and reduces health differences (Golberg &

al., 2002; Jusot, Grignon & Dourgnon, 2008; Folland, 2007; Islam, 2007; Sirven 2006). Social capital appears to be a particularly relevant health determinant for populations since it constitutes informal insurance against health risks, enabling a reduction in informational costs and to a spread of health norms (Putnam 1993, 2000; Veenstra, 2000; Kawachi & Berkman, 2000; Folland 2007). Actually, by providing information, social capital enables a reduction of informational costs regarding, for instance, access to health care system or amenities. In fostering communication among members, social capital spread health norms and may exert a social control over deviant health behaviour. Social ties may increase responsibility for the well being of other, which in turn modifies an individual propensity to adopt healthy risky behaviour. Finally, social capital constitutes an informal insurance against health risk through emotional or financial support. It provides individuals with connection to social group as well as access to social support which may have a positive impact on health status. Therefore and through these mechanisms it has been proven that there is a positive and strong association between social capital and a number of key health indicators (Kawachi & al, 1997, Kawachi & al, 1999, Sirven, 2006; Leclere & al, 1994; Szreter & Woolcock, 2004, Islam & Al 2006).

However, it is not well established whether social capital is the result of good health whether good health is the result of social capital (Kawachi, 2007). The endogeneity issue of social capital is still pending and little evidence has shown the causal influence of social capital on health status (D'Hombres & Al, 2007). Some studies have also stressed that social capital may have positive impact on health but only on sub-population like the older one. From this perspective we may wonder whether social capital is protective among active or homemakers due to role strain related to their involvement in multiple social roles.

III. Data and Method:

The analysis is based on a population survey, representative of the French population, the Health, Health Care and Insurance Survey (ESPS: "Enquête sur la santé et la protection sociale"), coordinated by the Institute for Research and Information in Health Economics (IRDES). We use the 2006 wave which included a set of question on health status, socio-economic conditions and social capital. The survey sample, made of 8100 households and 22 000 individuals, is based on a random draw from administrative files of the main sickness funds to which over 90% of the population living in France belong. Individuals drawn at random from the administrative files are used to identify households. The socio-economic questionnaire is answered by one key informant in each household (aged at least 18), who needs not be the individual selected at random and self-selected voluntary. This key informant reports socioeconomic status of each household members and answers for him or herself only to a set of questions including social participation. Questions on health status are collected through a self-administered questionnaire completed individually by each household member. Questions on health status are collected through a self-administered questionnaire completed individually by each household member.

Since our main objective is to examine the association and the causal influence of social capital and health status, we restrict our analysis to the key informants aged between 25 and 85 years old, who are not student and who reported both their health status, their social capital and their occupation (5933 individuals).

To analyse the causal influence of social capital on health status, we have breakdown our population into two sub-populations using the individuals' age and occupational status. People in employment, unemployed and homemakers aged less or equal to 55 years old are gathered together and constitute the first sub-population (called the "active" population). The retired, disabled population and the homemakers aged more than 55 years old constitute the second sub-population called the "inactive" population. Under the assumption that the "active" population may experience pressure in occupying multiple roles when they took part in social participation contrarily to the "inactive" one, who has more time, we may expect a different influence of social capital on self-assessed health status between these two populations (Rozario & Al; 2004, Klhat & Al, 2000; Martikainen, 1995).

The Health Status Assessment

Health status is difficult to represent as a unique indicator due to its multidimensional character. According to the WHO, a good health status means not only the absence of disease or injury but also physical, mental and social well being. Mortality and morbidity indicators are the most common measures for health status and the latter is used in our study. To assess individual health status, we use the first of three standardised questions suggested by the WHO European Office relative to self-assessed health.

This indicator relies on the following question: "*Would you say that your health is: very good, good, fair, bad or very bad?*". The self-assessed health (SAH) status is a subjective indicator of an individual's overall health status and it refers to the perception of a person's health in general. It has the advantage of reflecting aspects of health not captured in other measures, such as: incipient disease, disease severity, psychological or mental health. This indicator may however suffer from individual reporting heterogeneity (Bago d'Uva & al. 2008). Some studies have shown that health perception differs according to health norms and individual aspirations. Despite the variable's subjectivity, several studies have validated its utilisation and have shown that a poorer self-assessed health status is constantly associated with higher disease prevalence rate (Chandola & al., 2000; Molines & al., 2000; Jenkinson & al., 2001). This indicator has also been found to be a good predictor of mortality (Idler & Benyamini, 1997).

To study individuals' health we have constructed a binary health descriptor. This descriptor places people who have reported a "very good" or "good" general health status opposite people reporting a "fair", "bad", or "very bad" general health status.

As shown in table 1, which describes the characteristics of the whole population and the sub-populations, nearly 28% of the sample declares having a poor self-assessed health and conversely 72% of the whole population reports having a good or a very good self-assessed health status. The descriptive analysis indicates some differences according to the population considered. Actually, column 2 and 3 of table 1 indicate that the "active" population is less numerous in the poorest health category than the "inactive" population. Among the "active population", 18.1 % report a poor self-assessed health status while 50.7% of the "inactive" one reports the same self-assessed health status.

This result is not a surprise and may be seen as the result of the population break down since the "active" population is on average largely younger than the "inactive" one (42.2 years old versus 68.6 years old respectively).

Social capital measure and language spoken during childhood used as instrument

Social capital can be assessed through the dimension usually used in the literature that is social participation. From an empirical point of view, social capital is often measured at the individual level through civic engagement, which refers to participation in social activity. The following question is asked to respondents: "*Do you participate regularly in a collective activity such as a local school association, neighbourhood or community associations, sports or cultural clubs, religious community, union or political party?*". We used this binary variable to assess the participation of individuals in social activity and individual i is assigned 1 if he took part in social activity and 0 otherwise.

To analyse the causal influence of social capital on health status we have used the language spoken during childhood as an instrument of social participation. This instrument has never been proposed in the empirical literature. Respondent were asked "*When you were child, in which language were you speaking?*". The following responses are: "to have spoken in French", "to have spoken in French and another language" or "to have spoken only in language other than French".

This indicator enables to consider the practice of foreign language by migrant but also to capture some French local dialect that may have a direct influence of individual social participation through identification to social group, shared norms or value and sense of cultural community. Table 2 shows the distribution between foreign language and French local dialect spoken during childhood, among people reporting having spoken another language than French during childhood.

Table 1. Descriptives statistics: Characteristics of the whole population and the sub-populations

Characteristics		Whole population (N=5933)		"Active" Pop (N= 4155)	"Inactive" pop (N=1838)
		N	%	%	%
Self-Rated Health	Very Good	1075	17,9	23,4	5,7
	Good	3235	54,0	58,6	43,6
	Fair	1403	23,4	16,0	40,2
	Poor	219	3,7	1,8	7,9
	Very Poor	61	1,0	0,3	2,6
Sex	Male	2430	40,6	39,3	43,4
	Female	3563	59,5	60,7	56,6
Age	Age<30	458	7,6	11,0	0,1
	30<=age<40	1257	21,0	29,8	0,9
	40<=age<50	1354	22,6	31,9	1,6
	50<=age<65	1685	28,1	26,9	30,8
	65<=age<75	726	12,1	0,3	38,8
	age>=75	513	8,6	0,1	27,8
Migratory Status	French	4840	80,8	80,0	82,6
	1st generation migrant	531	8,9	9,1	8,4
	2nd generation migrant	593	9,9	10,6	8,2
	NR	29	0,5	0,4	0,8
Education level	Without certificate	127	2,1	1,4	3,8
	Primary	1190	19,9	7,5	47,9
	1st level of secondary school	2036	34,0	38,1	24,7
	2nd level of secondary school	953	15,9	18,0	11,2
	Post secondary education	1687	28,2	35,0	12,6
Professionnal Status	Agricultural employee	260	4,3	1,8	10,1
	Self-employed	330	5,5	4,6	7,6
	Executive	755	12,6	13,6	10,4
	Intermediary occupations	1244	20,8	22,1	17,9
	Administrative employee	1089	18,2	19,4	15,4
	Business employee	770	12,9	14,1	10,0
	Skilled worker	868	14,5	13,9	15,8
	Unskilled worker	601	10,0	9,4	11,4
	No occupation	76	1,3	1,2	1,5
Working Conditions	To have autonomy at work	3464	57,8	61,8	48,8
	To have no autonomy at work	2193	36,6	35,8	38,5
	Not applicable	336	5,6	2,4	12,8
Occupational status	In Employment	3453	57,6	-	-
	Non-working	475	7,9	-	-
	Retired	1567	26,2	-	-
	Unemployed	498	8,3	-	-

Table 1. Continued

Characteristics		Whole population (N=5933)		"Active" Pop (N= 4155)	"Inactive" Pop (N=1838)
		N	%	%	%
Income	1st Quintile	974	16,3	15,3	18,4
	2nd Quintile	1030	17,2	15,1	21,9
	3rd Quintile	1000	16,7	17,8	14,2
	4th Quintile	1045	17,4	19,2	13,5
	5th Quintile	1216	20,3	22,0	16,4
	Refus	728	12,2	10,6	15,6
Household composition	To be alone	1114	18,6	13,9	29,2
	Single-parent	466	7,8	9,4	4,1
	Childless couple	1851	30,9	19,8	55,9
	Couple with child	2393	39,9	54,0	8,1
	Other household composition	169	2,8	2,9	2,7
Language spoken	French	4491	74,9	76,0	72,6
	French and Other	737	12,3	12,5	11,9
	Other only	765	12,8	11,6	15,5
Social participation	Yes	2204	36,8	36,6	37,1
	No	3789	63,2	63,4	62,9

Table 2: Distribution of the other languages spoken during childhood between foreign language and french local dialect

Others languages spoken during childhood	N	%
Foreign Languages	819	54,5
French Local dialects	683	45,5
Total	1502	100,0

Descriptive statistics indicate that social participation in France is low and quite evenly distributed among both populations (Table 1). Actually, 36.8% of the whole population do not participate regularly in a collective activity. Similarly, among the “active” and “inactive” population respectively, 36.6% and 37.1% report not having a social participation. As for the social participation, the distribution of the language spoken during childhood is similar across population. 75% of the whole population have spoken only in French during their childhood and this share is similar among the “active” and “inactive” population.

Socio-economic conditions assessment

To assess the influence of socio-economic status on individual health status, educational level, professional and occupational status, income, household composition and working conditions are used.

Educational level is measured as follow: without certification, primary level, first level of secondary school, second level of secondary school, post secondary education and other level of education which includes missing value, foreign diploma, professional training and other education. There are four occupational statuses: in employment, non-working, retired and unemployed. For our analytical framework we also used the famous French “Socio Professional Category” in which 8 professional statuses are defined: executive, agricultural employee, self-employed, intermediary occupations, administrative employee, business employee, skilled worker, unskilled worker (used as reference) and without activity. Income is measured as household income (from all sources of income), divided by the OECD equivalent scale (1 for the first household composition, 0.5 for the second and 0.3 for the third and following one). We created income quintile and a last category was built which refers to those who did not provide income information. Then to assess the household composition we constructed 5 categories: couple with child (used as reference), be alone, single-parent, childless couple and other household composition. Finally, working conditions in our research is considered by the autonomy that individuals have in the contents of their work. This indicator is classified into three groups: “individuals who report having autonomy”, “individuals who report not having autonomy” and lastly “not applicable question”.

As previously, the descriptive analysis proves some differences in socio-economic conditions according to the population considered (Table 1, column 2 & 3). As expected, the “active” population have on average more favourable socio-economic conditions than the “inactive” population and this is mostly confirmed for the educational level, working conditions, income or household composition. The “active” population is, for instance, more likely to have a post secondary educational level, to be in a couple with child and to have a higher income than the “inactive” population. The distribution of professional status is however quite homogenous between both populations.

Migratory status

To build migratory status, we use information relating to the nationality and the country of birth of individuals and those of their parents. The crossbreed between these questions allows distinguishing 3 migratory statuses: “individual born French whose parents are born in France”, “First-generation migrant” and “Second-generation migrant”.

First, the population of individuals “born French whose parents are born in France” gathers individuals with French nationality whether they are born in France or not and whose parents are born in France. Then, the population of “First-generation migrants” gathers foreign individuals who are born abroad, regardless parents nationality and country of birth. And lastly, the “second-generation migrant” group represents individuals who are not foreigner born abroad and whose at least one parent is a foreigner born abroad.

Individuals born French from French parents, represent 80.8% of the whole population (Table 1). Nearly 9% of the sample is composed of first-generation migrants and second-generation migrants represent 9.9% of the sample. Once again, the distribution of first and second generation migrant is similar across both populations.

Analytic Strategy:

In order to explore the influence of social participation on health status, we adopt a two steps strategy.

First, we ran a baseline probit analysis (Model 1) to assess the association between social participation and the probability of reporting a good health status, controlling for other socio-economic characteristics, migratory status and biological dimensions such as age and gender. These analyses have been reproduced separately among the “active” population (Model 2) and the “inactive” population (Model 3). These analyses enable to test a different association of social participation on a person’s health status according to occupation and age. Under the assumption that older or retired people have more time to take part in social activity, age and occupation could be considered as consistent determinants of social participation. From this perspective, we may expect a less protective effect of social participation on health status among “active” population than “inactive” population.

We shall consider that the binary self-assessed health variable H_i is the result of a continuous latent health variable H_i^* , representing health status in a continuous way.

$$H_i = 1 \text{ if } H_i^* > 0$$

$$H_i = 0 \text{ if } H_i^* \leq 0$$

We assume that the latent health status is explained by several exploratory variables as follows:

$$H_i^* = \alpha + \beta X_i + \gamma S_i + \varepsilon_i$$

Where X_i stands as a vector of independent variables supposed to affect individual health status (socio-demographic status, socio-economic conditions and migratory status). Social participation that is social capital is represented by S_i . The error term ε_i is assumed to follow a normal distribution (N (0,1)). The probability for an individual to be in a good health status can be written as follow:

$$P_i = \text{Prob}(H_i = 1) = \Phi(\hat{\alpha} + \hat{\beta}X_i + \hat{\gamma}S_i)$$

Where $\Phi(\cdot)$ is the normal distribution function. The vector of parameters β and γ are estimated by the maximum likelihood methods under the assumption that the residual term ε_i is uncorrelated with the exogenous variables.

The correlation between social participation and self-assessed health status that we will monitor in these first models may not be seen as causality but considered as the result of other factors which determined at the same time both indicators. This endogeneity issue is related to unobserved variables that have an impact on both health status and social participation. It implies an identification issue which suggests that it is not possible to know whether social capital (measured by social participation) is the result of good health status or whether good health status is the result of taking part in social participation.

The second step of this research is, then, to resolve the identification issue of social capital using bivariate probit estimation with two equations. In this model, the first equation explains the self-assessed health status whereas the second one explains social capital. The bivariate probit regression model that we consider is the following (Maddala, 2001):

$$\begin{aligned} H_i^* &= \alpha_1 + \beta_1 X_i + \gamma S_i + \varepsilon_i, \\ S_i^* &= \alpha_2 + \beta_2 X_i + \varphi Z_i + \mu_i \end{aligned}$$

H_i^* and S_i^* are latent variables and what is actually observed is

$$\left\{ \begin{array}{l} H_i = 1 \text{ if } H_i^* > 0 \\ H_i = 0 \text{ if } H_i^* \leq 0 \end{array} \right. \quad \text{and} \quad \left\{ \begin{array}{l} S_i = 1 \text{ if } S_i^* > 0 \\ S_i = 0 \text{ if } S_i^* \leq 0 \end{array} \right.$$

As previously, the self-assessed health of individual i depends on her social participation and others covariates (socio-demographic characteristics, socio-economic conditions and migratory status). The social participation of individual i is determined by the same covariates but also by an instrumental variable, the language spoken during childhood.

Coefficients β_1, β_2, γ and φ are estimated by the maximum likelihood methods under the assumption that the residual terms ε_i and μ_i are uncorrelated with the exogenous variables.

We assumed a bivariate normal distribution with zero mean, unit variance, and the correlation between the error terms is given by $\rho_{\varepsilon, \mu} = \text{cov}(\varepsilon_i, \mu_i)$. To assess the endogeneity of social capital, the Likelihood Ratio Test is used to analyse the correlation between the residual terms of both equations. Equations of health status and social participation are correlated if $\rho_{\varepsilon, \mu} = \text{cov}(\varepsilon_i, \mu_i) \neq 0$, which indicates that there exist unobserved characteristics that have an impact on both health status and social participation. A significant value of rho (ρ) confirms the endogeneity issue of social participation and thus simultaneous estimation is needed to get consistent estimates of the parameters.

Finally, to test the instrument validity, we perform a t-test to assess if the language spoken during childhood is not associated with health status but sufficiently associated with social participation.

To perform this test, we assume the following bivariate probit model:

$$\begin{aligned} H_i^* &= \alpha_1 + \beta_1 X_i + \varphi_1 Z_i + \varepsilon_i \\ S_i^* &= \alpha_2 + \beta_2 X_i + \varphi_2 Z_i + \mu_i \end{aligned}$$

$$\left\{ \begin{array}{l} H_i = 1 \text{ if } H_i^* > 0 \\ H_i = 0 \text{ if } H_i^* \leq 0 \end{array} \right. \quad \text{and} \quad \left\{ \begin{array}{l} S_i = 1 \text{ if } S_i^* > 0 \\ S_i = 0 \text{ if } S_i^* \leq 0 \end{array} \right.$$

In this model, the self assessed health status and the social participation of individual i is determined by the same set of covariates (socio-demographic conditions, socio-economic characteristics and migratory status) but also by the language spoken during childhood. The instrument of social capital is valid if $\varphi_1 = 0$ indicating that the language spoken during childhood is not associated with the health status, and if $\varphi_2 \neq 0$ which proves that it is associated with social participation.

IV. Findings:

The table 3 presents the results of probit analysis aimed at studying the association between social participation and self-assessed health status among the whole population and sub-populations in order to test a different association of social participation and health status according to occupation and age.

The estimation on the whole population (column 1) confirms that social participation is strongly and significantly associated with the probability of reporting a good self-assessed health status (marginal effect equal to 0,05 and significantly different from zero at 1% level). Having a regular social participation increases the probability to be in the best health category, which confirms previous literature on social capital (Sirven, 2006; Folland, 2007; Islam, 2007; Jusot & al., 2008).

As expected, the probability of reporting a good health status decreases with age. Findings also confirm the influence of socio-economic conditions on health status proved by previous studies relating to social health inequalities (Goldberg & al., 2002; Cutler & al, 2008). All socio-economic variables have a significant effect on health status and on the expected way. Individuals without any certification and those with primary education level are less likely to report a good health status than individuals with post-secondary education level. Executives or individuals having an intermediary occupation are more likely to be in the best health category compared to unskilled workers. Individuals have also a lower probability to report a good health status when they are non-working, unemployed, alone and single parent. Autonomy at work is significantly associated with a good health status. Actually, individuals who do not have autonomy at work present a weaker probability to report a good self-assessed health status. Household income has a strongly significant effect on self-assessed health status since it increases the probability of reporting a good health status. Finally, the migratory status is also strongly associated with the probability to report a good health status. First and second generation migrants are less likely than French born population to report a good health status, and the probability of reporting a good health status is more reduced among the first generation migrants than among the second generation migrants (marginal effects equal to -0,09 and -0,04 respectively and significant at 1 and 5% level). This result is consistent with previous French studies that show poor health conditions of the migrant population in France (Attias-Donfut & Tessier, 2005; Lert & al., 2007; Jusot & al., 2009).

The replication of this analysis separately among the sub-populations shows different associations according to occupation and age.

Table 3. Influence of socio-economic conditions, migratory status and social capital on the probability to report a good self-assessed health status (binary probit)

Characteristics	Good SAH			Good SAH			Good SAH		
	Whole Population			Active Population			Inactive population		
	Mfx	SE		Mfx	SE		Mfx	SE	
<i>Male</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Female	0,01	0,014		-0,02	0,014		0,03	0,028	
<i>Age</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Age	-0,01	***	0,001	-0,01	***	0,001	-0,01	***	0,002
<i>Post-secondary education</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Without certificate	-0,15	**	0,061	-0,16	**	0,084	-0,10	0,087	
Primary	-0,06	**	0,025	-0,07	**	0,031	-0,04	0,051	
1st level of secondary school	-0,03		0,019	-0,02		0,018	-0,05	0,050	
2nd level of secondary school	0,01		0,021	-0,01		0,019	0,05	0,053	
Other level of education	-0,03		0,085	-0,04		0,083	0,11	0,175	
<i>Prof status: Unskilled Worker</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Agricultural employee	0,04		0,030	0,07	**	0,028	0,02	0,055	
Self-employed	0,04		0,028	0,08	**	0,022	-0,01	0,058	
Executive	0,06	**	0,027	0,06	**	0,023	0,07	0,064	
Intermediary occupations	0,05	**	0,023	0,04	*	0,021	0,12	**	0,051
Administrative employee	0,01		0,023	0,03		0,020	-0,02	0,050	
Business employee	0,00		0,025	0,02		0,021	-0,03	0,054	
Skilled worker	0,01		0,023	0,02		0,021	0,01	0,049	
No occupation	0,03		0,050	0,01		0,052	-0,09	0,106	
<i>To have autonomy at work</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
To have no autonomy at work	-0,05	***	0,014	-0,03	**	0,013	-0,10	***	0,028
Not applicable	-0,04		0,030	-0,09	**	0,050	-0,10	**	0,041
<i>Occ Status : In employment</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Non-working	-0,19	***	0,029	-			-		
Retired	-0,02		0,022	-			-		
Unemployed	-0,15	***	0,026	-			-		
<i>Income: 1st quintile</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
2nd quintile	0,05	**	0,018	0,06	***	0,015	0,09	**	0,038
3rd quintile	0,09	***	0,017	0,09	***	0,014	0,16	***	0,041
4th quintile	0,10	***	0,017	0,11	***	0,014	0,17	***	0,042
5th quintile	0,14	***	0,017	0,13	***	0,014	0,23	***	0,043
Unknown	0,09	***	0,018	0,10	***	0,014	0,10	**	0,042
<i>HH composition: Couple + child</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
To be alone	-0,07	**	0,020	-0,09	***	0,021	0,04	0,052	
Single-parent	-0,06	**	0,025	-0,04	*	0,022	-0,06	0,074	
Childless couple	-0,04	**	0,018	-0,03	*	0,018	0,06	0,048	
Other household composition	-0,05		0,039	-0,05		0,038	0,03	0,087	
<i>Migratory status: French</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
First generation migrant	-0,09	***	0,024	-0,09	***	0,024	-0,10	**	0,047
Second generation migrant	-0,04	**	0,021	-0,03		0,020	-0,09	**	0,044
<i>No social participation</i>	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Social participation	0,05	***	0,013	0,03	**	0,012	0,11	***	0,026
N	5993			4155			1838		
Pseudo R ² (Mc Fadden)	0,19			0,11			0,09		
Log L	-2894,3			-1739,2			-1155,9		

Legend : * p<0,1; ** p<0,05; *** p<0,01

Column 2 and 3 of Table 3 show respectively the result for the “active” population, which is composed of individuals in employment, unemployed and homemakers aged less or equal to 55 years old, and for the “inactive” population, which is composed of retired, disabled individuals and homemakers aged more than 55 years old.

Finding concerning social capital indicates that social participation is associated with the probability to report a good health status among both populations but not in the same magnitude. Among the “inactive” population, marginal effect equals to 0.11 and is significantly different from zero at 1% level while among the “active” population, marginal effect is smaller and less significant (marginal effects equal to 0.03 and significantly different from zero at 5%).

As expected, the influence of socio-economic conditions on health status is also different according to the population considered. While educational level, professional status and household composition are significantly associated with the health status among active population, those associations are not observed among the inactive one. Conversely, income and work conditions are significantly associated with the probability to report a good health status among both active and inactive populations. Individuals who report not having autonomy at work are more likely to have a poorest health status among both populations and, as shown before, household income increases the probability of reporting a good health status among both populations. Finally, among active population, first-generation migrants present a lower probability to report a good health status (marginal effect equals to -0.09 and significant at 1% level) than French born population, and the results show no significant difference between second-generation migrant and French born population. Conversely, among the “inactive” population, being a first generation migrant as well as a second-generation migrant is negatively associated with the probability to report a good health status in comparison to be born in France, and the risk is similar among the first and the second generation of migrants.

Table 4: Test for the validity of the language spoken during childhood as an instrument of social participation

	Whole population			
	Good SAH		Social participation	
	Mfx	p-value	Mfx	p-value
<i>French Language</i>	<i>Ref</i>		<i>Ref</i>	
French and other language	-0,022	0,253	0,064	0,002 ***
Other language	-0,021	0,379	0,040	0,131
Rho (Wald Test)	0,097	0,000	***	

Legend : * p<0,1; ** p<0,05; *** p<0,01

Table 5. IV probit estimation of the probability to report a good health status and to have a social participation
Estimation on the whole population

Characteristics	Bivariate Probit					
	Good Self-Assesed Health			Social participation (Instrumental Equation)		
	Mfx	p-value		Mfx	p-value	
Male	<i>Ref</i>			<i>Ref</i>		
Female	0,01	0,46		0,00	0,77	
Age	<i>Ref</i>			<i>Ref</i>		
Age	-0,01	0,00	***	0,00	0,00	**
<i>Post-secondary education</i>	<i>Ref</i>			<i>Ref</i>		
Without certificate	-0,23	0,00	**	-0,29	0,00	***
Primary	-0,11	0,00	**	-0,20	0,00	***
1st level of secondary school	-0,05	0,03	**	-0,11	0,00	***
2nd level of secondary school	0,00	0,93		-0,04	0,07	*
Other level of education	-0,04	0,57		-0,05	0,50	
<i>Prof Status: Unskilled Worker</i>	<i>Ref</i>			<i>Ref</i>		
Agricultural employee	0,05	0,10		0,11	0,01	**
Self-employed	0,06	0,06	*	0,09	0,01	**
Executive	0,08	0,01	**	0,10	0,00	**
Intermediary occupations	0,07	0,01	**	0,12	0,00	***
Administrative employee	0,02	0,40		0,09	0,00	**
Business employee	0,00	0,92		0,01	0,86	
Skilled worker	0,02	0,48		0,05	0,08	*
No occupation	0,02	0,65		-0,09	0,28	
<i>To have autonomy at work</i>	<i>Ref</i>			<i>Ref</i>		
To have no autonomy at work	-0,06	0,00	***	-0,08	0,00	***
Not applicable	-0,08	0,03	**	-0,17	0,00	***
<i>Occupational Status : In employment</i>	<i>Ref</i>			<i>Ref</i>		
Non-working	-0,18	0,00	***	0,01	0,68	
Retired	0,00	1,00		0,09	0,00	***
Unemployed	-0,16	0,00	***	-0,05	0,06	*
<i>Income: 1st quintile</i>	<i>Ref</i>			<i>Ref</i>		
2nd quintile	0,05	0,00	**	0,02	0,47	
3rd quintile	0,10	0,00	***	0,06	0,01	**
4th quintile	0,11	0,00	***	0,03	0,24	
5th quintile	0,15	0,00	***	0,08	0,00	**
Unknown	0,09	0,00	***	0,02	0,36	
<i>Household composition: Couple with child</i>	<i>Ref</i>			<i>Ref</i>		
To be alone	-0,08	0,00	***	-0,08	0,00	***
Single-parent	-0,07	0,01	**	-0,05	0,03	**
Childless couple	-0,05	0,01	**	-0,07	0,00	***
Other household composition	-0,08	0,05	**	-0,13	0,00	**
<i>Migratory status: French</i>	<i>Ref</i>			<i>Ref</i>		
First migrant generation	-0,11	0,00	***	-0,12	0,00	***
Second migrant generation	-0,05	0,01	**	-0,05	0,02	**
No social participation	<i>Ref</i>					
Social participation	-0,17	0,21				
French Language				<i>Ref</i>		
French and other language				0,07	0,00	**
Other language				0,05	0,08	*
N	5993					
Log L	-6538,61					
Rho (LR Test)	0,39	0,2	NS			

Legend :* p<0,1; ** p<0,05; *** p<0,01

If we now turn to the bivariate analysis, one should note that the *rho* correlation coefficient estimated thanks to the Wald Test is significant at 1% level (Table 4). This result indicates that the self-assessed health status and the social participation equations must be estimated simultaneously. It actually confirms the endogeneity issue induced by unobserved variables that may have an impact on both health status and social participation. Table 4 indicates also that the language spoken during childhood has a significant impact on social participation but not on self-assessed health status, which proves that language spoken during childhood can be considered as a valid instrument for social participation.

Table 5 shows the results of the simultaneous estimation of the probability to report a good self-assessed health status and to have a regular social participation on whole population. Finding indicates that after instrumentation, social capital (that is to say having a regular social participation) is no longer associated with a good health status. This result indicates that no causal effect is observed between having a regular social participation and the probability to report a good health status among the whole population. The sign of the marginal effect is negative, which indicates that, if it was significant, individuals having a social participation would be less likely to report a good health status than individuals who are not.

The result is quiet innovative compared to previous studies on the link between social capital and health status (Kawachi & al, 1997, 1999; Sirven, 2006; Folland, 2007; Islam, 2007; Jusot & al., 2008, d’Hombres & al., 2009), even if proper tests of causality in this literature remain scarce (d’Hombres & al., 2009). However, we can notice that the correlation coefficient between the residuals of the two equations is not significantly different from zero, which suggests that the endogeneity of social capital, on the whole population estimation, is not captured. Conversely, the correlation coefficients of the residuals of the two equations are significant at 5% and 10% among both “active” and “inactive” populations (Table 6 & 7 respectively) and the results are, by far, not similar when the analysis is conducted separately among those subpopulations.

After instrumentation of social capital, findings indicate that social capital is detrimental to the self-assessed health status in “active” population (Table 6) but not in the “inactive” one (Table 7). Among “active” population, having a regular social participation decreases the probability to report a good self-assessed health status (marginal effect equals to -0.38 and significantly different from zero at 1% level) whereas it increases this probability among the “inactive” population (marginal effect equals to 0.46 and significant at 1% level). The causal effect of social participation is, thus, different according to the population considered. As expected and according to the strain role hypothesis (Rozario & Al, 2004; Khlat, Sermet & Le Pape, 2000; Martikainen, 1995), accumulating multiple roles is associated with increased stress due to the pressure related to fulfil role obligations.

Table 6. IV probit estimation of the probability to report a good health status and to have a social participation
Estimation on the active population

Characteristics	Bivariate Probit					
	Good Self-Assesed Health			Social participation (Instrumental Equation)		
	Mfx	p-value		Mfx	p-value	
Male	<i>Ref</i>			<i>Ref</i>		
Female	-0,02	0,28		-0,01	0,67	
<i>Age</i>	<i>Ref</i>			<i>Ref</i>		
Age	-0,01	0,00	***	0,00	0,00	***
<i>Post-secondary education</i>	<i>Ref</i>			<i>Ref</i>		
Without certificate	-0,30	0,00	**	-0,30	0,00	**
Primary	-0,16	0,00	***	-0,19	0,00	***
1st level of secondary school	-0,07	0,00	**	-0,12	0,00	***
2nd level of secondary school	-0,03	0,16		-0,05	0,03	**
Other level of education	-0,04	0,63		0,05	0,60	
<i>Prof Status: Unskilled Worker</i>	<i>Ref</i>			<i>Ref</i>		
Agricultural employee	0,12	0,00	**	0,20	0,00	**
Self-employed	0,09	0,00	**	0,07	0,15	
Executive	0,09	0,00	**	0,09	0,03	**
Intermediary occupations	0,07	0,00	**	0,12	0,00	***
Administrative employee	0,06	0,01	**	0,09	0,01	**
Business employee	0,02	0,34		0,01	0,71	
Skilled worker	0,03	0,22		0,04	0,21	
No occupation	0,00	0,99		-0,14	0,15	
<i>To have autonomy at work</i>	<i>Ref</i>			<i>Ref</i>		
To have no autonomy at work	-0,06	0,00	***	-0,09	0,00	***
Not applicable	-0,15	0,00	**	-0,15	0,01	**
<i>Income: 1st quintile</i>	<i>Ref</i>			<i>Ref</i>		
2nd quintile	0,07	0,00	***	0,02	0,44	
3rd quintile	0,11	0,00	***	0,06	0,03	**
4th quintile	0,12	0,00	***	0,02	0,42	
5th quintile	0,15	0,00	***	0,08	0,01	**
Unknown	0,12	0,00	***	0,04	0,26	
<i>Household composition: Couple with child</i>	<i>Ref</i>			<i>Ref</i>		
To be alone	-0,12	0,00	***	-0,08	0,00	***
Single-parent	-0,06	0,01	**	-0,06	0,03	**
Childless couple	-0,07	0,00	***	-0,11	0,00	***
Other household composition	-0,10	0,01	**	-0,12	0,01	**
<i>Migratory status: French</i>	<i>Ref</i>			<i>Ref</i>		
First migrant generation	-0,13	0,00	***	-0,15	0,00	***
Second migrant generation	-0,03	0,11		-0,04	0,10	
<i>No social participation</i>	<i>Ref</i>					
Social participation	-0,38	0,00	***			
<i>French Language</i>				<i>Ref</i>		
French and other language				0,09	0,00	***
Other language				0,06	0,04	**
N	4155					
Log L	-4268,75					
Rho (LR Test)	0,77	0,01	**			

Legend :* p<0,1; ** p<0,05; *** p<0,01

Table 7. IV probit estimation of the probability to report a good health status and to have a social participation
Estimation on the "inactive" population

Characteristics	Bivariate Probit				
	Good Self-Assesed Health			Social Participation (Instrumental Equation)	
	Mfx	p-value		Mfx	p-value
Male	<i>Ref</i>			<i>Ref</i>	
Female	0,01	0,64		0,03	0,26
<i>Age</i>	<i>Ref</i>			<i>Ref</i>	
Age	0,00	0,00	**	0,00	0,26
<i>Post-secondary education</i>	<i>Ref</i>			<i>Ref</i>	
Without certificate	0,02	0,83		-0,25	0,00 **
Primary	0,05	0,39		-0,20	0,00 ***
1st level of secondary school	0,00	0,95		-0,10	0,03 **
2nd level of secondary school	0,06	0,24		-0,03	0,53
Other level of education	0,21	0,25		-0,24	0,10 *
<i>Prof Status: Unskilled Worker</i>	<i>Ref</i>			<i>Ref</i>	
Agricultural employee	-0,02	0,65		0,15	0,01 **
Self-employed	-0,06	0,35		0,16	0,01 **
Executive	0,02	0,81		0,15	0,02 **
Intermediary occupations	0,07	0,23		0,14	0,01 **
Administrative employee	-0,05	0,31		0,11	0,03 **
Business employee	-0,03	0,62		0,02	0,78
Skilled worker	-0,02	0,74		0,09	0,06 *
No Occupation	-0,08	0,45		0,03	0,82
<i>To have autonomy at work</i>	<i>Ref</i>			<i>Ref</i>	
To have no autonomy at work	-0,07	0,03	**	-0,05	0,04 **
Not applicable	-0,02	0,62		-0,19	0,00 ***
<i>Income: 1st quintile</i>	<i>Ref</i>			<i>Ref</i>	
2nd quintile	0,07	0,07	*	0,05	0,23
3rd quintile	0,11	0,02	**	0,11	0,01 **
4th quintile	0,12	0,01	**	0,10	0,03 **
5th quintile	0,15	0,01	**	0,17	0,00 ***
Unknown	0,07	0,10	*	0,06	0,15
<i>Household composition: Couple with child</i>	<i>Ref</i>			<i>Ref</i>	
To be alone	0,03	0,59		0,03	0,52
Single-parent	-0,06	0,41		0,04	0,57
Childless couple	0,03	0,60		0,09	0,06 *
Other household composition	0,05	0,54		-0,06	0,50
<i>Migratory status: French</i>	<i>Ref</i>			<i>Ref</i>	
First migrant generation	-0,08	0,09	*	-0,07	0,16
Second migrant generation	-0,05	0,25		-0,08	0,06 *
<i>No social participation</i>	<i>Ref</i>				
Social participation	0,46	0,00	***		
<i>French Language</i>				<i>Ref</i>	
French and other language				0,07	0,05 **
Other language				0,04	0,32
N	1838				
Log L	-2247,64				
Rho (LR Test)	-0,61	0,09	*		

Legend :* p<0,1; ** p<0,05; *** p<0,01

Hence, for individual in employment, unemployed or homemakers aged less or equal to 55 years old, having a social participation in addition to a paid job, to familial constraint and to search for employment is likely to lead to a poorer perceived health status. The obligation associated with multiple social roles in addition to time and energy constraint lead to role strain which seems to be detrimental to the self-assessed health status. Conversely, for individual retired, disabled or homemakers aged more than 55 years old, having a social participation increases the probability to be in the best health category. This population does not combine a paid job and have fewer familial constraints so that they do not have a multiple roles burden. They do not have to cope with many expectations and obligations like the “active” population. Thus for the defined “inactive” population, social participation may offers individuals personal enrichment or gratification, a connection to social group and social support and through these relationships the perceived health status of older or inactive persons is better.

Otherwise, the influence of biological dimension, socio-economic characteristics and migratory status on self-assessed health status remains comparable with the three binary probit analysis presented in Table 3.

In addition, determinants of social capital, presented on the second column of tables 5, 6 and 7 are quite similar across populations. Whatever the population considered individuals with lower levels of education and who do not have autonomy at work are significantly less likely to report having social participation. Similarly, household income increases the chance to have a social participation for both active and inactive population. In this way, richer individuals participate more often to collective actions. Conversely, household composition and migratory status do not have the same influence on the social participation of “active” population and the “inactive” one. Among active population, to be in a couple with child is associated with a higher probability to have a regular social participation compared to all other household compositions while among inactive population, to be in a childless couple compared to a couple with child is positively associated with a high probability to have a social participation. Among active population, first-generation migrant presents a lower probability to have a social participation compared to French born population while the probability is lower for second-generation migrant among the inactive population. Finally, the language spoken during childhood is strongly associated with social participation among both populations. To have spoken in French and another language increases the probability to have a regular social participation for both active and inactive populations. This result suggests that people who speak a French local dialect or a foreign dialect in addition to French language may encounter more opportunities to have social participation through a high sense of cultural communities or identification to social group.

V. Conclusion:

This study provides some empirical evidences of the causal influence of social participation on self assessed health status. Our empirical results confirm, at first sight, that social participation is strongly associated to health status of the whole population (Sirven, 2006; Folland, 2007; Islam, 2007; Jusot & al., 2008). Having a regular social participation is actually, positively associated with the probability of reporting a better health status. Since the association between social participation and health status should not be considered as causality, we intend to resolve the endogeneity issue using instrumental variable.

Using the language spoken during childhood as instrument of social participation, we found different result according to the population considered. On the whole sample, empirical results show no evidence of a causal influence of social participation on the probability to report a good self-assessed health status. Conversely, the bivariate estimation on the “active” population indicates that social participation is detrimental to health status. Hence individuals having a paid job, in search for employment or having dependent children and who, in addition, take part in social participation present a significant lower probability to report a good health status. This result confirms the roles strain hypothesis which suggests that involvement in different social roles may increases the pressure associated with obligations and expectation, which in turn increases stress and lead to poorer health condition. For the second population, namely the inactive population, results prove a beneficial causal influence of social participation on health status. Individuals retired, disabled or homemakers aged more than 55 years old take advantage of social participation because they have more time and fewer familial constraints and thus do not have as much pressure as the “active” population. Social participation for older or inactive persons provides positive outcomes in terms of self-assessed health status.

We must note the limitation of this study with regards to two different aspects. First, it has been shown that multiple roles burden is modified by marital status and material resources (Kmhath, Sermet & le Pape, 2000; Martikainen, 1995). We do not have performed estimation according to each income level and each household composition, which would certainly provide a more accurate interpretation of the causal influence of social capital on health status according to sub-populations. The use of self-assessed health to measure the health status could, in addition, be criticised as this variable may suffer from individual reporting heterogeneity (Bago d’Uva & al. 2008). However, despite its subjectivity, this indicator has been found to be a good predictor of mortality and it enables to capture overall health status (Idler & Benyamini, 1997).

Despite these limits, our results are supportive to the Healthy Ageing prospect in which European countries are engaged following the objectives of the Lisbon agenda. From a public policy perspective, the promotion of social capital appears as one of the priority topics for action to promote health of ageing population. Actually our findings support the assumption that social participation has a beneficial causal influence on the self assessed health status but only for sub-population like inactive and elderly, through for instance a prevention of loneliness, isolation and personal gratifications.

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