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Cultural stratification in the labor market outcomes of university-educated migrants in Australia

The relevance of cultural and linguistic proximity

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Research Summary

Why was the research done?

This paper contributes to literature on migrants' labor market outcomes by examining how the employment, occupation, and income of foreign-born graduates of Australian universities differ depending on the country of origin. Furthermore, the study explores how these outcomes are related to two key characteristics of migrants' origin–cultural and linguistic proximity to the host society, Australia.

What were the key findings?

The findings from statistical modelling show that Australian-born graduates tend to have some of the best labor market outcomes. Only graduates from regions that are culturally or linguistically closest to Australia (chiefly, from North America, New Zealand or the UK and Ireland) fare equally well, or sometimes even better than Australian-born graduates. However, thanks to the unprecedented scale of the data, our analysis revealed heterogeneity within the broad geographical regions, with large differences across countries within regions. The main analysis helps establish the importance of non-cognitive and non-economic factors in socioeconomic outcomes. Our analyses show that cultural proximity to the destination country (Australia) emerges as a factor that can help to explain these cross-country differences among permanent migrants who graduated from Australian universities. It was associated with better labor market outcomes. In turn, the results for linguistic proximity are more nuanced, with positive associations only for selected outcomes and age-at-arrival groups. Furthermore, our findings demonstrate that age at arrival moderates the relationship between cultural and linguistic proximity and labor market outcomes. Specifically, the estimated effects of linguistic and cultural proximity are weaker for individuals who arrive early in their lives.

What does this mean for policy and practice?

The findings call for investment in solutions that eliminate migrants' disadvantage in that labor market, which could be targeted at migrants from specific regions.

Citation

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We acknowledge the Traditional Custodians of the lands on which we work and live across Australia. We pay our respects to Elders past and present and recognise their continued connections to land, sea and community.

Cultural Stratification in the Labor Market Outcomes of University-Educated Migrants in Australia: The Relevance of Cultural and Linguistic Proximity

Abstract

Previous studies on segmented assimilation reveal that immigrants from various origin countries follow different labor market pathways and achieve diverse socioeconomic outcomes. This paper extends existing research on migrant integration by investigating how cultural and linguistic proximity to the host society affects labor market outcomes. Utilizing unique, whole-of-population, integrated government data on Australian university graduates (N=800,179), this study focuses on permanent migrants from multiple countries who obtained their degrees in Australia. The unprecedented scale of the data allows for detailed analysis of labor market outcomes by country of origin, revealing variations even among countries within the same region. In turn, this diversity enables examining the relationship between cultural and linguistic proximity to Australia and labor market outcomes. Cultural proximity emerges as a significant factor explaining cross-country differences in labor market success among permanent immigrants. However, the results for linguistic proximity are more nuanced, showing positive associations only for selected outcomes. Additionally, the findings indicate that age at arrival moderates the relationship between cultural and linguistic proximity and labor market success. We introduce the term "cultural stratification" to describe these processes.

1 Introduction

How important are cultural factors associated with nation or ethnicity for labor market outcomes? In their watershed account of segmented assimilation, Portes and Zhou (1993) recognized that immigrants from different origin countries had different labor market pathways and socioeconomic outcomes, reflecting factors like human capital, family structure and local context in the host society (Portes & Rumbaut, 2001; Portes & Zhou, 1993; Xie & Greenman, 2011). Segmented assimilation theory catalyzed an extensive research program documenting variability in immigrant outcomes depending on the immigrant group, the native group to whom immigrants assimilate, and individual factors like language and social relationships (Xie & Greenman, 2011). This paper contributes to this literature by examining how two key characteristics of migrants' origin–cultural and linguistic proximity to the host society, Australia–are related to the labor market outcomes of foreign-born graduates of Australian universities. Our focus on cultural and linguistic proximity to the host country extends recent research on other cultural and subjective factors in segmented assimilation (Piracha et al., 2022). Examining the role of national or ethnic culture also distinguishes a sociological approach to economic action (Smelser & Swedberg, 1991) from a mainstream economic one. We introduce the term "cultural stratification" to describe the processes we identify.

Culture includes norms and values, language, customs, and shared meanings. We consider two central elements, cultural values and language, to examine how the proximity or distance of migrant cultures to the dominant host culture in Australia is associated with labor market outcomes for migrant graduates from Australian universities. Cultural values are normative expressions of desired states, which shape behaviors, while language is the means for expressing, transmitting and reproducing cultural meaning, and a defining element and marker of culture and cultural identity. There are various conceptions of national cultural values (e.g. Inglehart & Welzel, 2005; Schwarz, 2012). We focus on Hofstede and Minkov's (2010) six dimensions of culture which include power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance, long versus short term orientation and indulgence versus restraint. Hofstede and Minkov's (2010) dimensions were first developed for explaining work-related cultures, attitudes, preferences and expectations. The dimensions include norms and preferences for hierarchical versus egalitarian distributions of power and reward, individualistic versus collectivist decision-making,

gendered or non-gendered roles, tolerance for uncertainty, short and long-term time horizons, and openness to new experiences.

These cultural values are embedded in labor-market processes and outcomes through labor market and industrial relations institutions, workplace relations, and expectations and behaviors of employers, managers and employees. Migrants whose values are congruent with labor market institutions, cultures and co-worker expectations are likely to behave in ways that are linked to labor market success.

Linguistic distance between the languages of origin and destination countries is often used as a proxy for proficiency in the native language of the host country (Adsera & Ferrer, 2021; Chiswick & Miller, 2002; Isphording & Otten, 2011). English language proficiency is a cognitive skill directly relevant for many jobs in Australia, especially those that require a university degree and involve complex communication and abstract language use. Because we also control directly for (self-reported) English language proficiency, linguistic and cultural distance enable us to assess the extent to which linguistic cultural correspondence or cultural "alignment" with the host culture influences migrant labor market outcomes, net of the effects of English proficiency. Cultural alignment occurs around attributes of language as an aspect of cultural identity. Among speakers of the same language, for instance, accent and dialect indicate social similarity and difference (Gelman & Roberts, 2017) and different varieties of language such American English, British English and African English contain different cultural understandings which can lead to intercultural miscommunication (Sharifian, 2017). Languages also express cultural differences, for example, in the importance they place on behaviors such as deference and politeness linked to social hierarchy, and in the cultural categories they make available to classify entities and experiences (Gelman & Roberts, 2017). These cultural differences are distinct from English language proficiency and can contribute to (mis)understandings and behaviors that reinforce or undermine labor market success.

The key mechanism in our argument is (cultural/linguistic) distance or proximity to the host country. Cultural and linguistic similarities between migrants and the host country are associated with aligned behaviors, understandings and expectations that are more conducive to labor market success than misaligned behaviors, understandings and expectations. In this way our work builds on prior studies of the impact of cultural source country characteristics on migrants' labor market outcomes (e.g., Antecol, 2001; Blau et al., 2011; Polavieja, 2015; Kanas & Müller, 2021) that have examined factors such as gender-

role attitudes and religiosity. Our analyses enable us to assess if cultural factors matter in the Australian graduate labor market, independently of individuals' language skills and educational attainment, contributing both to segmented assimilation theory, and research on the cultural embeddedness of the economy and economic behaviors.

Cultural and linguistic proximity to the host country are also objective precursors of social assimilation and sources of immigrant heterogeneity which precede migration and are often unmeasured in empirical research. Our analyses are confined to migrants who graduated from Australian universities, eliminating other sources of educational heterogeneity such as foreign educational credentials. Prior research, including the studies cited earlier, cannot disentangle issues of the transferability of foreign credentials from cultural factors in the source country. By focusing on foreign-born graduates of Australian universities, and controlling for English proficiency, we eliminate educational heterogeneity and language barriers, allowing any remaining variation in outcomes to be plausibly attributed to cultural and linguistic proximity or distance. Furthermore, we include age at migration – another key variable highlighted in the extant literature – as a moderating factor.

The paper proposes a novel question – to what extent is national or ethnic culture a stratifying principle of the Australian labor market? To answer this, the study utilizes rich, whole-of-population integrated administrative data. We focus on three key indicators of labor market success among university-educated migrants in Australia: employment, high-status occupation, and high income. Together, these outcomes capture distinct yet interrelated facets of labor market integration – employment reflects basic access to the labor market, high-status occupation indicates the quality or prestige of employment, and high income serves as a monetary measure of labor market reward.

Along with the United States, Australia is frequently described as a "nation of migrants" (National Archives of Australia, n.d.), and a multicultural "success story" (The McKell Institute, 2018), with migration shaping Australia's economic prosperity, cultural diversity and population growth. Our research adds to the academic body of knowledge about economic outcomes of migrants, contributes to social stratification and economic sociology, and offers insights for policy makers interested in improving migrants' labor market outcomes.

2 Literature Review

2.1 Migrant Labor Market Outcomes in Developed Countries

Labor market outcomes including employment, earnings, and occupational status are key "success" measures for individual migrants, migrant groups, and migration policy. For immigrants, migration to developed countries like Australia is frequently motivated by a desire to improve economic status (Castles et al., 2014) through opportunities for employment and earnings potential that are not available in the origin country. High-migration countries including Australia use migration to address labor demand that cannot be filled by native-born workers (Castles et al., 2014: 241-242) when labor markets are growing rapidly or specialist needs for skills and jobs exist (Castles et al., 2014: 260-261). Attaining labor outcomes that are equivalent or directly comparable to those of native workers indicates successful integration into the host society in classical (e.g. Alba & Nee, 2003; Gordon, 1964) and segmented assimilation (e.g. Portes & Zhou, 1993) theories.

Most studies of developed countries find overseas-born workers have poorer employment outcomes than their native-born peers (OECD, 2012). Migrants have lower labor market participation and employment rates than the native-born (Aeberhardt et al., 2017; Drinkwater, 2017; Dustmann & Fabbri, 2005; Dustmann & Frattini, 2011; Hansen, 2012; Husted, et al. 2001; Kahanec & Zaiceva, 2008; Vargas-Silva, 2016), and the employment rates of skilled immigrants lag behind equally qualified natives in the same field of study (ILO et al., 2015). The key correlate of the native-immigrant employment differential is the immigrant country of birth (Kerr & Kerr, 2011).

Migrant labor market outcomes in wealthy western countries–predominantly the US–have been studied for decades. Chiswick (1978) proposed the economic theory of assimilation that still guides much research. Chiswick found the earnings of foreign-born men were lower than the earnings of US-born men, with this gap varying by country of origin and years since arrival in the US. However foreign-born men experienced subsequent earnings growth, and the initial earnings gap reduced over time. Chiswick explained that as years since migration increased and foreign-born people acquired knowledge and skills relevant to the US, they experienced earnings growth and approached the earnings level of native-born men. This axiom of convergence in outcomes over time in the host country is central to the theory of economic assimilation that guides most of the literature on the wage gap, labor market participation and other labor market outcomes of migrants.

Borjas (1985, 1992, 1995, 2015) argued that cross-sectional analyses like Chiswick's overestimated the rate of wage growth of immigrants by neglecting changes over time in the composition of migrant populations and the associated unmeasured decline in the "quality" of migrants' human capital relevant to the US labor market. In Borjas's view, the decline in the quality of human capital was correlated with the change in the country-of-origin mix of immigrants in the US.

Research was further expanded by Portes and colleagues, including the theory of segmented assimilation developed in the 1990s (e.g. Portes & Zhou, 1993). The segmented assimilation hypothesis grew out of the diverse experiences of different subgroups of the foreign-born population. It contrasts with the straight-line assimilation hypothesis, that the labor market performance of overseas-born workers improves over time eventually catching up with the native population. Segmented assimilation theory recognizes that overseas-born workers from different countries face different barriers to economic participation and have different socioeconomic advantages and disadvantages, which straight-line assimilation models often ignore. These factors lead different immigrant groups to have different labor market profiles and trajectories to convergence with outcomes of the native-born population (Hirschman, 2016).

A growing literature also addresses the socioeconomic impact of immigrants' social identity (Algan et al., 2012; Carillo et al., 2023; Casey & Dustmann, 2010). Following from this work, cultural proximity also impacts labor market outcomes of immigrants through social identity processes. For example, immigrants may benefit from group membership, specifically in-group favoritism and positive network externalities that comes from group membership with native-born Australians (Carillo, Lombaro, & Venittelli, 2023). An associated impact could be that immigrants with established networks with native-born Australians may rely on those networks for securing employment. This could translate into higher earnings or more favorable labor market outcomes.

2.2 The Relevance of Cultural and Linguistic Proximity, and Age of Arrival in the Process of Labor Market Attainment

Drawing on economic sociology and socioeconomics, we posit cultural values as one potential source of cultural variability for immigrants' labor market outcomes. Culture includes language, norms, customs, moral beliefs and values, and promotes common understandings within a group of the world and individuals' relations to it (Austen, 2000).

Cultural values are preferences for normative or desired states associated with a cultural group. Cultural values can shape behaviors in the labor market by influencing evaluations of means and ends and perceptions of legitimate and feasible or illegitimate and infeasible actions (Austen, 2000). For example, cultural values can shape preferences for individual or collective approaches to securing wellbeing and define legitimate and illegitimate ways of acting to achieve economic ends (Austen, 2000, DiMaggio, 1994). In economic research cultural values have been associated with the economic productivity of workers, firms and nations, as well as individual behaviors. Cultural values potentially influence labor market outcomes by influencing the behavior and attitudes of employees, their managers and supervisors, and employers.

Cultural proximity in values refers to the proximity between the cultural values of the origin and destination countries. The closer two national cultures are, the smaller the differences in shared understandings of legitimate and illegitimate means, ends, and behaviors. Cultural proximity matters for employment outcomes because labor markets are culturally and institutionally "embedded", incorporating norms and values about legitimate and illegitimate behaviors, states and end-states in ways that link culturally sanctioned behaviors to employment, earnings and other outcomes. Cultural norms about the distribution of wealth and income, for instance shape understandings about legitimate reasons for differences in individual earnings, the degree of difference in earnings that is culturally acceptable, the extent to which the needs the lowest paid need to be addressed, and the extent to which individuals should aim to maintain their current positions or be mobile (Austen, 2000).

In cultures that value rewarding individual effort and contribution, labor markets may be structured to encourage and reward education, skills, training, effort, job complexity, individual discretion and responsibility, thereby defining culturally appropriate labor market behaviors. In cultures that value collective welfare, labor markets may be structured to limit variability in earnings associated with variations in education, skills, or experience, or to weaken the direct link between labor market participation and economic well-being. Our cultural distance approach allows us to examine the effect of cultural proximity without a priori assumptions about which specific dimension or values are most relevant in the Australian labor market. We simply need to note that closer cultural proximity between an immigrant's origin country and Australia implies a greater "cultural similarity" in relevant economic values and behaviors that is likely to be a source of employment advantage

compared to immigrants whose origin cultures are more distant. Together, our analyses of how linguistic and cultural proximity are related to labor market outcomes of immigrants who are homogeneous on Australian educational attainment allow us to document "cultural stratification" in the Australian graduate labor market.

To better capture cultural diversity of migrants, we also have a measure of linguistic proximity between English and the native language migrants spoke at home when they enrolled in university. Linguistic proximity between language in the country of origin and English captures English language proficiency alongside cultural, non-cognitive aspects of the home country language and culture. Previous studies (Adsera & Ferrer, 2021; Chiswick & Miller, 2002; Isphording & Otten, 2011) have used linguistic proximity to measure language proficiency in the host country when direct measures of language proficiency were unavailable.

Many international studies link fluency in the language of the destination country to labor market outcomes (Anderson, 2015; Chiswick, 1978; Chiswick et al., 1997; Dustmann, 1994; Massey & Akresh, 2006), with some (Chiswick & Miller, 1995, 2007) seeing it as an essential part of a foreign-born worker's destination-specific human capital. Empirical findings from other high-income countries, including UK (Dustmann & Fabbri, 2003), Denmark (Liebig, 2007), Sweden (Lemaître, 2007), and Australia (Guven & Islam, 2015) are consistent with this view. As our analysis focuses on cultural stratification, and not on cognitive skills, we control for a direct measure of self-reported English proficiency at an individual level, collected contemporaneously with our outcome information. This additional measure of cultural proximity allows us to capture the cultural diversity of migrant students coming from countries like Canada or South Africa, where culturally distinct communities speak different languages. We hypothesize that both cultural and linguistic proximity, indicating a greater "cultural similarity", are a source of employment advantage resulting in better labor market outcomes.

Previous research shows that age of arrival in the host country is also a pivotal factor linked with both cultural and economic assimilation (Bleakley & Chin, 2010; Friedberg, 1992; Hermansen, 2017). Bleakley and Chin (2004) were the first to employ information on immigrant age at arrival to construct an instrument variable for language skills of immigrants. For migrants of a given age, an earlier age of arrival implies longer exposure to the native environment, fostering heightened cultural assimilation and acquisition of destination-specific human capital (e.g. Chiswick, 1978; Friedberg, 2000). Arriving younger means more

time in the destination country to acquire destination-specific skills, experience and values, fewer pre-existing skills and values from the country of origin, and more time for origin-specific skills and values to decline. Those who arrived earlier may also benefit from better knowledge of labor market and social institutions and social services (Aoki & Santiago, 2018).

Age of arrival is also potentially linked to human development, including second language acquisition. The "critical period hypothesis" proposed by Lenneberg (1967) explains that there is an optimal window during childhood for language acquisition, beyond which achieving native-like proficiency becomes increasingly difficult. The hypothesis suggests that children are more sensitive to learning second languages than adults, partly because of the timing of brain development (Vanhove, 2013). Consequently, immigrants arriving as children should acquire stronger host-country language skills than those arriving in adulthood. This could translate into advantages in the labor market through improved English language fluency and reduced accent-based signals of outgroup status. In related work, Dollman et al. (2024) studied the impact of foreign accents in school-to-work transitions in Germany and found that a stronger foreign accent is associated with a higher likelihood of finding youth in occupations where language skills are less important.

Therefore, arriving younger could attenuate the size of associations between cultural factors and immigrant labor market outcomes because cultural and linguistic distance effects diminish, and children are more receptive than adults to acquiring destination-specific skills and values. Bacolod and Rangel (2017) similarly highlight the significance of the interaction of age of arrival and linguistic distance for studying the economic assimilation of childhood immigrants to the United States, while Isphording (2015) employs an interaction between age of arrival and linguistic distance to unravel the complexities of learning a new language among immigrant populations. Collectively, this literature underscores the need for a nuanced exploration of the age of arrival's role in shaping migrant labor market outcomes, bridging cultural and economic assimilation and allowing for life course and temporal effects on the influence of cultural factors from the country of origin. In this paper, we explore the moderating effects of age at arrival on the relationship between linguistic and cultural proximity on the migrants' labor market outcomes. We expect that the effects of cultural and linguistic proximity are less pronounced among those who arrived in Australia earlier in their lives and had more time to assimilate with the host society.

This study focuses on three interrelated indicators of labor market success among university-educated migrants in Australia: employment, high-status occupation, and high income. We examine multiple labor market outcomes as we expect cultural and linguistic proximity to operate differently across them, reflecting distinct underlying processes. For example, employment captures basic labor market access, where proximity may matter less due to broader demand for labor and lower barriers to entry. In contrast, high-status occupations and high income are more likely to be influenced by mechanisms of social closure, professional gatekeeping, and different valuation of culturally specific forms of capital. We therefore hypothesize that cultural and linguistic proximity will have stronger effects on occupational status and income, where employer preferences, communication skills, and cultural fit may play a more pronounced role.

2.3 Australian Context

The immigrant intake policy and along with it, the immigrant population in Australia has changed significantly over the last few decades. While the UK had earlier been the primary origin country of immigrants settled in Australia, in recent years, a larger number of immigrants arrived from China and India to settle in Australia (Phillips & Simon-Davies, 2017). That the vast majority of recent arrivals come from Asia is a significant change in the country-of-origin composition of first-generation immigrants[1]. This diversification of the immigrant population is largely a consequence of the dissolution of the 'White Australia' policy in the 1970s, the decline of family-based migration, and the subsequent shift towards skill-selective immigration policies (Cully, 2012).

Most Australian research has analyzed immigrant labor-market outcomes in terms of earnings, specifically the earnings gap between native-born Australians and immigrant groups (Cobb-Clark et al., 2012). Labor-market entry is also a key research focus (Antecol et al., 2006; Chiswick et al., 2008; Cobb-Clark et al., 2012), while earlier studies (Evans, 1984; Beggs & Chapman, 1990; Inglis & Stromback, 1986; Miller, 1986) examined employment and unemployment disparities by country of birth. Jones (1987) argued that non-English speaking background (NESB) groups (particularly immigrants from Southern Europe) faced greater difficulty in labor-market adjustment and employment due to lack of recognition of

[1] The top five countries of birth for overseas-born Australian residents in 2016 were the UK, New Zealand, China, India and the Philippines (Australian Bureau of Statistics, 2017).

foreign educational credentials in Australia, lack of skills transferability, institutional differences between home and host country, and labor-market discrimination.

Previous literature investigating labor market outcomes of foreign-born graduates focuses on people who came to Australia as international students and stayed after graduation. For example, Li and Miller (2013) and Hawthorne and To (2014) document poor labor market outcomes of international graduates and link them to being non-native English speakers. In turn, Tang et al. (2021) attributed the worse labor market outcomes of overseas graduates to a decreasing share of these graduates who are citizens or permanent residents of Australia. However, few studies focus specifically on foreign-born domestic students, i.e. migrants who had acquired a permanent residency or citizenship status before graduating from an Australian university. Hawthorne and To (2014) provide some evidence of the labor market disadvantage of domestic graduates whose main language is not English. However, they do not discuss the outcomes of domestic migrant graduates who are native English speakers, disaggregate the results by country, or discuss the role of cultural factors.

We thus aim to make several contributions with this paper. We introduce and examine the concept of cultural stratification, measured through linguistic and cultural distance, independently of English language proficiency. We allow the influence of cultural stratification on labor market outcomes to vary with age of arrival, and we condition on graduating from an Australian university to equivalize the "value" of immigrant education across countries of origin. Finally, we leverage whole-of-population data to document differences in labor market outcomes not only between regions of origin but also across individual countries. The next section presents the details of the data set and analytic methods employed in the paper.

3 Methodology

3.1 Data and Sample Selection

This paper utilizes Australia's Person Level Integrated Data Asset (PLIDA) comprising, among others, records of all domestic[2] undergraduate students who graduated from an Australian university between 2005 and 2015 extracted from the Higher Education

[2] The study focuses on domestic students, i.e. Australian and New Zealand citizens or permanent visa holders. International students are not included in the analysis.

Information Management System (HEIMS) linked to the 2016 Australian Census of Population and Housing (the Census). The Australian Bureau of Statistics (ABS) was responsible for linking the datasets and facilitated secure access to linked de-identified unit-level records. We dropped 1.6% of observations with missing data on the analytic variables. The final analytical dataset consists of 800,179 graduates, including 141,809 foreign-born individuals, who are both permanent migrants and graduates of Australian universities.

3.2 Measures

3.2.1 Labor Market Outcomes

This study focuses on three indicators of labor market success among foreign-born university graduates captured in the Australian Census: employment, high-status occupation, and high income. The first is a binary indicator capturing employment in the week preceding the Census. The second indicates holding a professional or managerial position in the week preceding the Census, which corresponds to top two Major Groups in the Australian and New Zealand Standard Classification of Occupations (ANZSCO)[3]. The last indicator is based on the Census measure of the total pre-tax income that a person usually receives, including wages and salaries, government payments, business, and other income. Instead of the exact amount, respondents indicate a band in which their income falls. Our *high-income* variable identifies graduates with personal weekly income exceeding A$1,750.[4] In our dataset, 89.7% of individuals are employed, 66.8% qualify as having a high-status occupation, and 18.8% belong to the high-income category.

We chose to dichotomize occupational status and income to align with common practices in the literature on higher education and labor market stratification, where outcomes are often presented consistently in terms of high-status or high-income attainment. This approach reflects the conceptual focus on vertical inequalities, where social closure mechanisms–such as employer discrimination, credential devaluation, and restricted access to elite networks–are especially pronounced at the top. As discussed in the previous section, prior research has shown that cultural and linguistic factors play a more significant role in access to prestigious occupations and higher earnings, making it analytically meaningful to

[3] https://www.abs.gov.au/ANZSCO

[4] The ABS uses income bands or intervals to collect and report income data rather than collecting a continuous measure of income. We selected a threshold that would allow us to identify around 20% of top earners in the graduate population.

focus on these upper-tier outcomes. This allows us to better capture stratification processes that are particularly relevant to the experience of highly educated migrants navigating competitive segments of the labor market.

3.2.2 Key Predictor and Moderating Variables

Our key predictors include the country and world region of birth. To increase the robustness of results, by-country analyses are based on a sample restricted to 114 countries for which at least 50 observations are available (the list of countries included in the analysis is available in Table A1 in Appendix). That resulted in the exclusion of just 1% of foreign-born graduates from the sample. We grouped countries into world regions using a modified version of the Standard Australian Classification of Countries (SACC)[5]. Depending on the number of observations, we use ABS's major groups of countries (e.g. North Africa and the Middle East), minor groups of countries (e.g Eastern Europe), or combined minor groups of countries (e.g. Southern Europe and Southeastern Europe). We treat New Zealand and South Africa as separate regions. These countries are important sources of migration to Australia. Individuals born in New Zealand and South Africa make up 6.4% and 5.4% of foreign-born graduates, respectively. Moreover, these countries stand out in economic terms from their respective regions of Oceania and Sub-Saharan Africa.

We measure cultural proximity to Australia using a cultural proximity index based on the six dimensions of culture identified by Geert Hofstede and his co-authors (Hofstede, 2001; Hofstede, Hofstede & Minkov, 2010): power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence. These six dimensions provide a framework for comparative cross-cultural study to understand how a society's culture relate to human social behavior. Importantly, Hofstede's cultural dimensions are available for a large number of countries and reflect the diversity of the immigrant population in Australia. Moreover, recent research shows that these measures are temporally stable and persistent (Beugelsdijk et al., 2015; Hofstede, 2001). We first calculated the Euclidean distance from Australia for each country in Hofstede's study. We do not apply weights to the dimensions assuming that all dimensions are equally relevant. The measure is intended to capture social separation by measuring how close proximate individuals are from the mainstream norms of the host society. For migrants from countries missing from Hofstede's study (8.7% of

[5] https://www.abs.gov.au/statistics/classifications/standard-australian-classification-countries-sacc/latest-release

foreign-born graduates), we used regional averages. The measure was then standardized and multiplied by minus one so that higher values represent closer cultural proximity to Australia.

The linguistic proximity indicator is derived from the normalized and divided Levenshtein Distance (LDND) proposed by the German Max Planck Institute for Evolutionary Anthropology's Automated Similarity Judgement Program (ASJP). Levenshtein Distance (LD) is a metric that measures the distance between languages in terms of the phonetic similarity between words with similar meaning in different languages. LDN is normalized LD which we get by dividing LD by the length of the longer of the two words compared and LDND is normalized LDN. This measure offers a number of advantages such as its purely descriptive nature, ease of computation, high variation compared to other measures of linguistic distance, and comprehensiveness when it comes to the coverage of different languages (Isphording & Otten, 2014). LDND has been employed in a number of studies on immigrant integration (Isphording & Otten, 2014; Jain, 2017; Schepens, 2015). In this study, we measured the distance between English and the languages spoken at graduates' homes when they enrolled in university.

Despite the impressive coverage of the ASJP database, 9.2% of migrant graduates had missing values, mostly because their language was not recorded as accurately as in the ASJP database dictionary. For example, a graduate using Mandarin or Cantonese at home could be recorded as a Chinese speaker. In such cases, we used average distances calculated for the Australian Standard Classification of Languages (ASCL)[6] language groups. Again, in the final step, the measure was standardized, and the direction was reversed though multiplying by minus one to ensure that higher values represent greater proximity to English.

The final explanatory variable is the age at which migrants arrived in Australia.[7] The variable has five categories corresponding to stages of a typical educational trajectory of an Australian graduate: early learning – 0 to 5 years, primary school - 6 to 12 years, secondary school – 12 to 18 years, university – 19 to 23 years, and after university – 24 years or more.

[6] https://www.abs.gov.au/statistics/classifications/australian-standard-classification-languages-ascl/latest-release

[7] Our models do not control directly for the arrival cohort, which might seem like a serious omission given the changes in Australian migration policy over time. However, the models do so indirectly by including age and age at arrival. As age at arrival is calculated using year of birth and year of arrival, we cannot include all three variables in the models.

3.2.3 Control Variables

In all our models, we control for several sets of potential confounders. First, these include demographic information such as gender (female vs male), age in 2016 (seven age brackets) and disability (self-reported and recoded in higher education records). Second, we used location data[8] to derive variables capturing coming from a disadvantaged backgrounds, including coming from a low socio-economic status area (defined as living before commencing university in the 20% of areas with the lowest values in the Socio-Economic Index for Areas (SEIFA) Index of Education and Occupation) and coming from rural or remote Australia (classified using ABS's Remoteness Areas). Third, we included characteristics of completed education, including field of study (26 categories), completion of multiple degrees (single vs multiple), time since graduation (one to eleven years). We control for higher education institution fixed-effects (the results for individual institutions are not presented due to confidentiality restrictions). Fourth, we control for state of residence in 2016 and enrolment in further higher education in 2016 to account for factors that might impact labor market activity. Finally, models including linguistic proximity control also for English language proficiency self-reported in the 2016 Census (Speaks English only, speaks English very well, and other categories collapsed into speaks English worse than very well) to account for direct effects of language skills. Table 1 presents descriptive statistics for all analytic variables, and Figure 1 presents the values of cultural proximity and averages of linguistic proximity calculated for countries using the migrant student sample.

[8] Location data in PLIDA are compiled using addresses reported during interactions with the health, welfare, and tax systems.

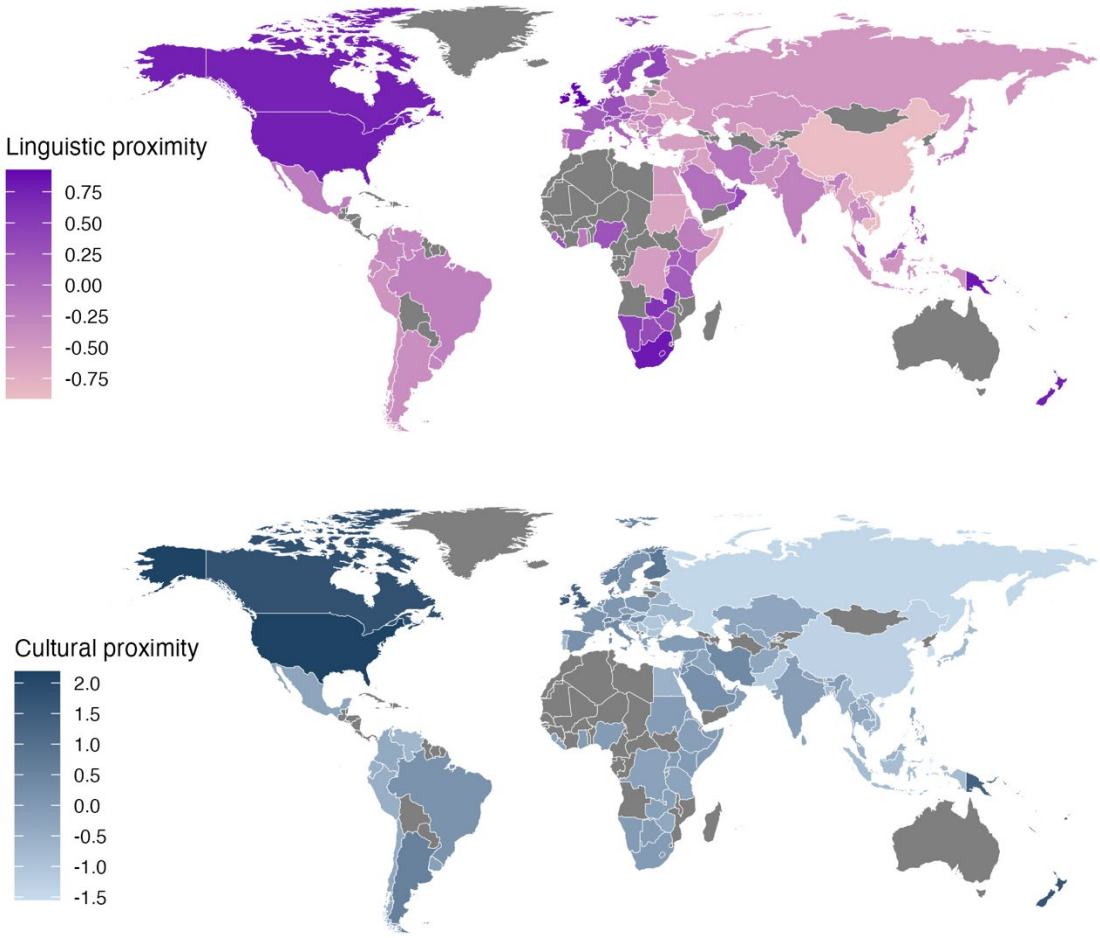
Table 1. Descriptive statistics for the entire sample and migrant subsample

	All graduates	Migrant graduates
Labor market outcomes		
Employed	89.7	86.3
High-status occupation	66.8	62.6
High income	18.8	19.1
Region of birth		
Australia	82.3	
New Zealand	1.1	6.4
Oceania & Antarctica	0.5	2.7
UK & Ireland	2.4	13.3
Western & Northern Europe	0.5	3.0
Southern & Southeastern Europe	0.8	4.4
Eastern Europe	0.5	2.6
North Africa & the Middle East	1.3	7.2
South-East Asia	3.0	16.8
North-East Asia	3.0	17.1
Southern & Central Asia	2.0	11.3
South and Central America	0.4	2.3
Northern America	0.6	3.2
Sub-Saharan Africa	0.8	4.3
South Africa	1.0	5.4
Female	62.2	59.3
Age in 2016		
25 or less	21.7	18.3
26-30	37.3	33.6
31-35	24.2	24.2
36-40	6.1	7.6
41-45	3.9	5.1
46-50	2.8	4.3
51 or more	4.1	6.9
Field of study		
Natural/Physical sciences	8.5	9.9
IT	2.9	4.0
Engineering	5.7	7.8
Architecture	1.7	1.5
Agriculture	1.6	0.9
Health	20.2	22.1
Education	12.2	6.3
Management & Commerce	17.9	22.8
Society & culture	20.9	18.9
Creative arts	8.3	5.8
Multiple degrees	9.8	9.4
Years since graduation		
1	11.9	12.3
2	11.2	11.4
3	10.6	10.6
4	9.8	9.8
5	9.6	9.6
6	9.0	9.1

7	8.5	8.5
8	8.1	8.2
9	8.1	8.0
10	6.9	6.5
11	6.3	6.0
State of residence		
NSW	31.7	36.0
VIC	27.5	25.9
QLD	18.3	15.4
SA	6.9	5.3
WA	10.1	13.1
TAS	1.7	0.8
NT	0.8	0.6
ACT	3.0	2.8
Enrolment in HE in 2016	21.1	21.3
Low SES (20%)	12.5	12.9
Disability	5.1	4.2
Regional, rural & remote	22.6	8.8
English proficiency		
Speaks English only		45.1
Speaks English very well		47.8
Speaks English worse than very well		7.1
Age at arrival		
Early learning (0-5 yrs)		29.9
Primary school (6-12 yrs)		28.3
Secondary school (13-18 yrs)		18.6
University (19-23 yrs)		8.2
After university (24+ yrs)		11.8
Missing		3.2
Number of observations	800,179	141,809

Notes: Data from customized PLIDA dataset (2011-2016).

Figure 1. Migrant graduates' cultural proximity and average linguistic proximity to Australia by country of origin



Notes: Data from customized PLIDA dataset (2011-2016). Cultural proximity based on six dimensions of culture: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence (Hofstede, 2001; Hoefstede, Hofstede & Minkov, 2010). Linguistic proximity is derived from the normalized and divided Levenshtein Distance (LDND), presented values are averages for each country observed in the sample. Countries and territories excluded from the analysis (with fewer than 50 observations) are colored gray.

3.3 Analytic Approach

First, we investigate the role of the country and region of birth. We do so by fitting a series of logistic regression models of the following form:

$$\ln\left(\frac{P(O_i = 1)}{1 - P(O_i = 1)}\right) = \alpha + \beta_1 CoB_i + \beta_2 C_i$$

Where O_i is one of the three binary variables capturing postgraduation outcomes of i-th graduate; CoB_i is a categorical variable representing, depending on the model, either i-th graduate's region of birth or their country of birth; C_i is a set of control variables, as

described before; α is the model's intercept; and β_1 and β_2 are vectors of coefficients to be estimated.

In the next step, we study the role of cultural and linguistic proximity as well as the age at arrival. As we mentioned before, Australian-born graduates are excluded from this analysis. The baseline models are of the following form:

$$\ln\left(\frac{P(O_i = 1)}{1 - P(O_i = 1)}\right) = \alpha + \beta_1 Prox_i + \beta_2 AaA_i + \beta_3 C_i$$

Where O_i is one of the dichotomous outcome variables; $Prox_i$ is a vector of two continuous variables capturing cultural and linguistic proximity to Australia,; *AaA* is a categorical variable capturing the age at arrival in Australia; *C is* a set of control variables (same as before); α is the model's intercept; and β_1 *to* β_3 are vectors of coefficients to be estimated.

In the final step we investigate the moderating effect of the age at arrival by including in the models *Prox*×*AaA* term representing interactions between cultural proximity and age at arrival and between linguistic proximity and age at arrival. The extended models with interactions have the following form:

$$\ln\left(\frac{P(O_i = 1)}{1 - P(O_i = 1)}\right) = \alpha + \beta_1 Prox_i + \beta_2 AaA_i + \beta_3 (Prox_i \times AaA_i) + \beta_4 C_i$$

To ease the interpretation of the models, we present and discuss their results as odds-ratios (OR) and adjusted proportions (average predicted probabilities) of graduates achieving given outcome. We estimate them for each region, country, and various combinations of variables characterizing migrants' background and age at arrival. To assess the significance of differences in the effect of cultural and linguistic proximity by age at arrival in a way that is appropriate for logistic regression, we use the techniques described by Mize (2019). Specifically, we evaluate the interaction effects in the predicted probability metric by using a Wald test to determine whether average marginal effects (AME) for cultural and linguistic proximity vary depending on the age at arrival.

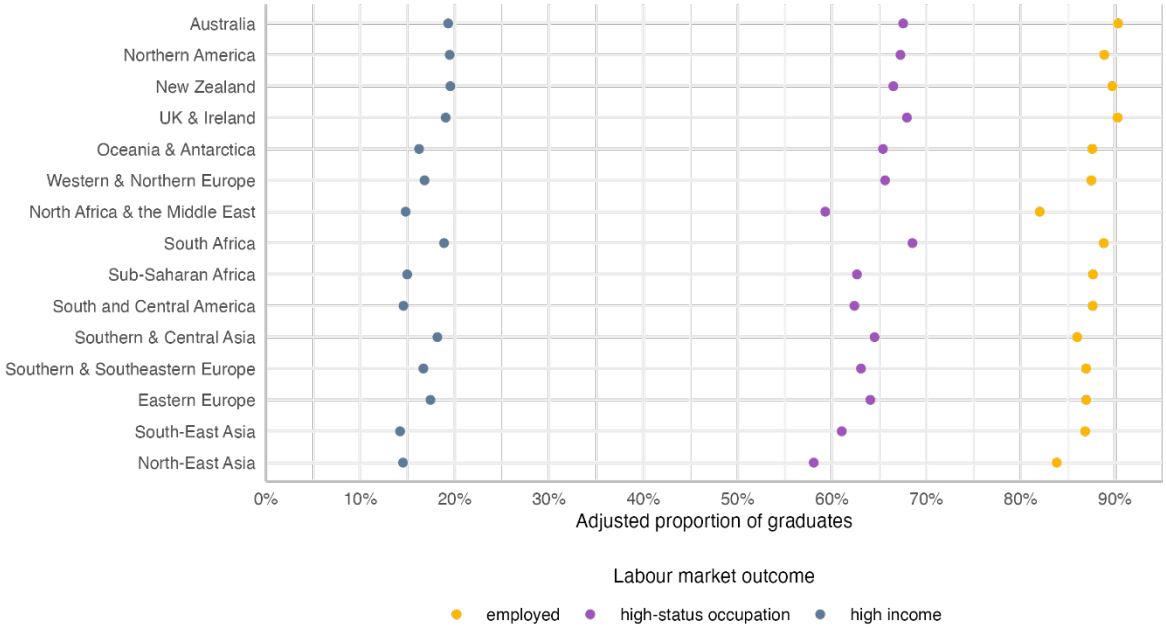
4 Results

4.1 Country and Region

Figures 2 and 3 present the results from the first two sets of models and compare the outcomes of graduates coming from different regions and countries, via-a-vis Australian-born graduates (full sets of model results are available in Tables A2 and A3 in Online Appendix). While Australian-born graduates do not always come at the top, they are always among the most advantaged in terms of labor market outcomes. Together with graduates from New Zealand, Northern America, South Africa, United Kingdom (UK) and Ireland, and Western and Northern Europe, i.e. regions that are linguistically and culturally close, they tend to exhibit higher probabilities of positive outcomes than those from other regions. Graduates from North Africa and the Middle East appear to be especially disadvantaged.

For example, the adjusted probability of being employed at 90.3% among graduates from Australia is 8.4 percentage points (pp) higher than among graduates coming from North Africa and the Middle East, who are least likely to be employed. The difference is even greater in the case of having a high-status occupation. The adjusted proportion of 58.9% for graduates from North Africa and the Middle East, who are again at the bottom of the ranking, is 8.7 pp lower than among Australian born graduates. Finally, the proportion of graduates from North Africa and the Middle East who receive high income is 13.5% which is 5.9 pp, or more than a quarter, lower than among Australian-born graduates.

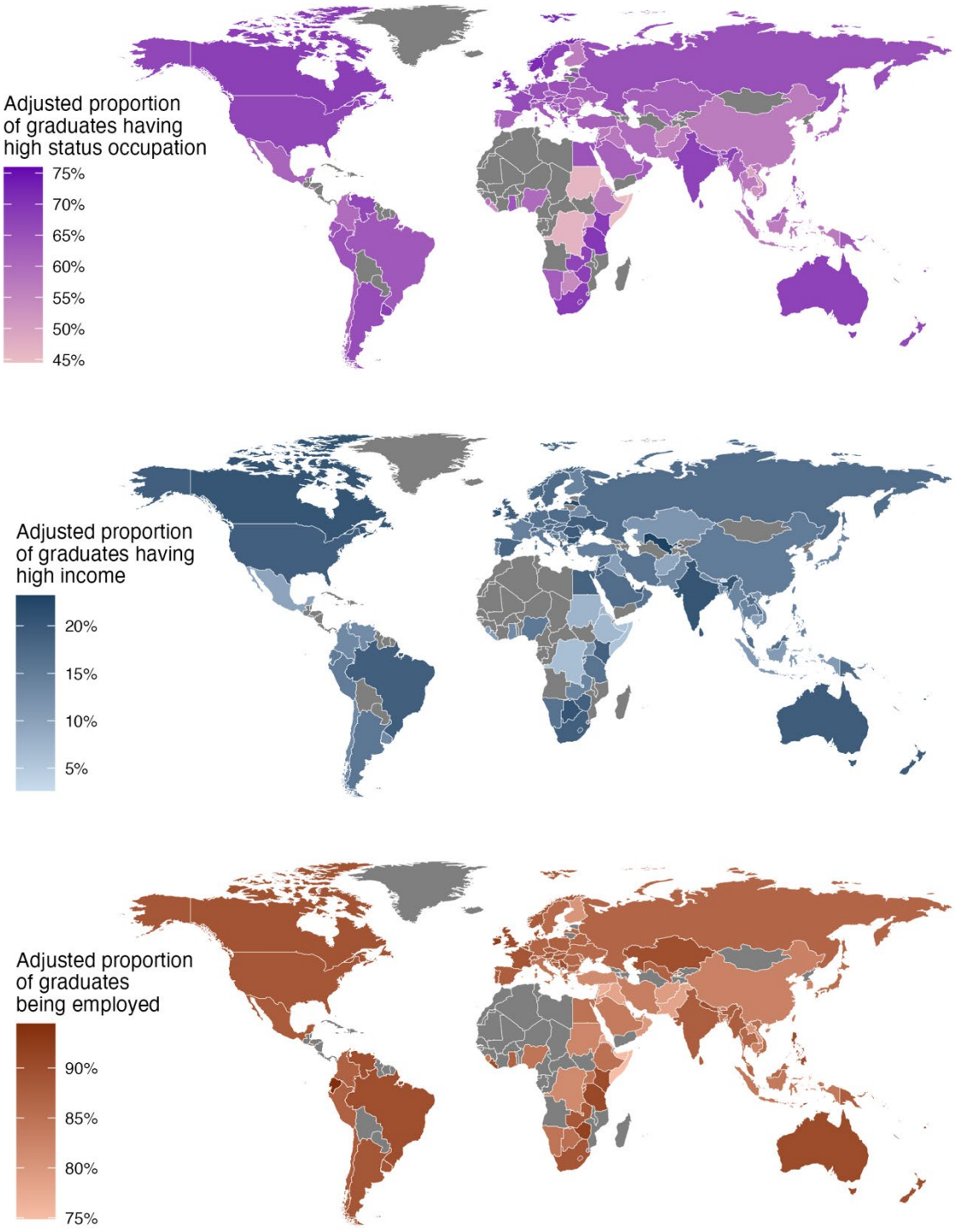
Figure 2. Labor market outcomes (adjusted proportions of graduates who are employed, have a high-status occupation, and have high income) by region of origin.



Notes: Data from customized PLIDA dataset (2011-2016). Domestic graduates living in Australia during the 2016 Census. Based on the model results presented in Appendix Table A2. Regions ordered by cultural proximity to Australia. A version of the figure with countries ordered by linguistic proximity is available in Appendix (Figure A1).

However, as Figure 2 demonstrates, regions are internally diverse. Sub-Saharan Africa is the most diverse region. While graduates born in Zimbabwe, Tanzania, and Kenya fare relatively well – and in some respects even better than those born in Australia – those from countries like Somalia, Eritrea, the Democratic Republic of the Congo, or Sudan achieve some of the worst outcomes. Among the graduates of Somali background, the adjusted probability of being employed, having a high-status occupation, and having high income are 74.9%, 44.5%, and 5.1%, respectively. The respective figures for the other countries are somewhat better, but still comparatively low. For example, 74.3% of those born in Eritrea are employed, 47.8% have a high-status occupation, and 7.8% receive high income.

Figure 3 Labor market outcomes (adjusted proportions of graduates who are employed, have a high-status occupation, and have high income) of graduates from Australian universities by country of origin



Notes: Data from customized PLIDA dataset (2011-2016). Domestic graduates living in Australia during the 2016 Census. Based on the model results presented in Appendix Table A3. Only countries for which there are at least 50 observations in the data. Countries and territories excluded from the analysis (with fewer than 50 observations) are colored gray.

Among those from North Africa and the Middle East, which is the most disadvantaged region, graduates born in Iraq and Syria stand out. Their outcomes are better than that of graduates coming from some countries in Sub-Saharan Africa, though. The adjusted proportion of employed among graduates born in Iraq and Syria is 78.1% and 76.7%, respectively; the proportion of those with a high-status occupation is 57.5% and 57.0%, and the proportion of those with high income is 10.2% and 16.7%.

The list of countries with relatively poor results that stand out from their regions includes Afghanistan and Pakistan in South and Central Asia. The adjusted proportions of employed, having a high-status occupation, and having high income are 79.3%, 53.9%, and 9.4% for the former and 78.2%, 57.7%, and 13.4% for the latter. Among South-East Asians, Laos and Cambodia-born graduates seem particularly disadvantaged, with the proportions at 82.4%, 52.2% and 16.8%, and 82.4%, 52.2%, and 10.3%. Individuals from Tonga (respective proportions at 82.5%, 55.1%, 16.3%) and Samoa (respective proportions at 82.7%, 60.4%, 10.9%) fare worse than others from Oceania, and Finland (respective proportions at 80.1%, 56.6%, 14.0%) stands out from Western and Northern Europe.

4.2 Cultural and Linguistic Proximity and the Age at Arrival in Australia

To investigate the relevance of graduates' background characteristics, we turn to models regressing labor market outcomes on measures of cultural and linguistic proximity to Australia. Table 2 presents results from baseline models, which include both proximity measures and the age of arrival but not the interaction term. The results suggest that cultural proximity is associated positively with all labor market outcomes, with OR=1.06 ($p<0.001$) for being employed and having a high-status occupation and OR=1.04 ($p<0.001$) for high income.

To better illustrate the magnitude of the effects we calculate predicted probabilities of the outcomes for graduates from the culturally closest and most distant countries. In all cases, the predicted probabilities are higher for graduates from culturally proximate countries. The differences between predictions for being employed, having a high-status occupation, and high income are 2.2 pp, 4.3 pp, and 1.9 pp, respectively. Since high income is much less common than employment or high-status occupations, it is useful to interpret these differences in relative terms. They represent approximately 2.5%, 6.7%, and 9.5%, respectively, of the estimated probability of the outcome among graduates from the most culturally proximate countries. This means that the seemingly small absolute difference of 1.9

pp in the case of income actually represents the largest relative change in the probability of achieving that outcome.

In contrast, we do not observe such a clear pattern for linguistic proximity, which is significantly associated only with having a high-status occupation (OR=1.02, p<0.01), for which the difference in predicted probabilities between graduates from culturally closest and most distant countries is 1.1 pp. The results also suggest that people arriving early in their lives, i.e. before turning 13, have better labor market outcomes than those coming at the ages between 13 and 23. Interestingly, those arriving after turning 24 perform quite well compared to other groups in terms of the share of employed and having high-status occupations, but do not achieve high-income as often as those arriving early in their lives.

Table 2. Abridged results from baseline logistic regression models of postgraduation labor market outcomes by cultural and linguistic proximity

	Employed	Manager/ professional occupation	High Income
Linguistic proximity	1.02	1.02**	1.02
Cultural proximity	1.06***	1.06***	1.04***
Age at arrival (ref. early learning 0-5 yrs)			
Primary school (6-12 yrs)	0.96	0.94***	0.99
Secondary school (13-18 yrs)	0.88***	0.87***	0.80***
University (19-23 yrs)	0.91**	0.90***	0.76***
After university (24+ yrs)	1.15***	1.09**	0.86***
Control variables	Yes	Yes	Yes
HE Institution fixed effects	Yes	Yes	Yes
Observations	141809	141809	141809
Pseudo R^2	0.082	0.105	0.186

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: ** p<0.01, *** p<0.001. Full sets of model results are presented in Appendix Table A4.

Our last set of models allows us to investigate the moderating role of age at arrival. Due to the complexity of these models, their results are easiest to grasp when presented graphically. Figure 4 illustrates the relationship between the key explanatory variables and the adjusted proportions of employed graduates, those in high-status occupations, and those with high incomes. Full sets of model parameters are presented in Tables A5 in the Online Appendix.

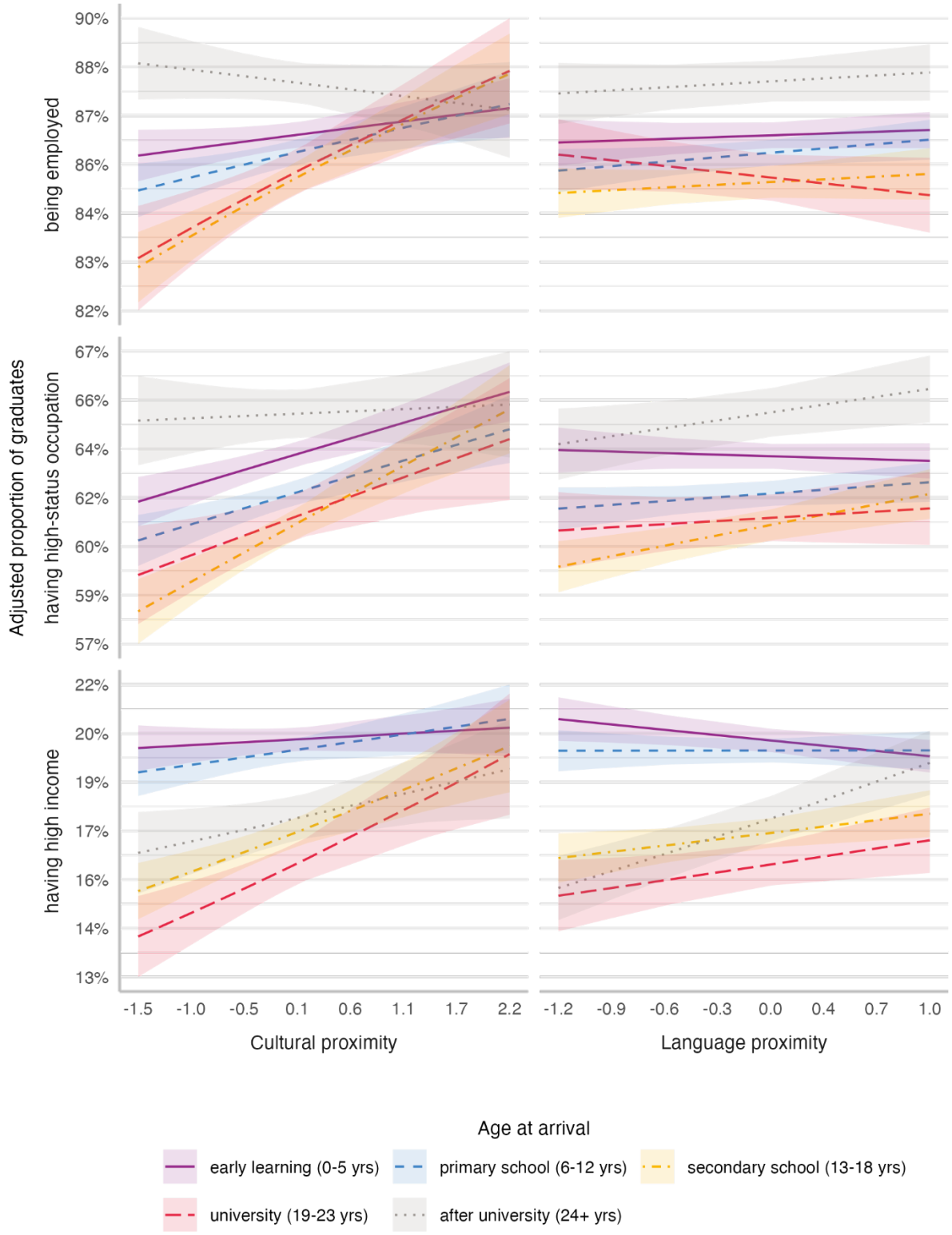
Besides the association between labor market outcomes, cultural and linguistic proximity, and the age arrival, Figure 4 shows how the effects of cultural and linguistic proximity vary across age-at-arrival groups. For example, while employment is not strongly linked to language proximity for most age-at-arrival groups (top right panel), the relationship with cultural proximity is moderated by age at arrival (top left panel). The difference in

predicted probabilities of employment between the migrants from the most culturally distant and close countries is 1.3 pp among those who arrived before turning six and 5.3 and 5.1 pp among those who came while being 13 to 18 or 19 to 23 years old, respectively.

Figure 4's middle panels show limited moderating effect of age at arrival in models predicting having a high-status occupation. The relationship between having a high-status occupation and cultural and linguistic proximity differs from the overall pattern only for those who arrived at the secondary school age, and, in the case of linguistic proximity, also those who arrived at the age of 24 or more.

The bottom panels of Figure 4 show the adjusted proportions of graduates earning high income. The moderating effect of age at arrival are visible on both panels, albeit they are less pronounced for language proximity. For example, while the difference in prediction between those from countries most and least culturally distant from Australia is only 0.6 pp among those who came to Australia before going to school, it stands at 4.5, 5.6, and 2.6 pp among those who arrived aged 13 to 18, 19 to 23, and 24 or more, respectively.

Figure 4 Adjusted proportions of graduates who are employed, have a high-status occupation, and have high income by cultural proximity, language proximity, and age at arrival



Notes: Data from customized PLIDA dataset (2011-2016). Domestic graduates living in Australia during the 2016 Census. Based on the model results presented in Appendix Table A5.

4.3 Robustness checks

To ensure the reliability of our main findings, we conduct a series of robustness checks. First, we fit the models using unimputed data only to test whether the imputation of proximity measures might have affected the results. The results (available in Appendix Table A6) are similar to those from the main analysis.

Second, we restrict the sample to those who are employed. We do so, because our outcome measures were designed as progressively more selective and they lump together people without employment with those who are employed but do not achieve other outcomes, e.g. do not work in a high-status occupation. Again, the results do not differ significantly from the main analysis (see Appendix Table A7).

Third, as cultural and linguistic proximity are correlated (r=0.5), we fit models with only one of them at a time (see Table A8 in Appendix). The coefficients for cultural proximity in models without interaction with age at arrival are largely unchanged. In turn, the effects for cultural proximity in models with interactions and linguistic proximity in general have become a bit more pronounced, but without affecting the overall patterns.

Finally, we fit models that do not include English proficiency among control variables. Consistent with arguments presented in Section 2.2, not controlling for English proficiency results in larger estimated effects of linguistic and cultural proximity (see Table A9 in Appendix). These results validate our analytic approach.

5 Discussion

This study expands the existing research on migrants' integration by drawing on unique, large-scale, integrated government data (N=800,179) to examine cultural stratification in the labor market outcomes among foreign-born university graduates in Australia. In doing so, it addresses some of the methodological shortcomings of previous studies and makes important contributions to the literature. Many studies attempt to explain variations in outcomes with highly heterogeneous migrant populations: lumping together migrants from many countries, arriving at different ages and life course stages, under different circumstances, and for different purposes. Often this heterogeneity is unobserved, potentially biasing findings. This study is one of the first to use a whole-of-population data on permanent migrants from multiple countries that have obtained a university degree in their destination country – Australia. This ensured analytic sample's homogeneity with respect to educational attainment, eliminating a key source of variability in immigrant human capital,

which allows us to better assess associations with origin-related factors. Furthermore, the rich and large-scale PLIDA data enabled us to differentiate outcomes for migrants from a large number of individual countries, rather than a handful of broad regions, and incorporate precise measures of origin characteristics.

The main analysis helps establish the importance of non-cognitive and non-economic factors in socioeconomic outcomes by investigating the relevance for labor market outcomes of cultural and linguistic proximity–two factors that have not been prominently considered in previous research. Finally, whole-of-population data also allows a very strong test of the moderating impact of age at arrival on the associations between cultural and linguistic proximity and labor market outcomes, contributing to previous research on the effects of age at arrival. Collectively, our analyses unravel the multifaceted nature of assimilation processes, emphasizing the need for a nuanced examination of cultural stratification for understanding labor market dynamics among migrant populations.

The findings from regression modelling show that Australian-born graduates tend to have some of the best labor market outcomes. Only graduates from regions that are culturally or linguistically closest to Australia (chiefly, from North America, New Zealand or the UK and Ireland) fare equally well, or sometimes even better than Australian-born graduates. By contrast, the graduates from North Africa and the Middle East, tend to be at the bottom of the ranking in terms of post-graduate outcomes (being employed, having a high-status occupation, or earning a high income). However, thanks to the unprecedented scale of the data our analysis revealed heterogeneity within the broad geographical regions, with large differences across countries within regions.

Our analyses show that cultural proximity to the destination country (Australia) emerges as a factor that can help to explain these cross-country differences among permanent migrants who graduated from Australian universities. It was associated with better labor market outcomes in the regression models. The differences in predicted probabilities of being employed, having a high-status occupation, and high income between graduates from the culturally closest and most distant countries were 2.2 pp, 4.3 pp, and 1.9 pp, respectively. This means that, consistent with previous literature, cultural proximity to the host country are objective precursors to social and cultural assimilation, which can improve labor market outcomes of migrants. Furthermore, representing these differences in relative terms, i.e. comparing to the probability of the outcome among graduates from culturally closest countries, suggest that the effects are most pronounced in the case of high income, and least

pronounced in the case of employment, which is consistent with our predictions. As such ,our findings build on and extend the recent focus on social assimilation, which addresses the role of cultural and subjective factors in immigrant attainment (Piracha et al., 2022).

The results for linguistic proximity are more nuanced, with positive associations only for selected outcomes and age-at-arrival groups. However, these results are not evidence of insignificance of the language. Our models included a direct measure of language proficiency, which is positively associated with labor market outcomes. Furthermore, results from additional models that did not control for English proficiency suggested possible more pronounced effects of linguistic proximity.

Furthermore, our findings demonstrate that age at arrival moderates the relationship between cultural and linguistic proximity and the labor market outcomes of permanent migrants who graduated from Australian universities. Specifically, the estimated effects of linguistic and cultural proximity are weaker for individuals who arrive early in their lives. Furthermore, arriving early in their lives improves graduates' chances of positive labor market outcomes. Combined, these findings corroborate previous research on age at arrival (e.g. Bleakley & Chin, 2010; Hermansen, 2017) and are consistent with the hypothesis of economic assimilation (Chiswick, 1978), which posits that migrants' outcomes improve with the length of time in the destination country.

Our results for cultural stratification in the Australian labor market are consistent with theories of taste-based, statistical, and implicit structural and organizational discrimination. Taste-based and statistical discrimination arise when employers and managers who are uncertain about culturally unfamiliar workers, or preferences among employers or customers/co-workers for culturally similar employees, opt for culturally similar workers (Guryan & Charles, 2013; Baraku & Busetta, 2024). Taste-based discrimination is a negative or aversive emotional reaction based on personal preference, such as prejudice, that may or may not be related to labor market performance (Guryan & Charles, 2013; Baraku & Busetta, 2024). Statistical discrimination arises when complete information about the determinants of an individual's labor-market performance is not available, and employers, managers and other decision-makers rely on (accurate and inaccurate) information about group characteristics.

Taste-based and statistical discrimination are intentional and operate at the level of interpersonal relations and intrapsychic factors, such as tastes and preferences. However,

unequal labor market outcomes associated with cultural and linguistic distance can also arise unintentionally from structural and organizational features of workplaces and societies (Pager & Shepherd, 2008). Linking career advancement to informal participation in social networks, such as socializing out-of-hours with co-workers, for example, can conflict with cultural norms and practices. Cultural and ethnic residential segregation can limit access to employment opportunities.

Identifying the causes of migrants' unequal labor market outcomes is necessary to develop effective policy responses. Responses to taste-based, statistical, structural and organizational discrimination vary (Baraku & Busetta, 2024; Pager & Shepherd, 2008) with solutions to the former addressing the intentional nature of discrimination, and solutions to organizational and structural discrimination addressing underlying organizational relations and opportunity structures. More research is needed to unpack the causes of cultural stratification identified here.

Despite its novel approach and contributions, our study is not without limitations. One limitation is the way that cultural distance has been captured in the study. Despite drawing on previously validated approach (Hofstede, 2001; Hofstede, Hofstede & Minkov, 2010), we have used aggregated measure of cultural distance at a country level. Individuals within the same countries can differ from the mean. In particular, national averages are problematic for countries with distinct subpopulations, e.g. Canada or Belgium. It is also possible that the values depend on other factors, such as social class, at an individual level. Moreover, such factors at an individual level might be correlated with the probability of moving to Australia, as the country has a selective migration system. However, capturing the values of the family and social environment in which migrants grew up at an individual level is hard.

Moreover, in contrast to studies from some other countries, this study could not explore the role of race. In Australia, information on race is not collected administratively to deliver services or policies and is not included in the 5-yearly Population Census. As a result, we could not determine whether race affects the relationship between cultural distance and labor market outcomes, which would be particularly important in the case of immigrants from racially diverse countries like South Africa.

Another limitation of the study is that, while capturing multiple countries of origin, we are only working with a single destination country–Australia. This means that we are calculating cultural and linguistic proximity to Australia and English as the language

commonly used in the country. As such, we are unable to distinguish between the interpretation that supports cultural/linguistic proximity to Australia/English as the primary explanation for better graduate outcomes of foreign-born university graduates versus one that supports an explanation in terms of geo-political dominance of English language and Anglo-Saxon work cultures for labor market outcomes. To specifically probe this further, a research design with multiple destination countries (including non-English speaking destination countries) would have to be constructed, which was beyond the scope of the current study.

Finally, while focusing on the graduates is one of the strengths of this study, we do not observe the full extent of the effects of linguistic and cultural proximity. Furthermore, we are not able to account for several potential sources of selection bias, such as varying levels of participation in higher education depending on the age at arrival or potential links between cultural and linguistic proximity and motivation to invest in education in Australia.

These limitations of the present study could be addressed in future research, which might attempt to construct more granular measures of cultural and linguistic proximity (e.g. at an individual level), and to employ a research design with multiple destination countries (in addition to multiple countries of origin). Such research, including mixed-method studies, could shed further light on the mechanisms and dimensions in which cultures differ that result in migrants' better or worse labor market outcomes. Further research could investigate the relative importance cultural dimensions instead of using a single indicator such as used here and how it changes across different ages at arrival. Future studies could also extend the observation window and look at the changes in migrant outcomes over time.

In conclusion, this study based on robust administrative data has produced novel findings, despite the limitations outlined above. These findings contribute to the body of substantive knowledge, and also demonstrate the value of using detailed large-scale administrative data in social science research. In this case, such data allowed us to reveal intraregional diversity within the migrant population that is not visible when broad regions and cruder data are used for analysis. From a policy perspective, the findings call for a need for investment in solutions that eliminate migrants' disadvantage in that labor market, which could be targeted at migrants from specific regions. Since these outcomes are a product of complex factors, that span multiple sectors and institutions, implementing these solutions might require a comprehensive approach and collaboration between the university sector, and multiple government agencies, including those responsible for higher education and

employment. Further research should guide the implementation of any interventions aimed at improving labor market outcomes of different groups of migrants.

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7 Appendix

Table A1. List of countries included in the analysis by region (with at least 50 observations)

Eastern Europe	**South Africa**	Malta
Belarus	South Africa	Moldova
Czech Republic	**South and Central America**	Portugal
Hungary	Argentina	Romania
Latvia	Brazil	Serbia
Poland	Chile	Slovenia
Russian Federation	Colombia	Spain
Slovakia	Ecuador	The Former Yugoslav Republic of Macedonia
Ukraine	El Salvador	**Sub-Saharan Africa**
New Zealand	Mexico	Botswana
New Zealand	Peru	Burundi
North Africa & the Middle East	Uruguay	Democratic Republic of Congo
Bahrain	Venezuela	Eritrea
Egypt	**South-East Asia**	Ethiopia
Iran	Brunei Darussalam	Ghana
Iraq	Cambodia	Kenya
Israel	Indonesia	Liberia
Jordan	Laos	Mauritius
Kuwait	Malaysia	Namibia
Lebanon	Myanmar	Nigeria
Oman	Philippines	Rwanda
Qatar	Singapore	Seychelles
Saudi Arabia	Thailand	Sierra Leone
Sudan	Timor-Leste	Somalia
Syria	Vietnam	Tanzania
Turkey	**Southern & Central Asia**	Uganda
United Arab Emirates	Afghanistan	Zambia
North-East Asia	Bangladesh	Zimbabwe
China (excludes SARs and Taiwan)	Bhutan	**UK & Ireland**
Hong Kong (SAR of China)	India	Ireland
Japan	Kazakhstan	United Kingdom
Macau (SAR of China)	Nepal	**Western & Northern Europe**
South Korea	Pakistan	Austria
Taiwan	Sri Lanka	Belgium
Northern America	Uzbekistan	Denmark
Canada	**Southern & Southeastern Europe**	Finland
United States of America	Albania	France
Oceania & Antarctica	Bosnia and Herzegovina	Germany
Fiji	Bulgaria	Netherlands
Papua New Guinea	Croatia	Norway
Samoa	Cyprus	Sweden
Solomon Islands	Greece	Switzerland
Tonga	Italy	

Table A2. Results from logistic regression models of postgraduation labor market outcomes by region of birth

	Employed	Manager/ professional occupation	High Income
Region of birth (ref. Australia)			
New Zealand	0.93*	0.95*	1.02
Oceania & Antarctica	0.75***	0.90**	0.77***
UK & Ireland	0.99	1.02	0.98
Western & Northern Europe	0.74***	0.91**	0.81***
Southern & Southeastern Europe	0.70***	0.80***	0.80***
Eastern Europe	0.70***	0.84***	0.86***
North Africa & the Middle East	0.47***	0.67***	0.68***
South-East Asia	0.69***	0.73***	0.64***
North-East Asia	0.54***	0.64***	0.66***
Southern & Central Asia	0.64***	0.86***	0.91***
South and Central America	0.75***	0.78***	0.66***
Northern America	0.85***	0.99	1.01
Sub-Saharan Africa	0.75***	0.79***	0.69***
South Africa	0.84***	1.05	0.97
Gender: Male	1.24***	1.03***	2.22***
Age in 2016 (ref. 25 or less)			
26-30	1.08***	1.21***	2.76***
31-35	0.81***	1.09***	4.00***
36-40	0.68***	1.04**	4.07***
41-45	0.74***	1.11***	4.47***
46-50	0.76***	1.09***	4.43***
51 or more	0.31***	0.69***	3.00***
Field of study (ref. Natural/Physical sciences)			
IT	1.64***	1.86***	2.09***
Engineering	2.18***	2.89***	3.71***
Architecture	1.93***	1.53***	1.61***
Agriculture	1.58***	1.04	0.93*
Health	3.33***	4.48***	2.35***
Education	2.35***	4.89***	0.98
Management & Commerce	2.12***	1.53***	2.31***
Society & culture	1.52***	1.25***	1.38***
Creative arts	1.31***	1.22***	0.62***
Multiple degrees	0.91***	1.33***	1.51***
Years since graduation (ref. 1)			
2	0.79***	1.07***	1.31***
3	0.91***	1.27***	1.87***
4	0.96*	1.44***	2.54***
5	1.03	1.59***	3.32***
6	1.05*	1.67***	4.22***
7	1.02	1.73***	5.29***
8	0.99	1.79***	6.21***
9	0.99	1.83***	7.00***
10	1.02	1.90***	7.36***
11	0.98	1.93***	7.90***
State of residence (ref. NSW)			
VIC	0.96*	0.92***	0.63***
QLD	0.92***	0.92***	0.75***
SA	0.78***	0.77***	0.53***
WA	0.77***	0.86***	1.28***
TAS	0.77***	0.87***	0.50***
NT	1.13*	1.06	1.71***
ACT	1.42***	1.21***	1.21***

Enrolled in HEI in 2016	0.44***	0.67***	0.73***
Low SES (20%)	0.93***	0.93***	0.85***
Disability	0.52***	0.71***	0.68***
RRR	1.05***	1.08***	0.92***
HE Institution fixed effects	Yes	Yes	Yes
Observations	808458	808458	808458
Pseudo R^2	0.063	0.081	0.187

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: * p<0.05, ** p<0.01, *** p<0.001.

Table A3. Results from logistic regression models of postgraduation labor market outcomes by country of birth

	Employed	Manager/ professional occupation	High Income
Country of birth (ref. Australia)			
New Zealand	0.93*	0.95*	1.02
Papua New Guinea	0.76*	0.81**	0.85
Solomon Islands	0.86	0.84	0.47
Fiji	0.76***	0.95	0.76***
Samoa	0.49**	0.71	0.45*
Tonga	0.48**	0.55**	0.78
Ireland	1.28*	1.21**	1.14
Austria	0.81	0.95	0.84
Belgium	0.90	0.85	0.96
France	0.85	0.93	0.66**
Germany	0.69***	0.87*	0.79**
Netherlands	0.78*	1.00	0.91
Switzerland	0.77	0.85	0.86
Denmark	0.95	0.94	0.96
Finland	0.41***	0.59**	0.63
Norway	0.78	1.23	0.86
Sweden	0.64**	0.98	0.84
Italy	0.58***	0.80*	0.70**
Malta	0.54**	0.85	0.61
Portugal	0.80	0.75	0.65*
Spain	0.75	0.74	0.90
Albania	0.33***	0.51**	0.91
Bosnia and Herzegovina	0.74***	0.77***	0.75***
Bulgaria	0.67	0.77	1.11
Croatia	0.76**	0.85*	0.71***
Cyprus	0.39***	0.61*	1.02
The Former Yugoslav Republic of Macedonia	0.85	0.92	0.98
Greece	0.63**	0.87	0.80
Moldova	0.59	0.65	0.91
Romania	0.67**	0.73***	1.01
Slovenia	0.60	0.87	1.12
Serbia	0.95	0.93	0.59
Belarus	0.68	0.78	0.58
Czech Republic	0.77	0.75	0.86
Hungary	0.82	0.74*	0.82
Latvia	0.66	0.95	1.26
Poland	0.72***	0.87*	0.84*
Russian Federation	0.68***	0.89	0.82*
Slovakia	0.69	0.90	0.76
Ukraine	0.65***	0.76***	0.98
Egypt	0.58***	0.86*	0.93
Sudan	0.48***	0.37***	0.28***
Bahrain	0.61	1.01	0.96
Iran	0.51***	0.69***	0.76***
Iraq	0.36***	0.62***	0.41***
Israel	0.95	1.16	0.86
Jordan	0.40***	0.74*	0.95
Kuwait	0.43***	0.73**	1.05
Lebanon	0.48***	0.77***	0.66***
Oman	0.40***	0.80	0.77
Qatar	0.64	1.34	1.05
Saudi Arabia	0.53***	0.76**	0.83

Syria	0.33***	0.61**	0.80
Turkey	0.45***	0.76**	0.66**
United Arab Emirates	0.46***	0.73**	1.10
Myanmar	0.74*	0.76**	0.61***
Cambodia	0.48***	0.49***	0.42***
Laos	0.42**	0.43***	0.82
Thailand	0.66***	0.61***	0.62***
Vietnam	0.61***	0.62***	0.53***
Brunei Darussalam	0.60**	0.95	0.84
Indonesia	0.54***	0.60***	0.45***
Malaysia	0.66***	0.77***	0.80***
Philippines	0.97	0.83***	0.62***
Singapore	0.61***	0.82***	0.82***
Timor-Leste	1.78	0.81	0.28***
China (excludes SARs and Taiwan)	0.50***	0.60***	0.69***
Hong Kong (SAR of China)	0.66***	0.70***	0.66***
Macau (SAR of China)	0.81	0.53***	0.53*
Taiwan	0.53***	0.63***	0.63***
Japan	0.62***	0.68***	0.59***
Korea, Republic of (South)	0.48***	0.65***	0.60***
Bangladesh	0.55***	0.72***	0.60***
Bhutan	0.53*	0.88	0.09*
India	0.74***	0.99	1.09**
Nepal	0.92	0.99	0.61***
Pakistan	0.36***	0.62***	0.59***
Sri Lanka	0.73***	0.89***	1.03
Afghanistan	0.39***	0.53***	0.37***
Kazakhstan	0.93	0.77	0.48*
Uzbekistan	0.71	0.71	1.34
Canada	0.88	1.02	1.09
United States of America	0.83**	0.97	0.98
Argentina	0.84	0.91	0.74*
Brazil	0.94	0.82	0.98
Chile	0.76*	0.75***	0.58***
Colombia	0.72	0.69**	0.57**
Ecuador	1.86	0.83	0.69
Peru	0.72*	0.85	0.69*
Uruguay	0.84	1.03	0.57*
Venezuela	0.95	0.95	0.56
El Salvador	0.56***	0.69***	0.58***
Mexico	0.78	0.74	0.39*
Congo, Democratic Republic of	0.46***	0.38***	0.23**
Ghana	0.70	0.84	0.56**
Liberia	0.96	0.52***	0.45*
Nigeria	0.57***	0.69***	0.72*
Sierra Leone	0.54**	0.63**	0.43***
Botswana	0.60	0.53*	1.10
Burundi	0.59	0.44***	0.30*
Eritrea	0.36***	0.40***	0.28***
Ethiopia	0.60***	0.60***	0.26***
Kenya	0.99	1.05	0.94
Mauritius	0.79	0.73**	0.64**
Namibia	0.57	0.79	0.77
Rwanda	0.59	0.76	0.85
Seychelles	0.96	1.58	0.75
Somalia	0.30***	0.34***	0.20***
South Africa	0.84***	1.05*	0.97
Tanzania	1.04	1.10	0.77
Uganda	0.57	0.45**	0.47*
Zambia	0.81	0.99	0.62*

Zimbabwe	1.18*	1.02	0.96
UK	0.98	1.01	0.97
Gender: Male	1.24***	1.03***	2.23***
Age in 2016 (ref. 25 or less)			
26-30	1.09***	1.21***	2.77***
31-35	0.81***	1.10***	4.03***
36-40	0.68***	1.05***	4.12***
41-45	0.74***	1.12***	4.52***
46-50	0.76***	1.10***	4.48***
51 or more	0.30***	0.69***	3.03***
Field of study (ref. Natural/Physical sciences)			
IT	1.64***	1.86***	2.09***
Engineering	2.19***	2.89***	3.70***
Architecture	1.93***	1.53***	1.60***
Agriculture	1.58***	1.03	0.93*
Health	3.31***	4.46***	2.34***
Education	2.34***	4.87***	0.98
Management & Commerce	2.13***	1.53***	2.30***
Society & culture	1.52***	1.25***	1.37***
Creative arts	1.30***	1.21***	0.62***
Multiple degrees	0.91***	1.33***	1.50***
Years since graduation (ref. 1)			
2	0.79***	1.07***	1.31***
3	0.90***	1.27***	1.87***
4	0.95**	1.44***	2.54***
5	1.03	1.59***	3.31***
6	1.04*	1.67***	4.21***
7	1.01	1.72***	5.27***
8	0.99	1.78***	6.19***
9	0.99	1.83***	6.96***
10	1.02	1.89***	7.32***
11	0.98	1.92***	7.86***
State of residence (ref. NSW)			
VIC	0.96*	0.92***	0.63***
QLD	0.92***	0.92***	0.75***
SA	0.78***	0.78***	0.53***
WA	0.77***	0.86***	1.28***
TAS	0.77***	0.87***	0.50***
NT	1.12*	1.06	1.72***
ACT	1.42***	1.22***	1.21***
Enrolled in HEI in 2016	0.44***	0.67***	0.74***
Low SES (20%)	0.94***	0.94***	0.86***
Disability	0.52***	0.71***	0.68***
RRR	1.05***	1.08***	0.92***
HE Institution fixed effects	Yes	Yes	Yes
Observations	806894	806894	806894
Pseudo R^2	0.064	0.082	0.188

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: * p<0.05, ** p<0.01, *** p<0.001.

Table A4. Results from baseline logistic regression models of postgraduation labor market outcomes by cultural and linguistic proximity

	Model 7 Employed	Model 8 Manager/ professional occupation	Model 9 High Income
Linguistic proximity	1.02	1.02**	1.02
Cultural proximity	1.06***	1.06***	1.04***
Age at arrival (ref. early learning 0-5 yrs)			
Primary school (6-12 yrs)	0.96	0.94***	0.99
Secondary school (13-18 yrs)	0.88***	0.87***	0.80***
University (19-23 yrs)	0.91**	0.90***	0.76***
After university (24+ yrs)	1.15***	1.09**	0.86***
Missing	1.08	1.00	1.11*
Gender: Male	1.27***	1.05***	1.99***
Age in 2016 (ref. 25 or less)			
26-30	1.12***	1.19***	2.51***
31-35	0.89***	1.04	3.31***
36-40	0.83***	1.02	3.14***
41-45	0.86**	1.10**	3.47***
46-50	0.82***	1.05	3.42***
51 or more	0.33***	0.67***	2.36***
Field of study (ref. Natural/Physical sciences)			
IT	1.88***	1.84***	2.34***
Engineering	1.92***	2.40***	3.26***
Architecture	1.74***	1.32***	1.53***
Agriculture	1.47***	1.00	1.00
Health	3.86***	6.17***	3.27***
Education	2.47***	4.31***	1.20***
Management & Commerce	1.92***	1.40***	2.18***
Society & culture	1.46***	1.25***	1.43***
Creative arts	1.21***	1.15***	0.63***
Multiple degrees	0.97	1.44***	1.65***
Years since graduation (ref. 1)			
2	0.83***	1.09***	1.26***
3	0.97	1.28***	1.86***
4	1.04	1.51***	2.60***
5	1.07	1.66***	3.45***
6	1.16***	1.82***	4.26***
7	1.13**	1.82***	5.44***
8	1.12**	1.96***	5.99***
9	1.14**	1.99***	7.44***
10	1.20***	2.17***	7.87***
11	1.09*	2.13***	8.04***
State of residence (ref. NSW)			
VIC	0.93	0.87***	0.67***
QLD	0.90*	0.81***	0.73***
SA	0.73***	0.76***	0.52***
WA	0.75***	0.74***	1.10*
TAS	0.60***	0.68***	0.57***
NT	1.37*	1.12	2.05***
ACT	1.36***	1.19***	1.13*
Enrolled in HEI in 2016	0.42***	0.66***	0.71***
Low SES (20%)	0.98	0.93***	0.80***
Disability	0.53***	0.68***	0.66***
RRR	0.99	1.02	0.86***
English proficiency (ref. Speaks English only)			

Speaks English very well	0.77***	0.87***	0.80***
Speaks English worse than very well	0.34***	0.40***	0.33***
HE Institution fixed effects	Yes	Yes	Yes
Observations	141809	141809	141809
Pseudo R^2	0.082	0.105	0.186

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: * p<0.05, ** p<0.01, *** p<0.001.

Table A5. Results from extended logistic regression models of postgraduation labor market outcomes by cultural and linguistic proximity

	Model 10 Employed	Model 11 Manager/ professional occupation	Model 12 High Income
Linguistic proximity	1.01	0.99	0.96*
Cultural proximity	1.03	1.06***	1.01
Age at arrival (ref. early learning 0-5 yrs)			
Primary school (6-12 yrs)	0.96*	0.93***	0.97
Secondary school (13-18 yrs)	0.90***	0.88***	0.79***
University (19-23 yrs)	0.91**	0.89***	0.73***
After university (24+ yrs)	1.15***	1.08**	0.82***
Missing	1.07	0.98	1.08
Gender: Male	1.27***	1.05***	1.99***
Age in 2016 (ref. 25 or less)			
26-30	1.13***	1.20***	2.51***
31-35	0.89***	1.05*	3.34***
36-40	0.82***	1.03	3.22***
41-45	0.85***	1.10**	3.54***
46-50	0.81***	1.06	3.45***
51 or more	0.33***	0.68***	2.34***
Field of study (ref. Natural/Physical sciences)			
IT	1.89***	1.84***	2.33***
Engineering	1.93***	2.41***	3.26***
Architecture	1.75***	1.32***	1.52***
Agriculture	1.48***	1.00	1.00
Health	3.85***	6.16***	3.26***
Education	2.47***	4.31***	1.19***
Management & Commerce	1.92***	1.40***	2.17***
Society & culture	1.47***	1.25***	1.42***
Creative arts	1.21***	1.15***	0.63***
Multiple degrees	0.97	1.43***	1.64***
Years since graduation (ref. 1)			
2	0.83***	1.09***	1.27***
3	0.97	1.27***	1.86***
4	1.04	1.51***	2.60***
5	1.07	1.65***	3.45***
6	1.16***	1.81***	4.25***
7	1.13**	1.81***	5.42***
8	1.12**	1.96***	5.97***
9	1.14**	1.98***	7.41***
10	1.20***	2.17***	7.82***
11	1.09*	2.12***	7.99***
State of residence (ref. NSW)			
VIC	0.93	0.86***	0.67***
QLD	0.90*	0.81***	0.72***
SA	0.73***	0.76***	0.52***
WA	0.74***	0.74***	1.10*
TAS	0.60***	0.68***	0.57***
NT	1.37*	1.13	2.06***
ACT	1.35***	1.18***	1.13*
Enrolled in HEI in 2016	0.42***	0.66***	0.71***
Low SES (20%)	0.98	0.93***	0.80***
Disability	0.53***	0.68***	0.66***
RRR	0.99	1.02	0.86***
English proficiency (ref. Speaks English only)			

Speaks English very well	0.77***	0.86***	0.80***
Speaks English worse than very well	0.34***	0.41***	0.35***
Age at arrival × Linguistic proximity	-	-	-
Primary school (6-12 yrs) # Linguistic proximity	1.02	1.03	1.04
Secondary school (13-18 yrs) # Linguistic proximity	1.01	1.07***	1.10***
University (19-23 yrs) # Linguistic proximity	0.94	1.03	1.11**
After university (24+ yrs) # Linguistic proximity	1.01	1.06*	1.21***
Missing # Linguistic proximity	1.03	1.06	1.06
Age at arrival × Cultural proximity			
Primary school (6-12 yrs) # Cultural proximity	1.03	1.00	1.02
Secondary school (13-18 yrs) # Cultural proximity	1.10**	1.04*	1.09**
University (19-23 yrs) # Cultural proximity	1.09*	1.01	1.12**
After university (24+ yrs) # Cultural proximity	0.94*	0.96	1.05
Missing # Cultural proximity	0.99	1.01	0.92*
HE Institution fixed effects	Yes	Yes	Yes
Observations	141809	141809	141809
Pseudo R^2	0.082	0.106	0.187

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: * p<0.05, ** p<0.01, *** p<0.001.

Table A6. Selected results from baseline and extended logistic regression models of postgraduation labor market outcomes by cultural and linguistic proximity using unimputed data only

	Employed	Manager/ professional occupation	High Income	Employed	Manager/ professional occupation	High Income
Linguistic proximity	1.01	1.02*	1.02	1.01	0.99	0.97
Cultural proximity	1.05***	1.06***	1.04***	1.03	1.06***	1.01
Age at arrival × Linguistic proximity						
primary school (6-12 yrs) # Linguistic proximity				1.02	1.03	1.03
secondary school (13-18 yrs) # Linguistic proximity				1.01	1.07**	1.09**
university (19-23 yrs) # Linguistic proximity				0.92	1.03	1.11*
after university (24+ yrs) # Linguistic proximity				1.00	1.05	1.18***
missing # Linguistic proximity				1.01	1.06	1.04
Age at arrival × Cultural proximity						
primary school (6-12 yrs) # Cultural proximity				1.02	0.99	1.04
secondary school (13-18 yrs) # Cultural proximity				1.09**	1.04	1.08*
university (19-23 yrs) # Cultural proximity				1.10*	1.00	1.11**

after university (24+ yrs) # Cultural proximity				0.95	0.97	1.06
missing # Cultural proximity				0.97	1.01	0.91
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
HE Institution fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	117668	117668	117668	117668	117668	117668
Pseudo R^2	0.085	0.104	0.187	0.085	0.104	0.188

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: ** p<0.01, *** p<0.001. In contrast to the main models, the results presented above were estimated using observations for which neither linguistic proximity nor cultural proximity were imputed.

Table A7. Selected results from baseline and extended logistic regression models of postgraduation labor market outcomes by cultural and linguistic proximity using a sample restricted to individuals who were employed

	High Income	High Income	High Income	High Income
Linguistic proximity	1.02*	1.02	0.98	0.96*
Cultural proximity	1.06***	1.04***	1.06***	1.01
Age at arrival × Linguistic proximity				
primary school (6-12 yrs) # Linguistic proximity			1.03	1.04
secondary school (13-18 yrs) # Linguistic proximity			1.09***	1.11***
university (19-23 yrs) # Linguistic proximity			1.06	1.12**
after university (24+ yrs) # Linguistic proximity			1.08**	1.23***
missing # Linguistic proximity			1.07	1.04
Age at arrival × Cultural proximity			0.99	1.02
primary school (6-12 yrs) # Cultural proximity			1.02	1.08**
secondary school (13-18 yrs) # Cultural proximity			0.98	1.12**
university (19-23 yrs) # Cultural proximity			0.97	1.04
after university (24+ yrs) # Cultural proximity			1.01	0.92
missing # Cultural proximity			1.03	1.04
Control variables	Yes	Yes	Yes	Yes
HE Institution fixed effects	Yes	Yes	Yes	Yes
Observations	122372	122372	122372	122372
Pseudo R^2	0.105	0.181	0.106	0.182

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: ** p<0.01, *** p<0.001. In contrast to the main models, the results presented above were estimated using data for individuals who were employed.

Table A8. Selected results from baseline and extended logistic regression models of postgraduation labor market outcomes with only one proximity measure at a time (either cultural or linguistic proximity)

	Cultural proximity						Linguistic proximity					
	Employed	Manager/ professional occupation	High Income	Employed	Manager/ professional occupation	High Income	Employed	Manager/ professional occupation	High Income	Employed	Manager/ professional occupation	High Income
Cultural/ linguistic proximity	1.06***	1.06***	1.05***	1.03*	1.05***	0.99	1.03**	1.04***	1.03**	1.02	1.00	0.96**
Age at arrival × Cultural/ linguistic proximity												
Primary school (6-12 yrs) # proximity				1.04	1.01	1.04*				1.03	1.03*	1.05**
Secondary school (13-18 yrs) # Cultural proximity				1.10***	1.08***	1.14***				1.05*	1.10***	1.15***
University (19-23 yrs) # proximity				1.06	1.02	1.18***				0.99	1.04	1.19***
After university (24+ yrs) # proximity				0.94*	0.98	1.14***				0.98	1.04	1.23***
Missing # proximity				1.00	1.03	0.94				1.02	1.06	1.02
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HE Institution fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	141809	141809	141809	141809	141809	141809	141809	141809	141809	141809	141809	141809
Pseudo R^2	0.082	0.105	0.186	0.082	0.105	0.186	0.082	0.105	0.186	0.082	0.105	0.186

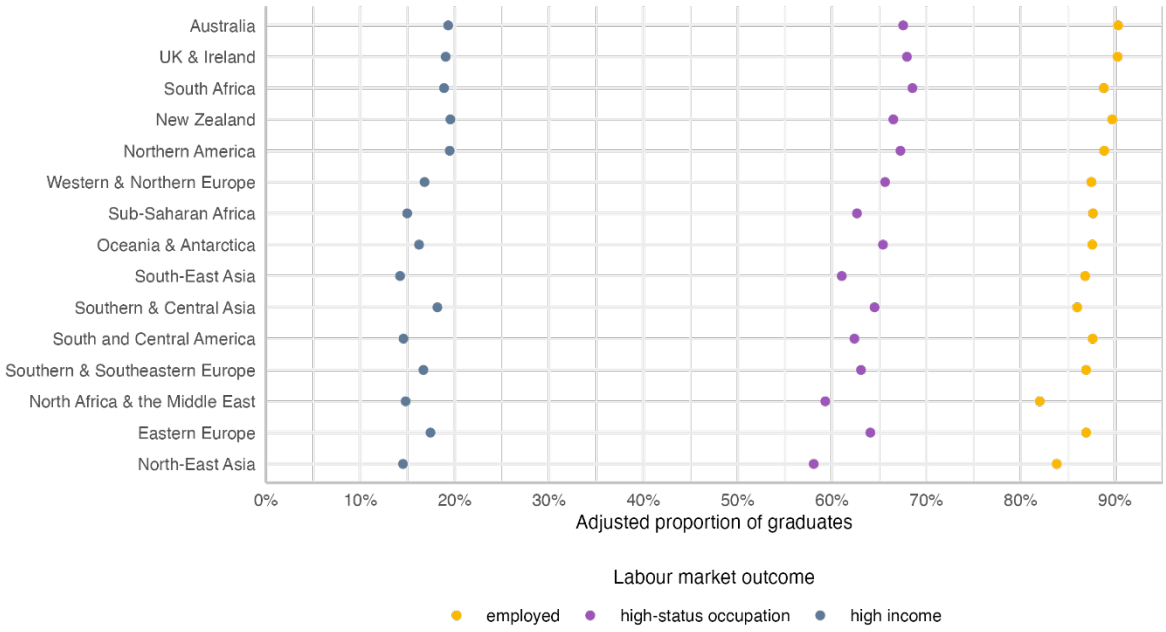
Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: ** p<0.01, *** p<0.001.

Table A9. Selected results from baseline and extended logistic regression models of postgraduation labor market outcomes by cultural and linguistic proximity without controlling English proficiency

	Employed	Manager/ professional occupation	High Income	Employed	Manager/ professional occupation	High Income
Linguistic proximity	1.12***	1.09***	1.10***	1.10***	1.04**	1.03
Cultural proximity	1.13***	1.10***	1.09***	1.06***	1.07***	1.03*
Age at arrival × Linguistic proximity						
primary school (6-12 yrs) # Linguistic proximity				1.02	1.04*	1.04
secondary school (13-18 yrs) # Linguistic proximity				1.03	1.10***	1.12***
university (19-23 yrs) # Linguistic proximity				0.97	1.05	1.13***
after university (24+ yrs) # Linguistic proximity				1.04	1.09***	1.22***
missing # Linguistic proximity				1.03	1.06	1.06
Age at arrival × Cultural proximity						
primary school (6-12 yrs) # Cultural proximity				1.04	1.01	1.04
secondary school (13-18 yrs) # Cultural proximity				1.17***	1.10***	1.14***
university (19-23 yrs) # Cultural proximity				1.19***	1.08**	1.20***
after university (24+ yrs) # Cultural proximity				1.05	1.04	1.15***
missing # Cultural proximity				1.02	1.03	0.94
English proficiency	No	No	No	No	No	No
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes
HE Institution fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	141809	141809	141809	117668	117668	117668
Pseudo R^2	0.073	0.099	0.180	0.085	0.104	0.188

Notes: Data from customized PLIDA dataset (2011-2016). Exponentiated coefficients. Statistical significance: ** p<0.01, *** p<0.001. In contrast to the main models, the results presented above were estimated without controlling for English proficiency.

Figure A1. Labor market outcomes (adjusted proportions of graduates who are employed, have a high-status occupation, and have high income) by region of origin.



Notes: Data from customized PLIDA dataset (2011-2016). Domestic graduates living in Australia during the 2016 Census. Based on the model results presented in Appendix Table A2. Regions ordered by linguistic proximity to Australia.