

# Intellectual Autonomy, Future Orientation, and the Cultural Roots of Human Capital Accumulation

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## Abstract

While the accumulation of human capital is widely recognized as a key driver of economic development, what drives cross-country differences in human capital accumulation remains little understood. I use an epidemiological approach involving migrants to test for a possible cultural gradient in individuals' propensity towards human capital accumulation. However, advancing on traditional macro-focused epidemiological culture research, I also explore possible micro-level channels through which country-of-origin culture affects human capital accumulation. Results confirm that culture affects individuals' propensity towards human capital accumulation. Moreover, both individuals' personal values and, particularly, their occupations appear to act as channels linking group-level culture to human capital accumulation at the individual level. Finally, culture's effect on human capital accumulation traces back to cultural differences in emphasis on intellectual autonomy and future orientation. I conclude that understanding countries' differential development experiences requires detailed study of the various micro channels through which culture can have macroeconomic consequences.

**Keywords:** Culture; skill accumulation; epidemiological approach; intellectual autonomy; microfoundations

**JEL codes:** I20, O11, Z10

*All of the East Asian miracle economies have become [...] increasingly well-educated. [...] These facts—or at least some of them—must figure in any explanation of the growth miracles, but they are additions to the list of events we want to explain, not themselves explanations.*

- Robert Lucas, 1993, p.252

## **1. Introduction**

Human capital accumulation is an important source of economic growth and development (Barro, 1991; Erosa et al., 2010; Gennaioli et al., 2013; Mankiw et al., 1992; Manuelli and Seshadri, 2014). However, in explaining countries' growth experience, the accumulation of human capital is a proximate factor that itself requires explaining (Lucas, 1993). In fact, some authors find that capital accumulation or education are best seen as manifestations of growth rather than as causal factors; “they are growth” (North and Thomas, 1973, p.2).

In an influential paper, Acemoglu et al. (2001) propose that the nature of the formal institutions in a country, specifically whether institutions are extractive or inclusive, is critical for development. They test this argument using data on settler mortality, finding that European colonizers designed institutions aimed at extracting value rather than creating value in environments in which their chances of survival were smaller. Other work is more critical of the role of formal institutions, suggesting that human capital is a more basic source of growth than formal institutions are (Glaeser et al., 2004). Particularly, the argument is that European colonizers did not bring with them institutions as much as they brought human capital—and more of this human capital settled permanently in places more hospitable to Europeans, i.e., in places with lower settler mortality. Other work still identifies informal institutions such as culture and certain societal norms as fundamental drivers of economic development (see Nunn,

2012, Roland, 2015, and Spolaore and Wacziarg, 2013 for surveys; also see Fukuyama, 1995 and Landes, 1998). Meanwhile, the challenge put forth by Lucas (1993) and North and Thomas (1973) of studying human capital as an *explanandum* rather than an *explanans* remains largely unaddressed.

This paper takes up this challenge, extending the culture-development literature to study the role of culture as a deep factor underlying individuals' propensity towards human capital accumulation. A straightforward definition of culture is as values, beliefs, practices and norms that are shared by members of a group and are transmitted fairly unchanged from generation to generation (Guiso et al., 2006; Javidan et al., 2006). Standard human capital theory (Becker, 1964; Mincer, 1958) finds that the expected rate of return on investment and people's preferences (particularly their level of impatience) together determine how much human capital an individual accumulates. Empirical work confirms this insight, identifying both individuals' level of impatience (Cadena and Keys, 2015) and their life expectancy (Oster et al., 2013)—a proxy for return on investment—as important determinants of individual differences in human capital. Cross-country differences in human capital have similarly been related to differences in life expectancy but also to differences in access to public education (Cordoba and Ripoll, 2013). Studies of the economic consequences of culture commonly focus on the effect of cooperative norms or social trust on the level of per-capita GDP and a variety of other societal structures and outcomes (Algan and Cahuc, 2010; Knack and Keefer, 1997). However, there is also a growing number of studies that relates specific dimensions of national culture to different economic phenomena (Bloom et al., 2012; Davis and Williamson, 2016; Davis and Abdurazokzoda, 2016; Gorodnichenko and Roland, 2011, 2016; Klasing, 2013; Van Hoorn, 2014). Finally, there is some work at the intersection of cross-country education and culture research. Hofstede (2001)

and Minkov (2007), for instance, find that cultural future orientation affects academic achievement (see, also, Hofstede and Minkov, 2010). Related research finds that dimensions of national culture predict differences in classroom behavior and learning practices (e.g., Cortazzi and Jin, 2013). My concern is not with such educational phenomena, however, but with culture as a factor explaining the accumulation of human capital (cf. Lucas, 1993). The main hypothesis that I test in this paper is that *national culture affects individuals' propensity towards human capital accumulation*.

To test this hypothesis I follow earlier culture research (e.g., Atkin, 2016; Fernández and Fogli, 2006) and apply an epidemiological approach involving data on migrants from different countries of origin that are at present living in various destination countries. Using data that combine different economic, institutional and cultural environments, it is possible to distil an effect of cultural background on individuals' propensity towards human capital accumulation that is unbiased by economic and other institutional conditions that might correlate with culture and cause biases. Underlying the epidemiological approach is the idea that culture continues to have an effect on migrants' behavior because culture is persistent, as per the large literature on cultural inertia and intergenerational transmission of values and practices (e.g., Bisin and Verdier, 2001; Grosfeld and Zhuravskaya, 2015; Voigtländer and Voth, 2012). Importantly, however, I also expand on traditional macro-focused epidemiological culture research by considering micro-levels channel that link culture to individuals' propensity towards human capital accumulation. Whereas broad-level correlations between country-of-origin culture and economic behavior in the destination country are suggestive of a cultural explanation for cross-country economic differences, deeper understanding of culture's economic consequences requires taking a combined micro/macro approach and analyzing how exactly culture may go on

to affect economies in the aggregate. Two specific micro channels that I consider in this paper involve individuals' personal values and their occupations, both of which seem likely to be affected by migrants' country-of-origin culture. Finally, I incorporate insights from cross-cultural research identifying different dimensions of national culture and test two hypotheses concerning the effect of cultural differences in intellectual autonomy and future orientation on human capital accumulation.

Results for a sample of about 9,400 migrants reveal a significant effect of country-of-origin culture on individuals' propensity towards human capital accumulation. Moreover, the empirical evidence supports the idea that the effect of country-of-origin culture on the propensity towards human capital accumulation is partly mediated by individuals' personal values and, particularly, their occupations. Finally, I find that cultural differences in emphasis on intellectual autonomy and future orientation are important for understanding differences in the accumulation of human capital across countries. These results are robust to a variety of checks, including adding controls for typical outcomes associated with human capital accumulation such as personal income and years of education. Hence, the paper finds robust evidence for national culture playing a role in cross-country differences in human capital accumulation, confirming the gist of Lucas' (1993) plea to consider education as a proximate rather than an ultimate cause of economic development.

This paper makes several contributions. Most obviously, the paper adds a significant explanatory factor to the literature seeking to understand countries' differential experiences in accumulating human capital. More generally, however, the paper is able to provide some microeconomic underpinning for the role of culture in accounting for economic differences between countries. Studies of the idea that culture can have critical economic consequences have

a long history (Banfield, 1958; Weber, 1904/5). Empirical culture research typically examines aggregate-level relationships, however, thus neglecting the microeconomic foundations for culture's macroeconomic impact. The present paper, then, could provide some guidance on how to incorporate a mechanism for culture's macroeconomic consequences that involves specific traits or characteristics of individuals. Overall, the paper draws attention to the value of and need for more work that takes a combined micro/macro approach to study culture as a factor shaping economic outcomes.

## **2. Background and empirical approach**

### *2.1. Culture, preferences, and the accumulation of human capital*

In line with classic human capital theory (Becker, 1964; Mincer, 1958), I expect that culture plays a role in the accumulation of human capital partly because culture affects people's preferences (Guiso et al., 2006). Culture refers, among others, to certain values shared by members of a group (Javidan et al., 2006; Schwartz, 2006). Values, in turn, are akin to preferences and can be defined as concepts that pertain to desirable outcomes and provide non-situation specific guidance to individuals in their selection and evaluation of alternative courses of action (Schwartz, 1992). As a group-level construct, culture refers to a general inclination among members of the group to have certain values and beliefs, behave in certain ways and to follow certain norms (Hofstede, 2001). Culture therefore is not deterministic but speaks to individuals' dispositions and affects the incidence of certain behaviors among the members of a particular cultural group, often a country, including their engagement in human capital accumulation.

Exploring the idea of culture affecting preferences, earlier work has found, for instance, that

average fertility rates of women in the country of origin correlate with fertility rates of women that have migrated to the U.S. (Fernández and Fogli, 2006). Using the same approach, Atkin (2016) finds that state-of-origin food preferences correlate with food preferences and, ultimately, the caloric uptake of interstate migrants in India. For human capital accumulation, I similarly hypothesize a strong relationship between the average propensity towards human capital accumulation in the country of origin and migrants' engagement in the accumulation of human capital. Moreover, following the connection between culture and individuals' preferences (Guiso et al., 2006), I expect that a genuine effect of national culture on human capital accumulation involves a micro-level channel in which individuals' personal values act as a mediator. That is, part of the effect of culture on individuals' engagement in human capital accumulation occurs because culture affects individuals' personal values.

Interestingly, though, the role of culture in shaping economic behavior, and human capital accumulation in particular, probably does not only involve systematic, culturally driven differences in preferences. Different religious and cultural practices, for instance, have been linked to differences in literacy rates and specialization in human capital-intensive occupations (Becker and Woessmann, 2009; Botticini and Eckstein, 2007; Chiswick, 1983). The underlying idea is that cultural norms and conventions affect groups' efficacy in creating and using human capital, which encourages these groups to seek jobs that fit this comparative advantage. Hence, I expect that national culture also affects individuals' propensity towards human capital accumulation through a second micro-level channel involving individuals' occupation. The more a culture favors engagement in human capital accumulation, the more prone members of this culture are to have jobs in which the accumulation of human capital is relatively common.

A final expectation is that it is possible to unpack the generic effect of culture on individuals'

behavior that is central to epidemiological culture research and identify specific dimensions of national culture (Roland, 2015) that affect migrants' propensity towards human capital accumulation. Instead of using averaged country-of-origin behavior, which is a rather thin construct, we can draw on quantitative frameworks of national culture developed by cross-cultural researchers to explain differences in the propensity towards human capital accumulation. These frameworks measure cultural differences between countries on specific sets of dimensions that have clear theoretical definitions. Out of the available frameworks and dimensions of national culture, I expect the intellectual autonomy dimension from the framework by Shalom Schwartz (e.g., 1994, 2006) and the future orientation dimension from the GLOBE framework (House et al., 2004) to be particularly relevant for understanding variation in human capital accumulation. In contrast to earlier culture frameworks (particularly Hofstede, 1980, 2001), both the Schwartz framework and the GLOBE framework are based on a priori theorizing as to the specific dimensions on which countries' cultures are likely to differ, making them the most advanced frameworks of national culture currently available (Maseland and Van Hoorn, 2017).

Shalom Schwartz (e.g., 1994, 2006) identifies three opposing dimensions of national culture, including embeddedness versus autonomy. Embeddedness thereby refers to being a member of a group and sharing goals within a group. Autonomy on the other hand is about encouragement of individuals to pursue their own interests and experiences. A specific component of the autonomy dimension is intellectual autonomy, which is about encouragement for individuals to pursue their own ideas and intellectual directions (Schwartz, 2006, p.140). The expected effect of greater emphasis on intellectual autonomy therefore is to strengthen individuals' interest in and motivation for having knowledge about the world around them and for learning new things. Hence, the specific hypothesis that I test is that migrants from countries with more cultural

emphasis on intellectual autonomy have a stronger tendency to accumulate human capital.

Future orientation is defined as “the degree to which individuals in organizations or societies engage in future-oriented behaviors such as planning, investing in the future, and delaying gratification” (House et al., 1999).<sup>1</sup> A further explication of future orientation is that it concerns the extent to which members of a society “focus on investment in their future” as well as “look far into the future for assessing the effects of their current actions” (Ashkanasy et al., 2004, p.285). Accordingly, I expect that migrants from countries that are more strongly future-oriented are more inclined to see human capital accumulation as an attractive investment opportunity and are more willing to incur short-term costs in order to engage in the accumulation of human capital. Hence, the specific hypothesis that I test is that migrants from countries that are more strongly future-oriented have a stronger tendency to accumulate human capital.

<<Insert Figure 1 about here>>

Figure 1 presents an overview of the variables analyzed in this paper and their expected relationships (see, also, Eq. 1 below).

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<sup>1</sup> Future orientation can also be referred to as long-term orientation, which is the term used by Hofstede (2001). For this paper, I consider future orientation because Hofstede’s (1980, 2001) culture framework has been heavily criticized for not actually measuring culture, notably because country scores on his measures are highly dependent on reigning circumstances (Maseland and Van Hoorn, 2009, 2010; Taras et al., 2010; see, also, Roland, 2015).

## 2.2. Identifying the effect of national culture on human capital accumulation

The basis of my approach to empirically analyzing the role of culture in human capital accumulation is the cross-country epidemiological approach used by Fernández and Fogli (2006), among others. By using measures of average behavioral propensities in the region of origin, these studies have advanced on earlier culture research that considered fixed region-of-origin effects in migrant outcomes (e.g., Carroll et al., 1994). An important advancement provided by the present paper is that I not only assess the relationship between country-of-origin culture (e.g., average behavioral propensities) and migrant behavior in the destination country, but also consider the mediating effect of individuals' personal values and occupation that act as channels linking group-level culture to individual behavior.

The baseline model that I estimate reads as follows:

$$A_{iod} = \beta_0 + \beta_1 C_{io} + \beta_2 X_i + \beta_3 Z_{iod} + D_{id} + \varepsilon_{iod} . \quad (1)$$

$A_{iod}$  thereby refers to human capital accumulation (1=yes) by individual  $i$  from country of origin  $o$  and currently living in destination country  $d$ . For testing the hypothesis that national culture affects individuals' propensity towards human capital accumulation, the independent variable of interest is variable  $C_{io}$ , which refers to the culture of individual  $i$ 's country of origin. Other variables are included to control for potential confounders at the level of the individual ( $X_i$ ), and the origin-destination dyad ( $Z_{iod}$ ). Meanwhile,  $D_{id}$  refers to a set of destination country dummies that controls for differences in migrants' accumulation of human capital that are due to specific features of their destination country.

To consider potential channels linking country-of-origin culture to human capital

accumulation, I extend Eq. 1 to include mediator variables referring to certain characteristics or traits of individual migrants. Similarly, to consider specific dimensions of national culture (Roland, 2015) that might affect the propensity towards human capital accumulation, I use alternative operationalizations of the culture measure  $C_{io}$ . I estimate Eq. 1 using logit models. However, I obtain similar results when using probit models instead (results available on request). Finally, as my sample involves migrants from different countries of origin, I correct my standard errors for clustering at the country-of-origin level. In this case, I obtain similar results (available on request) if I use a multilevel approach and simultaneously estimate joint models for individual-level variation and for variation that is between countries of origin.

### **3. Data**

#### *3.1. Main source and sample*

The main source of data used for my analysis is the bi-annual European Social Survey or ESS. I use the cumulative data file, which covers seven waves of data collected in 2002, 2004, 2006, 2008, 2010, 2012 and 2014 (European Social Survey, 2016). Following earlier analyses of migrants using ESS data (e.g., Bisin et al., 2011), I identify migrants in this data set using respondents' answers to a set of questionnaire items. First, I distinguish between migrants and natives based on the answer to the item asking respondents whether they are born in the country. Next, I use the follow-up item asking respondents in which country they are born to identify individuals' country of origin. Given the nature of these questionnaire items, this procedure classifies a small group of individuals as migrants even though they are actually natives. This group comprises individuals that have been born in a foreign country, even though their parents are natives. This may happen, for instance, when someone was born while his/her parents were

on holiday abroad. To ensure that my sample comprises only genuine migrants, I exclude this group of individuals using the ESS items that ask respondents about the country of birth of their mother or father. That is, I exclude respondents that are living in the country of birth of their parents even though these respondents themselves are born in a foreign country.

After exclusion of respondents with missing data and depending on specific (control) variables considered, I end up with a sample of about 9,400 migrants. Table A.1 in the appendix presents an overview of the origin countries in the sample. The destination countries in the sample, 32 in total, are: Austria, Belgium, Bulgaria, Switzerland, Cyprus, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, United Kingdom, Greece, Croatia, Hungary, Ireland, Israel, Iceland, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Sweden, Slovenia, Slovakia, Turkey, and Ukraine.

### *3.2. Dependent variable: Propensity towards human capital accumulation*

I measure individuals', i.e., migrants' propensity towards human capital accumulation by their answer to the following survey item: "During the last twelve months, have you taken any course or attended any lecture or conference to improve your knowledge or skills for work?" This item has a dichotomous answer scale, capturing whether or not respondents have engaged in such human capital accumulation (1=yes). A major advantage of the measure of human capital accumulation provided by this item is that it refers to behavior and the actual act of accumulating human capital accumulation and not to a stock of capital that has been accumulated in the past. Meanwhile, there is ample evidence to support the validity of the answers to this item, the item's comparatively simple nature notwithstanding. Specifically, answers to the item vary in expected ways with answers to other questionnaire items capturing related constructs (Table 1).

Respondents in jobs that require learning new things, for instance, are much more likely to report having engaged in the accumulation of new knowledge and skills than respondents in jobs that do not require learning new things are. Similarly, younger people are substantially more prone to accumulate human capital than older people are, which is expected given how much time these two groups have left to earn a return on their human capital investments.

<<Insert Tables 1 and 2 about here>>

At the same time, this measure has an obvious limitation, which is that it does not capture how many courses/lectures/conferences individuals have taken/attended in the last twelve months or the intensity or duration of these activities. Still, the evidence presented in Table 1 does show that this measure is able to capture important features of individuals' engagement in human capital accumulation. Table 2 presents descriptive statistics for the measure of human capital accumulation and selected other variables.

### *3.3. Key independent variable: National culture*

*Average behavioral propensity in the country of origin.* My key independent variable concerns the culture of migrants' countries of origin. The main culture measure that I use refers to the average behavioral tendency in the country of origin, which is standard in the literature (see, for example, Fernández and Fogli, 2006). However, an important feature of my data is that I can construct this aggregate-level indicator myself on the basis of raw, individual-level data available from the ESS. This feature, in turn, is an important advantage, as it enables me to construct a culture measure that is as pure as possible, cleansed of idiosyncratic influences that

increase measurement error or, worse, introduce systematic biases. A particular concern is that differences in national culture measured at a given point in time do not only capture genuine cultural differences between countries but also variation that is due to the confounding influence of age, period and cohort effects (Inglehart and Welzel, 2005; Mannheim 1928/129), what culture guru Geert Hofstede refers to as maturation, generation and zeitgeist effects (Hofstede, 2001, p.35). While a country's culture can be "as hard as [its] geographical position or its weather" (Hofstede et al., 2010, p.20), measuring culture and cultural differences may render different results depending on the age composition of the sample of respondents considered, the cohort composition of the sample, or the time of data collection. Using individual-level data from the ESS, I can control for the confounding influence of age-period-cohort effects, however, thus obtaining a purer measure of national culture. To do so, I proceed in two steps. First, I take the same ESS item on human capital accumulation as before and use it as the dependent variable in a logistical model with dummies for age, year of birth and year of data collection as independent variables. Saving the residuals, I obtain a measure of individuals' propensity towards human capital accumulation that is cleansed of the confounding influence of age-period-cohort effects (cf. Van Hoorn, 2017). Second, I calculate averages for these residuals, one score for each country of origin, thus obtaining a pure measure of the cultural propensity towards human capital accumulation in migrants countries of origin. Because the ESS database is also the source of data for my sample of individual migrants, it may actually seem that this measure of country-of-origin culture is not independent from my dependent variable. This is not the case, however, as the two samples used are entirely different. The cumulative data set covering Waves 1-7 of the ESS comprises more than 330,000 individuals. Out of this total number, some 9,400 individuals are the migrants whose propensity towards human capital accumulation I am analyzing. Almost

300,000 other individuals are in the sample that I use to construct the measure of the cultural propensity towards human capital accumulation in migrants' countries of origin, while the remaining individuals could not be considered due to missing data. Hence, when it comes to measuring country-of-origin culture, there is no material difference between my analysis and that of, for example, Fernández and Fogli (2006), although the latter study cannot rely on individual-level data to measure country-of-origin culture. Meanwhile, the empirical results are similar when I do not use the above-described measure of country-of-origin culture and use a plain measure that is not cleansed of age-period-cohort effects instead (results available on request). Table A.1 in the appendix presents the culture scores for the countries of origin in my sample.

My use of an epidemiological approach is meant to facilitate analysis of the effect of individuals' cultural background on their behavior, independent of the economic, institutional and cultural environment in which these individuals currently find themselves. However, to be able to identify more clearly that the relationship between country-of-origin culture and human capital accumulation reflects a causal effect of culture, I also construct a measure of country-of-origin culture that precedes migrants' behavior in the destination country, thus limiting the potential for reverse causality. I do so by calculating country-of-origin propensity towards human capital accumulation for a sample of older individuals. Cultural values are a stable trait of individuals that gets formed in their pre-adult formative years (Hofstede, 2001; House et al., 2004; Schwartz, 2006). Hence, there is no plausible theoretical argument of how the behavior of contemporary migrants can affect the cultural values, beliefs, practices or norms of older individuals in the country of origin. The specific cut-off year that I select is 1968. I thus calculate my alternative measure of country-of-origin propensity towards human capital accumulation using only data from respondents born in 1967 or earlier. As before, I cleanse the underlying

individual-level data of any confounding age-period-cohort effects. Similarly, the sample used to construct this culture measure again does not have any overlap with the sample of migrants whose propensity towards human capital accumulation I am analyzing.<sup>2</sup>

*Intellectual autonomy and future orientation dimensions of national culture.* To measure differences in cultural emphasis on intellectual autonomy, I follow the procedure outlined in Schwartz (2006) and operationalize the dimensions of his framework using survey items included in all seven waves of the ESS. The relevant items ask respondents how important it is for them to think new ideas and be creative and to understand different people, among others.

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<sup>2</sup> As a final note, a possible concern with my use of individual-level ESS data to construct the measure of country-of-origin culture is that some of the migrants in my migrant sample (see above) did not emigrate from their countries of origin until after some of the individual-level data for my culture measure have been collected. While data for migrants have been collected as late as 2014 (Wave 7 of the ESS), collection of the data used to measure country-of-origin culture occurred as early as 2002 (Wave 1 of the ESS). Strictly speaking, there is thus a chance that the same individual has been surveyed twice, once as a native-born in his/her country of origin and once as a migrant in his/her destination country. Given the population size of the countries surveyed vis-à-vis the size of the ESS country samples, this chance is minute. However, given the individual-level data available, it is possible for me to restrict the sample of migrants that I consider to those individuals that had already emigrated from their country of origin before the data needed to measure country-of-origin culture have been collected, notably before 2002, the start of the ESS. Empirical results using this restricted sample are the same as when using my main sample (results available on request).

Further details about these survey items and the procedure for measuring Schwartz's cultural value dimensions using these items are available on request. The approach to cleansing the underlying individual-level data of confounding age-period-cohort effects is the same as before, involving the estimation of a regression models and saving the residuals before aggregating these residuals at the country-of-origin level. Similarly, it may again seem that this culture measure is not independent from my dependent variable on the count that both involve data from the ESS. Also in this case, however, the samples used are entirely different. The specific measure of future orientation that I use is the measure of future orientation practices available from House et al. (2004). This measure is not based on ESS data but on survey data collected by House and collaborators between 1995 and 1998. Table A.1 presents scores on these two culture dimensions for the origin countries in the sample.

### *3.4. Control variables*

*Demographics and other standard control variables.* To limit the potential for spurious results, in addition to my key independent variable, I consider a variety of (individual-level) control variables. Given that I use an epidemiological approach involving non-natives currently residing in a range of destination countries, in all models I control for destination-country fixed effects. Similarly, all models control for year/wave fixed effects.

Further standard control variables concern basic demographics (sex, age and age squared) and aspects of individuals' employment history and work. These latter variables are total hours worked, historical experience of unemployment, employment relation (employee, self-employed, or working for own/family business), size of establishment (e.g., under 10 employees, 10 to 24 employees, 500 or more employees, et cetera) and current employment status (e.g., in paid work,

in education, unemployed and looking for job, unemployed and not looking for job, retired, et cetera).

A specific concern is that country-of-origin culture may affect the degree to which a migrant is integrated in the destination country, which, in turn, affects the opportunity to accumulate human capital. This would be an effect that is driven by country-of-origin culture but not the type of cultural effect emphasized in the present paper. Hence, I control for various factors capturing the degree of migrants' acculturation into the destination country. These factors are time spent in the destination country (5 years or less, 6-10 years, 11-20 years, or more than 20 years), whether the migrant is a citizen of the destination country, and whether he/she speaks the destination-country language at home.

To complete my set of standard control variables, I consider two features of the specific origin country-destination country dyad to which an individual belongs, as this could also be a confounding influence. The two dyadic features that I control for are geographic distance between the origin and destination country and whether the origin and destination country share the same official language. While data for the individual-level control variables are all included in the ESS data set, data for these latter two variables come from the CEPII GeoDist database (Mayer and Zignago, 2011).

*Additional control variables for robustness checks.* To check the robustness of my baseline results, I also consider some additional control variables beyond the above-described set of standard controls. First, there remains a generic concern that country-of-origin culture proxies for unobserved individual-level traits other than those focused on in this paper. Second, there is a concern that the culture measure proxies for other, non-cultural country-of-origin characteristics that would affect migrants' destination-country behavior, specifically their engagement in human

capital accumulation.

To address the former concern, I consider three additional control variables that are likely to be affected by the kind of unobserved individual-level traits that could render my baseline results spurious. These three variables are the individual's years of education, his/her personal income and the ease with which (s)he can borrow money from credit suppliers if needed. To address the latter concern, I add individual-level controls for the education level of an individual's father and an individual's mother, which are reflective of relevant (historical) conditions in migrants' origin countries. To be sure, these five variables are best seen as outcomes that are causally affected by the same factors that would causally affect migrants' engagement in human capital accumulation. The ease with which someone is able to borrow money, for instance, would be affected by the wealth that (s)he has accumulated, which, in turn, is connected to the tendency towards human capital accumulation. Hence, controlling for these variables increases the risk of making a Type II error in the analysis. Still, I consider these variables as a strict check of the robustness of the baseline results obtained using the set of standard control variables described above.

Years of education is measured as the answer to the ESS item asking respondents how many years of fulltime education they have completed. To measure personal income, I calculate a measure of rank income using respondents' answers to the ESS items that ask respondents to state the total net income of their household on a scale that runs from 1 to 12 (Waves 1-3, 2002-2006) or from 1 to 10 (Waves 4-7, 2008-2014). The advantage of using a measure of rank income is that it is comparable across countries and years, rendering a percentile score that indicates the percentage of respondents from the same country surveyed in the same year that had an income below that of the respondent (Hoorn 2015). The ESS measures respondents'

ability to borrow money using the following item: “If for some reason you were in serious financial difficulties and had to borrow money to make ends meet, how difficult or easy would that be?” Answers can range from 1 (Very difficult) to 5 (Very easy) and for simplicity I consider this measure as a cardinal measure. To be complete, a disadvantage of considering this last variable is that it has not been included in Waves 6 and 7 of the ESS, resulting in a comparatively small sample. However, I obtain similar results when I consider a larger sample and do not control for respondents’ ability to borrow money (results available on request).

Finally, the education of an individual’s mother and father is measured by two ESS items asking respondents about the level of education of their fathers and mothers. Possible answers are less than lower secondary education, lower secondary education completed, upper secondary education completed, post-secondary non-tertiary education completed or tertiary education completed.

### *3.5. Individual-level variables linking national culture to human capital accumulation*

The final set of variables in my analysis concerns the mediators that I use to explore micro-level channels that link country-of-origin culture to human capital accumulation through certain characteristics or traits of individual migrants. The first individual-level characteristic that I consider concerns individuals’ personal values, specifically their openness-to-change versus conservation values. Openness-to-change versus conservation values constitute one of the overarching value dimensions in the framework of universal human values also developed by Shalom Schwartz (e.g., Schwartz, 1992; Schwartz et al., 2001). Schwartz’s framework has become the standard values framework in psychology and is designed to cover the whole spectrum of human motivations. Individuals that score higher on openness-to-change versus

conservation values attach relatively much value to independent thought and new experiences and have less resistance to change. The expected direct effect of openness-to-change versus conservation values therefore is to increase the likelihood that an individual is engaged in the accumulation of human capital. The expected mediating effect is that part of culture's effect on human capital runs through individuals' openness-to-change versus conservation values. I measure openness-to-change versus conservation values using ESS value items designed by Schwartz. Schwartz et al. (2001) provide a detailed description of these items and the procedure for constructing the openness-to-change versus conservation value dimension. These details are also available on request.

The second individual-level characteristic that I consider concerns individuals' occupation, specifically the average propensity towards human capital accumulation of all the individuals working in a particular occupation. The motivation for considering this specific mediator is that accumulating human capital may be an intrinsic feature of and more common in some occupations than in others so that part of the effect of individuals' culture on their propensity towards human capital accumulation is likely to be expressed in individuals' chosen occupation. I measure occupation using standard four-digit ISCO codes recorded by the ESS. To classify occupations I calculate the percentage of all individuals working in a particular four-digit occupation that indicate having attended one or more courses, lectures or conferences to improve their knowledge or skills for work. Meanwhile, to check the robustness of my results, I also consider another occupational indicator, namely the average years of education of individuals working in a particular occupation. Empirical results (available on request) are similar as when using the measure of average human capital accumulation in an individual's occupation.

## 4. Results

### 4.1. Baseline results

Table 3 presents results for the test of my main hypothesis that national culture affects human capital accumulation, using different specifications of the model depicted in Eq. 1. Results indicate a strong relationship between country-of-origin culture and migrants' engagement in human capital accumulation (Model 1). Hence, results support the existence of a cultural gradient in human capital accumulation. Variables that control for the impact of, for instance, acculturation (e.g., language spoken, citizenship) have the expected effect on the tendency to accumulate human capital (Model 2). In addition, the coefficient for country-of-origin culture decreases when these variables are included as additional control variables (Models 2 and 3). In general, however, culture appears an important factor accounting for differences in the propensity towards human capital accumulation. As a simple illustration, the effect of a one standard deviation increase in country-of-origin propensity towards human capital accumulation on migrants' human capital accumulation is comparable to the effect of speaking the destination-country language or having become a citizen of the destination country.

<<Insert Table 3 about here>>

Meanwhile, it is important to realize that the found cultural gradient applies to an annual phenomenon, having taken/attended a course/lecture/conference during the last twelve months. Hence, the effect of culture on human capital accumulation found above—an odds ratio of 1.45 for a one standard deviation increase in country-of-origin propensity towards human capital accumulation (Model 3)—is repeated each year. Culture therefore appears to have the power to

bring about wide disparities in countries' human capital stock, even over relatively short time spans.

#### *4.2. Robustness*

*Addressing possible reverse causality.* As a first check of the robustness of the above baseline results, I delve more deeply into the possibility of reverse causality. Applying an epidemiological approach, makes it rather implausible that the found relationship between culture and human capital accumulation reflects an effect of human capital accumulation on culture rather than the other way around. However, to strengthen the evidence, I re-estimate my baseline empirical model (Model 3) using an alternative culture measure. As described in detail in the previous section, the alternative culture measure concerns average propensity towards human capital accumulation in the origin country but is based on data for older respondents only. Using older respondents has the advantage of rendering a measure that is even more independent from any confounding influences associated with current migrants and how they behave in their destination countries than my main measure is. Results (Model 4 in Table 3) are highly similar to earlier results. The main difference with earlier results is that culture's effect is estimated less precisely. However, there is a simple explanation for this finding, which is that restricting the size of the sample of respondents for measuring country-of-origin culture renders a noisier measure of country-of-origin culture compared to the culture measure that is based on the full ESS data set.

*Addressing possible omitted variable bias.* In addition to the possibility of reverse causality, the chief reason why the baseline results might not reflect a causal effect of culture on the propensity towards human capital accumulation is that there is an omitted variable bias. Hence,

as my main robustness check, I extend the baseline model (Model 3) to include additional variables that control for outcomes related to the accumulation of human capital. Adding outcomes as controls is a powerful means to control for unobserved factors that could cause spurious correlations. However, as stated, doing so also increases the risk of making a Type II error. Noting that models that include outcomes related to the accumulation of human capital as control variables are not my preferred models, I present these results as a particularly prominent and strict check of the robustness of my baseline results.

The first of these strict checks is to take into account unobserved individual-level traits that might affect human capital accumulation, using the amount of schooling that individuals have had, their income and their ability to borrow money as additional control variables. Estimates confirm earlier results, indicating a strong and statistically significant relationship between country-of-origin culture and human capital accumulation (Model 5 in Table 3). As the second of these checks, I control for the education level of an individual's father and mother, which captures the net effect of all the non-cultural features of a country of origin that affect the propensity towards human capital accumulation in this country. Again, results are robust to inclusion of additional control variables (Model 6 in Table 3). Hence, I conclude that there is robust evidence for a cultural gradient in the propensity towards human capital accumulation.

#### *4.3. Extensions*

*Linking culture to human capital accumulation via individual-level characteristics.* As the main extension to the baseline results, Table 4 reports results of tests of possible micro channels through which country-of-origin culture affects migrants' accumulation of human capital in their destination countries. Using mediation analysis, it is possible to assess the extent to which

culture has a direct effect on human capital accumulation or an indirect effect that runs through specific characteristics or traits of individual migrants. Models 7 and 8 depict the results for the analysis of personal values as mediators of the relationship between culture and engagement in human capital accumulation, where the coefficient for country-of-origin culture decreases when the variable measuring individuals' openness-to-change versus conservation values is included (Model 7 versus Model 8). Together with Model 3 in Table 3, the results imply that about 13.0% (95%CI: 10.5%-16.9%) of the total effect of culture on human capital accumulation is due to culture's effect on individuals' personal values. Hence, there is statistically significant evidence of individuals' values acting as a channel through which culture affects the accumulation of human capital.

<<Insert Table 4 about here>>

I obtain similar but stronger results when considering occupation, specifically the average propensity towards human capital accumulation in an individual's occupation, as a mediator (Models 9-11). The average propensity towards human capital accumulation in an individual's occupation not only has a strong effect on human capital accumulation (Model 10), but controlling for occupational differences also significantly lowers the coefficient for country-of-origin culture (Model 9 versus Model 11). Together the results imply that about 47.5% (95%CI: 38.4%-60.4%) of the total effect of country-of-origin culture on human capital accumulation is mediated by occupation.

Overall, the results of the mediation analysis serve to highlight the value of taking a combined micro/macro approach to complete our understanding of culture's economic consequences.

Particularly in an epidemiological setting, macro-level correlations are best seen as a starting point for further analysis and it seems that we can learn more about the cultural gradient in macroeconomic outcomes if we move beyond aggregate-level epidemiological relationships and consider some specific micro-level features of this gradient.

*Intellectual autonomy and future orientation as cultural roots of human capital accumulation.*

As a second extension, I have re-estimated the main models estimated above, but measuring culture using two specific dimensions of national culture developed by cross-cultural researchers. Out of the many frameworks and dimensions available in the culture measurement literature, I deemed intellectual autonomy and future orientation to be most relevant for understanding cultural differences in human capital accumulation. Results indicate that both cultural emphasis on intellectual autonomy (Table 5) and future orientation (Table 6) correlate positively with the propensity towards human capital accumulation. Hence, results confirm the hypothesized positive effects of intellectual autonomy and future orientation on human capital accumulation. In addition, results confirm earlier findings on the mediating effects of personal values and occupation. The found mediating effects for intellectual autonomy are 12.6% (95%CI: 10.4%-15.6%) when considering openness-to-change versus conservation values as mediator and 48.5% (95%CI: 39.9%-60.6%) when considering occupation as mediator. The found mediating effects for future orientation are 20.9% (95%CI: 14.5%-35.3%) when considering openness-to-change versus conservation values as mediator and 67.6% (95%CI: 46.1%-117%) when considering occupation as mediator. The main difference with earlier results is that the size of the estimated coefficient for culture can be lower. However, this is easily explained by the fact that the intellectual autonomy and future orientation dimensions have a much broader scope than a culture measure based on a propensity towards one specific behavior has. Hence, the evidence

strongly indicates that cross-country differences in human capital accumulation can be traced back to how countries score on the intellectual autonomy and future orientation dimensions of national culture.

<<Insert Tables 5 and 6 about here>>

Importantly, the results for intellectual autonomy and future orientation as cultural roots of human capital accumulation also increase the plausibility of the causal interpretation of the relationship between national culture and human capital accumulation. The measure of future orientation, in particular, is based on data collected between 1995 and 1998 so that scores on this measure cannot have been affected by social, economic or institutional conditions that reigned during the period of collecting the ESS data on migrants' human capital accumulation.

## **5. Discussion**

A large literature has studied human capital accumulation, particularly as a factor explaining countries' differential growth experiences. Contributing to this literature, I have studied human capital accumulation as a proximate causal growth factor, i.e., as a factor that itself requires explanation. Increasingly, economists are identifying culture as a key informal institution that can explain differences in a variety of phenomena and macroeconomic outcomes. For my analysis, I posited that national culture affects individuals' propensity towards human capital accumulation. Following the standard set by recent culture research in economics, for testing this hypothesis, I used an epidemiological approach involving migrants. Empirical results provided strong support for the existence of a cultural gradient in human capital accumulation and this

evidence was robust to a variety of checks, including controlling for certain outcome variables associated with the accumulation of human capital such as years of schooling or parents' education level.

Following earlier epidemiological culture research, I take this gradient to suggest a cultural explanation for cross-country differences in human capital accumulation. However, to strengthen the analysis, I have also gone beyond broad macro-level correlations between country-of-origin culture and destination-country behavior to consider possible micro-level channels underlying these correlations. The specific channels that I considered involved a mediating effect of individual-level traits, which is to say that part of culture's effect on human capital accumulation runs through culture's effect on certain traits of individuals. I found significant evidence supporting such a micro channel but much more so when considering occupation as a mediator than when considering personal values as a mediator.

The final element of the analysis presented in this paper was to unpack the relationship between average behavioral tendencies in the country of origin and migrants' human capital accumulation by considering established dimensions of national culture that would affect this behavior. Empirical results confirmed that two specific dimensions on which cultures are different help explain cross-country differences in the propensity towards human capital accumulation. These two dimensions are countries' cultural emphasis on intellectual autonomy and their future orientation, both of which had a significant positive relationship with migrants' propensity towards human capital accumulation.

Implications of these findings for policy are not immediately obvious. In particular, though perhaps tempting, large-scale and top-down cultural change does not appear very feasible and many would question attempts to do so on normative grounds. However, this paper's findings

would alert policy makers to cultural factors as a potentially important barrier keeping people from accumulating more human capital. Of course, many governments have already deemed human capital accumulation to be sufficiently important to warrant subsidizing education. Still, knowing that a country faces a cultural barrier might induce further policies aimed at making the accumulation of human capital more attractive to citizens.

To conclude, an important limitation of the analysis presented in this paper should be noted, the general robustness of the empirical evidence notwithstanding. This limitation is that, due to data availability, my sample comprised relatively few countries, maximum 53. In addition, in my sample European countries were overrepresented. The specific properties of my sample have most likely biased my analysis against finding evidence for a cultural gradient in human capital accumulation. However, follow-up research would be needed to generalize my results and further increase our understanding of the role of culture in explaining differences in human capital accumulation. Overall, an important conceptual contribution of this paper is to underscore the value of and need for more work taking a combined micro/macro approach to study culture as a key factor shaping economic outcomes.

## **Appendix**

<<Insert Table A.1 here>>

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**TABLE 1**  
Construct Validity of Measuring Human Capital Accumulation

During the last twelve months, have you taken any course or attended any lecture or conference to improve your knowledge or skills for work? (0=no, 1=yes)	Percentage yes
Current job: Job requires learning new things (ESS Waves 2 & 5) [n=39,238]	
Not at all true [n=5,039]	15.2% (35.9%)
A little true [n=10,115]	28.9% (45.3%)
Quite true [n=12,656]	48.6% (50.0%)
Very true [n=11,428]	61.9% (48.6%)
Age (ESS Waves 1-7) [n=328,584]	
Below average age [n=167,789]	39.3% (48.8%)
Above average age [n=160,795]	17.4% (37.9%)
How long does it take to learn how to do your job well (ESS Waves 2 & 5) [n=37,590]	
Three months or less [n=19,994]	34.4% (47.5%)
More than three months [n=17,596]	54.8% (49.8%)
Would someone applying for your job need education beyond compulsory? (ESS Waves 2 & 5) [n=38,425]	
Yes [n=27,170]	52.6% (49.9%)
No [n=11,255]	22.1% (41.5%)
Selected employment status (ESS Waves 1-7) [n=190,363]	
In paid work [n=159,812]	43.6% (49.6%)
Housework, looking after children, others [n=30,551]	12.5% (33.0%)
Years of fulltime education (ESS Waves 1-7) [n=326,418]	
Below average years of education [n=185,565]	16.3% (37.0%)
Above average years of education [n=140,853]	45.0% (49.7%)

Notes: Number of observations in square brackets. Standard deviations in parentheses. Data are from the European Social Survey (ESS), Waves 1 (2002) to 7 (2014).

**TABLE 2**  
Descriptive Statistics for Selected Variables

Variable	Mean and standard deviation
Dependent variable	
Human capital accumulation during the last twelve months (1=yes)	28.3% (45.1%)
Main independent variables (country-of-origin level)	
Country-of-origin propensity towards human capital accumulation [n=9,405]	-0.069 (0.111)
Country-of-origin propensity towards human capital accumulation, pre-1968 cohort [n=9,405]	-0.068 (0.101)
Intellectual autonomy [n=9,405]	-0.074 (0.174)
Future orientation (1-7) [n=9,515]	3.60 (0.468)
Mediators (individual level)	
Openness-to-change versus conservation values (-5,5)	-0.387 (1.18)
Average human capital accumulation in occupation (0-1) [n=12,022]	30.2% (16.9%)
Average years of education in occupation [n=12,022]	12.5 (2.51)
Selected individual-level control variables	
Sex (1=male)	44.7% (49.7%)
Age in years	49.1 (16.7)
Total hours normally worked per week in main job overtime included	39.9 (14.3)
Ever unemployed and seeking work for more than three months (1=yes)	32.3% (46.8%)
Citizen of destination country (1=yes)	50.7% (50.0%)
Destination-country language spoken at home (1=yes)	57.7% (49.4%)
Years of fulltime education completed [n=12,038]	13.0 (4.30)
Personal income (percentile rank) [n=9,280]	48.0 (28.2)
Easy of borrowing money (1-5) [n=7,778]	2.55 (1.24)
Dyadic control variables	
Geographic distance between country of origin and destination country (km)	2,204 (2,759)
Destination country has same official language as country of origin (1=yes)	24.3% (42.9%)

Notes: Standard deviations in parentheses. Number of observations is 12,129 unless otherwise indicated. Because both measures of country-of-origin propensity towards human capital accumulation are pure culture measures that are cleansed of age-period-cohort effects, they are not measured as percentages, even though the raw data concerns a dummy variable.

**TABLE 3**  
Is There a Cultural Gradient in Human Capital Accumulation by Migrants?

Dependent = Human capital accumulation (1=yes)				Culture measure based on pre-1968 cohort	Outcomes added as control variables	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Country-of-origin propensity towards human capital accumulation	0.405*** (0.046)	0.387*** (0.037)	0.372*** (0.039)	-	0.241*** (0.058)	0.291*** (0.067)
Country-of-origin propensity towards human capital accumulation, pre-1968 cohort	-	-	-	0.349*** (0.044)	-	-
Years of education	-	-	-	-	0.673*** (0.049)	-
Income rank	-	-	-	-	0.070 (0.048)	-
Ease of borrowing money	-	-	-	-	0.140*** (0.041)	-
Dummies education father	No	No	No	No	No	Yes
Dummies for education mother	No	No	No	No	No	Yes
Sex (1=male)	-0.313*** (0.054)	-0.284*** (0.058)	-0.286*** (0.058)	-0.288*** (0.058)	-0.191** (0.077)	-0.191** (0.076)
Hours worked per week	0.100*** (0.030)	0.100*** (0.031)	0.100*** (0.031)	0.099*** (0.031)	0.085* (0.052)	0.107** (0.049)
Ever unemployed and seeking work for more than three months (1=yes)	-0.048 (0.051)	-0.048 (0.052)	-0.047 (0.052)	-0.048 (0.051)	0.035 (0.075)	-0.014 (0.068)
Citizen of destination-country (1=yes)	-	0.316*** (0.101)	0.316*** (0.101)	0.315*** (0.104)	0.317*** (0.080)	0.351*** (0.093)
Destination-country language spoken at home (1=yes)	-	0.310*** (0.076)	0.291*** (0.076)	0.293*** (0.076)	0.275*** (0.100)	0.330*** (0.107)
Origin-destination geographic distance	-	-	-0.008 (0.037)	-0.022 (0.038)	0.011 (0.044)	0.012 (0.065)

Table 3, ctd.

Dependent = Human capital accumulation (1=yes)				Culture measure based on pre-1968 cohort	Outcomes added as control variables	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Destination country has same official language as country of origin (1=yes)	-	-	0.070 (0.075)	0.096 (0.077)	0.094 (0.095)	0.092 (0.101)
Dummies for time in destination country	No	Yes	Yes	No	Yes	Yes
Age and age squared	Yes	Yes	Yes	Yes	Yes	Yes
Dummies for employment status	Yes	Yes	Yes	Yes	Yes	Yes
Dummies for employment relation	Yes	Yes	Yes	Yes	Yes	Yes
Dummies for establishment size	Yes	Yes	Yes	Yes	Yes	Yes
Destination-country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year/wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	9,405	9,405	9,405	9,405	4,008	4,008
No. of origin countries	32	32	32	32	32	32
Log pseudolikelihood	-4363.2	-4332.8	-4332.4	-4335.8	-1812.7	-1889.5
Pseudo R <sup>2</sup>	0.2258	0.2312	0.2313	0.2307	0.2833	0.2530

Notes: Table reports log-odds and robust standard errors (in parentheses) that are clustered at the country-of-origin level. All continuous, non-dummy measures are standardized to have a mean of 0 and a standard deviation of 1. To save space, the table presents a selection of coefficients and standard errors but complete results are available on request. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5% and 1% level.

**TABLE 4**

## Linking Culture to Human Capital Accumulation through Individual-Level Characteristics

Dependent = Human capital accumulation (1=yes)	Personal values as mediators		Occupation as mediator		
	Model 7	Model 8	Model 9	Model 10	Model 11
Openness-to-change versus conservation values	0.333*** (0.036)	0.302*** (0.035)	-	-	-
Average human capital accumulation in occupation	-	-	-	0.858*** (0.036)	0.838*** (0.038)
Country-of-origin propensity towards human capital accumulation	-	0.329*** (0.036)	0.357*** (0.047)	-	0.203*** (0.035)
Standard control variables	Yes	Yes	Yes	Yes	Yes
No. of observations	9,405	9,405	9,321	9,321	9,321
No. of origin countries	32	32	32	32	32
Log pseudolikelihood	-4321.4	-4285.4	-4292.0	-3912.8	-3900.8
Pseudo R <sup>2</sup>	0.2337	0.2401	0.2318	0.2997	0.3018

Notes: Table reports log-odds and robust standard errors (in parentheses) that are clustered at the country-of-origin level. All continuous, non-dummy measures are standardized to have a mean of 0 and a standard deviation of 1. Standard control variables are sex, age and age squared, hours worked per week, dummy for unemployment and seeking work for more than three months, dummy for citizen of destination-country, dummy for destination-country language spoken at home, origin-destination geographic distance, dummy for destination country having same official language as country of origin, dummies for time in destination country, dummies for employment status, dummies for employment relation, dummies for establishment size, destination-country dummies, year/wave dummies (see Table 3). Model 9 compares to Model 3 in Table 3. To save space, the table presents a selection of coefficients and standard errors but complete results are available on request. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5% and 1% level.

**TABLE 5**  
The Relationship Between Cultural Emphasis on Intellectual Autonomy and Human Capital Accumulation

Dependent = Human capital accumulation (1=yes)	Outcomes added as control variables			Personal values as mediator	Occupation as mediator	
	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17
Country-of-origin emphasis on intellectual autonomy	0.394*** (0.044)	0.251*** (0.061)	0.334*** (0.064)	0.351*** (0.039)	0.397*** (0.045)	0.220*** (0.037)
Years of education	-	0.665*** (0.052)	-	-	-	-
Income rank	-	0.077* (0.047)	-	-	-	-
Ease of borrowing money	-	0.138*** (0.040)	-	-	-	-
Dummies for education father	No	No	Yes	No	No	No
Dummies for education mother	No	No	Yes	No	No	No
Openness-to-change versus conservation values	-	-	-	0.300*** (0.034)	-	-
Average human capital accumulation in occupation	-	-	-	-	-	0.833*** (0.038)
Standard control variables	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	9,405	4,008	4,008	9,405	9,321	9,321
No. of origin countries	32	32	32	32	32	32
Log pseudolikelihood	-4328.0	-1812.5	-1886.5	-4282.8	-4283.6	-3899.3
Pseudo R <sup>2</sup>	0.2321	0.2834	0.2542	0.2406	0.2333	0.3021

Notes: Table reports log-odds and robust standard errors (in parentheses) that are clustered at the country-of-origin level. All continuous, non-dummy measures are standardized to have a mean of 0 and a standard deviation of 1. Standard control variables are sex, age and age squared, hours worked per week, dummy for unemployment and seeking work for more than three months, dummy for citizen of destination-country, dummy for destination-country language spoken at home, origin-destination geographic distance, dummy for destination country having same official language as country of origin, dummies for time in destination country, dummies for employment status, dummies for employment relation, dummies for establishment size, destination-country dummies, year/wave

dummies (see Table 3). Models 12 and 16 compare to each other, to Model 3 in Table 3 and to Model 9 in Table 4. Models 13 and 14 compare to Models 5 and 6 in Table 3. Models 14 and 17 compare to Models 8 and 11 in Table 4. To save space, the table presents a selection of coefficients and standard errors but complete results are available on request. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5% and 1% level.

**TABLE 6**  
The Relationship Between Cultural Future Orientation and Human Capital Accumulation

Dependent = Human capital accumulation (1=yes)	Outcomes added as control variables			Personal values as mediator	Occupation as mediator	
	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23
Country-of-origin future orientation	0.166*** (0.050)	0.135** (0.060)	0.171*** (0.065)	0.131*** (0.046)	0.165*** (0.050)	0.054 (0.036)
Years of education	-	0.671*** (0.049)	-	-	-	-
Income rank	-	0.155*** (0.057)	-	-	-	-
Ease of borrowing money	-	0.060 (0.045)	-	-	-	-
Dummies for education father	No	No	Yes	No	No	No
Dummies for education mother	No	No	Yes	No	No	No
Openness-to-change versus conservation values	-	-	-	0.322*** (0.033)	-	-
Average human capital accumulation in occupation	-	-	-	-	-	0.808*** (0.036)
Standard control variables	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	9,515	4,045	4,045	9,515	9,434	9,434
No. of origin countries	53	52	52	53	52	52
Log pseudolikelihood	-4441.1	-1816.3	-1890.9	-4383.8	-4399.4	-4017.27
Pseudo R <sup>2</sup>	0.2048	0.2719	0.2420	0.2158	0.2065	0.2755

Notes: Table reports log-odds and robust standard errors (in parentheses) that are clustered at the country-of-origin level. All continuous, non-dummy measures are standardized to have a mean of 0 and a standard deviation of 1. Standard control variables are sex, age and age squared, hours worked per week, dummy for unemployment and seeking work for more than three months, dummy for citizen of destination-country, dummy for destination-country language spoken at home, origin-destination geographic distance, dummy for destination country having same official language as country of origin, dummies for time in destination country, dummies for employment status, dummies for employment relation, dummies for establishment size, destination-country dummies, year/wave

dummies (see Table 3). Models 18 and 22 compare to each other, to Model 3 in Table 3, to Model 9 in Table 4 and to Models 12 and 16 in Table 5. Models 19 and 20 compare to Models 5 and 6 in Table 3 and to Models 13 and 14 in Table 5. Models 20 and 23 compare to Models 8 and 11 in Table 4 and to Models 14 and 17 in Table 5. To save space, the table presents a selection of coefficients and standard errors but complete results are available on request. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5% and 1% level.

**TABLE A.1**  
Descriptive Statistics for Country-of-Origin Measures

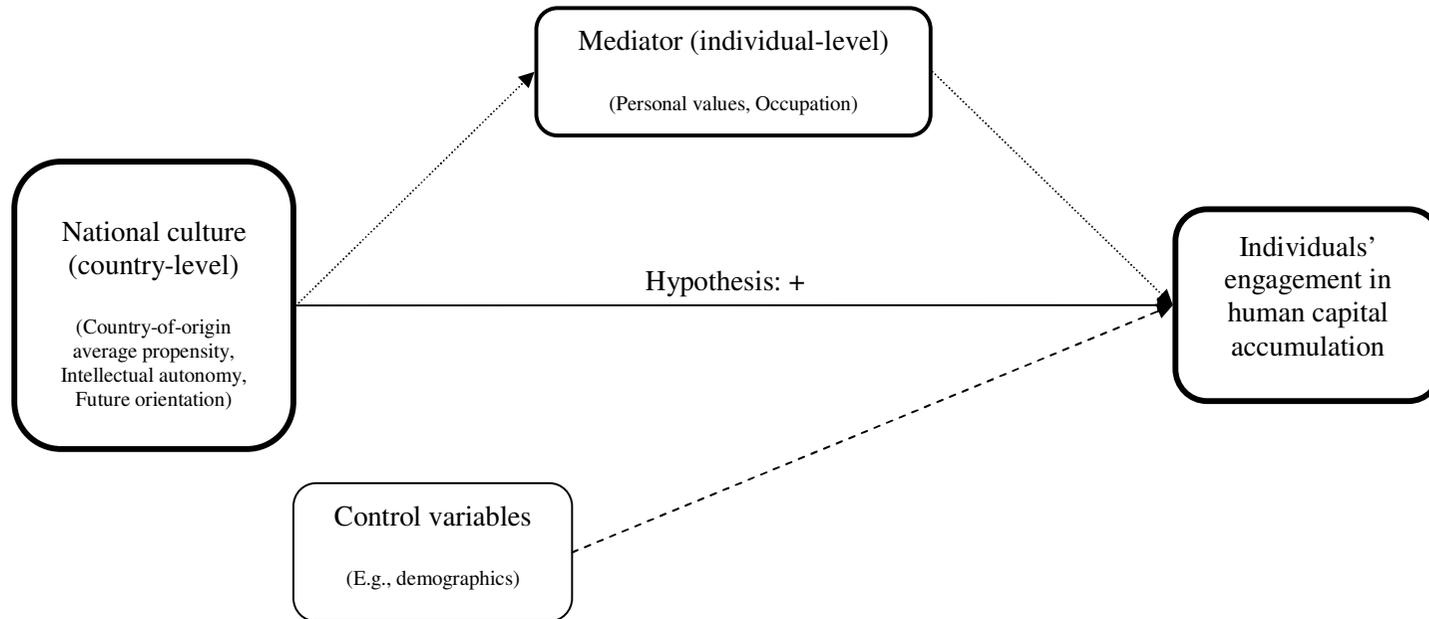
Country	Propensity towards human capital accumulation	Propensity towards human capital accumulation, pre-1968 cohort	Intellectual autonomy	Future orientation (1-7)
Albania				3.69
Argentina				3.10
Australia				4.09
Austria	0.051	0.033	0.040	4.47
Belgium	0.057	0.029	-0.020	
Bolivia				3.55
Brazil				3.90
Bulgaria	-0.172	-0.136	-0.398	
China				3.68
Colombia				3.35
Costa Rica				3.64
Croatia	-0.095	-0.095	-0.107	
Cyprus	-0.090	-0.104	-0.003	
Czech Republic	-0.098	-0.076	-0.083	
Denmark	0.188	0.198	0.166	4.59
Ecuador				3.66
Egypt				3.80
El Salvador				3.73
Estonia	0.052	0.053	0.056	
Finland	0.196	0.183	0.155	4.39
France	-0.004	-0.027	0.141	3.74
Georgia				3.45
Germany	0.047	0.028	0.225	
Greece	-0.173	-0.158	-0.160	3.53
Guatemala				3.35
Hong Kong				3.88
Hungary	-0.130	-0.113	-0.160	3.31
Iceland	0.215	0.234	0.199	
India				4.04
Indonesia				3.61
Ireland	-0.016	-0.031	0.024	3.93
Israel	-0.053	-0.005	-0.112	3.82
Italy	-0.118	-0.095	-0.057	3.34
Japan				4.29
Kazakhstan				3.72
South Korea				3.90
Kuwait				3.18
Lithuania	-0.103	-0.089	-0.353	
Luxembourg	0.045	-0.009	0.134	

Table A.1, ctd.

Country	Propensity towards human capital accumulation	Propensity towards human capital accumulation, pre-1968 cohort	Intellectual autonomy	Future orientation (1-7)
Malaysia				4.39
Mexico				3.75
Morocco				3.50
Namibia				3.32
Netherlands	0.084	0.072	0.160	4.72
New Zealand				3.46
Nigeria				3.95
Norway	0.184	0.163	0.119	
Philippines				3.92
Poland	-0.082	-0.096	-0.145	3.23
Portugal	-0.133	-0.121	-0.139	3.77
Russia	-0.149	-0.135	-0.210	3.06
Singapore				4.88
Slovak Republic	-0.041	-0.041	-0.157	
Slovenia	0.069	0.034	-0.089	3.56
Spain	-0.048	-0.060	0.068	3.52
Sweden	0.189	0.210	0.174	4.37
Switzerland	0.169	0.147	0.277	4.80
Taiwan				3.65
Thailand				3.27
Turkey	-0.258	-0.240	-0.305	3.74
Ukraine	-0.156	-0.144	-0.219	
United Kingdom	0.049	0.033	0.111	4.31
United States				4.13
Venezuela				3.43
Zambia				3.55
Zimbabwe				3.76

Notes: Sources of the data are House et al. (2004) and own calculations based on data from Waves 1-7 of the ESS (see text). Though they are mostly European, the 32 countries for which data on country-of-origin propensity towards human capital accumulation and intellectual autonomy are available already cover the majority of the cultural clusters recognized in the cross-cultural literature, including 6 out of the 10 global clusters identified by the GLOBE project (House et al. 2004). In addition, the set of 32 countries comprises such countries as Ukraine and Lithuania that are absent in the standard cultural clusterings. Similarly, the set of 32 countries comprises the majority of the G7 / G8 countries. Finally, in terms of formal institutions, these 32 countries represent all five major legal systems (common law, French law, German law, socialist law and Scandinavian law).

**FIGURE 1**  
Schematic Overview of Expected Relationships and Empirical Analysis



Notes: See also Eq. 1.