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KELSEY J. O'CONNOR,
MARTIJN HENDRIKS,
JOSE MARQUEZ, AND
FENGYU WU

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Immigrant adolescents generally report lower subjective well-being (SWB) than their native peers, representing an important dimension of inequality among adolescents – who are already vulnerable and facing a growing SWB-crisis in many countries. Yet, little is known about the country-level determinants of the immigrant-native gap in adolescent SWB. Using data for more than 750,000 15-year-old students across 42 countries from the Programme for International Student Assessment (PISA) 2015, 2018, and 2022 waves, we contribute, finding immigrant adolescents report, on average, 0.24 points lower life satisfaction (on a 0-10 scale) than their native peers. However, this gap varies widely across countries, from a positive 0.23 (where immigrants are more satisfied) to a negative 0.83. To explain the difference in gaps across countries, we show that they are systematically related to macro-level factors. Immigrant adolescents fare relatively worse than native adolescents in countries with: lower uncertainty avoidance (a cultural dimension), larger and more diverse immigrant populations, and weaker institutional quality. These findings highlight the importance of national contexts, especially culture, in shaping SWB inequalities between immigrant and native adolescents.

Keywords: subjective well-being, inequality, immigration, adolescence, PISA, culture

O'Connor: Senior Researcher, STATEC Research (National Institute of Statistics and Economic Studies); GLO Fellow, Global Labor Organization (GLO); Research Fellow, Institute of Labor Economics (IZA); 12 Boulevard Du Jazz, 4370 Esch-Belval Sanem, Luxembourg. Phone: +352 247 84351. Email: Kelsey.OConnor@statec.etat.lu. ORCID: 0000-0002-1413-3619.

Hendriks: Deputy Director, Erasmus University Rotterdam; Associate Professor, University of Johannesburg. hendriks@ese.eur.nl.

Marquez: Research Fellow, Manchester Institute of Education, University of Manchester; Research Associate, Wellbeing Research Centre, University of Oxford. Email: jose.marquez@manchester.ac.uk.

Wu: Researcher, STATEC Research (National Institute of Statistics and Economic Studies); GLO Fellow, Global Labor Organization (GLO); fengyu.wu@statec.etat.lu.

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1. Introduction

As of 2020, 36 million children under the age of 18 lived outside their country of birth (United Nations, Department of Economic and Social Affairs, 2020). This group is doubly vulnerable as immigrants (foreign-born[1]) tend to experience lower subjective well-being (SWB) than their native peers (Hendriks 2015) and because adolescents have experienced worrying trends in many countries recently (Haidt 2024; Marquez et al., 2024b). Adolescent SWB is important per se, and because adolescence is a pivotal developmental stage affecting the rest of life. Early and middle adolescence are characterized by identity exploration, peer socialization, and rapid cognitive and emotional growth (Steinberg, 2014). Experiences during this period, including levels of well-being, lay the foundation for long-term life trajectories, influencing outcomes ranging from career paths and income to mental health and overall well-being (Kim et al., 2024; Patton et al., 2016; De Neve & Oswald, 2012; Geijsen & Bartels, 2025; Clark et al., 2019).

Understanding how immigrant adolescents fare compared to their native peers is especially critical. Negative experiences such as feeling relatively worse off than native peers may sow the seeds of long-term disadvantage for immigrant adolescents (Smith et al., 2012). As a particularly vulnerable group, they must navigate the challenges of adolescence while also coping with difficulties linked to their migration background, including integration into the host society. While positive experiences can buffer against stressors such as acculturation and discrimination, negative ones may intensify harmful effects and have enduring consequences in adulthood (Oppedal et al., 2022). Taken together, these considerations highlight the importance of focusing on inequality in SWB between native and immigrant adolescents, rather than on overall levels alone. Such inequality may capture perceived unfairness and differences in social inclusion that are not evident in average measures (Goff et al., 2018). Examining disparities in SWB can therefore shed light on how migration and social contexts shape adolescents' sense of belonging and prospects for successful integration. Gaining a clearer understanding of the mechanisms driving these inequalities is essential for developing targeted interventions and policies that foster inclusion and help reduce well-being gaps.

The existing literature on SWB gaps between immigrant and native adolescents is growing but incomplete. Cross-national research shows immigrant adolescents frequently report a SWB gap, experiencing lower SWB compared to their native peers, however, this pattern is far from uniform across countries of residence (Stevens et al., 2015; Dinisman & Ben-Arieh, 2016; Bradshaw & Rees, 2017; OECD, 2018; Tang, 2019; Kern et al., 2020; Cerna et al., 2021; Delaruelle et al., 2021; Wang, 2021). Single-country studies also support this heterogeneous pattern. For instance, SWB levels were higher among "expatriate" students compared with their native peers in the United Arab Emirates (Marquez et al., 2023), but lower among immigrants and refugees in Germany (Henkens et al., 2022; Frankenberg et al., 2013).

In most countries, immigrant adolescents lag behind their native peers in various aspects that shape well-being, such as higher anxiety and lower academic performance, sense of belonging, and peer acceptance (OECD, 2018). Some studies have directly related these immigrant disadvantages to explaining the SWB gap between immigrants and natives across countries. These studies, focused on micro- or meso-level factors, offered partial explanations for the gap by demonstrating the relevance of various sets of indicators, such as family affluence (Stevens et al.,

[1] We use the term immigrant and foreign-born interchangeably as in our analysis, immigration status is based on country of birth. Anyone born in a country different from where they reside is deemed an immigrant.

2015); support from parents, school, and peers (Delaruelle et al., 2021); school-related experiences like bullying and anxiety, as well as home behaviours including talking to parents after school, eating breakfast, and exercising (Tang, 2018); and broader demographic and socio-economic factors including gender, language use at home, fear of failure, grade repetition, family wealth, and parents' socio-economic status (Wang, 2021).

Cross-national research has not yet explicitly examined what macro-level conditions of host countries explain cross-national variation in the immigrant–native SWB gap, for either adolescents or adults, despite evidence that the macro-environment is associated with immigrants' well-being (Hendriks & Bartram, 2016; Kogan et al., 2018). Indeed, Bronfenbrenner's ecological systems theory (1979) conceptualizes adolescent development as shaped by nested systems of influence, ranging from immediate microsystems such as family, peers, and schools, to mesosystems (i.e., the interconnections among microsystems, such as how family support shapes experiences at school or with peers), and broader exosystems (i.e., settings that indirectly influence the adolescent, such as parents' workplaces or community services) and macrosystems encompassing cultural, institutional, and national conditions. This perspective emphasizes that immigrant adolescents' SWB is simultaneously influenced not only by their everyday experiences and interactions in their close environment but also the wider contexts of their host countries. Indeed, Kern et al. (2020) demonstrate the interplay between individual-level and national-level indicators, with larger SWB disadvantages found for members of multiple disadvantaged social groups (low socio-economic status, female, and immigrant) in countries with low levels of income equality and restrictive migration policies.

To advance our understanding of immigrant-native SWB-inequality, we assess which host-country characteristics explain the cross-national variation in the difference in life satisfaction[2] between immigrant and native adolescents. In particular, we draw on data from more than 750,000 student observations aged 15 from the 2015, 2018 and 2022 waves of the Programme for International Student Assessment (PISA). We first present the average life satisfaction of immigrant adolescents by country, followed by the extent to which their life satisfaction differs from that of native adolescents in each country (i.e., conditional difference in means). Next, we perform regression analyses of the immigrant-native SWB differences on a wide range of host-country macro-level variables. Using this approach, we are able to explain more than 60 percent of the cross-national variation in life satisfaction differences between immigrant and native adolescents. This evidence contributes to existing knowledge by providing a previously missing macro-level perspective on why the life satisfaction gap between immigrant and native adolescents varies across countries. The analysis moves beyond micro- and meso-level factors to reveal broader structural and cultural contexts shaping these disparities. Notably, it identifies cultural factors as the most salient drivers of cross-national differences, providing new insight into how societal values and norms influence immigrant adolescents' well-being and relative disparity.

The remainder of the study is organized as follows: section 2 presents the conceptual framework, section 3 documents the data and method, section 4 discusses our results, and section 5 concludes.

[2] Life satisfaction is a common form of evaluative subjective well-being. The specific question is included in data section. For details on the different forms of subjective well-being, see Mahoney (2023).

2. Conceptual framework

Drawing on Bronfenbrenner's ecological systems theory (1979), we conceptualise country characteristics as macrosystem features that likely affect the immigrant–native differences in adolescent life satisfaction. We classify country characteristics into four dimensions.

The first dimension concerns economic conditions. Economic factors may be particularly important determinants of SWB among migrants, since many migrant households moved for economic reasons (Bartram, 2011). Migrants often occupy more disadvantaged economic positions than the native population (OECD, 2018), which contributes to lower SWB among both adult- and adolescent migrants (Elgar et al., 2015). This disadvantage, reflected in higher risks of poverty and unemployment, is likely to be especially pronounced in countries with more income inequality, higher unemployment, and other weaker economic conditions, potentially widening the immigrant–native SWB gap in such countries. At the same time, such countries may experience a narrower immigrant–native SWB gap. Countries with poor economic conditions attract fewer migrants, especially with lower socio-economic status (SES), since poverty, weak labour markets, and income inequality are disproportionately harmful for this group. And attracting less low-SES migrants may narrow the gap, because migrants with lower SES generally report lower SWB. Determining how these opposing dynamics play out is ultimately an empirical question. To capture the economic dimension, we will focus on the most commonly used macroeconomic indicators in the literature, as they have been shown to be particularly related to adolescents' life satisfaction: GDP per capita[3], GDP per capita growth, the unemployment rate, and income inequality (Marquez et al. 2024a, Levin et al. 2011; Johansson et al., 2019; Oishi et al., 2011).

The second dimension concerns institutions, governance, social welfare, and health. Good government is a robust correlate of life satisfaction across countries (Helliwell & Huang, 2008; O'Connor 2017), including amongst migrants (Hendriks & Bartram, 2016). A higher quality of governance and stronger institutions may particularly benefit vulnerable populations, including newcomers. For instance, effective and predictable public institutions can reduce uncertainty and transaction costs for migrants by ensuring fair procedures (e.g., no discrimination), reliable access to services, and limiting corruption that tends to favour non-vulnerable groups. For immigrant adolescents navigating school systems, predictable institutions may buffer against uncertainty and discrimination (Delaruelle et al., 2021). As such, better governance and institutions may narrow the immigrant–native SWB gap. Similarly, greater social welfare generosity can benefit newcomers/immigrants more than their native peers, as the parents of adolescent immigrants represent a more vulnerable group in the labour market. However, like with economic factors, countries with greater institutions and social welfare generosity may attract more vulnerable immigrant groups with typically lower SWB-levels, which could in turn widen the immigrant–native SWB gap. Since people care not only about quality of life but also about quantity of life, countries with better health systems and higher life expectancy may attract more individuals with poorer health, which is associated with lower SWB (Bjørnskov et al., 2008; Hessami, 2010). Therefore, to capture this dimension, we will focus on the roles of government

[3] Since wealth has diminishing marginal utility for SWB, immigrants' disadvantaged economic position may have a weaker effect on SWB in wealthier countries, suggesting a smaller SWB gap there. However, we will log-transform GDP per capita to reduce the influence of outliers. It mitigates the potential role of decreasing marginal utility, as it is accounted for in the log-transformed measure.

effectiveness/quality (World Bank, 2025b), social welfare generosity (using proxy measures), and healthy life expectancy.

The third dimension concerns globalization, the structure of immigration, and immigration policies. Greater global connectedness and migrant presence can expand opportunities and foster bridging social capital among migrants in particular, while also normalising diversity and facilitating immigrants' adaptation, which will ultimately reduce the immigrant-native SWB gap (Knies et al., 2016; Maani, 2016). However, large migrant inflows can increase segregation, trigger group-threat dynamics and perceived competition over resources, including in schools (Blalock, 1967), while more diversity may reduce interpersonal trust (Putnam, 2007). Together, these processes can lead to more negative attitudes towards immigrants and reduce the SWB of immigrants in particular, and ultimately widen the immigrant-native SWB gap. Hence, there are also potentially competing mechanisms at play here. Concerning integration policies, in theory they should particularly benefit immigrants and thereby lower the SWB gap, although previous research has not shown positive effects of better integration policies on immigrants' SWB (Hendriks & Bartram, 2016; Kogan et al., 2018). Based on the above discussion, in dimension we focus on globalization, the scale (immigrant share) and heterogeneity (diversity by origin) of immigration, and the quality of integration policies.

The fourth dimension concerns culture. Deep-rooted cultural norms shape everyday expectations and responses to ambiguity in schools and communities. Indeed, large cross-national studies on children's and adolescents' SWB indicate that cultural patterns—such as collectivism, religious traditions, and social norms—help explain cross-country differences in average SWB levels, inequalities, and developmental trajectories (Exton et al., 2015; Voicu & Vasile, 2014). Complementing these findings, Marquez et al. (2023) show that in the United Arab Emirates, both national and expatriate students attending British-curriculum schools report lower SWB than those in other private (American, Indian, other international) or public schools, suggesting that cultural norms and expectations embedded in school environments influence the SWB of both immigrant and native adolescents. Cross-country cultural differences can be summarized in six dimensions based on the prominent work of Geert Hofstede (Minkov & Hofstede, 2011; Hofstede, 2011; Hofstede, 2025) which include: power distance (acceptance of unequal power distribution), individualism (preference for loose vs. tight social ties), masculinity (emphasis on competition and material success vs. care and quality of life), uncertainty avoidance (tolerance for ambiguity and reliance on rules), long-term orientation (focus on future rewards vs. tradition and immediate obligations), and indulgence (extent to which gratification and enjoyment are socially accepted vs. restrained). Some of the dimensions have documented associations with SWB and social attitudes across nations (Diener et al., 2003; Fischer & Boer, 2011). More power distance could potentially disadvantage the immigrant population compared to the native population due to their generally lower socio-economic position (i.e., less power). More individualism can also increase the immigrant-native SWB gap because it makes it more difficult for immigrants to build social networks upon arrival in the destination country. Lower uncertainty avoidance can be detrimental for vulnerable populations, as they are less protected by formal rules and regulations, and more informal societies are often harder for newcomers to navigate. The other three dimensions have less straightforward associations with the immigrant-native SWB gap but will be considered for completeness.

Together, these domains provide a macro-level framework to assess variation in the immigrant–native SWB gap across countries.

3. Data and Methods

3.1. Adolescent data: PISA

We used data from several sources. Adolescent data are from the PISA by the Organization for Economic Co-operation and Development (OECD). PISA is a repeated cross-sectional survey that is generally rolled out every 3 years in dozens of countries worldwide. Its focus is on assessing the academic competence of 15-year-old students, but also collects rich data on students' background characteristics and schools' policies and practices. Recent editions have moved beyond this focus on academic competence and education policies and practices to also collect data on students' well-being.

Individual student life satisfaction is obtained using the response to the question "The following question asks how satisfied you feel about your life, on a scale from '0' to '10'. Zero means you feel 'not at all satisfied' and '10' means 'completely satisfied'. Overall, how satisfied are you with your life as a whole these days?" To determine the immigration status of the student, we used information from PISA's variable COBN_S. Those who reported a country of birth other than the country where they sat for the PISA test were categorized as foreign-born immigrants, and everyone else as native born. Unfortunately, the respondent's specific 'other' country of birth was frequently not provided and there are too many missing values for country of origin to be reliable. Future research will need to assess the role of adolescent immigrant origins', as these have been found to affect the well-being of adult immigrants (Voicu & Vasile, 2014; Berggren et al., 2020).

To construct our sample, we began with the full set of data from PISA 2015, 2018, and 2022, the last three waves that collected data on our outcome variable of interest (students' life satisfaction) in a large number of countries. Appendix Table presents our micro sample by country and year. Across 42 countries, we have 754,587 student observations. Each year has more than 200,000 observations; 2015 has the fewest, 211,849. The Netherlands has the fewest observations at a little over 5,000 confined to 2015. We excluded regions (e.g., Puerto Rico (USA) and B-S-J-Z (China)); countries with less than 30 foreign-born students; countries with a low life satisfaction response rate (i.e., missing 20% or more); countries without important macro variables; and 12 countries in 2022 that did not meet standard PISA sampling requirements (Schleichter, 2023). Individual observations without requisite variables were also dropped.

3.2. Estimating the Immigrant-Native Differences in Life Satisfaction

We begin by estimating the conditional difference in life satisfaction between immigrant and native adolescents using linear regressions. As presented in equation 1, adolescent life satisfaction ($LifeSat$) is assumed to depend linearly on immigration status ($immigrant$), a vector of individual characters (X), common year effects (λ), and school / country characteristics (μ).

$$LifeSat_{ist} = \alpha + immigrant_{ist}\beta + \boldsymbol{X}'_{ist}\boldsymbol{\gamma} + \lambda_t + \mu_s + \epsilon_{ist} \quad (1)$$

β represents the difference in life satisfaction between immigrant and native adolescents (conditional on covariates). Although the literature tends to refer to gaps in which larger gaps mean *natives are more satisfied* than the immigrants, we instead estimate differences that take larger positive values when the *immigrants are more satisfied* than natives (and larger negative values when the natives are more satisfied). We chose this operationalization because natives are not always more satisfied, meaning that both the direction and magnitude of life satisfaction differences are relevant and a negative difference is intuitively worse from the perspective of immigrants.

We used a limited number of individual characteristics that are generally exogenous to immigrants' life satisfaction, including gender, relative age (i.e., the age gap between classmates), parental background, and survey administration mode. Parental background is captured using the PISA-created Socio-Economic and Cultural Status index, which is based on material resources in the household, parents' level of education, and parents' occupational status. We intentionally left out so called "bad controls" that could mediate the relation.[4] For instance, numerous factors, such as bullying, could be due to the student's immigration status, and controlling for these factors would shut down channels through which immigration status affects life satisfaction. We added relative age as an exogenous control, as it has been found to affect numerous important outcomes among adolescents, including life satisfaction (Fumarco et al., 2019, 2020). Survey administration mode was included as it may introduce noise by affecting survey responses (Sarracino et al., 2017, Schork et al., 2021). In this case, surveys were conducted either using paper or a computer. We also used PISA final student weights (W_FSTUW).

As emphasized by Bronfenbrenner's ecological systems theory (1979), one of the most important factors in explaining student life satisfaction is the school itself (Clark et al., 2019; Marquez, 2022). The school fixed effects capture these factors along with any country level characteristics as they are fixed within a school.

To estimate differences between immigrants and native adolescents by country, we rerun equation 1 in each country separately and extract the coefficients (β) on $immigrant$. This approach was chosen as opposed to using interaction terms of $immigrant$ on country dummies, as it permits country-level heterogeneity in the associations between variables. The choice does not matter much, however, as the correlation between differences obtained from the two approaches is 0.98.

3.3. Method to Explain the Life Satisfaction Differences Across Countries

Having obtained the life satisfaction differences between immigrant and native adolescents by country, we then proceed to use them as the dependent variable in a series of linear regressions based on equation 2.

$$\beta_c = \alpha + \boldsymbol{Y}_c'\boldsymbol{\delta} + \varepsilon_c \quad (2)$$

Where β_c represents the conditional difference in life satisfaction in country c, as calculated in the previous section. Recall β_c takes positive values when immigrants are on average more

[4] Socio-Economic and Cultural Status may also partially mediate immigrant status, as it is likely influenced by the parents' immigrant status; however, we felt Socio-Economic and Cultural Status was too important as a control to be left out. In either case, its inclusion does not change the results too much - it affects the magnitude of β (presented later in Table 2), but by less than 10 percent.

satisfied and negative values when natives are more satisfied. $\boldsymbol{Y}_c'$ is a vector of explanatory variables. As the differences are defined at the country level, the regressions have a sample size equal to the number of countries, i.e., 42. We chose this approach, as opposed to a hierarchical model, because it allows us to explore more cross-country characteristics, which is our focus.

We chose 18 country characteristics as explanatory variables for their plausible role in explaining adolescents' life satisfaction, as discussed in section 2.[5] They include economic, health, institutional, globalization, immigration, and cultural factors. The economic variables include the natural log of real GDP per capita, GDP per capita growth, unemployment rate, and income inequality measured using the Gini coefficient. The institutional and health variables include indexes of governmental quality[6], healthy life expectancy, public health expenditures (as a percent of GDP) as a proxy of social welfare, and the old age dependency ratio, which is the ratio of people older than 64 to those aged 15-64.[7] In addition, we include an index of globalization[8], the total immigrants share of the population, and ethnic diversity[9] of immigrants. We also utilize the Migrant Integration Policy Index (MIPEX; Solano & Huddleston, 2020)[10], which is intended to measure how well public policies enable immigrants to participate equally in society. However, since it has smaller country coverage, it is not included in the main analysis but separately examined. Lastly, we use the prominent Hofstede cultural dimensions (Minkov and Hofstede, 2011; Hofstede, 2011; Hofstede, 2025), specifically: Power distance (acceptance of unequal power distribution), individualism (preference for loose vs. tight social ties), masculinity (emphasis on competition and material success vs. care and quality of life), uncertainty avoidance (tolerance for ambiguity and reliance on rules), long-term orientation (focus on future rewards vs. tradition and immediate obligations), and indulgence (extent to which gratification and enjoyment are socially accepted vs. restrained. The sources and descriptive statistics of all macro-variables are provided in Appendix Table A2.

[5] Not every variable is available in each year. When there are holes in the data, we make use of linear interpolation. If later data are missing (e.g., 2022), we use the value for the most recently available year.

[6] Specifically, government delivery, which is constructed following Helliwell and Huang (2008) from the Worldwide Governance Indicators (World Bank, 2025b) as the average of four out of six governance indicators: Control of Corruption, Government Effectiveness, Regulatory Quality, Rule of Law. The other two indicators are Voice and Accountability, and Political Stability/Absence of Violence. It tends to have a stronger relation with SWB than the average of all six measures (Helliwell & Huang, 2008).

[7] Variables directly assessing welfare state generosity have limited country coverage and so do social protection expenditures. Health expenditures were included instead because they are plausibly positively related to life satisfaction when they represent a more generous welfare state. We also included the old age dependency ratio to capture the mechanical relation between health expenditures and an aging population. Previous research found it was necessary to include the old age dependency ratio to improve the performance of social protection expenditures (O'Connor, 2017). Old-age dependency can in part pick up the mechanical impacts of an aging population, on health expenditures, for instance, and signal fiscal pressure in ageing societies that may crowd out youth-oriented supports.

[8] Our measure, the KOF Globalisation Index, takes the average of three subdimensions: economic, social and political globalization, which are in turn comprised of subdimensions. See Gygli (2019) and Dreher (2006) for details.

[9] Following Akay et al. (2016) and O'Connor (2020), calculated as the Herfindahl-Hirschman Index, which ranges between 0 and 1 and takes greater values as the number of groups increases or size of groups equalize.

[10] MIPEX measures policies that promote immigrant integration across eight policy areas and 58 indicators. For details, see Solano and Huddleston (2020).

The large number of explanatory variables and small sample size presents a problem for interpretation.[11] Although each variable is plausibly related to the immigrant-native life satisfaction differences, several have overlapping concepts (e.g., healthy life expectancy and public health expenditures). As it is not clear beforehand which are most important, we utilize a backward stepwise regression technique in which all regressors are initially used and then through a stepwise procedure, the regressor with the highest p-value is dropped and the regression rerun (Afifi et al. 2012; Efroymson, 1960). The steps proceed, dropping regressors until each has a p-value of no more than 0.33. Using this approach, we identify the most important explanatory variables and improve their interpretability. We also conduct some sensitivity analysis as discussed in the results section, including a stepwise procedure that drops variables based on their magnitude.

We use weights in this analysis to account for the fact that the proportion of immigrant students differs substantially across countries, specifically analytical weights that are equal to the share of the immigrant population aged 15-19 in each host country. Thus, countries like Ireland, Luxembourg, and Switzerland have a greater influence on the results than countries with small population shares (e.g., Brazil, Indonesia, and the Philippines).

4. Results

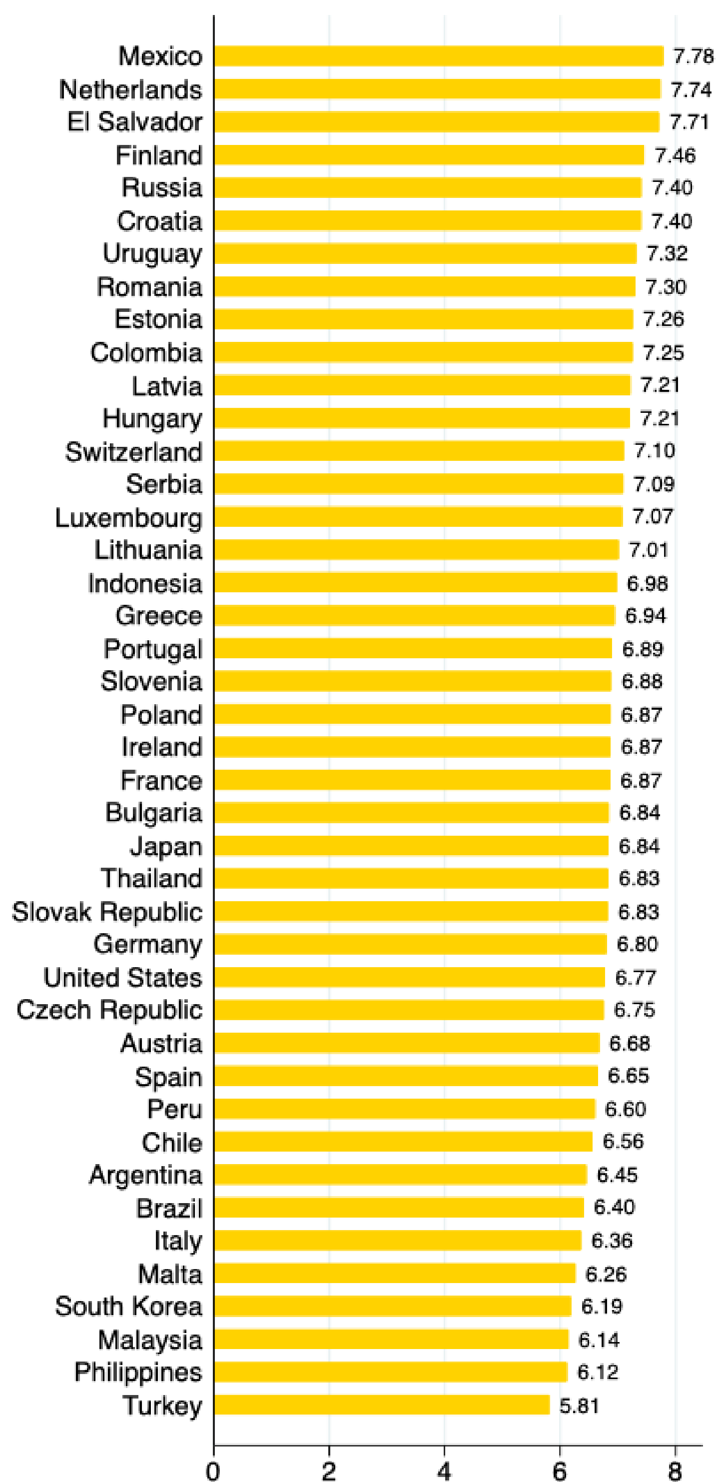
Around the world there is a significant amount of variation in the life satisfaction of immigrant adolescents (as presented in Figure 1), with three countries reporting more than 7.5, while several others report more than a point lower. Turkey scores the lowest at 5.81.

This variation in immigrant adolescents' life satisfaction could be driven by country conditions affecting all immigrants or adolescents; indeed both likely affect the outcome. For instance, El Salvador's general population does not rank nearly as highly (Helliwell et al., 2025) as their immigrant adolescents (Figure 1), suggesting there is something specific to immigrants' or adolescents' experience there. On the other hand, Turkey's general population and immigrant adolescents' ranks are more consistent.[12] The immigrant-native difference accounts for the shared country experiences and narrows in on the differences felt specifically by immigrant adolescents.

[11] Note that other potentially relevant macro-conditions are not included because of insufficient cross-national coverage.

[12] Rank comparison is imprecise as there are few sources of SWB data around the world. The World Happiness Report is one of the best, but uses a different metric of SWB and larger sample of countries. We also drew from the most recent year.

Figure 1 Average life satisfaction (0-10) of immigrant adolescents in 42 countries (2015-2022)



Source: Authors' calculations. PISA 2015, 2018, 2022.

We find immigrant 15-year-olds report an average 0.24 life satisfaction points fewer than their native peers using our preferred specification (presented in Table 1, column 4).[13] This gap is sizable, equivalent to about half that of being female. The magnitude is quite stable after including sampling weights (column 2)[14] and the first set of controls (column 3: gender, relative age, and socio-economic and cultural status). All regressions account for year and school fixed effects, which capture several important influences, i.e., all factors common to the school, including but not limited to the country context.

0.24 represents the average conditional difference in life satisfaction among immigrants and native adolescents across our sample of 42 countries. In the next section we allow the difference to vary and explain the variance across countries.

Table 1 Estimation of the Immigrant-Native Life Satisfaction Difference

	(1)	(2)	(3)	(4)
Immigrant	-0.295***	-0.261***	-0.243***	-0.243***
	(0.052)	(0.041)	(0.050)	(0.050)
Rel. Age			-0.005**	-0.005**
			(0.002)	(0.002)
Female			-0.486***	-0.486***
			(0.052)	(0.052)
Socioecon. & Cult. Status			0.124***	0.124***
			(0.029)	(0.029)
Mode: Computer				-0.196
				(0.126)
Constant	7.468***	7.508***	7.842***	8.036***
	(0.025)	(0.034)	(0.062)	(0.125)
School and Year Effects	yes	yes	yes	yes
Total Obs.	754587	754587	754587	754587
Adj. R Sq.	0.047	0.066	0.077	0.077
# of countries	42	42	42	42

Dependent variable: life satisfaction. Columns 2 – 5 utilize population weights. Clustered standard errors in parentheses (by country). Source: Authors' calculations
* p<0.10 ** p<0.05 *** p<0.01

[13] Tang (2019) and Wang (2021) estimated similar differences using PISA 2015 and 2018, respectively. Tang (2019) obtained -0.216 with similar controls in a sample of 48 countries (Table 5). Wang (2021) obtained estimates ranging from -0.122 to -0.077 (Table 2) on an augmented scale from 1 to 4 (with 3 steps) – meaning the magnitudes should be multiplied by 3.3 to approximate the magnitudes on a 0 to 10 scale (which has 10 steps). Kern et al (2020) also find immigrant adolescents report 0.21 points lower on the Cantril Ladder scaled 0-10 (Table 1), using the 2017-18 wave of the Health Behaviour in School-aged Children survey in 33 countries.

[14] The approximately 10 percent decline in magnitude from column 1 to 2 indicates the importance of including sampling weights, which has not always been done in previous literature.

4.1. Immigrant-Native Life Satisfaction Differences by Country

As presented in Figure 2, the life satisfaction differences vary significantly across countries. Indeed, seven countries report positive differences in which the immigrants report higher life satisfaction than the natives. On the other hand, 35 countries have negative differences, of which six are at least double the average (which is -0.24, Table 1, column 4). These differences represent important sources of inequality. The differences are not explained by immigrant life satisfaction alone (Figure 1), as the differences are uncorrelated with immigrant life satisfaction levels when accounting for country weights (based on youth (15-19) immigrant population shares).

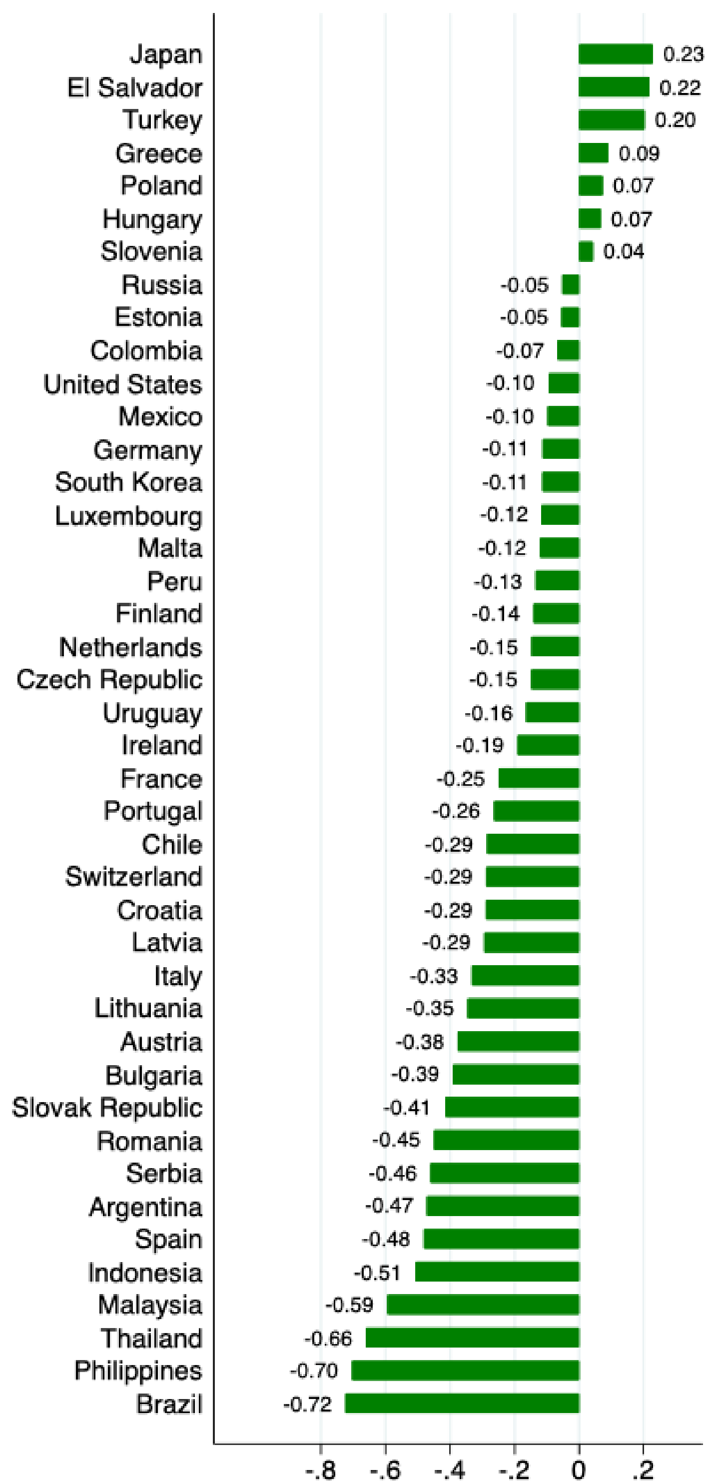
Japan, El Salvador, and Turkey stand out with differences that are positive and fairly large. These differences might be viewed as unimportant due to the small number of immigrants residing in those in countries. Indeed, they generally have a small share, especially El Salvador, which has a youth (15-19) immigrant population share that is less than 1.0 percent (Appendix Table A3). It is for this reason that we include country weights as discussed above – to emphasize the experiences of countries with larger adolescent immigrant population shares. Nonetheless, not all countries with positive differences have small immigrant shares – Greece, Hungary, Slovenia, and Turkey have youth immigrant shares that are closer to 6 percent (above average), and the bivariate correlation between the life satisfaction differences and adolescent immigrant population shares is insignificant.

The main results, presented in Table 2, indicate that more than 60% of the immigrant-native life satisfaction difference can be explained using national characteristics (the R-squared exceeds 0.60). This is a significant portion, generally more than that which is explained using micro variables.

Ten of 17 explanatory variables are retained with p-values less than 0.33 following the stepwise elimination procedure. Ln GDP per capita and government delivery are positively related to the immigrant-native life satisfaction difference; meaning, for instance, that countries with greater GDP per capita tend to have greater immigrant adolescent life satisfaction relative to natives. Somewhat surprising are the negative coefficients on immigrant population share and immigrant diversity – immigrant adolescents fare relatively worse in countries with more, and more diverse, immigrants. Better health – in the form of healthy life expectancy and government expenditures on health – is also negatively correlated, however, their relations are not always robust, as discussed below. Two of the culture variables have statistically significant and positive relations, Individualism and Uncertainty Avoidance.

Seven explanatory variables were dropped as conditionally unimportant – Globalization; three economic variables: Unemployment, GDP pc growth, and Income inequality (Gini); and three cultural dimensions: Long-Term Orientation, Masculinity, and Power Distance. The economics variables are also somewhat surprisingly insignificant for the reasons mentioned in Section 2.

Figure 2 Conditional difference in immigrant and native adolescent life satisfaction in 42 countries (2015-2022)



Source: Authors' calculations and PISA 2015, 2018, 2022.

Table 2 Regressions of immigrant-native life satisfaction differences (β_c) on country-level characteristics

	(1) Coef.	(2) Coef.	(3) Coef.	(4) Coef.	(5) Coef.	(6) Coef.	(7) Coef.	(8) Coef.	(9)[a] Std. Coef.
ln(GDP pc)	0.594***	0.594***	0.588***	0.580***	0.571***	0.575***	0.560***	0.565***	1.550***
	(0.003)	(0.003)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Gov. Delivery	0.162*	0.160*	0.162*	0.163*	0.147*	0.128*	0.138*	0.124*	0.484*
	(0.086)	(0.085)	(0.090)	(0.074)	(0.079)	(0.075)	(0.064)	(0.078)	
Healthy Life Exp.	-0.037**	-0.037**	-0.037**	-0.038**	-0.034**	-0.034**	-0.035**	-0.036**	-0.428**
	(0.032)	(0.028)	(0.025)	(0.025)	(0.019)	(0.021)	(0.014)	(0.014)	
Healh Exp.	-0.042	-0.042	-0.042	-0.042	-0.041*	-0.039*	-0.040*	-0.034*	-0.318*
	(0.142)	(0.134)	(0.128)	(0.100)	(0.091)	(0.091)	(0.075)	(0.093)	
Immig. Diversity	-1.185**	-1.184**	-1.176**	-1.163***	-1.163***	-1.149***	-1.163***	-1.237***	-0.728***
	(0.028)	(0.025)	(0.016)	(0.008)	(0.006)	(0.008)	(0.007)	(0.003)	
Immig. Share (%)	-0.020***	-0.020***	-0.020***	-0.020***	-0.019***	-0.019***	-0.018***	-0.017***	-1.208***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Individualism (HOF)	0.004	0.004	0.004*	0.004*	0.004*	0.004*	0.004*	0.005**	0.471**
	(0.101)	(0.101)	(0.099)	(0.094)	(0.086)	(0.081)	(0.054)	(0.036)	
Uncertain. Avoid. (HOF)	0.010***	0.010***	0.010***	0.010***	0.011***	0.010***	0.011***	0.012***	1.234***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Indulgence (HOF)	0.005*	0.005*	0.005*	0.005*	0.004*	0.005*	0.004	0.003	0.286
	(0.083)	(0.075)	(0.070)	(0.075)	(0.078)	(0.060)	(0.130)	(0.160)	
Old Age Dep.	0.002	0.002	0.001	0.001	0.001	0.002	0.002	-0.001	-0.052
	(0.875)	(0.872)	(0.884)	(0.878)	(0.878)	(0.845)	(0.839)	(0.880)	
Globalization	-0.007	-0.007	-0.007	-0.007	-0.006	-0.006	-0.005		
	(0.299)	(0.285)	(0.233)	(0.154)	(0.246)	(0.301)	(0.384)		
LT Orientation (HOF)	0.001	0.001	0.001	0.002	0.001	0.001			
	(0.442)	(0.432)	(0.415)	(0.217)	(0.377)	(0.356)			
Masculinity (HOF)	0.001	0.001	0.001	0.001	0.001				
	(0.489)	(0.532)	(0.539)	(0.535)	(0.548)				
Unemployment	0.004	0.004	0.004	0.004					
	(0.688)	(0.682)	(0.675)	(0.671)					
GDP pc Growth	-0.084	-0.088	-0.103						
	(0.927)	(0.920)	(0.905)						
Gini	0.001	0.001							
	(0.936)	(0.933)							
Power Distance (HOF)	0.000								
	(0.962)								
Constant	-3.549*	-3.539*	-3.434*	-3.340**	-3.510***	-3.606***	-3.383***	-3.716***	
	(0.098)	(0.087)	(0.058)	(0.019)	(0.009)	(0.006)	(0.007)	(0.004)	
Total Obs.	42	42	42	42	42	42	42	42	
R Sq.	0.645	0.645	0.645	0.645	0.641	0.637	0.629	0.620	
Adj. R Sq.	0.393	0.417	0.440	0.460	0.474	0.487	0.494	0.497	
Max VIF	22.374	22.374	18.687	14.222	14.045	14.007	13.779	13.753	
Max VIF Var.	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	

a. Column 9 presents standardized beta coefficients.
Weighted by the immigrant 15–19-year-old share of the total 15–19-year-old population.
Source: Authors' calculations.
Robust p-values in parentheses. * p<0.10 ** p<0.05 *** p<0.01

To ease magnitude comparisons, column 9 presents the standardized coefficients. For instance, countries with one standard deviation greater Uncertainty Avoidance are associated with 1.23 standard deviations greater immigrant life satisfaction compared to natives. 1.23 standard deviations is quite large, considering that the standard deviation of the immigrant-native life satisfaction difference is slightly larger than the mean (0.22 compared to -0.18, as presented in Appendix Table A2). Thus, countries with 0.8 ($\simeq$ 1/1.23) standard deviations greater Uncertainty Avoidance experience approximately no difference in immigrant-native life satisfaction (ceteris paribus). 0.8 standard deviations greater Uncertainty Avoidance is approximately 16.2 points

(0.8*20.26), which is similar to moving from the mean of 65.40 to Mexico, which has a score of 82. The largest magnitude is on ln GDP per capita (GDP for short), followed by the immigrant share of the total population, however, multicollinearity is a risk that particularly affects GDP.

Some caution should be exercised when interpreting the results. There exists notable multicollinearity in addition to the normal limitations that apply to cross-sectional results. GDP, Government Delivery, and Immigrant Population Share, while clearly representing different phenomena, are all approximately 80% correlated (correlations available upon request). To assess the severity of multicollinearity, the maximum variance inflation factor (VIF) is presented at the bottom of each column in Table 2 along with the connected variable (GDP, in each case). While the VIF declines as variables are dropped, it remains above the commonly applied threshold of 10 for reliable interpretation. In some of the sensitivity tests that follow, the VIF declines below 10.

As mentioned above, migration integration policies are in theory another likely candidate for explaining the immigrant-native differences, but could not be included in the main analysis due to sample coverage. Better integration policies should make it easier for the parents of adolescent immigrants to get jobs and government services, and generally improve quality of life for both parents and adolescents, especially as children's well-being is related to parents' (Augustijn, 2022). However, previous empirical research has shown no relationship between the commonly used Migrant integration policy Index (MIPEX) and life satisfaction (Hendriks & Bartram, 2016; Kogan et al. 2018). Indeed, there is little positive influence visible in the raw data. As presented in Figure 3, countries with better integration policies do not have better immigrant-native life satisfaction differences. If anything, the raw relation is negative, however, it could be due to important omitted variables.

Figure 3 Relation between Immigrant-Native Life Satisfaction Difference and Migration Integration Policies (2015-2022)

The line of best fit regression yields an insignificant relation on MIPEX and an R-squared of approximately 0.01, using a sample of 35 countries, because 7 do not have MIPEX data, specifically: Colombia, El Salvador, Malaysia, Peru, Philippines, Thailand, Uruguay. Source: Authors' calculations and PISA & MIPEX.

To assess the robustness of our results, we conduct three sensitivity tests, beginning with the specification from Table 2 column 8 and dropping one explanatory variable at a time. Second, we added MIPEX as an additional regressor. The last test replicates the main analysis using stepwise regression but with a decision rule based on magnitude.

The results of the first two tests are presented in Table 3. Overall, the first test indicates that the relations are sensitive to the inclusion of different explanatory variables – the magnitudes and significance change on certain variables – however there are some consistent results across specifications. The second test yields results that are similar to the baseline, indicating that adding migration policies has little impact.

The sensitivity results reveal Uncertainty Avoidance to be the most important and reliably significant variable (presented in Table 3). Dropping Uncertainty Avoidance (column 10) reduces the adjusted R-squared to practically nil and meaningfully affects the magnitude and significance of nearly all of the other explanatory variables. It also maintains a similar and statistically significant magnitude throughout the specifications (including when the VIF drops below 10). Uncertainty Avoidance, as the name implies, refers to macrosystem norms (Bronfenbrenner, 1979) connected with a cultural orientation towards certainty in formal and informal settings. It is plausible that immigrants will generally be able to assimilate easier in countries with greater Uncertainty Avoidance, i.e., places where rules are set and can be followed.

Table 3 Sensitivity Tests: Regressions of Immigrant-Native Life Satisfaction Differences on Various Explanatory Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ln(GDP pc)	0.565***		0.636***	0.499***	0.508***	0.572***	0.387**	0.158	0.706***	0.458**	0.506***	0.661***
	(0.000)		(0.000)	(0.001)	(0.000)	(0.000)	(0.037)	(0.212)	(0.000)	(0.023)	(0.000)	(0.000)
Gov. Delivery	0.124*	0.212***		0.095	0.092	0.117**	0.086	0.066	0.072	-0.140	0.171***	0.137*
	(0.078)	(0.005)		(0.194)	(0.225)	(0.029)	(0.270)	(0.422)	(0.342)	(0.111)	(0.002)	(0.094)
Healthy Life Exp.	-0.036**	-0.023	-0.031**		-0.032**	-0.037***	-0.041*	-0.038**	-0.043**	-0.018	-0.026*	-0.039**
	(0.014)	(0.281)	(0.036)		(0.040)	(0.003)	(0.090)	(0.038)	(0.011)	(0.426)	(0.056)	(0.028)
Healh Exp.	-0.034*	-0.020	-0.028	-0.029		-0.035*	-0.028	-0.008	-0.026	-0.008	-0.029	-0.037
	(0.093)	(0.396)	(0.171)	(0.213)		(0.085)	(0.277)	(0.706)	(0.195)	(0.745)	(0.114)	(0.109)
Old Age Dep.	-0.001	-0.006	0.003	-0.007	-0.005		-0.001	0.003	0.004	0.014	-0.008	-0.001
	(0.880)	(0.522)	(0.691)	(0.394)	(0.653)		(0.906)	(0.786)	(0.631)	(0.230)	(0.189)	(0.939)
Immig. Diversity	-1.237***	-0.987***	-1.193**	-1.273***	-1.203***	-1.237***		-0.942**	-1.071**	-0.777	-1.177***	-1.307**
	(0.003)	(0.007)	(0.013)	(0.003)	(0.008)	(0.004)		(0.040)	(0.018)	(0.172)	(0.002)	(0.010)
Immig. Share (%)	-0.017***	-0.004	-0.016***	-0.018***	-0.014***	-0.017***	-0.011**		-0.018***	-0.006	-0.017***	-0.020***
	(0.000)	(0.236)	(0.000)	(0.000)	(0.000)	(0.000)	(0.030)		(0.000)	(0.261)	(0.000)	(0.000)
Individualism (HOF)	0.005**	0.008***	0.004*	0.006**	0.004*	0.005***	0.002	0.005*		-0.000	0.005**	0.005**
	(0.036)	(0.001)	(0.074)	(0.014)	(0.097)	(0.008)	(0.540)	(0.070)		(0.878)	(0.011)	(0.046)
Uncertain. Avoid. (HOF)	0.012***	0.011***	0.010***	0.011***	0.011***	0.012***	0.009***	0.008***	0.010***		0.012***	0.013***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)		(0.000)	(0.000)
Indulgence (HOF)	0.003	0.001	0.005**	0.002	0.003	0.004**	0.002	0.003	0.004*	0.004		0.003
	(0.160)	(0.575)	(0.023)	(0.450)	(0.291)	(0.017)	(0.511)	(0.198)	(0.057)	(0.159)		(0.229)
MIPEX												-0.000
												(0.976)
Constant	-3.716***	1.076	-4.744***	-5.194***	-3.393***	-3.707***	-2.131	0.345	-4.684***	-3.547	-3.568***	-4.562***
	(0.004)	(0.399)	(0.000)	(0.000)	(0.003)	(0.004)	(0.211)	(0.756)	(0.001)	(0.102)	(0.006)	(0.004)
R Sq.	0.620	0.445	0.589	0.562	0.577	0.619	0.347	0.454	0.558	0.258	0.588	0.558
Adj. R Sq.	0.497	0.289	0.473	0.438	0.458	0.512	0.164	0.300	0.434	0.050	0.472	0.346
Total Obs.	42	42	42	42	42	42	42	42	42	42	42	35
Max VIF	13.753	6.900	12.540	13.181	13.186	13.151	12.876	7.256	11.327	13.511	12.913	16.944
Max VIF Var.	ln(GDP pc)	Gov. Delivery	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	Gov. Delivery	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)	ln(GDP pc)

Column 1 repeats Table 2, column 8. Weighted by the immigrant 15–19-year-old share of the total 15–19-year-old population.
Source: Authors' calculations.
Robust p-values in parentheses. * p<0.10 ** p<0.05 *** p<0.01

Immigrant diversity has the next most reliable relation (only losing significance when Uncertainty Avoidance is dropped). This macrosystem demographic condition may create either opportunity or perceived threat, shaping integration experiences. The magnitude drops somewhat when the VIF drops below 10 (columns 2 and 8), though is still meaningful as it was one of the largest in Table 2 column 9. GDP per capita is possibly the next most important variable. It only loses significance when Immigrant Share is dropped (column 8), however, only in this regression is the VIF below 10 when GDP is included. Some caution should still be exhibited when interpreting the relations for GDP.

Individualism is fairly reliable, maintaining significance and magnitude in both cases when the VIF drops below 10, and only losing significance when either Uncertainty Avoidance or Diversity is dropped. Immigrant population share and Healthy Life Expectancy are somewhat similar – losing significance when either Uncertainty Avoidance or GDP is dropped. Government Delivery is not very robust and highly correlated to GDP and Immigrant Share. Health Expenditure (% of GDP), the old age dependency ratio, and Indulgence are mostly insignificant – they also previously had the smallest magnitudes (Table 2, column 9).

The third sensitivity test changes the decision rule from one based on statistical significance to magnitude or effect size, recognizing the limitations of statistical significance. In this test we begin with a regression of the immigrant-native life satisfaction difference on the full set of explanatory variables and then sequentially drop the variable with the lowest magnitude (standardized regression coefficient), rerun with the reduced set of variables, and repeat until all variables have a magnitude of at least 0.2, which is considered the minimum for a small effect (Cohen 1969). As shown in Appendix Table A4, the results are quite consistent with the baseline results in Table 2 (compare Appendix Table A4 col. 9 with Table 2 col. 9). The order in which variables are dropped differs, but the set of retained variables are nearly the same. The only difference is that the old-age dependency ratio is dropped due to a small magnitude.[15] The statistically significant variables from Table 2 match those from Appendix Table A4 with quite similar magnitudes.

5. Conclusions

Around the world immigrant (foreign-born) adolescents tend to have worse outcomes compared to their native peers. This translates into undesirable inequality that can be summarized by the gap in immigrant compared to native life satisfaction (a form of evaluative SWB). Specifically, we find immigrant adolescents (15 years old) report on average 0.24 life satisfaction points (0-10 scale) less than natives (conditional on a limited number of controls) using data from the 2015, 2018, and 2022 waves of PISA. Not all countries exhibit such a gap however. Seven of our 42 sample countries show positive differences in which the immigrant adolescents report greater life satisfaction than their native peers. This result is striking – in numerous countries, immigrants do not necessarily experience less family affluence, worse school-related experiences, or other negative influences that have been used to (partially) explain the life satisfaction gap in previous studies (e.g., Tang, 2019; Wang 2021; Stevens et al., 2025; Delaruelle et al., 2021). Or if they do,

[15] This difference from the main analysis is mechanical. In the main analysis the old-age dependency ratio and health expenditures were treated together using joint statistical significance. That is not possible when using a decision rule based on magnitude. While theoretically it is important to include the old-age dependency ratio, practically, dropping it has little impact.

then these negative influences are being offset by positive influences. What then explains the immigrant-native gap in adolescent life satisfaction across countries?

This study is, to the best of our knowledge, the first to explicitly examine how macro-level conditions of host countries explain the adolescent immigrant-native life satisfaction gap. Across 42 countries we find 60 percent of the difference in life satisfaction between immigrant and native adolescents can be explained using national characteristics. This is a larger share of the gap than some studies explain using micro characteristics (e.g., Tang 2019[16]). From an ecological perspective (Bronfenbrenner, 1979), these results show that macrosystem features can either buffer or exacerbate the challenges immigrant adolescents face at the micro- and meso-level.

The most important of a battery of 18 explanatory variables is the cultural dimension "Uncertainty Avoidance". Countries with a one standard deviation greater Uncertainty Avoidance have an immigrant-native life satisfaction difference that is positive, meaning in these countries, adolescent immigrants are more satisfied than their native peers. This result is intuitively plausible. While all societies have mechanisms to reduce uncertainty, from religion to savings, countries characterized by high Uncertainty Avoidance prefer greater certainty in both formal and informal settings. For immigrants, this certainty reduces ambiguity and likely makes it easier to integrate. Ambiguity may be more difficult to navigate when less familiar with the social norms.

We also find immigrant adolescents experience lower life satisfaction relative to natives in countries with a greater share of immigrants and in countries that have more diverse immigrants (based on country of origin). This finding suggests that the negative mechanisms affecting immigrants and connected to larger immigrant populations, such as ethnic segregation and tension, and increased competition in disadvantaged economic conditions, outweigh the positive mechanisms, such as bridging social capital (Blalock, 1967). Similarly, it confirms previous findings that ethnic diversity does not improve the life satisfaction of immigrant populations (Akdede & Giovanis, 2022; Longhi, 2014), and actually, may disproportionally reduce their well-being due to, for instance, ethnic tensions, reduced interpersonal trust, and anti-immigration sentiment (Putnam, 2007). Greater diversity also implies that migrants from any given country constitute a smaller share of the overall immigrant population, which can reduce opportunities to form meaningful social networks within one's own ethnic group at school and elsewhere, ultimately leading to a lower sense of belonging.

Another consistent driver is institutional quality – immigrant adolescents in countries with lower institutional quality fare relatively worse. A likely explanation for this finding is that lower institutional quality is particularly harmful to vulnerable populations, such as immigrants, as it protects them less against discrimination and corruption that favours non-vulnerable groups (Delaruelle et al., 2021).

Economic factors contribute surprisingly little to the gap. GDP growth, the unemployment rate, and income inequality were dropped as insignificant. Only the natural log of GDP per capita contributes to the explanation, and the magnitude is difficult to interpret due its high correlation with other explanatory factors, such as the immigrant share. This may be explained either by competing mechanisms, as discussed in our conceptual framework, that balance each other out, or by the absence of any mechanism with a substantial impact. Migration integration policies (MIPEX) also do not meaningfully explain the gap, which though surprising, is consistent with

[16] Wang (2011) explains the gap in life satisfaction, rendering it statistically insignificant, but uses another measure of SWB, happiness, which we argue is less informative due to the close nature of happiness and life satisfaction and common methods variance.

previous findings that integration policies have not been effective for increasing immigrants' life satisfaction (Hendriks & Bartram, 2016; Kogan et al., 2018).

As ever, data constraints pose limitations. The cross-sectional analysis is exploratory in nature and we caution against making causal inferences. While we assess a battery of country characteristics, the list of characteristics is necessarily not exhaustive. Also, many of the characteristics have overlapping concepts or are otherwise strongly correlated. Yet, the results nonetheless illuminate holes in our previous understanding and point towards new research questions. For instance, why does culture play a larger role in adolescent immigrants' experience than economic factors, especially given the past focus on economics factors in determining emigrants' destination choices (Grimes & Wesselbaum, 2019).

It is desirable to improve the well-being of adolescents per se, and because adolescent SWB is among the strongest predictors of adult SWB, which in turn predicts numerous positive outcomes (Tay et al., 2015). Relatedly, inequality is often perceived as unfair and undesirable (Oishi et al., 2011; Clark & d'Ambrosio, 2015), and relative deprivation (inequality) felt by immigrants can exacerbate challenges of integration. For these reasons, it is important to analyse both the levels of life satisfaction and its distribution (including gaps). Improving life satisfaction without regard for its distribution does not necessarily reduce life satisfaction inequality. For instance, immigrant and native life satisfaction could increase at unequal rates, and thereby reduce or exacerbate the life satisfaction gap. In the present analysis, among adolescents, average immigrant life satisfaction is uncorrelated with the immigrant-native life satisfaction gap across countries – meaning, the immigrant-native life satisfaction requires particular attention.

We find culture may be the most important explanatory factor of the immigrant-native life satisfaction gap among adolescents – more important than economic factors and migration integration policies. Although we cannot draw many policy implications, we can say country characteristics matter a great deal. Policy makers interested in reducing the inequality between immigrant and native adolescents should be interested in their national characteristics, just as they are interested in school-level issues.

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Appendix

Table A1 Micro sample characteristics, unweighted student observations by country and year. Weighted observations and life satisfaction by nativity (2015-2022).

	Unweighted Observations				Weighted Observations		Life Satisfaction	
	2015	**2018**	**2022**	**Total**	**Native**	**Foreign-Born**	**Native**	**Foreign-Born**
Argentina		10,427	11,042	21,469	994,601	27,477	7.01	6.45
Austria	6,850	6,439	5,869	19,158	193,837	20,455	7.17	6.68
Brazil	19,625	8,731	9,460	37,816	5,668,951	35,136	7.17	6.40
Bulgaria	5,435	4,434	5,527	15,396	134,243	2,922	7.23	6.84
Chile	6,780	6,883	5,423	19,086	537,600	22,641	6.95	6.56
Colombia	11,136	6,620	7,139	24,895	1,483,632	36,917	7.49	7.25
Croatia	5,608	6,367	5,932	17,907	104,417	3,144	7.66	7.40
Czech Republic	6,663	6,606	8,018	21,287	249,781	7,020	6.85	6.75
El Salvador			6,149	6,149	61,694	727	7.40	7.71
Estonia	5,449	5,108	6,226	16,783	33,793	768	7.20	7.26
Finland	5,740	5,388	9,617	20,745	157,222	7,820	7.65	7.46
France	5,799	5,838	6,334	17,971	2,017,499	134,063	7.22	6.87
Germany	5,483	4,310	5,137	14,930	1,636,360	122,628	6.98	6.80
Greece	5,349	6,070	6,207	17,626	265,129	12,442	6.83	6.94
Hungary	5,515	4,944	5,892	16,351	244,667	4,254	7.17	7.21
Indonesia		11,290	13,069	24,359	7,041,357	39,184	7.34	6.98
Ireland	5,458	5,333		10,791	95,752	17,481	7.05	6.87
Italy	11,148	10,872	10,283	32,303	1,362,495	79,162	6.80	6.36
Japan	6,435	5,988	5,642	18,065	3,132,912	28,106	6.58	6.84
Latvia	4,751	5,050		9,801	29,584	539	7.27	7.21
Lithuania	6,173	6,429	6,854	19,456	72,789	1,396	7.54	7.01
Luxembourg	5,081	4,862		9,943	7,803	2,596	7.26	7.07
Malaysia		5,772	6,643	12,415	724,814	7,534	6.86	6.14
Malta		3,097	2,851	5,948	6,440	740	6.41	6.26
Mexico	7,339	5,884	5,987	19,210	3,721,294	106,428	7.88	7.78
Netherlands	5,038			5,038	173,062	6,332	7.83	7.74
Peru	6,640	4,902	6,101	17,643	1,163,945	18,423	7.07	6.60
Philippines		6,126	6,653	12,779	2,786,025	54,153	7.13	6.12
Poland	4,393	5,415	5,756	15,564	955,812	15,977	6.73	6.87
Portugal	7,135	5,521	6,581	19,237	260,184	19,107	7.21	6.89
Romania		4,720	7,129	11,849	282,720	11,295	7.72	7.30
Russia	5,679	7,167		12,846	2,159,800	82,196	7.54	7.40
Serbia		5,910	6,210	12,120	109,945	2,599	7.55	7.09
Slovak Republic	6,042	5,516	5,454	17,012	128,840	3,093	7.25	6.83
Slovenia	6,116	6,000	6,267	18,383	47,496	2,869	6.87	6.88
South Korea		6,568	6,337	12,905	859,866	8,085	6.44	6.19
Spain	6,550	33,926	29,033	69,509	1,094,073	110,227	7.28	6.65
Switzerland	5,681	5,387	6,296	17,364	185,240	30,131	7.44	7.10
Thailand		8,302	8,309	16,611	1,135,168	9,101	7.39	6.83
Turkey	5,653	6,606	7,170	19,429	2,623,898	35,494	5.54	5.81
United States	5,387	4,562		9,949	6,150,595	520,266	7.08	6.77
Uruguay	5,718	4,571	6,200	16,489	106,052	2,706	7.42	7.32
Total	**211,849**	**273,941**	**268,797**	**754,587**	**50,201,387**	**1,653,634**	**7.15**	**6.89**

Source: PISA

Table A2 Macro Summary Statistics (Weighted) and Variable Sources

	Obs	Mean	Std. Dev.	Min	Max	Source
F.B. Life Sat.	42	6.75	0.41	5.81	7.78	PISA (OECD 2025)
Native Life Sat.	42	7.04	0.47	5.54	7.88	PISA (OECD 2025)
LS Gap (FB-N)	42	-0.18	0.22	-0.72	0.23	Estimate
ln(GDP pc)	42	10.77	0.43	9.07	11.79	World Bank 2025a
GDP pc Growth	42	0.02	0.02	0.00	0.15	World Bank 2025a
Gini	42	35.84	4.42	23.37	47.60	Solt 2019
Unemployment	42	6.25	3.87	0.77	18.86	World Bank 2025a
Gov. Delivery	42	0.85	0.79	-0.76	1.97	World Bank 2025b
Healthy Life Exp.	42	67.45	2.57	61.40	73.36	WHO 2025
Healh Exp.	42	6.50	2.45	1.32	9.01	World Bank 2025a
Old Age Dep.	42	24.15	7.93	6.82	47.56	World Bank 2025a
MIPEX	35	59.69	16.31	28.00	86.00	Solano & Huddleston
Globalization	42	76.02	7.18	57.36	90.50	Gygli et al. 2019
Immig. Diversity	42	0.87	0.11	0.40	0.95	UN 2025
Immig. Share (%)	42	11.82	5.69	0.10	46.22	UN 2025
Immig. 15-19 Share (%)	42	7.34	3.39	0.12	28.81	UN 2025
Power Distance (HOF)	42	54.36	20.30	11.00	104.00	Hofstede 2025a
Individualism (HOF)	42	64.17	25.83	13.00	91.00	Hofstede 2025a
Masculinity (HOF)	42	55.28	14.27	9.00	110.00	Hofstede 2025a
Uncertain. Avoid. (HOF)	42	65.40	20.26	35.00	112.00	Hofstede 2025a
LT Orientation (HOF)	42	44.87	22.18	13.10	100.00	Hofstede 2025a
Indulgence (HOF)	42	54.05	17.34	12.95	97.32	Hofstede 2025a

Statistics weighted by youth (15-19) immigrant (foreign-born) share of the total youth population. Source: labelled in table

Table A3 Select Macro Data by Country (2015-2022)

	F.B. Life Sat.	LS Gap (FB-N)	Immig. Share (%)	Immig. 15-19 Share (%)
Argentina	6.45	-0.47	4.25	2.94
Austria	6.68	-0.38	19.87	12.90
Brazil	6.40	-0.72	0.45	0.22
Bulgaria	6.84	-0.39	2.55	1.56
Chile	6.56	-0.29	5.66	2.66
Colombia	7.25	-0.07	2.54	1.02
Croatia	7.40	-0.29	13.59	6.22
Czech Republic	6.75	-0.15	6.98	3.01
El Salvador	7.71	0.22	0.68	0.31
Estonia	7.26	-0.05	14.88	2.72
Finland	7.46	-0.14	6.78	5.42
France	6.87	-0.25	12.50	6.70
Germany	6.80	-0.11	17.14	7.62
Greece	6.94	0.09	12.29	6.26
Hungary	7.21	0.07	5.66	3.57
Indonesia	6.98	-0.51	0.10	0.13
Ireland	6.87	-0.19	17.70	14.24
Italy	6.36	-0.33	9.91	9.09
Japan	6.84	0.23	2.36	1.60
Latvia	7.21	-0.29	13.19	1.62
Lithuania	7.01	-0.35	5.13	0.58
Luxembourg	7.07	-0.12	46.22	28.81
Malaysia	6.14	-0.59	11.05	6.65
Malta	6.26	-0.12	19.98	10.17
Mexico	7.78	-0.10	1.03	0.92
Netherlands	7.74	-0.15	12.55	6.43
Peru	6.60	-0.13	2.48	0.66
Philippines	6.12	-0.70	0.10	0.12
Poland	6.87	0.07	2.35	0.75
Portugal	6.89	-0.26	9.25	5.95
Romania	7.30	-0.45	1.72	1.81
Russia	7.40	-0.05	5.66	5.01
Serbia	7.09	-0.46	10.99	3.07
Slovak Republic	6.83	-0.41	3.85	1.15
Slovenia	6.88	0.04	12.73	6.61
South Korea	6.19	-0.11	3.00	0.91
Spain	6.65	-0.48	14.55	13.05
Switzerland	7.10	-0.29	29.69	17.28
Thailand	6.83	-0.66	4.17	3.56
Turkey	5.81	0.20	6.51	5.00
United States	6.77	-0.10	15.17	8.57
Uruguay	7.32	-0.16	3.05	1.70

Source: Authors’ calculations. PISA and UN

Table A4 Sensitivity Test – Step wise regressions of immigrant-native life satisfaction differences on country-level characteristics, presenting standardized beta coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(GDP pc)	1.457***	1.468***	1.468***	1.455***	1.444***	1.413***	1.556***	1.498***	1.549***
	(0.515)	(0.481)	(0.473)	(0.451)	(0.451)	(0.410)	(0.320)	(0.306)	(0.301)
Gov. Delivery	0.618*	0.615*	0.605*	0.589*	0.548*	0.577**	0.496**	0.547**	0.468**
	(0.330)	(0.341)	(0.330)	(0.320)	(0.296)	(0.264)	(0.200)	(0.211)	(0.187)
Healthy Life Exp.	-0.437**	-0.437**	-0.438**	-0.418**	-0.422**	-0.394**	-0.364***	-0.383***	-0.420***
	(0.205)	(0.201)	(0.197)	(0.175)	(0.179)	(0.143)	(0.131)	(0.135)	(0.128)
Healh Exp.	-0.391	-0.391	-0.392	-0.386	-0.374	-0.349	-0.371*	-0.377*	-0.355*
	(0.258)	(0.253)	(0.248)	(0.234)	(0.225)	(0.208)	(0.203)	(0.201)	(0.191)
Immig. Diversity	-0.662**	-0.665**	-0.665**	-0.663**	-0.647**	-0.657**	-0.703***	-0.712***	-0.748***
	(0.296)	(0.267)	(0.261)	(0.249)	(0.254)	(0.251)	(0.224)	(0.225)	(0.219)
Immig. Share (%)	-1.368***	-1.371***	-1.371***	-1.356***	-1.323***	-1.329***	-1.420***	-1.323***	-1.286***
	(0.366)	(0.352)	(0.344)	(0.330)	(0.329)	(0.327)	(0.303)	(0.296)	(0.276)
Individualism (HOF)	0.473**	0.472**	0.468**	0.475**	0.479**	0.507***	0.498***	0.535***	0.522***
	(0.216)	(0.221)	(0.217)	(0.221)	(0.219)	(0.177)	(0.169)	(0.155)	(0.155)
Uncertain. Avoid. (HOF)	1.161***	1.165***	1.163***	1.173***	1.148***	1.202***	1.178***	1.223***	1.274***
	(0.282)	(0.244)	(0.240)	(0.262)	(0.250)	(0.234)	(0.232)	(0.212)	(0.177)
Indulgence (HOF)	0.494**	0.494**	0.492**	0.477**	0.504**	0.458***	0.425***	0.340**	0.355***
	(0.221)	(0.216)	(0.210)	(0.189)	(0.195)	(0.141)	(0.137)	(0.129)	(0.126)
Globalization	-0.310	-0.305	-0.303	-0.294	-0.300	-0.257	-0.179	-0.129	
	(0.257)	(0.219)	(0.215)	(0.223)	(0.229)	(0.256)	(0.207)	(0.189)	
LT Orientation (HOF)	0.220	0.220	0.220	0.209	0.235	0.230	0.144		
	(0.167)	(0.162)	(0.161)	(0.171)	(0.183)	(0.190)	(0.127)		
GDP pc Growth	0.106	0.106	0.104	0.111	0.135	0.132			
	(0.172)	(0.168)	(0.162)	(0.152)	(0.159)	(0.164)			
Old Age Dep.	0.087	0.090	0.088	0.082	0.099				
	(0.362)	(0.363)	(0.348)	(0.343)	(0.340)				
Masculinity (HOF)	0.066	0.065	0.061	0.055					
	(0.113)	(0.122)	(0.132)	(0.117)					
Unemployment	0.041	0.039	0.039						
	(0.193)	(0.195)	(0.191)						
Power Distance (HOF)	0.018	0.017							
	(0.194)	(0.190)							
Gini	-0.009								
	(0.201)								
Constant	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.119)	(0.117)	(0.115)	(0.113)	(0.110)	(0.109)	(0.107)	(0.105)	(0.106)
Total Obs.	42	42	42	42	42	42	42	42	42
R Sq.	0.653	0.653	0.653	0.652	0.651	0.649	0.645	0.635	0.628
Adj. R Sq.	0.408	0.432	0.453	0.472	0.488	0.504	0.515	0.517	0.523
AIC	109.669	107.672	105.683	103.790	102.020	100.202	98.643	97.860	96.659
Max VIF	26.344	20.522	20.518	20.304	20.250	19.603	14.125	13.810	13.452

Weighted by the immigrant 15–19-year-old share of the total 15–19-year-old population.
Source: Authors' calculations.
Robust standard errors in parentheses. * p<0.10 ** p<0.05 *** p<0.01