

## Impact of Social Capital on Individual Health in Community in Bolivia

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### ABSTRACT

Growing attention is given to the role of social capital in affecting the well-being of individuals, households, and the level of development of communities and nations. The complementary role of social capital in development is a missing link to economic growth. Social capital is rapidly recognized as social determinants of health and has been linked to individual health through a number of ways including health information and habits, access to health care. The study tested hypothesis about the association between social capital on individual health in a foraging-farming society of native Amazonians (Tsimane') in Bolivia. Findings indicated that Social capital has positive association with improved individual health status particularly for received support and gift, while access to credit has negative association. Regression by sex indicates that social capital impacts relatively differently on male and female BMI. The results are after controlling for relevant individual attributes, and for unobserved sources of variation of health.

**Keywords:** Social capital, Social capital approach, Health status, Missing link, Quantitative, Tsimane', Bolivia, developing nations, confounders

### INTRODUCTION

Social Capital (SC) has been linked to health outcomes, though research has been inconsistent and the link is dependent on the measures of social capital and health used (Patland *et al.*, 1998). Social capital is multifaceted and its relationship with health is complex. However, SC is an increasingly important concept in international health research because of the growing recognition of social determinants of health (Harpham and Thomas, 2000).

The social capital approach to delivery of health care is a young but rapid growing field. Between 1990 and 2006, there has been an increase of studies that empirically explore the dimensions and roles of social capital in health (Hendryx, 2002) in Rocco (2006). Harper (2001) in a report of UK Office of National Statistics suggests that social capital buffers the effects of stress and might generate a sense of well-being and belonging. Godoy *et al.*, (2007) surveyed the existing literature and found out that recent studies explored how individual income and social capital in the form of trust, safety nets, and norms of reciprocity might influence individual health. Further, they found that the

studies used information from industrialized nations, and proxies of social capital over wider geographical areas mainly in an urban context.

However, Brabec *et al.*, (2007) conducted a study on the association between social capital and individual health in small-scale rural societies of Tsimane' focusing on whether the interaction of social capital and income-explanatory variable influence individual health outcomes. They found that social capital within both a community and individual income not only influence individual health but interact with each other, and with community and individual resources to mold individual health. This finding may answer the questions Woolcock *et al.*, (2004) asked on whether social capital is a direct or secondary (indirect) cause of the health outcomes of an individual. That is, does a change in stocks and flows (investments) of social capital *per se* make significant independent contribution to observed health outcomes, do the changes respond to the varying character of broader political and economic forces fixed effects. This study examined the influence of confounders that bias the relative impact of social capital on

individual health. Few quantitative studies have examined the relationship between social capital and health outcomes by measuring individuals' anthropometric indicators of health outcomes while controlling for individual and community fixed effects of villages particularly in developing countries. Furthermore, there are fewer quantitative studies in developing countries than developed nations. Therefore, this paper based on the impact of social capital on health in a developing nation while controlling fixed effects hence filling the gap by exploring and contributing to the growing literature and recommendations for policy interventions.

### How Social Capital Work

Econometric estimates show a causative effect of social capital on individual health outcomes. Social capital can impact health through three ways of analysis, namely the macro-level, micro-level, and individual perspectives (Rocco, 2006). At a macro-level, social capital facilitates health service delivery through social networks. The social network among and between each group of health service providers (government, market, and family/ community) affects the efficiency and efficacy of the delivery of health services. Additionally, social capital promotes effective disease prevention efforts through formal and informal networks from which people receive information and medicine. At a micro-level, social capital can improve health by enforcing or changing social norms, resulting in a more cohesive society and improved pro-social behaviors that promote generosity in adverse situations such as ill-health. Finally, at the individual level, intensive social interactions provide a channel for information transmission and sharing of past experience on health facilities, doctors, drugs and diseases. Thus social capital reduces the cost of health information. Moreover, trust is formed which gives access to the support, aid, and health services provided by informal institutions based on reciprocity. It creates a sort of insurance for health shocks.

Growing empirical evidence suggests that social capital contributes significantly to sustainable development; I will assess the level and trend of health outcomes and general social well-being. Social capital proxies such as gifts, support, and access to credit in an emergency (assets, stocks and flow) are used to examine whether investment in these assets have significant impact on BMI of the individuals in Tsimane', Bolivia. The study draws its importance by

developing the understanding of social interventions which can help governments improve their responsiveness to social needs such as health care. Further, the results will highlight false assumptions about social problems which can be corrected through responsive social policies not only in Bolivia but also in other developing nations.

As the rural and indigenous population is not well known and marginalized, hence it is important to understand their social lifestyle and community fabric for individual health, well-being, and prosperity. Recent research noted that people live longer, happier, and safer when they are part of a close-knit community (Subramanian and Kawachi, 2004). However, what happens when the social fabric begins to fray?, people do not volunteer to do community work, do not attend PTA meetings where issues important to the community such as health and education could be discussed, when people no longer looking out for one another? Large or small, these actions reduce the strands of the fabric of the community and social capital investment, impairing development in the community. Nevertheless, Grootaert, (2001) found that there is increasing concern on the role of social capital in affecting the well-being of households and the level of development of communities and nations. Narayan and Pritchett (1999) agree with Grootaert (1998), on the role of social capital on community development. Their study shows that social capital is associated with higher reported levels of parental participation in schools and attendance at community meetings, which is related with higher levels of school quality. These findings suggests that more parental and community involvement in schools leads to better quality schools and health facilities.

### Applications of Social Capital in Anti-Poverty Programs

Saracostti (2007) noted that community social capital complements public services in many ways. He observed that mobilization of communal social capital helps to promote urban micro-enterprises and peasant production in poor Latin America areas. According to Paxton, (1999), programs developed in Brazil, Chile, Bolivia, and Guatemala emphasized associativity and bridging as ways to develop social capital. For example, the Ceibo grassroots program in Bolivia focused on bonding through self-management and self-practices and involved Quenchaus and Mosevenes. It also used

linking to provide increased social status, opportunities to learn new skills and access to networks in the capital for program participants. This program is the country's most widely respected/successful small farmers' organizations, because of its impressive economic expansion, widespread membership, improved stewardship of the tropical forest environment and social equity in the distribution of its economic benefits.

### Relationship between Social Capital and Health Outcomes

A study by Subramanian and Kawachi, (2004) on measuring individual and community social trust (as proxy for social capital) on health demonstrates a positive linear correlation. Higher levels of community trust are associated with better health among high trusting individuals. This means that close knit communities comprised of strong social fabrics have highly trusting individuals who interact, and share information resulting in better health.

Godoy *et al.*, (2006) surveyed the existing literature that explored how social capital (trust, safety nets, and norms of reciprocity) and individual income might influence individual health mainly in urban settings. They conducted a study on association between social capital and individual health in small-scale rural societies. They examined whether interaction of social capital of community and individual income (both as explanatory variables) influence individual health outcomes. The finding suggested a significant effect on individual health.

Subramanian and Kawachi (2004) disagreed on both theoretical and empirical literatures about social capital on individual health. The differences related to the view of social capital as an individual attribute vis-a-viz a collective property. In contrast, Szreter and Woolcock (2004) argued between the micro and macro ends of the levels of social capital. They recognize that individuals can draw upon resources through their connections to others (the 'social support' mechanism) and improve their well-being and health. At the same time, they noted the need to include the nature and extent of state-society relations as a part of the theory and public health policy. That is, assessing how the state relates to society to make health care accessible and improve the health of an individual. This demonstrates the need of allowing interaction of both individual and collective levels of social capital and

assesses significant observable impact on individual health.

Finally, studies in health literature indicate a positive relationship between social capital and individual health (Scheffler and Brown, 2008); Kawachi and Berkman, 2000). The findings on the relationship between social capital and health are result of extensive research studies mainly on effects of community social capital on individual health outcome in urban settings. Studies have shown a positive linear correlation to health and a possibility of individual resources impacting positively on health. Few quantitative studies have examined the interaction of social capital of community and individual income, and individual resources on health in developing countries. This paper will expand on the interactive relationship of social capital at multi-level analytical framework on individual health. Further, this study will specifically examine the effect of social capital interacting with individual attributes, household resources and community dummies particularly in developing nations. This study assess the relationship and significant impact of social capital on health while controlling for individual, household, and community fixed effects of individual Tsimane' in Bolivia.

### Impact of Social Capital on Health

The latest field in which social capital has been examined and applied is within the discipline of public health (Kawachi and Berkman 2000). Kawachi and Kennedy, (1997a) analyzed effects of social capital on state-level mortality rates of residents in 39 U.S. states. The social capital proxies were levels of interpersonal trust, norms of reciprocity, and density of associational membership as used by Putnam *et al.*, (1993b; 1995). The authors reported strong correlations between social capital and mortality rates. The study showed that lower levels of social trust were associated with higher rates of most major causes of death, including coronary heart disease, cerebrovascular disease, and infant mortality. From this, one sees a negative correlation meaning that an increase in level of trust is associated with a decrease in mortality rate. For example, an increase in level of trust by one standard deviation (or 10 percent) would be associated with about a 9 percent lower level of overall mortality.

Research dating back to Durkheim's study of the causes of suicide has shown that social integration can enhance population well-being (Kawachi and Kennedy, 1999a). For instance,

epidemiologic investigations of social ties found that individuals who lack social connections have 2 to 3 times the risk of dying from all causes compared with well-connected individuals. This is because the latter individuals are in a cohesive society that is richly endowed with stocks of social capital such as “mutual moral support, which instead of throwing the individual on his own resources, leads him to share in the collective energy and supports his own when exhausted (Kawachi&Lochner, 1997).

Another study on the effect of state-level social capital on individual self-reported health among 167,259 individuals in U.S was carried out by (Kawachi and Kennedy, 1999a). A dichotomous outcome measure of self-rated health was created and coded (fair or poor health=1; excellent, very good, or good=0). The study found a strong association between individual risk factors (low income, low education, lack of access to health care, obesity, and smoking) and poor self-rated health. Hence, individuals living in states with low social capital are at increased risk of poor self-rated health. These findings were consistent with an evident contextual effect of state-level social capital on individual well-being.

In Indonesia, research by Miller and Scheffler (2006) examined the effect of community social capital on overall health and mental health. The study used the Petris Social Capital Index (PSCI), an actual measure of the level of organizational resources within a community. The study finds a robust positive association between community-level social capital and good health. For example, a research shows a positive relationship between social capital and smoking cessation (Brown, 2008). Additionally, one study by Brown, (2006) found that smokers use fewer cigarettes in areas where there are higher levels of social capital.

The impact of social capital depends on the level at which it is measured. Most epidemiologic studies have measured social networks and social support at the level of individual characteristics, while social cohesion (strong social bonds-measured by level of trust and norms of reciprocity) is looked at through a level of collective characteristics (Fukuyama, 1997). Therefore, social capital measured at the community level may determine pattern of political participation and policy-setting that are health promoting, whereas social networks measured at the individual level shows strong

association with poor self-rated health. These studies focused on effects of social capital [*per se*] on health but very few considered some other confounding (contributing) factors that have a significant impact on health. Most studies were focused on subject and community as units of analysis, while my study expands the unit of analysis (person, household, and community) and adds to literature of social capital on health by examining social capital alongside other omitted variables such as individual attributes, household resources, individual wealth rank of village, and community dummies.

### Mechanisms linking social capital to health

Social capital’s impact on health depends on the level at which it is measured, either measured at neighborhood level or state level on individual health (Kawachi and Kennedy, 1999; Kawachi and Berkman, 2000). Researchers have established three routes through which social capital affects health-related behavior and individual health: 1) by influencing health-related behaviors (health information and health habits); 2) by influencing access to services and amenities (health services); 3) by affecting psychosocial processes.

## METHODOLOGY

### Sample and Data

Measure of the effect of social capital on health (body mass index, BMI) of Tsimane’ over 16 years of age was conducted in Bolivia. Body mass index as an objective way of measuring physical health outcome means the ratio of body weight in kilogram(s) and standing physical stature in meters squared. Access to credit in emergencies, receiving gifts, and receiving support was used as proxies for social capital to measure health outcomes

This paper focused on Tsimane’ community in the Bolivian Amazon. The most recent Bolivian census shows that Tsimane’ population is roughly 8000 people (Instituto Nacional de Estadística, 2003). Tsimane’ is a foraging and farming society living along the Maniqui River. Their main economic activities include fishing, farming, hunting, and logging (Godoy et al., 2006). This community also has intermittent interactions with the outside world and is highly autarkic. This paper is based on quantitative data obtained at the household level from a longitudinal survey conducted by the Tsimane’ Amazon Panel Study (TAPS). The data gathered

from 2002 to 2006 (inclusive) survey was used to analyze the effect of social capital on health in 13 villages of approximately 378 households with a total sample size of 3522 people (Godoy et al., 2007).

### Statistical Analysis

Univariate analysis was used for all variables in the study to statistically describe the parameters. Multiple regressions were used with robust standard error where there was need to correct for heteroskedasticity. Further, the STATA 10 software program and the acquired knowledge from courses such as Applied Econometrics, Applied Statistical Data Analysis for Development, Survey Design and Data Analysis, and Statistics for managers to analyze and discuss the regression results were also applied.

### Literature research

To build understanding on concept and impact of social capital on health in developing nations, analysis of the existing quantitative research literature obtained from documentation review and peer review journals. Evidence based literature thus far was dominated by studies from developed countries and it remains uncertain if the theory and measurement of social capital fit equally well in developing countries. The study adds to the existing recent literature on social capital as a social health determinants.

## DISCUSSION OF RESULTS

Empirical evidence suggests that socially isolated individuals are at risk for poor health outcomes because of their limited access to resources such as information and emotional support (Kawachi and Kennedy, 1999). Despite small regression coefficients, the findings are still meaningful as they support a priori expectations, except on self-reported ability to borrow 100 bolivianos (Bs). Small insignificant coefficients may be attributed to measurement error and small sample size which restrict the model's ability to accurately estimate the relation between social capital and body mass index. As stated earlier, the ability of social capital to smooth consumption and change behaviors at individual and household level is logic, it influences the health behaviors. The analysis above identifies household and village wealth rank as potential confounders of adult BMI, singling out individual attributes as the most important influencing factor of BMI. The role each variable/factor plays on individual

health will be addressed below, as well as specific examples of how social capital has been applied in anti-poverty programs for economic development (Saracostti, 2007).

### Gift and Support

The positive association between valued social capital (received gift/support) and BMI supports findings of Godoy et al., (2007), indicating that received gift and unpaid support account for only 2.66 percent of daily personal income and 3.66 percent of food consumption. Their findings suggest social capital has a positive influence on the overall individual income which, in turn, can impact individual BMI. Therefore, in times of need or mishaps (ill-health), social capital is expected to have big impact on health outcomes, while in contrast the study findings illustrate small coefficients (received support, 0.0014, received gift, 0.0024, and access to credit, -0.0031) in table 2 meaning small impact on individual health. This finding interconnects with the results of Morduch (2004) which suggest that informal transfers (received gift/support) provide incomplete insurance in time of need in low-income areas of developing nations. The complementary effect of social capital on self-insurance is due to the strong social ties which is a characteristic of poor neighborhoods such as the Tsimane'. Saracostti (2007) explained that social capital in low-income areas serves vitally important protection, risk management, and solidarity functions especially in absence of outside networks. Essentially, this study finding implies that Tsimane' (like other foraging communities) have access to other forms of self-insurance strategies to cushion against adverse shocks: they maintain small, mobile, self-reliant, autonomous households, and rely on hardy perennial tubers. This is not surprising as Tsimane' remain highly autarkic despite intermitted exposure to the market economy and social networks.

Therefore, social capital complements these strategies and increases individual BMI by smoothing consumption and increasing individual income that can enhance access to health care/services. In addition, social capital influences the individual BMI through psychological health that makes individuals feel better, sharing of goods and information on health care provision (medicine, experience on certain diseases and medical practitioner) amongst individuals, and with other households. This fit together with findings that preferential

cross-cousin marriage of Tsimane' increases interpersonal interaction (Brabecet al., 2007), thus increasing received support and gifts from the neighbors as well as subjective happiness.

**Social capital and individual attributes**

Table 1, column 2 shows the relationship between individual BMI and social capital and individual attributes. Social capital acts as complementary mechanism of a safety net against the limitations imposed by low income in small-scale rural societies. In societies without formal mechanisms of insurance, people invest in others through various expressions of generosity to protect themselves against adversity or misfortunes such as poor health Morduch (2004). Therefore social capital (received gift/support) substitutes for the resources and services that are normally provided by the state or market. For instance, poor access to health care is compensated by strengthening the social ties which form the cultural glue that binds individuals and rural societies together. This protects the individual in times of economic shocks, leading to improved well-being and a relatively increased individual BMI. Individual education attained and total

wealth (individual attributes) have positive and significant ( $p < 0.001$ ) correlation to individual BMI. This is because individuals with high education have a higher potential for employment resulting in high income which, in turn, improves the well-being and access to health care. In addition, employment has positive effect on social capital in that it increases the number and types of people to interact with and increases social networks that enhance subjective happiness and BMI. It is also true with total wealth, as findings of Maluccio and Haddad, (2000) indicating that assets are an integral component of a foraging individual Tsimane'. Logically, increased wealth means more rifles, bows, and other assets that facilitate the hunting process and an improve individual's ability to secure food sources. Also, the effect of social capital on individual BMI is probably more through mirth, happiness, and subjective well-being than with consumption smoothing of the individual. However, expression of pro-social behavior such as gift/ support likely produce net increase in consumption, possible reduced work load and, as a result, better BMI of the individual.

**Table 1.** Comparison of multiple linear OLS regression results with robust standard errors for natural logarithm of body mass index (dependent variable) on social capital (explanatory variable) of Tsimane' over 16 years of age: 2002-2006

Dependent variable: natural logarithm of body mass index				
Explanatory Variables	Social capital(SK) ( N = 2252)	Individual attributes(IA) ( N = 2127 )	Household resource(HR) ( N= 2127 )	Wealth rank(IR) ( N=2127)
[0]	[1]	[2]	[3]	[4]
I: Social capital (SK)				
Log received support	0.0004, p=0.94 (0.005)	0.0011, p=0.84 (0.005)	0.0013, p=0.81 (0.005)	0.0012, p=0.83 (0.005)
Frequency of received gift	0.004, p=0.0.22 (0.003)	0.0018, p=0.59 (0.003)	0.0021, p=0.53 (0.003)	0.0024, p=0.47 (0.003)
Log access to credit in emergency	-0.002, p=0.50 (0.003)	-0.0034, p=0.27 (0.003)	-0.0035, p=0.26 (0.003)	-0.0025, p=0.43 (0.003)
II: Individual attributes (IA)				
Total number of days in bed: 2 weeks		-0.0007, p=0.42 (0.001)	-0.0008, p=0.38 (0.000)	-0.0009, p=0.31 (0.000)
Logarithm of total wealth		<b>0.016***</b> (0.003)	<b>0.016***</b> (0.002)	<b>0.029***</b> (0.005)
Logarithm of height (In stature)		-0.01, p=0.94 (0.15)	-0.019, p=0.89 (0.15)	-0.015, p=91 (0.15)
Education attained		<b>0.0055***</b> (0.001)	<b>0.0055***</b> (0.001)	<b>0056***</b> (0.001)
III: Household resources (HR)				
Logarithm of household size			0.0069* (0.005)	<b>0.0066*</b> (0.005)
IV: Wealth rank				
Wealth rank				<b>-0.00097**</b> (0.005)

V: Control variables				
Logarithm of age	<b>0.021***</b> (0.005)	<b>0.017**</b> (0.007)	<b>0.017* *</b> (0.007)	<b>0.019**</b> (0.007)
Male	0.0018,p=0.70 (0.004)	-0.02,p=0.12 (0.012)	-0.019,p=0.12 (0.012)	-0.017,p=0.17 (0.013)
Survey year	<b>0.0037*</b> (0.001)	<b>0.0036*</b> (0.001)	<b>0.0037*</b> (0.001)	<b>0.0036*</b> (0.001)
Mean VIF	4.11	2.13	2.09	2.43
R-squared	0.078	0.103	0.104	0.104
Test of joint significance (F statistics and in parenthesis P>f)				
I	F=0.59, P= 0.62	F=0.48, P= 0.69	F=0.52, P= 0.66	F=0.44, P=0.72
II		F=11.5, P= 0.00	F=11.8, P= 0.00	F=8.3, P=0.00
III			F= 1.9, P= 0.17	F= 1.8, P=0.17
IV				F=1.0, P=0.31
I+II		F=7.1, P=0.00	F=7.3, P=0.00	F=5.4, P=0.00
I+II+III			F= 6.5, P=0.00	F= 4.8, P=0.00
I+II+III+IV				F= 5.9, P=0.00

**CONCLUSION**

The analysis depicts a weak impact of social capital on individual health, contrast to a *priori* expectations. The finding suggests statistically insignificant impact on individual health but illustrates a relatively significant impact on the individual health. This is exhibited by the positive coefficients of the received gifts and support that influence the nutritional status of the individual through increased body mass index. The small coefficients are probably due to a small sample size or biases as indicated in the methodology.

The literature suggests that social capital impacts individual health by complementing smooth consumption and increasing social interactions that influence healthy behaviors and psychological health which, in turn, increases BMI. Also, social capital promotes economic growth and development through enhanced individual and community participation in development programs and decision-making as seen in community program in Bolivia. In addition, the small coefficients indicate that social capital offers incomplete self-insurance in time of individual adversity such as ill-health. This is contrary to most literature on the role of social capital during hardships. This suggests that social capital contributes to certain level of self-insurance, and therefore complements to other health self-insurance strategies that exists in the Tsimane’ society.

Further, social capital being resources embedded in social interaction impacts individual health through psychological health which results in subjective happiness and increased body mass index. Social capital can impact individual health (body mass index) through other mechanisms such as sharing information on health care (e.g. medical practitioner, certain drugs/disease, and health institutions/services), adapting healthy behavior and emotional support from non-household members. Therefore, the observed social networks and interactions in the developing world are not just strong; they are necessary survival mechanisms that the society has developed to cope in resource-poor context. This complements the access to health care of the individual and therefore it is important to incorporate the social capital approach (SCA) to health care provision into public health policy in developing nations.

**RECOMMENDATIONS**

This paper unveils the importance of the concept of social capital for governments in developing nations, bringing together the theoretical and empirical rationale for considering social ties as a potentially important ingredient of well-being and prosperity in society. Therefore, from the public policy perspective, interest must move beyond social capital as a research topic to social capital as a heuristic tool, which would yield substantial gain in the design, implementation, and evaluation of public

intervention. In other words, where applicable, government should integrate a social capital approach in developing research projects, policy, and programs in order to design appropriate interventions for the marginalized and indigenous population in the developing world.

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