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The origins of monetary income inequality☆ Patience, human capital, and division of labor

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Abstract

We present an explanation about the origins of monetary income inequality when an economically self-sufficient society opens to a market economy. The chain of associations runs from patience, to the accumulation of different forms of human capital, to self-selection into different occupations, and to the division of labor, which contributes to monetary income inequality. In a self-sufficient society, patience is exogenously determined and people rely on folk knowledge as the only form of human capital. With the establishment of schools, patient and impatient people sort themselves out by the type of human capital they begin to accumulate. Impatient people do not acquire folk knowledge because return to schooling takes many years to bear fruit. Schooling opens opportunities in occupations outside the village, whereas folk knowledge enhances employment opportunities that draw on farming or foraging. Self-selection into different occupations with different earnings potential spawns monetary income inequality. To test the explanation, we draw on data from a foraging–farming society in the Bolivian Amazon, the Tsimane'. We collected data during four consecutive quarters in 1999–2000 and a follow-up interview (2004). Data came from 151 adults (age, 16 years or more) from all households ($n=48$) in two villages with different levels of market exposure. During 1999–2000, impatience was associated with (a) greater folk knowledge and fewer years of schooling, (b) lower likelihood of working in wage labor, and (c) greater likelihood of working in rural subsistence occupations. People who had been patient in 1999–2000 had greater wage earnings and more modern physical assets in 2004.

Keywords: Patience; Division of labor; Income inequality; Human capital; Tsimane'; Bolivia; Amazon; Indigenous populations; Amerindians; Latin America

How poor are they that have no patience! (*Othello*, Shakespeare)

1. Introduction

In this article, we present and test an explanation about the origins of monetary income inequality when a small-scale economically self-sufficient society opens to a market economy. We posit a chain of associations from patience or private time preference, to the accumulation of different forms of human capital, to the occupational division of labor, ending with the growth of monetary income inequality. We start by asking a simple question: "Why do societies have monetary income inequality?" We trace monetary income inequality back to earning differentials across occupations, and then ask: "Given differences in earning across occupations, why do people select to enter some occupations and not others?" We trace the occupational division of labor to differences in the type of human capital people have, and then pose the last question: "What causes people to invest in different forms of human capital?" The answer to the last question takes us to patience, which, we suggest, shapes the accumulation of different forms of human capital and produces associations with the occupational division of labor and the monetary income inequality just described.

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Here we present the intuition behind the explanation and empirical evidence bearing on the explanation from a small-scale preindustrial society of foragers and farmers in the Bolivian Amazon in the early stages of continual exposure to the market economy. Hard to test in an industrial society where many confounds muddle associations, the explanation can be tested more easily in a preindustrial setting because such a setting provides one with a simpler natural laboratory to measure variables and to detect their links. A relatively isolated society of foragers and farmers allows one the rare opportunity to see in a snapshot what things must have been like over a broad swath of societies and time before "the great transformation" to the market economy took place (Polanyi, 1944).

Evolutionary anthropologists have been interested in patience (Rogers, 1994), human capital (particularly embodied human capital; Kaplan & Bock, 2001), and economic inequality (Godoy, Gurven, et al., 2004; Henrich et al., 2004). They have been interested in patience because patience presumably confers adaptive advantage since it makes people plan for the future. They have been interested in various forms of human capital because the various forms allow people to deal with disequilibrium and to use local resources better, thereby enhancing their inclusive fitness. In addition, they have been interested in economic inequality, in part, because it might threaten cooperative and prosocial behavior, which has adaptive advantages. These three lines of research have advanced our understanding of patience, human capital, and inequality, but they have left unanswered two large questions that we try to fill here. First, how do these three seemingly disparate aspects of human condition link with each other? Second, how do the three aspects interact with each other to explain the evolution of inequality?

2. The explanation

We posit a causal chain linking patience, the accumulation of different forms of human capital, occupational choice, and monetary income inequality. Researchers have studied the links between adjacent rings of the chain, or the drivers of income inequality, but not the entire chain. Parts of our hypothesis in linking economic with psychological variables hark back to the work of Banfield (1958) and Foster (1965), but we go beyond earlier works in linking psychological states with different patterns of human capital accumulation and then in tracing the effects of human capital on income inequality. Unlike Banfield or Foster, we test the hypothesis with quantitative information.

Our explanation begins in a self-sufficient remote economy without modern forms of human capital, without an occupational division of labor (other than along sex or age lines), and without much income inequality. In our idealized preindustrial economy, as Marx (1983) taught more than a century ago and as modern ethnographers have since confirmed (Siskind, 1975), people hunt and fish in the morning, farm in the afternoon, and beguile the rest of the day socializing with kith and kin (Sacket, 1996). In this idealized preindustrial economy, patience is exogenously determined. Patience or the rate of private time preference refers to the ability to delay gratification (Camerer, 1995; Frederick, Loewenstein, & O'Donoghue, 2002). High rates of private time preference imply a greater propensity to consume now rather than later, impulsiveness, myopia, inability to defer gratification, and a lower proclivity to invest in the future. Empirical work supports the assumption that the rate of private time preference comes partially hardwired in childhood (Shoda, Mischel, & Peake, 1990) and that it may even have neurological roots (McClure, Laibson, Loewenstein, & Cohen, 2004). Nevertheless, even in a small-scale relatively remote preindustrial society, the rate of time preference will change with age (Rogers, 1994) or illness (Kirby et al., 2002). However, differences in the rate of time preference between people cannot reflect schooling since preindustrial societies lack schools, nor can they reflect differences in wealth or income because such societies presumably lack salient economic inequalities.

In preindustrial societies, people rely on only one form of human capital—what evolutionary anthropologists have called embodied capital. Embodied capital includes growth-based attributes such as body size, strength, and balance, but also experience-based attributes such as knowledge, memory, or skills (Kaplan, 1996; Kaplan & Bock, 2001). Embodied capital allows children to become competent adults. As Bock (2002) points out, there is a tradeoff between the acquisition of experience-based embodied capital and immediate productivity among children. Time allocated to different economic activities reflects the short-term and long-term costs and benefits to parents of investing in children's embodied capital. Unlike schooling, embodied capital yields immediate and long-term benefits. Some complex skills, such as hunting or craft production, generate benefits in the long term or after people have become proficient in the skill, but simpler skills, such as the ability to identify and prepare medicinal plants, yield immediate benefits. For instance, children in rural preindustrial societies self-medicate with local herbs (Geissler et al., 2000; Reynolds, 1996; Sternberg et al., 2001). In short, in remote preindustrial societies, people are stuck with one and only one form of human capital that, in many cases, produces immediate tangible benefits.

Many changes follow when these societies open up to the market economy. In particular, the introduction of schools allows people, for the first time, a choice in the type of human capital they can accumulate. Unlike embodied capital, modern human capital only yields payoffs in the distant future, and in the early stages of contact with the market economy, even those returns come with much uncertainty (Schultz, 1975). Furthermore, returns from schooling only come after many years of exposure to schools (Mingat & Bruns, 2002). With a standard school