Human capital and biological well-being: intragenerational and intergenerational effects in 20th-century Spain[1]

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Introduction and objectives

At present, well-being is a very complex concept that tends to be identified with quality of life which includes not only objective but also a good number of subjective dimensions of human life. Health is broadly accepted as a main component of well-being since a good number of people's utilities and capabilities depend on health status (Nussbaum and Sen, 1993). Consequently, in a historical perspective, health transition processes, as a comprehensive look at epidemiologic, socioeconomic, cultural and behavioural changes in contemporary societies (Frenk *et al*, 1991; Caldwell, 1993) have been regarded as one of the most representative signs of the dramatic improvement in well-being standards happened in a number of countries mainly during the 20th century. This area of well-being has consequently preferred final output indicators able to capture epidemiological and environmental scenarios that influence the number and quality of the years lived by a population or the mean height finally attained in adulthood by a given cohort.

On the other hand, health and human capital have shown very powerful synergies contributing to a better life. Education is accepted to be an important factor to promote health, well-being, economic growth and general socioeconomic development. For instance, well educated people usually self-report good health while poor health levels directly diminish educational attainment. Even when there is no clear agreement about the explanations for these associations, Ross and Wu (1995) propose that work and economic condition, social-psychological resources and health lifestyle are the links between education and health. Also, the relationship between adolescent health and educational attainment within a generation raises the potential for health to contribute in a nontrivial way to intergenerational inequality (Jackson, 2009). In that same sense, education and health can be specifically related with socioeconomic status and moreover to the access to resources mostly defined by the country's development level.

Spain seems to us a particularly interesting case to explore these interactions due to its rapid transition towards high levels of development and well-being standards among Western societies. This allows the

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Spanish survey system to interview people whose living conditions have dramatically changed during their life course. Consequently, very diverse cohorts in terms of life-styles and well-being components such as education, income, nutrition and access to a wide variety of social, health and sanitary services can be studied.

Considering the health components of well-being, this country experienced a late central stage of health transition during the 20th century. Cohorts born since 1940 have been especially benefited during the last years but they have also suffered the worst stages of the recent Spanish economic history. The residual adverse effects of the Civil War and the subsequent autarchy held back the economic system until the end of the 50's reaching one of the lowest development levels of Europe. Illustratively, Spaniards did not attain a stable situation of food security until the mid 1950s and older cohorts were variably affected by scarcity, poverty and –in some cases- famine depleting health and living conditions for the survivors. Contrarily, the dramatic improvement of living standards since the end of that decade has lead to substantial increases in life expectancy, cohort adult height and other indicators of biological well-being.

Referred to the changes in human capital, the access to elementary education was not generalized until the last quarter of the 20th century. Given the socioeconomic conditions, access to education represented an almost unreachable opportunity cost for many families. As a consequence, until the second half of the century, child labour –necessary for household's survival- was the main cause of truancy and the higher illiteracy rate. It was not until the economic recovery and after the generalized literacy campaigns of the 60's that Spain walked towards the total school enrolment of the population between 6 and 12 years of age.

Though the implications of the socioeconomic modernization experienced by Spain during the last five decades are obvious, the specific contribution of human capital and its interaction with the general environment remains a less studied issue. For instance, it is ignored to what extend economic growth and modernization would have rendered so successful outputs in terms of health without an improvement of educational status, particularly among mothers due to its implications on childbearing. It is also unknown to what extend differences in health status among regions and social classes are due to the human capital factor. Likewise it seems adequate to speculate with the varying influence of human capital on the geographic gradient showed by health indicators in Spain once they are controlled by sociodemographic variables like sex, income and urbanization levels.

The aim of this paper is to shed some light on these research questions by exploring the specific interactions between human capital and biological well-being throughout the 20th century in Spain. The former will be approached by educational levels attained in adulthood whereas cohort adult height will serve as a proxy of biological well-being. The main objective of our study is to observe intra and intergenerational effects of human capital accumulation on the biological well-being of the Spanish population during the central stage of the health transition process that took place throughout the last century in Spain. A number of socioeconomic and environmental factors, namely income, birth cohort and place of residence will be used as control variables.

Our research hypothesis is that the effects of human capital on biological well-being reflected by adult height might have varied according to sociodemographic and socioeconomic traits such as sex, birth cohort, region and income. Likewise, we hypothesize a different effect of human capital on biological well-being when the aforementioned interactions are analyzed either within a given group of cohorts (*intragenerational*) or between different group of cohorts (*intergenerational*). By conducting the analysis at these two levels, it is intended to assess the actual contribution of educational levels to the rapid improvement of biological living standards throughout the 20th century in Spain once socioeconomic and environmental factors are controlled for. Given the socioeconomic conditions of the last century, intragenerational effects should show that for the older cohorts' higher educational attainment implied better access to education and hence better socioeconomic level also reflected on health as a higher adult height. On the other hand, intergenerational effects will show the influence of parents' characteristics but also the improvement of living conditions as a result of the development policies of the last 40 years.

Sources and methods

The bulk of this work will be based on data on adult height, educational level, income and region from the waves of the Spanish National Health Survey (SNHS) held between 1987 and 2006. Demographic analysis together with different multivariate statistical techniques will integrate the core of the methodology.

Data

In previous works the high coherence of responses regarding cohort adult height among different waves of the SNHS has been assessed (Spijker et al., 2008) showing that cohort height remains relatively constant once adulthood is reached. Although the SNHS is a cross-sectional survey where no follow-up is done, that coherence allows to aggregate microdata from all these surveys by birth cohorts thus improving consistency and representativeness. More importantly, this permits that cohort adult height –used as a final-output indicator of the biological components of well-being- could be disaggregated by sex, region and single birth cohorts between 1910 and 1976. We will proceed by standardizing this indicator by infant mortality and general fertility levels whose changes across time may generate a selection effect on mean cohort adult height (Alter, 2004).

Data on income, region and educational level are also provided in the SNHS. The later has to be harmonized since the response set have changed across waves. To ease comparability among sources and to eventually allow for the correction of biases, educational categories from the Spanish census will be used to recode those from the survey.

Briefly on data analysis

Height will be the dependent variable in our study. This anthropometric indicator has been profusely used during the last decades in the fields of economic history and human development due to its capacity to

capture the general living conditions lived by an individual until his/her physical growth cycle is completed at the end of the adolescence. The literature on anthropometrics and their relationship with health and nutrition is extensive. For instance, recent works show that poor maternal nutrition during gestation may contribute to restricted foetal growth and increased health susceptibility in later life (Roseboom, *et* al, 2006) and for those on early childhood directly affects height in adulthood (Chen and Zhou, 2007).

With regard to human capital, our independent variable, we will take into account educational attainment at 25 years-of-age assuming that someone who has reached the typical age for each stage of schooling and has attained a given level of attainment will maintain it until the end of his life. This age threshold is adequate given that the most recent cohorts included in the analysis are those born in 1976 and most of those individuals are not expected to have improved their educational level after that age.

Regarding the levels of analysis, we will define intragenerational effects as those that are determined mostly by contextual characteristics under a cross-section perspective, while intergenerational effects include those under a longitudinal perspective. That is, intergenerational effects are also referred to the parent-children relation not only with respect to encouragement for obtaining a higher educational attainment but in sense of their children's health level. Given the time lag of expected causality of educational investment policies (Lutz, 2009) the increase in the human capital of the total adult population can be actually measured given the higher weight of the better educated cohorts. Since our data are cross-sectional, this longitudinal approach will be undertaken following an ecological research framework based on the generational lagged effects of education for the whole of the population.

References

- Alter, G. (2004): "Height, Frailty, and the Standard of Living: Modeling the Effects of Diet and Disease on Declining Mortality and Increasing Height. *Population Studies* 58: 265-279.
- Caldwell, J. (1993): Health transition: The cultural, social and behavioural determinants of health in the Third World. *Social Science & Medicine* 36: 125-135.
- Chen, Y. and Zhou, L. (2007): The long-term health and economic consequences of the 1959-1961 famine in China. *Journal of Health Economics* 26: 659-681.
- Frenk, J., Bobadilla, J.L., Stern, C., Frejka, T., Lozano, R. (1991): Elements for a theory of the health transition. *Health Transition Review* 1: 21-38.
- Jackson, M.I. (2009): Understanding the link between adolescent health and educational attainment. *Demography* 46: 671-694.
- Lutz, W. (2009): Sola schola et sanitate: human capital as the root cause and priority for international development? *Philosophical Transactions of the Royal Society B* 364: 3031-3047.
- Nussbaum, M. and Sen, A (eds.) (1993): *The Quality of Life*. Oxford, Oxford University Press.
- Roseboom, T.; de Rooij, S. and Painter, R. (2006): The Dutch famine and its long-term consequences for adult health. *Early Human Development* 82: 485-491.
- Ross, C. and Wu, C. (2009): The links between education and health. *American Sociological Review* 60: 719-745.
- Spijker, J.; Pérez, J. and Cámara, A.D. (2008): Cambios generacionales de la estatura en la España del siglo XX a partir de la Encuesta Nacional de Salud. *Revista de Estadística Española* 169: 571-604.