

Individualism, Human Capital Formation, and Labor Market Success

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There is an ongoing debate about the economic effects of individualism. We establish that individualism leads to better educational and labor market outcomes. Using data from the largest international adult skill assessment, we identify the effects of individualism by exploiting variation between migrants at the origin country, origin language, and person level. Migrants from more individualistic cultures have higher cognitive skills and larger skill gains over time. They also invest more in their skills over the life-cycle, as they acquire more years of schooling and are more likely to participate in adult education activities. In fact, individualism is more important in explaining adult skill formation than any other cultural trait that has been emphasized in previous literature. In the labor market, more individualistic migrants earn higher wages and are less often unemployed. We show that our results cannot be explained by selective migration or omitted origin-country variables.

Keywords: cognitive skills; culture; individualism; education over the life cycle.

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1 Introduction

Paragraph Individualism may well be the most polarizing element of our *Zeitgeist* (Dionne 2012). While individualism is a distinguishing feature of American culture—in fact, the United States is the most individualistic country in the world (Hofstede 2001; Gorodnichenko and Roland 2012)—it has also been recognized as one of the main dimensions of cultural variation across countries (Greenfield 2000; Heine 2007). Contributing to the individualism-related polarization is the lack of consensus about whether individualism is favorable for economic welfare. Individualistic culture emphasizes personal freedom and achievement, which fosters economic growth and innovation (Gorodnichenko and Roland 2011b, 2011a, 2017), but at the same time may undermine collective action. For example, recent U.S. evidence shows that more individualistic counties more strongly oppose redistribution (Bazzi, Fiszbein, and Gebresilasse 2020) and are less willing to respond to public health risks such as the COVID-19 pandemic (Bazzi, Fiszbein, and Gebresilasse 2021).¹ Given these opposing aggregate economic effects of individualism, it is a priori unclear whether individualism is actually beneficial for the *individual*. Surprisingly, there is no empirical evidence on this question. Our paper fills this gap by investigating whether and how individualism affects human capital formation and labor market success.

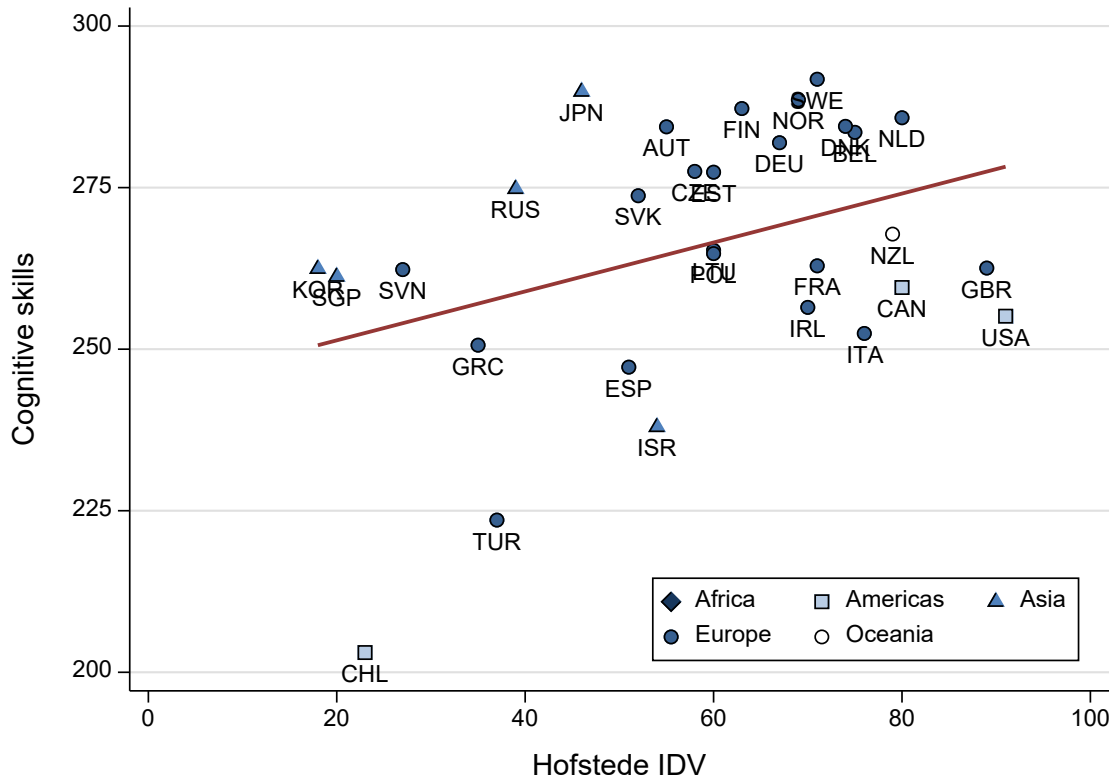
The main focus of the paper is on cognitive skills as an important measure of individual productive capacity. We use unique international survey data from the OECD “Programme for the International Assessment of Adult Competencies” (PIAAC), designed to allow for cross-country comparisons of the cognitive skills of persons aged 16 to 65 years. Cognitive skills in PIAAC, as measured by numeracy test scores, reflect the knowledge and capabilities acquired at school as well as skill developments on the labor market. Our primary measure of individualism comes from Hofstede (2001), which is mainly based on a worldwide survey of IBM employee values in the 1960s and 1970s. Figure 1 gives a stylized preview of our main result. In this simple cross-country analysis, individualism and cognitive skills are clearly positively related.

However, these cross-country comparisons do not allow to disentangle the effects of individualism from those of institutional and economic factors (Alesina and Giuliano 2015). We establish the impact of individualism on economic outcomes by comparing migrants from different cultural backgrounds within the same destination country. This so-called epidemiological approach (Fernández and Fogli 2009; Fernández 2011) relies on the idea that migrants take (some of) their original cultural toolkit with them when they migrate. This idea is formalized by Bisin and Verdier (2000, 2001), who argue that cultural values are persistent as

¹ Similarly, Chen, Frey, and Presidente (2021) provide international evidence that compliance with governmental lockdown policies during the COVID-19 pandemic is considerably lower in countries with high levels of individualism.

they are passed on relatively unchanged from generation to generation within the family (see also Guiso, Sapienza, and Zingales 2006 and Tabellini 2008).²

Figure 1. Individualism and Cognitive Skills



Notes: The figure establishes the positive association between individualism and cognitive skills across countries. Hofstede IDV refers to Hofstede’s individualism index. Average country-level PIAAC numeracy scores and country-level Hofstede IDV values are plotted in the sample of natives. The variation in individualism explains 14 percent of the international skill variation.

Data sources: PIAAC, Hofstede (2001).

Our individual-level regressions compare migrants from different cultures in the same destination country, and also account for migrant composition and geographical clustering of cultural traits. We find that individualism is strongly related to cognitive skills. In terms of magnitude, a one-standard-deviation increase in Hofstede IDV is associated with an increase in numeracy test scores of 0.29 standard deviations for first-generation migrants and 0.23 standard deviations for second-generation migrants. To put this result into perspective, if an average Austrian migrant who scores slightly above the international average on the Hofstede IDV scale was as individualistic as an average U.S. American, then her test scores would increase by

² An unconditional comparison of first-generation migrants from different origin countries reveals that as much as 46 percent of the international variation in cognitive skills can be explained by differences in individualism. The share of explained variance is 33 percent for second-generation migrants, who were born in the respective destination country and for whom we assign culture based on the origin language (see Figure A.1).

approximately half a standard deviation. This roughly amounts to the learning progress between lower secondary and upper secondary education in the international sample.

A series of robustness and identification checks supports a causal interpretation of our individualism estimates. Most importantly, we show that the results cannot be explained by selective migration or omitted origin-country characteristics. The results are also robust to using other measures of individualism. For example, we find similar results when we measure individualism using the Kashima and Kashima (1998) index, which is purely language-based. We also construct an individualism measure at the person level based on detailed information regarding the preferences for freedom and challenge-seeking of PIAAC respondents. In terms of identification, these alternative measures provide within-origin-country variation in individualism, which allows us to augment the epidemiological approach by controlling for confounding characteristics of migrants' birth countries.

Next, we exploit that we can observe migrants over the life-cycle to investigate the effect of individualism on the formation of human capital. We find that the skill advantage of migrants originating from countries with high individualism is only modest during adolescence. While the cognitive skills of migrants from low individualism cultures decay from labor market entry age onwards, migrants from high individualism cultures experience a rather stable skill-age profile for several years during their working life. Thus, the skill gap between migrants with high levels of individualism and those with low levels of individualism widens throughout the life-cycle. We confirm that this pattern is not just due to cohort effects using skill panel data for Germany, which show that the cognitive skills of high individualism migrants improve in relative terms over time compared to those of low individualism migrants. Consistent with the dynamics of the high-low-individualism skill gap, we observe substantially higher investments in various education activities by migrants from more individualistic cultures. More specifically, a mediation analysis (Heckman, Pinto, and Savelyev 2013; Heckman and Pinto 2015) shows that educational investments in formal and adult education can explain approximately half (45 percent) of the individualism effect on cognitive skills.

To date, among all the traits in Hofstede's model of culture, the economics literature has devoted the most attention to long-term orientation.³ We find that individualism is more important in explaining adult skill formation than long-term orientation—and any other cultural trait that has been emphasized in the previous literature; including patience, trust, risk aversion, altruism, and reciprocity. In particular, individualism is a stronger predictor of cognitive skills than long-term orientation in 20 out of the 22 destination countries in our sample. The most important exception to this pattern is the United States (a highly individualistic and short-term oriented society), which exhibits by far the highest skill returns to long-term orientation worldwide, while

³ Long-term orientation describes the ability to defer gratification and exert self-control. Together with the related concept of patience, it has gained substantial interest in recent literature (Hanushek et al. forthcoming; Sunde et al. forthcoming).

the skill returns to individualism are close to the international average. This result is consistent with the extraordinary educational and economic performance of Asian migrants in the United States, who often come from countries that are generally characterized by low levels of individualism and high levels of long-term orientation.

We also investigate the impact of individualism on wages and employment as further measures of individual productivity. Migrants from more individualistic cultures earn higher wages and face a lower unemployment risk. These labor market effects are partly driven by occupational selection. More individualistic migrants are more likely to work in research-oriented and analytical-task-intensive occupations, which provide them with a more challenging work environment and require a higher degree of creativity and problem-solving. These results suggest that the U.S.-specific findings by Gorodnichenko and Roland (2017) on the relationship between individualism and occupational choice also hold internationally.

Our paper contributes to the understanding of how and why culture, specifically the cultural trait of individualism, matters for economic outcomes.⁴ We are the first to show that individualism is an economically productive cultural trait and part of the human capital production function (Ben-Porath 1967; Cunha and Heckman 2007; Cunha, Heckman, and Schennach 2010). This adds important insights to the ongoing debate about individualism, suggesting that this trait fosters economic prosperity not only at the aggregate but also at the individual level. In fact, our results provide a micro-foundation for why more individualistic countries tend to be more innovative and prosperous (Gorodnichenko and Roland 2011b, 2011a, 2017). Moreover, our findings extend the small stream of recent literature that emphasizes the role of cross-country cultural differences in time and risk preferences (Figlio et al. 2019; Hanushek et al. forthcoming) and of differences in cultural practices, specifically matrilocality and patrilocality (Bau 2021), for educational achievement. Since individualism is formed early in life and transmitted within the family, our results help to explain why family background is—by “accident of birth” (Heckman 2008)—a powerful predictor of individual success.⁵ Thus, our paper is directly related to the literature on the intergenerational persistence of education and income (Black and Devereux 2011; Jäntti and Jenkins 2013).

In addition to this core contribution, our paper makes two more general contributions to the literature on the economics of culture. First, our U.S.-specific results imply that the country context matters for the economic effects of culture. Thus, our paper calls for caution on the generalizability of findings from studies investigating the effects of culture in only a single country. Second, by using various measures of culture that vary at different levels (country,

⁴ For general overviews of the economic effects of culture, see, for example, Guiso, Sapienza, and Zingales (2006) and Alesina and Giuliano (2015).

⁵ See, for example, Behrman and Rosenzweig (2002). Bau and Fernández (2021) provide a discussion of the family as a social institution.

language, person), we provide rigorous evidence on the economic effects of culture even in the absence of experimental cultural variation.

2 Individualism

Individualism represents one cultural dimension in the multi-dimensional model of national culture put forth by Geert Hofstede.⁶ The model has widely been used in economics to conceptualize culture (e.g., Alesina and Giuliano 2015; Figlio et al. 2019). Individualists strive to *stand out* among their peers through talent, unique characteristics, and personal achievements (Triandis 1995; Hofstede 2001; Gorodnichenko and Roland 2012). Moreover, individualists can be characterized by valuing freedom and independence (Waterman 1981), self-fulfillment (Ivtzan 2008), creativity (Goncalo and Staw 2006), personal time (Hofstede 2001), and privacy (Oyserman, Coon, and Kimmelmeier 2002). Collectivists, who are positioned at the other end of the individualism-collectivism spectrum, derive a context-specific sense of self from being members of a larger entity, i.e., an in-group. In contrast to individualists, collectivists try to *fit in* and not stand out (Hofstede 2001). They have a strong desire for harmony and emphasize group goals (Triandis 1995).

Part of the cultural differences in individualism are deeply anchored in the history of modern societies. For instance, Olsson and Paik (2016) trace present-day differences in individualism in the Western Hemisphere back to the Neolithic revolution more than 10,000 years ago when hunters and gatherers became farmers. A recent study by Bazzi, Fiszbein, and Gebresilasse (2020) shows that the current level of individualism in the United States—measured through the prevalence of infrequent names—is strongly linked to the experience of frontier settlement patterns. Individualism also has a personal component. Waterman (1984) describes theories on the early-life formation of individualism, which also coincides with the vertical transmission of the cultural component of individualism (Cavalli-Sforza and Feldman 1981; Bisin and Verdier 2001). According to these theories, identifying one’s potential and interests during childhood and early adulthood is essential for the development of individualism as part of identity (see also Erikson 1968, Ruble et al. 2004, and Phinney and Ong 2007). While there is some variation in individualism over the life-cycle (i.e., maturation, assimilation into culturally different environments, major life events), individualism remains largely stable (Waterman 1984; see, e.g., van Dijk et al. 2020 for empirical evidence on personality traits in general).

Previous literature provides ample evidence of individualism affecting cognitive style, that is, the way people think, how they form arguments and approach problems, and which cognitive biases they are prone to (Nisbett et al. 2001; Gorodnichenko and Roland 2012). In an economic context, Cunha and Heckman (2007) and Cunha, Heckman, and Schennach (2010) formulate a

⁶ See Hofstede (2001) and Hofstede and Minkov (2013). The other dimensions are power distance, uncertainty avoidance, masculinity, indulgence, and long-term orientation. Appendix B.1 provides more details on Hofstede’s cultural measures.

skill production function, which depends on the parental environment and skill investments. Within this framework, we argue that individualism can be considered a productive trait that is family-dependent, is formed early in life, is transmitted from generation to generation, and affects the formation of skills through at least two channels (see, e.g., Figlio et al. 2019 for a similar argument using long-term orientation). First, individualistic parents invest more in the skill development of their children than collectivistic parents because they attach a higher value to the personal achievement of their offspring. Second, individualistic parents transmit and exemplify a uniqueness- and autonomy-focused mindset and analytic cognitive style to their children. Moreover, considering a skill production function with adult skill investments (see, e.g., Ben-Porath 1967), we also expect that individualists have strong incentives to invest in skills during their adult life to stand out among peers and to achieve their own goals (Triandis 1995; Oyserman, Coon, and Kimmelmeier 2002). In fact, Hofstede (2001) highlights individualism as the dimension of culture that most strongly emphasizes life-long learning. However, since individualistic cultures face coordination and collaboration problems, we may expect a negative effect on individual skill development if these problems lead to a lower provision of public goods such as public schooling and healthcare.

Previous literature has already shown that skills investment decisions are shaped not only by individualism but also by other traits and economic preferences. In particular, recent studies have documented that long-term orientation (i.e., the ability to defer gratification and exert self-control), patience, and risk-taking affect human capital investments, which reflects the intertemporal nature of educational choices.⁷ To disentangle the effect of individualism from that of other components of a person's cultural toolkit, we control for these and other important dimensions of cross-country cultural differences in the empirical analysis. Furthermore, as individualists do not distinguish between an in-group and out-group (Tabellini 2008), individualistic societies are also characterized by high levels of generalized trust (Schulz et al. 2019). However, conceptually (and, as we show below, also empirically), individualism has a distinct effect on skill formation because the willingness to stand out as well as the passion for challenge and innovation, are not characteristics of trust.

To the best of our knowledge, there are no specific theories linking individualism directly to wages and employment. From the discussion above, we may expect that a productivity-enhancing effect of individualism should also carry over to the labor market. Additionally, individualists seek challenges and personal achievement, which could motivate them to, for instance, apply for more lucrative and demanding positions or chase promotions. The innovation-focused, open mindset associated with individualism might also yield particularly high rewards on today's labor market. Individualism could thus affect labor market outcomes beyond the skill channel. However, if individualists mainly invest in non-labor market-relevant skills or pursue high-risk

⁷ See, among others, Hanushek et al. (forthcoming).

low-return careers for pure self-fulfillment motives (e.g., performing arts or backpacking), then higher levels of individualism will not necessarily improve labor market outcomes.

3 PIAAC Data

To investigate how individualism affects human capital formation and labor market outcomes, we use data from the Programme for the International Assessment of Adult Competencies (PIAAC), which is administered by the OECD (see OECD 2013 for details). PIAAC has been designed to provide internationally comparable measures of cognitive skills for adults aged 16 to 65 years.⁸ In each participating country, a representative sample of at least 5,000 adults participates in the PIAAC survey, leading to a total sample size of almost 215,000 individual-level observations. An extensive background questionnaire contains detailed information on respondents' demographic characteristics, education, and labor market outcomes. PIAAC has been designed to measure key cognitive and workplace skills needed for individuals to advance in their jobs and participate in society. Moreover, PIAAC has also been designed to facilitate international comparisons as the skill test is culturally and linguistically neutral and equivalent in difficulty across countries. It is crucial for our analysis to use assessment data rather than self-reported skills because individualism (and culture in general) likely influences the way in which people assess and report their own skills. Cognitive skill data also have a number of advantages compared to educational attainment data. For example, the quality of schooling might change over time and might vary across countries (Hanushek and Zhang 2009). Approximating an individual's stock of human capital with educational attainment is especially problematic for cross-country comparisons because such comparisons implicitly assume that the contribution of each school year to human capital accumulation is independent of the quality of the education system (Hanushek and Woessmann 2008). Moreover, attainment data reflect only a person's human capital at the end of their formal education, thus neglecting the skills that are acquired during one's working life.

⁸ A total of 33 countries participated in PIAAC. Data collection proceeded in two rounds. The first round, which was conducted between August 2011 and March 2012, included the following countries: Australia, Austria, Belgium (Flanders), Canada, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, Russia, the Slovak Republic, Spain, Sweden, the United Kingdom (England and Northern Ireland), and the United States. The second round was conducted between April 2014 and March 2015 and covered an additional nine countries: Chile, Greece, Indonesia (Jakarta only), Israel, Lithuania, New Zealand, Singapore, Slovenia, and Turkey. For expositional simplicity, we refer to 2012 (2015) as the year of PIAAC round 1 (round 2).

4 Estimation

To more rigorously examine the relationship between individualism and economic outcomes, we estimate the following individual-level regression model:

$$(1) \quad NUM_{iydo} = \beta_0 + \beta_1 \overline{IDV}_o + \mathbf{X}'_{iydo} \boldsymbol{\gamma} + \mu_d \times \mu_y + c_o + u_{iydo}.$$

We regress the numeracy score of migrant i who immigrated in year y to destination country d from origin country o , NUM_{iydo} , on the average individualism score of her origin country, \overline{IDV}_o . Thus, relying on the stability of cultural traits, we assign migrants their country-of-origin individualism value. In addition to individual-level controls (quadratic polynomial in age and gender in our main specification), \mathbf{X}_{iydo} , we also add the full set of interactions between destination country and year-of-migration fixed effects, $\mu_d \times \mu_y$. Thus, we compare migrants with different cultural backgrounds who have moved to the same destination country in the same year, as these migrants were therefore exposed to the same educational and labor market institutions. At the same time, these fixed effects also control for destination-country-cohort-specific differences in migrant characteristics (e.g., due to country-specific immigration policies attracting certain types of migration in a given year)⁹ and destination-country-specific migrant assimilation patterns. We also add continent-of-origin fixed effects, c_o , to rule out that our results reflect geographical clustering in individualism by continent.

Analogously, the epidemiological approach for second-generation migrants is implemented by estimating a version of equation (1) with individualism measured at the origin-language level and with destination country fixed effects replacing destination-country-by-year-of-migration effects.¹⁰ Standard errors are adjusted for clustering at the origin-country level for first-generation migrants and at the origin-language level for second-generation migrants.

There are two well-known identification challenges in regard to the epidemiological approach. First, since migrants are not a random draw from their origin country, the selection of migrants may correlate with individualism and cognitive skills. Thus, we test for migrant selection on individualism and control for measures of migrant selection in various ways to find that it does not pose a problem to our results.

Second, country-of-origin individualism could be confounded by other characteristics of migrants' origin countries (e.g., GDP, educational institutions, or other cultural characteristics). That is, differences in skill levels could correlate with differences in patterns and speed of

⁹ One example for such policies is the German “green card” initiative, which was introduced in 2000 to ease the migration of foreign experts in the field of information and communication technology (ICT) to Germany.

¹⁰ In the model with second-generation migrants, origin continent fixed effects are defined at the origin-language level. We follow David Figlio et al. (2019) in assigning the origin language to the continent on which at least 50 percent of first-generation migrants speak the language reported by second-generation migrants. In the rare case of a 50-50 tie, we use the overall number of first-generation migrants in our data from a given continent as a tiebreaker (in descending order: Europe, Asia, Africa, Americas, and Australia).

assimilation across migrants from different origin countries. Thus, Section V.C. studies the sensitivity of our results when including country-of-origin controls that, whenever possible, are specific to the year of migration. While some of these country-of-origin controls are likely endogenous to individualism, we can obtain potential bounds of the relationships between individualism and adult skills when comparing the results both including and excluding these potentially endogenous control variables. We additionally conduct an instrumental variables approach that exploits arguably exogenous variation in individualism across countries to address unobserved origin-country heterogeneity.

To address unobserved origin-country heterogeneity even more rigorously, we propose two extensions to the traditional epidemiological approach. In the first approach, we use the language-based Kashima and Kashima (1998) index of pronoun drop, which varies within origin countries and thus provides the possibility of including origin-country fixed effects. In the second approach, we construct an individualism measure at the person level, thereby exploiting the fact that the PIAAC survey includes items that capture the most important elements of individualism. An analysis of the economic effects of person-level cultural traits is rarely done in the literature because most datasets do not contain information on both economic outcomes and individual-level cultural traits. While the person-level individualism approach and the epidemiological approach both have their merits and demerits (see Figlio et al. 2019 for a discussion), the main advantage of measuring cultural traits at the person level is that we do not have to make assumptions about the appropriate assignment mechanism of aggregate cultural traits. Moreover, we can compare migrants who moved from the same origin country to the same destination country in the same year. We can even use within-country variation in individualism for natives. While none of the approaches and extensions exploit truly exogenous variation in individualism, they hold different aspects of the institutional and economic environment constant. Since all approaches lead to very similar conclusions regarding the link between individualism and economic outcomes, we consider it plausible that our estimates do not simply reflect the economic and institutional environment intertwined with individualism.

Importantly, all our approaches lead to the same positive and highly economically significant relationship between individualism and human capital formation as well as labor market success.

5 Individualism and Cognitive Skills

5.1.1 Main Results

Table 1 presents our results from estimating equation (1). By conditioning only on destination country and year of migration fixed effects, it can be seen that a one-standard-deviation increase in origin-country Hofstede IDV is associated with an increase in numeracy skills by 0.26 standard deviations for first-generation migrants (Column (1)). Columns (2) to (4) show that the results are robust to including sociodemographic controls, migration-year-specific destination country fixed

effects, and continent-of-origin fixed effects. These results suggest that it is not a specific continent or specific migrant characteristic that drives the positive relationship between individualism and cognitive skills. The individualism estimate is also economically meaningful. For instance, Austria has a Hofstede IDV score of 55, which is somewhat above the international average (44). If an average Austrian migrant was as individualistic as an average U.S. person (individualism score: 91), then her numeracy skills would increase by half a standard deviation. To put this into perspective, this roughly amounts to the learning progress made by school-attending PIAAC respondents between lower secondary and upper secondary education.¹¹ This underlines the economic significance of individualism differences even between countries that are commonly regarded as Western and developed. We can also compare two neighboring countries, namely, Japan (46) and Korea (18). While Japan might seem like a collectivistic society from a U.S. perspective, among Asian countries it is, in fact, considered individualistic (Hofstede 2001). If an average Korean migrant was as individualistic as an average Japanese migrant, then her numeracy skills would increase by more than one-third of a standard deviation.¹²

However, the skill differences of first-generation migrants presented thus far may be driven by the institutional and economic environment of their origin countries rather than by cultural background. Reassuringly, individualism estimates for second-generation migrants are also statistically significant and sizeable (Columns (5) to (7) of Table 1), which suggest that the institutional and economic environment of the origin country is not a dominant confounding factor. However, these estimates are somewhat smaller than those for first-generation migrants. One potential explanation is that some cultural assimilation has taken place for the descendants of first-generation migrants (see, e.g., Duncan and Trejo 2007 and Abramitzky et al. 2020 for cultural assimilation of migrants in the United States). Furthermore, the individualism estimates of second-generation migrants may be attenuated due to measurement error that arises from constructing a language-based indicator of cultural background (due to lacking information on the parental country of birth).¹³

¹¹ This “ISCED-level equivalent” is equal to 0.42 standard deviations. It is calculated by regressing numeracy skills of PIAAC respondents aged 16–18 years on an indicator that takes the value 1 if the respondent is currently in upper secondary education (ISCED 3A-B, C long) and 0 if the respondent is currently in lower secondary education (ISCED 2, 3C short). Regressions control for gender, age, number of books at home at age 15, indicators for first- or second-generation migrant status, and country fixed effects. The estimate provides an approximation of how much students learn on average transiting from lower secondary to upper secondary education.

¹² In Appendix Table A.3, we control for the educational background of migrants’ parents and the number of books at home at age 15 as a proxy for the family’s socioeconomic background. Adding these variables substantially reduces the individualism estimate, which is consistent with the idea that the family is the main locus where cultural values are formed and transmitted from one generation to the next.

¹³ In the German sample, we can compare individualism estimates when assigning the cultural background of second-generation migrants either based on the parental country of birth or based on the language spoken at home in childhood. Appendix Table A.4 presents the results. The two assignment procedures lead to rather similar individualism coefficients; in fact, the language-based individualism estimate is even somewhat larger. Thus, inferring the cultural background of second-generation migrants from the origin language does not appear to matter for the German results, but it is unclear whether this finding carries over

Table 1. Individualism and Cognitive Skills: Hofstede IDV

	First-generation migrants				Second-generation migrants		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hofstede IDV	0.261*** (0.039)	0.257*** (0.038)	0.264*** (0.038)	0.290*** (0.049)	0.223*** (0.063)	0.256*** (0.055)	0.228*** (0.056)
Age		0.021*** (0.007)	0.021** (0.009)	0.021** (0.009)		0.049*** (0.009)	0.050*** (0.008)
Age squared (/100)		-0.045*** (0.008)	-0.045*** (0.009)	-0.045*** (0.009)		-0.078*** (0.014)	-0.080*** (0.014)
Female		-0.218*** (0.025)	-0.226*** (0.025)	-0.227*** (0.025)		-0.216*** (0.022)	-0.210*** (0.021)
<i>Fixed effects</i>							
Destination country	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of migration	Yes	Yes	Yes	Yes			
Destination country × year of migration			Yes	Yes			
Continental				Yes			Yes
Different language							Yes
Destination country × different language							Yes
R-squared	0.11	0.14	0.24	0.24	0.06	0.12	0.14
Observations	15,349	15,349	15,349	15,349	13,372	13,372	13,372
Origins	68	68	68	68	84	84	84

Notes: The table shows the results for numeracy test scores in the sample of first-generation migrants (Columns (1) to (4)) and second-generation migrants (Columns (5) to (7)). Observations are weighted, giving each destination country the same weight. Numeracy test scores are standardized to a mean of 0 and a standard deviation of 1 in the full international sample. Hofstede IDV refers to Hofstede's individualism index and is standardized to a mean of 0 and a standard deviation of 1 in the full international sample. *Continental fixed effects* refer to the continent of origin country for first-generation migrants and to the most plausible continent of parental origin for second-generation migrants (see Section B). *Origins* refer to origin country for first-generation migrants and origin language for second-generation migrants. Standard errors clustered at the origin-country level for first-generation migrants and at the origin-language level for second-generation migrants reported in parentheses. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Data sources: PIAAC, Hofstede (2001).

5.1.2 Methodological Extensions

Country-level and language-level individualism measures reflect the average level of individualism of a society. A unique feature of PIAAC is that it also allows us to construct an individualism index that varies at the person level. The approach enables the comparison of outcomes of migrants from the *same* origin country and language. That is, we exploit differences in individualism that occur between migrants (or migrant families) with the same broad cultural background. Using person-level variation in individualism within countries, we can also more credibly examine the role of individualism in human capital formation for natives. If it is true that cultural traits are formed within the family and are fairly stable across generations, then we would

to the other countries in the sample, especially to traditional immigration countries such as the United States and the United Kingdom.

expect to find a similarly strong influence of individualism across samples of natives and migrants.

PIAAC includes items that capture the most important elements of individualism emphasized in previous literature, namely, freedom and challenge-seeking—two fundamental parts of Hofstede’s individualism index—and broad-mindedness and cognitive style—which are emphasized in other individualism measures. More specifically, we use the following PIAAC items to construct person-level individualism index (*person-level IDV*): *i) planning one’s own activities at work, ii) using one’s own approach to the job, iii) managing one’s own time at work, iv) solving complex problems at work, v) enjoying learning new things, vi) getting to the bottom of difficult things, and vii) seeing if different ideas fit together.*¹⁴

The first three items measure different behaviors that express freedom and autonomy at the workplace, i.e., behaviors that are strongly valued by individualists and frequently used to measure individualism (Hofstede 2001; Oyserman, Coon, and Kimmelmeier 2002; Gorodnichenko and Roland 2012). Items iv) to vi) capture a desire for intellectual challenge and growth—both at the workplace and in the private domain—that is also strongly linked to individualism (Hofstede 2001, Gorodnichenko and Roland 2012).¹⁵ Item vii) reflects both openness-related and cognition-related aspects of individualism. Individualism is associated with an analytical rather than holistic cognitive style (Choi and Nisbett 1998; Nisbett et al. 2001), which favors the investigation and resolution of potential contradictions as captured by item vii). To construct our measure of person-level IDV, we follow Kling, Liebman, and Katz (2007) and first standardize each item by subtracting the mean and dividing by the standard deviation. We then compute the mean across all standardized items and standardize again.¹⁶ The correlation between (aggregated) person-level IDV and Hofstede IDV is 0.52.

The relationship between skills and individualism measured by person-level IDV is shown in Table 2. When deriving inference, we allow for correlations in the error term at the origin-country and origin-language levels for first- and second-generation migrants, respectively. Clustering at this level allows for an arbitrary correlation of skills among migrants from the same origin country or language in the various destinations. The empirical analysis starts again with a replication of the epidemiological approach, thereby replacing Hofstede IDV with person-level IDV (see Columns (1) and (3) for first- and second-generation migrants, respectively). The person-level IDV measure enables us to very rigorously control for origin-country or origin-language confounds. To do so, Columns (2) and (4) add fixed effects for the destination-specific origin

¹⁴ Appendix B.4 describes in detail on which survey items person-level IDV is based and provides both an assessment of the internal reliability and a cross-validation using existing country-level individualism measures.

¹⁵ The desire for intellectual challenge as measured by items iv) to vi) is considered particularly important in the context of innovation (Gorodnichenko and Roland 2017).

¹⁶ Using latent factors extracted from factor analysis results in a person-level IDV measure that is very highly correlated with the averaged measure ($r > 0.9$).

country (for first-generation migrants) and for the destination-specific origin-language (for second-generation migrants), respectively, which allows the investigation of individual-level

Table 2. Individualism and Cognitive Skills: Person-Level IDV

	First-generation migrants		Second-generation migrants		Natives
	(1)	(2)	(3)	(4)	(5)
Person-level IDV	0.353*** (0.021)	0.289*** (0.021)	0.301*** (0.029)	0.290*** (0.030)	0.258*** (0.013)
Age	0.004 (0.006)	0.007 (0.006)	0.025*** (0.006)	0.024*** (0.005)	0.025*** (0.004)
Age squared (/100)	-0.022*** (0.007)	-0.029*** (0.007)	-0.042*** (0.009)	-0.042*** (0.009)	-0.044*** (0.005)
Female	-0.172*** (0.019)	-0.196*** (0.018)	-0.152*** (0.022)	-0.152*** (0.023)	-0.160*** (0.017)
<i>Fixed effects</i>					
Destination country	Yes	Yes	Yes	Yes	Yes
Year of migration	Yes	Yes			
Destination country × year of migration	Yes	Yes			
Continental	Yes		Yes		
Origin country		Yes			
Destination country × origin country		Yes			
Origin language				Yes	
Destination country × origin language				Yes	
R-squared	0.29	0.44	0.19	0.24	0.26
Observations	21,451	21,451	17,869	17,869	159,068
Origins	212	212	123	123	31

Notes: The table shows the results for numeracy test scores in the sample of first-generation migrants (Columns (1) and (2)), second-generation migrants (Columns (3) and (4)), and natives (Column (5)). Observations are weighted, giving each destination country the same weight. Numeracy test scores are standardized to have a mean of 0 and a standard deviation of 1 in the full international sample. Person-level IDV refers to our newly constructed individualism index that varies at the person level; the index is standardized to a mean of 0 and a standard deviation of 1 in the full international sample. *Continental fixed effects* refer to the continent of origin country for first-generation migrants and to the most plausible continent of parental origin for second-generation migrants (see Section IV.B). *Origins* refer to origin countries for first-generation migrants, origin languages for second-generation migrants, and destination countries for natives. Standard errors clustered at the origin-country level for first-generation migrants, at the origin-language level for second-generation migrants, and at the destination-country level for natives, reported in parentheses. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Data source: PIAAC.

variation in individualism among migrants from the *same* origin in the same destination. For comparison, Column (5) exploits within-country variation in individualism and skills in the sample of natives. Overall, the results indicate a strong and significant positive association between individualism and cognitive skills, which is strikingly similar across samples of natives and migrants.¹⁷ Thus, the results are consistent with the view that cultural traits are primarily transmitted within the family.

¹⁷ Our person-level IDV index includes various items directly connected to the labor market, to capture Hofstede's concept of individualism. However, one may be worried that our person-level IDV measure

Results are also consistent when we use an alternative approach based on a language-based individualism measure, which also allows for the introduction of origin-country fixed effects (see working paper for these results).

6 Individualism and Education

Next, we make use of PIAAC’s rich background questionnaire to explain the influence of individualism on skill accumulation over the life-cycle by investments in skill-increasing activities. Specifically, PIAAC elicits information on respondents’ academic achievement early in life and on their skill-investment activities later in life (both work-related and non-work-related), all of which may affect skill accumulation. The following parsimonious skill production function illustrates how we think of individualism affecting cognitive skills:

$$(2) \quad \textit{skills} = f(\textit{formal schooling}(\textit{IDV}), \textit{adult education}(\textit{IDV}), \textit{IDV})$$

Equation (2) illustrates that one factor through which individualism affects skills is formal schooling, which is measured by the number of years an individual has spent in formal education. Although university education also enters the years-of-schooling measure, we also separately examine whether individualism is associated with the likelihood of receiving a university degree, respectively. Columns (1) and (2) of Table 3 show that Hofstede IDV is strongly positively associated with years of education and the probability of receiving a university degree. To explain skill formation after labor market entry, the remaining columns of Table 6 examine investments in non-formal (i.e., on-the-job training and any other training) and informal (e.g., frequency of reading newspapers and other outlets) adult learning activities. The results shown in Table 3 highlight that migrants from more individualistic cultures invest more in skill-enhancing activities after labor market entry than do those from less individualistic cultures.

7 Individualism and Labor Market Success

For the effect of individualism on labor market success, please refer to our full working paper. Most importantly, we show that individualism is strongly related to hourly wages. If individualism increases by one standard deviation, then hourly wages increase by 8.4 percent. This is approximately half of the average wage return resulting from a one-standard-deviation increase in numeracy skills among prime-age workers. More individualistic persons are also less likely to be unemployed and – in line with our theory – more likely to work in research jobs.

overly emphasizes labor market aspects. Therefore, we additionally construct indices that rely only on Items i) to iv) to construct a work-related index and on Items v) to vii) to construct a non-work-related index (see Appendix B.4 for details). Appendix Table B.5 shows that the results are very similar for the different person-level IDV measures across samples of natives and migrants. These results provide further evidence that our conclusions do not depend on a specific definition of individualism.

Table 3. Individualism and Skill Investments over the Life-Cycle

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Formal education		Non-formal adult education			Informal adult education		
	Years of education	University degree	Training on-the-job	Any other training	Training to increase knowledge	Read newspaper	Read professional journals	Read books
Hofstede IDV	0.616*** (0.143)	0.069*** (0.013)	0.034*** (0.008)	0.045*** (0.007)	0.028*** (0.010)	0.147*** (0.030)	0.141*** (0.043)	0.173*** (0.035)
Age	0.329*** (0.022)	0.049*** (0.004)	0.019*** (0.003)	0.017*** (0.003)	-0.002 (0.005)	0.035*** (0.006)	-0.003 (0.009)	-0.017** (0.009)
Age squared (/100)	-0.366*** (0.028)	-0.052*** (0.005)	-0.027*** (0.003)	-0.024*** (0.003)	0.003 (0.006)	-0.036*** (0.007)	-0.002 (0.012)	0.030*** (0.010)
Female	-0.054 (0.109)	0.015 (0.015)	-0.046*** (0.012)	-0.012 (0.015)	0.016 (0.016)	-0.004 (0.027)	-0.229*** (0.038)	0.516*** (0.044)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.36	0.27	0.14	0.16	0.24	0.20	0.16	0.19
Observations	15,150	15,312	14,909	14,909	5,426	15,346	15,337	15,343
Origin country	68	68	68	68	68	68	68	68

Notes: The table shows the results for the outcome indicated in the column header in the sample of first-generation migrants. Observations are weighted, giving each destination country the same weight. *Years of schooling:* years of schooling to obtain the highest educational degree. *University degree:* a dummy variable equal to 1 if the respondent has a university degree and 0 otherwise. *Training on-the-job:* dummy variable equal to 1 if respondent has participated in training on-the-job during the 12 months prior to the survey, 0 otherwise. *Any other training:* dummy variable equal to 1 if respondent has participated in any training other than training on-the-job during the 12 months prior to the survey and 0 otherwise. *Training to increase knowledge:* dummy variable equal to 1 if respondent has participated in training to increase knowledge and skills, 0 otherwise (question only asked if respondent participated in training due to work-related reasons). *Reading:* indicates the frequency with which respondent reads outlets indicated in the column header in private life; variables take values of 1 (never), 2 (less than once a month), 3 (less than once a week but at least once a month), 4 (at least once a week but not every day), and 5 (every day). Hofstede IDV refers to Hofstede’s individualism index and is standardized to a mean of 0 and a standard deviation of 1 in the full international sample. *Fixed effects:* destination country, year of migration, destination country \times year of migration, and continent of origin country. Standard errors clustered at the origin-country level reported in parentheses. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Data sources: PIAAC, Hofstede (2001).

8 Conclusion

“No man is an island”, said John Donne, a British poet. While his sentiment is indisputably right, we may acknowledge that some of us are more like islands—peninsulas maybe—than others who seek a landlocked position in this world. Such attitudes and human characteristics shape the societies we live in. Societies differ in many dimensions. One of them describes how loose—or island-esque—the ties between their members are, namely, individualism.

In this paper, we have established a strong positive relationship between individualism and human capital formation in adults. This is in line with the notion of individualists continuously seeking challenges, self-development, and self-fulfillment. Our analysis relies on international skill assessment data, which not only allow the use of thoroughly measured, internationally

comparable post-school skill scores but also provide the opportunity to investigate a wide range of relevant mechanisms and labor market outcomes. Our findings are robust across complementary identification strategies that leverage within-country variation in individualism and skills across different specifications and populations. We also employ several robustness and identification checks, which show that the relationship is not driven by confounding factors. Importantly, when comparing the effect of individualism to the effect of other cultural traits, we observe that individualism is more important in explaining skill formation of adults than any other cultural trait emphasized in previous literature.

With this paper, we contribute to economic research that has already demonstrated the power of culture as a factor that influences decision-making in many different dimensions. However, economically relevant aspects of culture and their multifaceted economic implications are far from being systematically explored. The link we establish between individualism and both human capital formation and labor market success is another step toward a thorough economic understanding of culture.

However, the results of this study warrant a careful interpretation; we investigate the effect of individualism on economic outcomes at the *individual* level. While other research has shown that more individualistic countries grow faster and are more prosperous, it is important to acknowledge that individualism can also have negative effects such as reduced social cohesion and cooperation at the societal level. Thus, by no means does our research suggest that there are “better” or “worse” cultures. Instead, we use cultural differences as a vehicle to gain insights into the formation of human capital and the determinants of individual labor market success. Future research must examine the effects of individualism on other important life outcomes to draw a more complete picture of the role of individualism in economics.

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