



## On the human capital of Inca Indios before and after the Spanish Conquest. Was there a “Pre-Colonial Legacy”?

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### ABSTRACT

Not only the colonial period, but also the pre-colonial times might have influenced later development patterns. In this study we assess a potential “pre-colonial legacy” hypothesis for the case of the Andean region. In order to analyze the hypothesis, we study the human capital of Inca Indios, using age-heaping-based techniques to estimate basic numeracy skills. We find that Peruvian Inca Indios had only around half the numeracy level of the Spanish invaders. The hypothesis holds even after adjusting for a number of potential biases. In addition, we find evidence on inequality in pre-Columbian times. Given the low educational level and the high inequality reigning before the Spanish Conquest in the Andean region, we argue that more attention should be paid to the pre-colonial legacies when assessing the genesis of the long-term path of only modest economic growth in the countries of Latin America.

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### 1. Introduction

One commonly accepted view on the genesis of Latin America's economic backwardness blames mainly the legacy of colonial institutions for today's underdevelopment (Engerman and Sokoloff, 2000; Engerman et al., 1999; Acemoglu et al., 2001, 2002; Coatsworth and Taylor, 1998; Coatsworth, 2008; Bulmer-Thomas, 2006). Acemoglu et al. claim that bad institutions originated in areas in which small European elites exploited large populations of native or African descent. These so-called “extractive institutions” – favoring the concentration of power by a small fraction of the population, hampering property and human rights, and restricting public investment in schools and other growth-inducing infrastructure – have tended to persist until today, hindering GDP growth. Engerman and Sokoloff argued that geography and initial factor endowments at the time of the conquest – both natural resources and labor supply (the latter determined by population density) – defined the later inequality of the colonies. Where climate and soils were suitable for cultivating highly valued commodities and indigenous population was dense, they argue, extractive institutions were more likely created in order to facilitate exploitation in the form of large plantations or cattle and grain haciendas. This was the case in the Andes and Mexico, for example.

While we agree with the role of colonial development obstacles, we argue in this study that there might also have been an additional legacy of pre-colonial societies for economic success. Especially low human capital investment in the Inca Empire might have initiated a path-dependent process of agriculture which was not human-capital intensive in the following centuries. Recently, Comin et al. (2010) constructed a measure of technological adoption at a regional level reaching back to 1500 AD. Applied to Latin America and specifically to Peru, they find that the Inca Empire not only lagged far behind most of Eurasia and Northern Africa, but was also outperformed by the

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Aztecs in terms of the utilization of a set of basic technologies (communications, agriculture, military, industry and transportation). Using this measure they report a positive correlation between pre-colonial technology history and per capita income today. Thinking of human capital as a core determinant of economic development, in this paper we contribute to the literature on the genesis of underdevelopment in the Andean region by constructing a data set that permits us to measure pre-colonial educational levels and compare them with European and Asian values. We also argue that educational inequality was substantial in Peru before the Spanish conquest.

How can human capital of the “Inca” Indios be measured?<sup>1</sup> Obviously, no school enrollment or literacy rates are available for this early period of human history. However, a considerable number of studies have recently used an innovative measure of basic numerical skills, which takes the share of people who report an exact age as an indicator. In historical populations (as well as in the poorest countries today), a substantial share of the people was not able to state their exact age and hence reported a rounded age, such as “I am 40”, when they were in fact e.g. 39 or 41. In hundreds of samples and dozens of studies, it has been proven that there is a significant correlation between the share of exact reported ages and other human capital indicators (see [Section 2](#) and [Appendix A](#) for a longer methodological treatment). For example, one population register on a remote Andean region (Huanuco) contains both age statements of Indios born before the Spanish conquest and thereafter. Another register of Indios in the capital of Peru reflects the birth cohorts of the later 16th century and is therefore an interesting source for the history of numeracy under Spanish colonial rule. We also study a census of the population of Lima born during the 17th century, which allows us to perform a comparison between urban Peruvians of indigenous, European, black and mixed ancestry.

Of course, our study faces a number of challenges. Cultural counting differences, selective mortality, and other human capital components apart from numeracy are all potential lacunae of our research design and hence will be discussed in detail below. But before doing so, we will give a brief history and chronology in [Section 1](#), discuss our sources and the methods of basic numeracy measurement in [Section 2](#), and present the main results in [Section 3](#). After the “Potential Objections section” we will dig slightly deeper and assess social and regional differences in [Section 5](#), before ending with a conclusion.

## 2. History and chronology

Sources used by historians writing about pre-Columbian Peru comprise the legacy from officers of the Crown – like the *visitantes* from which we derive information for our dataset, often conducted on the basis of detailed questionnaires and including remarks of the visitor – Spanish travelogues and native chronicles.<sup>2</sup> Most important travelogues of conquistadors told from a Spanish point of view include Pedro Pizarro’s (brother of Francisco Pizarro). Other authors like Pedro de Cieza de León were more interested in the Indian world and cross-referenced their evidence with information provided by natives ([Esteban, 1997; p.112](#)). Works from mestizo and Peruvian writers such as Garcilaso de la Vega and Felipe Guaman Poma de Ayala, both descendants of the Inca nobility, brought up in close contact to Quechua culture and language, provide a valuable insight into the Inca history and culture, though probably also positively exaggerating their advance ([Poma de Ayala, 1615; Esteban, 1997; p.118](#)).

The date of creation of the Inca Empire in the city of Cuzco is assigned to the early thirteenth century, about three hundred years before the Spanish arrived in Peru ([Bakewell, 2004; p. 25](#)).<sup>3</sup> At the time of its greatest expansion, the beginning of the 16th century, the Inca Empire included today’s Ecuador, Peru, Bolivia and a large part of Chile, as well as smaller territories in Argentina and Colombia.<sup>4</sup> The Spanish conquistador Francisco Pizarro reached Inca territory arriving from Panama in 1526. Three years later he obtained the permission from the Spanish crown to conquer the region and become governor of New Castile—as the administrative unit reaching from Ecuador in the north to Cuzco in the south would be called until 1542. At that time, the smallpox epidemic that had already devastated the population in the Caribbean and Mexico, had also reached Inca territory, causing a population catastrophe in this Empire as well, as reported by a number of studies ([Lockhart, 1968; Denevan, 1976; Cook, 1981; Cook and Lovell, 1991](#)).<sup>5</sup> [McCaa et al. \(2004\)](#) argue, however, that smallpox epidemics and disease factors in general were probably less important, whereas the effects of civil war and of exploitation were rather more decisive for the demographic catastrophe of the Andean region.

When the Spanish troops arrived in Ecuador with the intention of conquering the Inca Empire, the ruler Atahualpa had just defeated his half-brother Huascar and his supporters in a bloody assault of Cuzco. In 1532 the Spanish soldiers led by Pizarro captured Atahualpa at the Battle of Cajamarca. This was the first step of a long fight to subdue the Inca Empire. The Inca ruler was held as a prisoner for eight months. During this time Pizarro received a ransom of “enough gold to fill a room 22 feet long by 17 feet wide to a height of over 8 feet” ([Diamond, 1997; p. 68](#)) in exchange for the promise to free Atahualpa (which was never fulfilled). The Inca was sentenced to execution in a mock trial because the Spanish suspected he was plotting his rescue by a large troop under the Inca general Rumiñahui. The charges against Atahualpa were polygamy, incestuous marriage, and idolatry – all common rites in the Inca culture – and having killed his brother Huascar. Following Atahualpa’s death, further Spanish troops arrived in their mission to conquer Ecuador and Peru. Benalcázar’s soldiers defeated the great Inca warrior Rumiñahui in Ecuador and occupied the city of Quito

<sup>1</sup> “Inca” Indios are used here in citation marks, because the Inca Empire consisted of nearly 200 tribes, and only the family of the ruler was called Inca. But as the Habsburg Empire was named after the ruling family, it seems reasonable to name the whole group “Inca Indios”. Hence, we will drop the quotation marks in the following.

<sup>2</sup> As the Incas knew no writing, their oral tradition was written down in the early colonial time often in a mixture of Quechua and Spanish language ([Wachtel, 1977; p. 5](#)). Members of the intellectual elite soon adopted cultural opportunities as the written language, offered by the interaction with the Spanish.

<sup>3</sup> Their own creation myths link Inca people’s point of origin to the Lake Titicaca, 300 km south-east of Cuzco.

<sup>4</sup> The territory of the Inca Empire was then called *Tahuantinsuyu* and included *Chinchay Suyu* (the north), *Anti Suyu* (the Amazon jungle in the east), *Colla Suyu* (the south) and *Conti Suyu* (the west). The word *Tahuantinsuyu* derives from the Quechua *tawa* (meaning “four”), to which the suffix *-ntin* (“together” or “united”) is added, followed by *suyu* (“region” or “province”), which roughly renders as “The four regions together”.

<sup>5</sup> Following [Crosby \(1972, p. 207\)](#), the smallpox epidemic reached Inca domain in 1525 or 1526.

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