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SOCIAL CAPITAL AND SELF-RATED HEALTH IN ARGENTINA

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SUMMARY

The potential link between social capital and health suggests important pathways by which health may be improved. We examine this relationship using a unique data set from Argentina. This national survey allows us to determine whether the relationships between social capital and health that have been found in the US and Europe also apply to countries in South America (Argentina is the second-largest country in South America with a population of approximately 40 million). We estimate a causal effect of individual-level social capital on health using a measure of informal social interactions as our measure of social capital. Using information about access to public transportation as instrumental variables, we find that both men and women with higher levels of social capital report better health. Copyright © 2010 John Wiley & Sons, Ltd.

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1. INTRODUCTION

The relationship between social capital, health, health-care utilization, and health behaviors are topics of increasing interest among economists (Scheffler and Brown, 2008). The potential link between social capital and health suggests important pathways by which health may be improved. Social capital has been found to be positively associated with health status (d'Hombres *et al.*, 2009; Iversen, 2008; Petrou and Kupek, 2008), negatively related to non-specific psychological distress (Scheffler *et al.*, 2007), and negatively related to the recurrence of acute coronary syndrome (Scheffler *et al.*, 2008). The relationship between social capital and health-care utilization has been found to lower the utilization of general practice physicians (Laporte *et al.*, 2008). In addition, social capital has been found to be negatively correlated with the demand for cigarettes, cocaine, and physical inactivity (Folland, 2008; Brown *et al.*, 2006).

As informative as most of these studies are, they often fall short of measuring a true causal effect of social capital on health outcomes. This limitation is explicitly recognized in Petrou and Kupek (2008) who mention that it is unclear whether the observed associations are causal or due to reverse causality. Both Folland (2007) and d'Hombres *et al.* (2010) have attempted to correct for the potential endogeneity of social capital in their econometric models of self-rated health status, relying mainly on community-level and state-level instruments.

In this study we employ an instrumental variable approach. We use a unique data set from Argentina and focus on the relationship between social capital and health status among the elderly. Argentinean data allows us to determine whether the relationships between social capital and health found in the US

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and Europe also apply to countries in South America. We use individual-level instruments measuring access to public transportation. Convenient access to public transportation is likely to serve as a valid instrument. First, it is positively correlated with social capital because few elderly in Argentina have other means of transportation. Second, access to public transportation is unlikely to have a direct impact on individual health. Third, we control for factors that could be correlated with both public transportation and health, such as distance to the nearest public hospital, whether there is open garbage in the neighborhood, and include locality fixed effects. Fourth, the overidentification test does not reject the null hypothesis of valid instruments.

Definitions and measures of social capital vary significantly (Harpham *et al.*, 2002; Hawe and Shiell, 2000; Macinko and Starfield, 2001; Paldam, 2000), but social capital can be broadly defined at the individual level as the level of trust, networking, and/or cooperation that an individual experiences within a given community, and can be defined at the community level as the density of trust, networks, and/or cooperation (Paldam, 2000). Social capital is usually conceptualized to include at least two components: cognitive and structural. The cognitive component includes perceptions of trust, reciprocity, and sharing, while the structural component includes the extent and intensity of associational links and activity in society (Harpham *et al.*, 2002). The structural component facilitates linkages between people by lowering transactions costs and the cognitive component predisposes people toward making such linkages (Uphoff, 2000). Both the cognitive and structural aspects of social capital can be bonding (social connections between individuals who are similar), bridging (social connections between individuals who are dissimilar), or linking (social connections across different levels of social status). Epidemiologists have suggested that the mechanisms by which social capital confers health benefits include access to psychosocial support as well as the diffusion of health information (Kawachi and Berkman, 2000). Economists have proposed that social capital may directly enter the utility function (Islam *et al.* 2008; Folland, 2006, 2008; Becker and Murphy, 2003). In particular, in Folland's (2006, 2008) formulation the presence of social capital modifies the risk/reward tradeoffs of engaging in risky behaviors such that individuals with higher levels of social capital will be less prone to engage in risky behavior.

In this study, we focus on a structural measure of social capital at the individual level and its association with self-rated health. We also shift focus to Latin America.

2. DATA

Participants in this study were residents of Argentina aged 65 years and older, and composed of approximately 9.6% of the entire Argentine population. These residents were asked to complete the Encuesta de Desarrollo Social (EDS), a household survey conducted during October 1997 covering 113 localities across all 24 provinces in Argentina.[1] The EDS is a stratified random sample and it represents 96% of the urban population and 83.4% of the total population. The number of individuals with complete responses for the measures used in this study is 6287, representing 98% of individuals in the EDS.

The main outcome in this study is a binary version of self-rated health status where 0 = no health problems and 1 = some health problems. Approximately half of the sample reports having some health problems. Our measure of individual social capital is informal social interactions. Informal social interactions are measured by creating an index based on three factors (each measured in a binary fashion): whether or not a person often meets with friends, whether or not a person often meets with relatives, and whether or not a person reports living alone. We sum the first two factors and then

[1]The definition of a locality in the EDS is vague. A locality is neither a political nor an administrative unit in Argentina. Most of the urban agglomerates included as localities in the EDS are small cities (i.e. between 10 000 and 100 000 people), but there are a few large agglomerates (i.e. more than a million people) that are also categorize as a single locality.

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Table I. Descriptive statistics

	Women		Men	
Variable	Mean	Std dev	Mean	Std dev
Self-rated health problem (yes = 1, no = 0)	0.531	0.499	0.475	0.499
Informal Social Interactions Index	0	1	0	1
Age	73.451	6.796	72.518	6.173
Married	0.348	0.476	0.737	0.440
Divorced	0.042	0.200	0.035	0.185
Widowed	0.522	0.500	0.173	0.378
Unmarried	0.088	0.283	0.055	0.228
Years of schooling	5.972	4.064	6.566	4.105
Income per capita (total monthly family income in pesos over household size)	355.4	412.6	340.8	430.6
Household size (number of members)	2.721	1.829	2.987	1.890
Lack public transportation in neighborhood (yes = 1, no = 0)	0.210	0.407	0.203	0.403
Transportation is an important problem (yes = 1, no = 0)	0.090	0.286	0.070	0.256
Distance nearest public hospital (kilometers)	1.854	1.758	1.955	1.839
Contamination problem in neighborhood (yes = 1, no = 0)	0.311	0.463	0.309	0.462

Notes: Number of observations is 3719 for females and 2568 for males.

subtract the third factor. Finally, we convert this difference to a z-score by subtracting the mean and dividing by the standard deviation in the sample. This standardization allows for easier interpretation.[2]

Other independent variables include age (65 years and older), marital status (married, divorced, widowed or not married), years of schooling (years), family income per capita (pesos per month), household size (number of members), distance to nearest public hospital (kilometers), and whether there exists a contamination problem in one's neighborhood (binary variable). This last variable is a measure of the presence of open garbage in a neighborhood. The two instruments we use are: whether there is lack of public transportation in the neighborhood (binary variable), and whether the person reports that transportation is an important problem in her/his life (binary variable). One out of five people reside in a neighborhood that lacks public transportation and almost 10% of the sample reports that transportation is an important problem on their lives. Table I presents descriptive statistics separately for males and females.

To illustrate the relationship between social capital and health in the sample, we group women and men separately in four groups based on the score they have in the informal social interactions index. Then, we compute the share of the population in each group reporting health problems (Figure 1).

The percentage of women reporting health problems among those with the lowest level of social capital is 82%, while among those with the highest level of social capital is 42%. The figures for men are 94 and 39%, respectively. People with lower social capital are more likely to report having health problems. This correlation, however, is insufficient to claim that social capital has a causal effect on health.

3. ECONOMETRIC ANALYSIS

We use the following simple specification to model the relationship between individual-level social capital and health:

$$H_i = \beta \mathrm{SC}_i + X_i\delta + \varepsilon_i \quad (1)$$

[2]The first two factors are positively correlated, and both are negatively correlated with the third factor. The correlation coefficients are small (0.09, −0.02, and −0.04, respectively), suggesting that each factor adds information to the social capital index.

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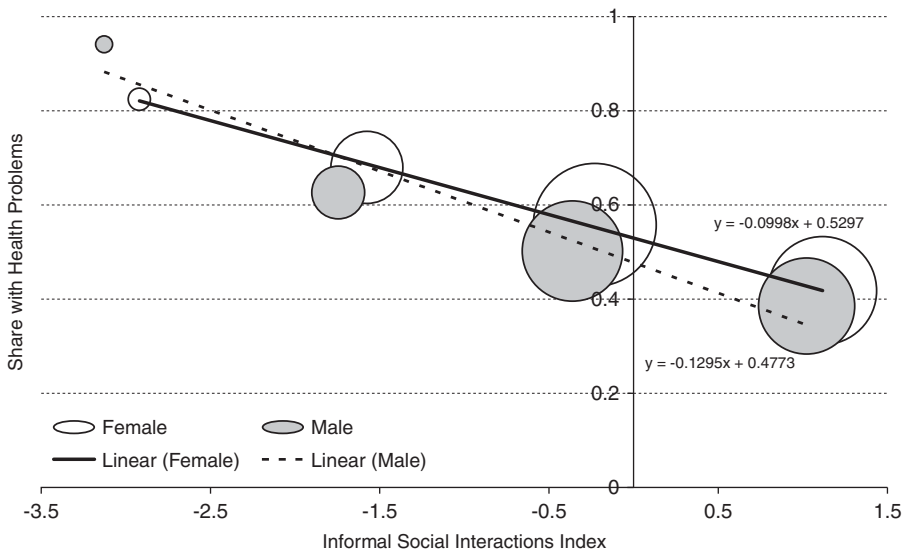

Figure 1. Share of the population reporting health problems by level of informal social interactions for women and men

where H_i is self-rated health status, SC_i is social capital for individual i, X_i is a vector with the remaining independent variables: age, education, income, marital status, household size, distance to nearest public medical facility, whether there is open garbage in neighborhood, and area-level fixed effects. β is the parameter of interest and captures the effect of informal social interactions with people not living in the same household on health problems.

In order to control for potential omitted variable bias and correct for potential endogeneity, we include area-level fixed effects and use the instrumental variable method.[3] The instruments are the two measures of access to public transportation described above. Few people in Argentina aged 65 years or older own a car; thus, convenient access to public transportation in a given neighborhood is critical to establishing and maintaining frequent social contacts with friends and family.[4] The exclusion restriction of omitting the two measures of access to public transportation from the second-stage equation rests on the reasonable assumption that, after conditioning on covariates, people who live in a place where there is public transportation are neither more nor less healthy than those who live in a place with lack of public transportation. The reasonableness of this assumption rests on the fact that the main threat to this assumption is that neighborhoods with more public transportation may also have more medical facilities or a healthier environment, both of which are controlled for in the second-stage model.

The first-stage equation is shown below:

$$SC_i = \pi T1_i + \varphi T2_i + X_i\rho + \upsilon_i \tag{2}$$

where $T1_i$ is a dummy equal to 1 if the person reports lacking public transportation in the neighborhood and 0 otherwise; and $T2_i$ is a dummy equal to 1 if the person reports that transportation is an important problem in her/his life and 0 otherwise. Equations (1) and (2) are estimated simultaneously using limited

[3]Access to public transportation is unevenly distributed within cities in Argentina. Hence, there is much variation in the instruments within localities. The within-locality standard deviation is 0.380 and the overall standard deviation is 0.405 for the variable 'lack of public transportation in the neighborhood', and 0.261 and 0.274 for the variable 'transportation is an important problem'.

[4]There are 146 passenger cars per 1000 people in Argentina compared to 461 in the US Retrieved from www.worldbank.org on 09/16/2009.

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information maximum likelihood (LIML) with a correction for heteroscedasticity.[5] All analysis is performed using STATA 9.[6]

4. RESULTS

To determine if males and females may differ with regard to the relationship between individual social capital and health, we estimate separate equations by sex. Table II presents the first-stage estimates. We find that people who lack access to public transportation, and people who report that transportation is an important problem in their lives, have less social capital. The lower part of the table reports identification statistics. The instruments are sufficiently strong for both females and males. The strength of the instruments in the first-stage regressions for both males and females is such that the maximum relative bias is less than 10% (the *F*-statistic is 11.81 for females and 10.51 for males; the critical value is

Table II. Estimates of the effects of public transportation on social capital

	DV: Informal social interactions	
	Women	Men
Lack of public transportation	−0.071	−0.097
	(0.042)	(0.053)
Transportation important problem	−0.277	−0.322
	(0.065)	(0.081)
Age	−0.015	−0.019
	(0.003)	(0.003)
Married	0.055	0.224
	(0.037)	(0.058)
Divorced	−0.065	−0.070
	(0.082)	(0.115)
Unmarried	−0.069	−0.146
	(0.062)	(0.109)
Years of schooling	0.025	0.020
	(0.004)	(0.006)
Income per capita	0.00014	0.00022
	(0.00005)	(0.00005)
Household size	−0.009	−0.022
	(0.009)	(0.011)
Distance to nearest public hospital	−0.004	0.006
	(0.011)	(0.012)
Contamination in neighborhood	−0.097	−0.066
	(0.037)	(0.044)
Area-level (locality) fixed effects	Yes	Yes
Test of excluded instruments		
F-statistic	11.81	10.51
P-value	0.0000	0.0000
Overidentification test		
Anderson–Rubin overid statistic	0.117	0.028
P-value	0.7321	0.8669

Notes: Robust standard errors in parentheses. Number of observations is 3719 for women and 2568 for men.

[5]Ignoring potential endogeneity also produces negative and statistically significant coefficients for the relation between social capital and health problems (dF/dx equal to −0.087 for females and −0.077 for males), but these estimates are biased if social capital is endogenous.

[6]A discrete model would be more appropriate because the dependent variable is dichotomous. But the STATA command ivprobit (which fits probit models where one or more of the regressors are endogenously determined) assumes that the endogenous regressor is continuous, and our index of social capital is not continuous. Hence, we cannot use this command.

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Table III. Second-stage estimates of social capital on health status

	DV: self-rated health problem	
	Women	Men
Informal social interactions	−0.676	−0.674
	(0.149)	(0.163)
Age	−0.005	−0.003
	(0.003)	(0.004)
Married	0.031	0.157
	(0.030)	(0.055)
Divorced	−0.023	0.009
	(0.060)	(0.087)
Unmarried	−0.090	−0.014
	(0.048)	(0.081)
Years of schooling	0.001	0.008
	(0.005)	(0.005)
Income per capita	0.0001	0.0001
	(0.0001)	(0.0001)
Household size	−0.006	−0.017
	(0.007)	(0.009)
Distance nearest public hospital	−0.011	0.001
	(0.008)	(0.009)
Contamination in neighborhood	0.010	0.024
	(0.032)	(0.037)
Area-level (locality) fixed effects	Yes	Yes

Notes: Robust standard errors in parentheses. Number of observations is 3719 for women and 2568 for men. Informal social interaction is instrumented by lack of public transportation in the neighborhood and whether the person reports that transportation is an important problem in her/his life. Models are estimated using LIML.

8.68). Note that the critical values for LIML are smaller than for two-stage least squares (Stock and Yogo, 2005). The Anderson–Rubin overidentification statistic does not lead to reject the null hypothesis of valid instruments.

In Table III, we present the second-stage estimates. We find that informal social capital have a strong negative association with self-rated health problems ($P<0.01$). These estimated parameters are similar for both males and females. For a standard deviation increase in the social capital index, the predicted probability of reporting health problems decreases by 0.68 for women and by 0.67 for men, other things equal.[7]

5. DISCUSSION

Results from this study show that, using measures of access to public transportation as instruments, individual-level social capital has a causal effect on self-rated health status. This relationship remained highly significant, even adjusting for other variables that may confound the association between social capital and health status. This study demonstrates that the relationships between social capital and health found in the US and Europe are not culturally specific and are also found in South America, in other words: social capital matters in the determination of health.

There are several limitations to this study. First, the measurement of health status collected in this study could be subject to measurement error. It is likely that this measurement error is random. As the

[7]Very similar results are obtained using two-stage least squares. The estimated coefficients are −0.67 for both females and males, and the standard errors are 0.15 and 0.16, respectively.

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measurement error occurs in the dependent variable of our model, it will not bias the estimated coefficients, but will merely decrease efficiency.

Future studies should focus on clarifying the mechanism of how increased social capital causes better health, especially since current research is lacking strong evidence for any one particular mechanism. One possibility for a mediating variable would be psychological stress, although other factors can be explored as well. Ultimately, the goal could be to gain enough understanding to develop a conceptual model showing how social capital and health are related, by way of other intervening factors that strengthen this association.

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