

Dissecting the Gap in Life Satisfaction Between Native and Immigrant Adolescents: A Cross-Country Analysis Using PISA 2018

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Abstract

It is generally accepted by the scientific community that immigrants experience lower satisfaction compared to natives. Despite that, very few studies have looked thoroughly at the size and determinants of the life satisfaction differential at a cross-national level. This study is also the first to explore why country differences in the native-immigrant life satisfaction gap occur. This paper employs the PISA 2018 cross-sectional dataset, including observations for 470,558 adolescents in 70 different countries. Multilinear OLS regressions are applied to test the existence of the native-immigrant gap in life satisfaction. A Blinder-Oaxaca decomposition is used to explain this gap, whilst interacted multilinear regressions are employed to deconstruct the influence of the host country in 8 relevant political and cultural indicators. Main results confirm the negative life satisfaction gap between natives and migrants. They additionally show that factors such as wealth, school characteristics, and cognitive differences provide large explanatory power for the differential in satisfaction. The effects of country-level indicators on the gap are mixed and are rather different depending on the immigrant's home country development status. The findings invite scholars and researchers to delve deeper into cross-country analysis and commit to specific inquiry into each factor that explains differences in self-reported life satisfaction between migrants and natives. The findings have practical implications for education and policy-making.

Keywords: Life Satisfaction; Immigration Status; PISA 2018; Country-Level Indicators; Development.

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1.Introduction

Globalization has long been a nation-shaping phenomenon, to the extent that some may forget the key immigration component that goes into it. The 2022 World Migration report estimates that approximately one in thirty individuals is a migrant (McAuliffe & Triandafyllidou, [2022](#)). The number of immigrants more than doubled in 2020 compared to previous years. This trend is still going upwards. The most recent UNICEF data reports that in [2020](#), around 13% of all immigrants and half of asylum seekers were children and adolescents. Sociological concepts such as culture and communication have been drastically changed by immigration (Albrow et al., [1994](#)). Diversity has been shown to positively influence collaboration in the research field (Cheruvilil et al., [2014](#)) and immigrants on average display a higher predisposition towards entrepreneurship and success (Morelix et al., [2017](#)). Immigrants experience significant changes in life satisfaction when moving, and it is a rather contested matter whether this difference in life satisfaction changes with time (Hendriks, [2015](#)).

An enduring reality has been that immigrant status is associated with lower life satisfaction. Immigrants coming to Europe have to face severe cultural and social barriers (Heizmann & Böhnke,[2019](#)) as well as discrimination in the education system. These differences have rather important negative consequences on their job prospects, child-raising, and general happiness. (Heckman, [2008](#); Neto et al., [2011](#); Wang, [2018](#)). The quality of life of young individuals should plausibly influence success in later stages of life, and by extension and taking the large immigrant population into consideration, factors such as GDP, comparative advantage, and policy decisions. When analyzing the immigration phenomenon, it is informative to look at adolescents' quality of life because of their general ability to accurately self-report under the promise of anonymity. Despite some exceptions when it comes to weight and health (He et al., [2017](#)), sexual behavior (Clark et al., [1997](#)), and gambling (Ladoceur et al., [2000](#)), questionnaires addressed to adolescents are as reliable as those provided to adults, when referring to the possibility of intentionally misreporting (Lopez & Hillygus, [2018](#)). Other reasons to use adolescents in immigration studies include the broad availability of international datasets such as PISA 2018 and their predilection for emotional instability (Silk et al., [2003](#)). Attachment to geographical location is also documented to significantly influence a child's life satisfaction (Jack, [2010](#)).

This study aims to find the correlation link between immigration and self-reported life-satisfaction, explain its existence by employing a large set of relevant explanatory variables, and test if the native-migrant difference in life satisfaction changes based on country characteristics. The following research questions are formulated:

1. How do immigrant adolescents fare when compared to native adolescents in terms of life satisfaction?
2. What explains differences in life satisfaction between migrant and native adolescents?
3. Is the life-satisfaction gap moderated by different country characteristics?

The Program for International Student Assessment for the year 2018 (PISA 2018) will be used to test all three research questions. This dataset contains data on academic scores, detailed student questionnaires, and reliable indicators constructed by the OECD from 80 countries. The population of interest are adolescents aged 15 to 16 undergoing the PISA examination.

Yipeng Tang uses the 2015 version of this dataset to test differences separated by countries and generations in the life satisfaction of migrants (Tang, [2019](#)). Zi Wang employs the use of PISA 2018 to focus on the gaps in academic performance and subjective life satisfaction of immigrants for major destination countries (Wang, [2021](#)). These two studies are quite relevant for this paper, as before their publishing the study field for immigration using large scale survey data was rather barren. Both studies have shown that school and family factors can provide a good explanation for the large life satisfaction gap experienced by migrant children as well as explain this difference across generations and countries, but there remains a gap in both methodology, questions to be asked, and focus. Better understanding if, how, and why these immigrants are unhappier will open the doors towards more inclusive societies that more efficiently integrate strangers in a better-tuned economy.

Despite similar versions of the first research question having been tested before, even using the PISA datasets, the present study will use appropriate statistical weights obtained by PISA 2018 in order to make the sample representative for the worldwide immigrant population. Statistical weighting has not been used by either Tang or Wang, despite it being heavily emphasized by the PISA data analysis manual (OECD, [2009](#)) and independent authors (Jerrim et al., [2017](#)) for the provision of externally-valid and causal results. Furthermore, studies conducting general analyses have not used country-fixed effects in their comparisons. This

study will apply this additional layer of controlling to account for the tendency of immigrants to be clustered in happier countries.

In regards to the second research question, whilst the previously mentioned studies have analyzed potential explanations for the native-immigrant differential, the use of statistical weights is once again missing. Moreover, Wang is specifically focused on education while Tang uses an arbitrary set of controls with a very heavy emphasis on causal inference. This paper will employ the use of the Blinder-Oaxaca decomposition method to split the life satisfaction gap into an explained and unexplained component, based on 9 clusters of uncorrelated explanatory variables. The use of school and teacher characteristics such as the type of school and the teachers' behavior are notably absent from previous studies, despite existing relationships between these and a student's life satisfaction (Braun et al., [2020](#)). Differences in cognition and motivation are also important and seemingly missing from previous analysis despite their influence on life satisfaction and immigration (Te Nijenhuis et al., [2004](#)).

The third research question is the main contribution of this study. Eight country-level indices that have documented use in the academic world will be used to assess if the life satisfaction differential differs for different types of countries. These indices include Freedom, Children's Rights, Migrant Integration Policy, Income Inequality and 4 cultural differences, namely Power-Distance, Individualism, Masculinity, and Uncertainty Avoidance. Some of these indices have been previously used in analysis marginally relating to life satisfaction and immigration, but never in the manner exposed in this study (see sections [3.2](#) and [4.4](#) for a detailed description). Interacted terms of immigration and country characteristics will be used to assess if the gap in life satisfaction can be influenced by one country's policy, culture, freedom, and inequality. So far, there is no concern for the effects of country types, national indicators of life satisfaction, and cultural dimensions in cross-country studies involving the life satisfaction of immigrants, at least for the purpose of this research question. Appropriate statistical weights will once again be applied in all analysis involved in these models.

Additional inquiry will be conducted to test for the robustness of the results when including the development status of the migrant's home country. The two previous studies did not account for the country of origin. It is expected poor and rich immigrants are two wildly different groups of individuals and that bundling them as a single group removes many

interesting insights into their life satisfaction. Regressions involved in testing research questions 1 and 3 will be split and re-run separately for the migrants from developed vs developing countries. Development status is a general measure of life satisfaction used to proxy the life satisfaction level immigrants bring from their home countries

Section [2](#) of this paper will present background literature related to the study of immigrant life satisfaction, PISA, and other elements of this study. Sections [3](#) and [4](#) will describe in detail the data and variables used in the analysis. Section [5](#) will present the empirical methods used to reach the results discussed in section [6](#). The study will end with sections [7](#) and [8](#), a discussion of the results found and the conclusion.

2.Theoretical Background

2.1 Life Satisfaction

As a metric, life satisfaction or subjective life satisfaction is rather popular among researchers. A widely renowned psychological and psychometric study conducted by Diener ([2009](#)) has shown that this metric is very appropriate for academic research of any kind. Kahneman and Krueger conducted a behavioral study in the attempt to test the accuracy and validity of subjective life satisfaction, with strict emphasis on distinguishing between its impact on utility and its influence on perceptions and preferences (Kahneman & Krueger, [2006](#)). It is known to be reliable in analysis involving children and adolescents (Proctor et al., [2009](#)). As far as cross-country analysis is concerned, this young individuals' life satisfaction has been used in correlation analysis regarding national levels of life satisfaction (Bradshaw et al., [2017](#)), decomposition analysis examining the relationship between community and subjective life satisfaction across 12 nations (Lee & Yoo, [2017](#)), and hierarchical linear modelling involving OECD countries (Klocke et al.,[2014](#)). Additionally, this study is not the first to use country-fixed effects in cross-country research regarding adolescent life satisfaction (Dinisman & Ben-Arieh, [2016](#)).

2.2 The Native-Immigrant Gap in Life satisfaction

When it comes to immigration studies, the general consensus is that immigrants experience lower life satisfaction¹ compared to natives in the same country (Heizmann & Böhnke, [2019](#); Amit & Riss, [2014](#)). An overview of studies that analyze the happiness of migrants concluded that there is a clear pattern in immigrants becoming happier and that, generally, there seems to be a significant gap in life satisfaction (Hendriks et al., [2018](#)).

There are three studies that have used the PISA databases to analyze the life satisfaction differences between immigrant and native adolescents. Rodríguez et. al ([2020](#)) evaluate the difference in academic proficiency and life satisfaction between immigrants and natives in Spain, using the PISA 2018 dataset. They perform a multivariate analysis of variance on factors such as resilience, the feeling of belonging at school, and positive affectation to find that there is no difference in self-reported life satisfaction between Spanish migrants and natives, but that locals have other general advantages over newcomers.

When it comes to cross-country large scale survey data relating immigration to subjective life satisfaction, there are two studies that are rather similar in their initial approach. Tang ([2019](#)) uses the PISA 2015 dataset to analyze the impact of immigration status on life satisfaction in 48 different countries. Instead of opting for country-fixed effects, the above study runs multilinear regressions for each country in the sample, finding a gap in life satisfaction between natives and immigrants that can be reduced by changing family behaviors and behaviors at home such talking to one's parents, bullying, and anxiety. Wang ([2021](#)) employs the use of PISA 2018 data to compare immigrants' reading proficiency, happiness, and subjective life satisfaction in a subset of 15 countries. Whilst not entirely focused on the life satisfaction aspect, the paper does find a significant negative gap in self-reported satisfaction. The author additionally bundles the analysis by 4 educational systems. This study hypothesizes to find the same positive difference in life satisfaction between natives and immigrants.

¹ Going forward, whenever a gap in life satisfaction is mentioned, it will refer to the difference between natives and immigrants, and not the other way around, unless specified.

2.3 Micro-Level Explanations for the Native-Immigrant Gap in Life Satisfaction

Amongst potential explanations for this differential, the Wang mentions grade repetition and fear of failure. Explanatory variables used in these three² immigration-life satisfaction studies are scores in reading, mathematics, and science, resilience, sense of belonging at school, gender, the index of economic, social, and cultural status, bullying, anxiety, exercise, daily meals with parents, talking to parents, happiness, language use at home, fear of failure, grade repetition, family wealth and the student's expected occupational status. The OECD has additionally conducted a comparative study on the academic achievement of immigrants using the PISA 2003 dataset (OECD, [2006](#)). Besides dimensions found to provide explanations in these studies, it is hypothesized that factors such as social status, school and teacher characteristics will be of particular relevance.

2.4 Macro-Level Explanations for the Native-Immigrant Gap in Life Satisfaction

The effect of freedom on the happiness of immigrants has been previously documented in psychology (Phinney et al., [2001](#)). Migrant integration policy has been shown to positively influence both migrants and natives in some studies (Tatarko et al.,[2021](#); Hadjar & Backes, [2013](#)), while others report it having no significant impact (Hendriks & Bartram, [2016](#)). Income inequality is known to negatively affect a population's physical and mental health (Pickett & Wilkinson, [2015](#)) as well as access to mental health services (Finnvold, [2019](#)).

As far as cultural indicators are concerned, Leong and Ward ([2006](#)) find a negative association between tolerance towards immigrants and power-distance, masculinity, and uncertainty avoidance. A positive relationship is highlighted for individualism. This falls in line with the expectation that, on average, an immigrant is unhappier in an inequality-compliant, collectivist, masculine, or uncertainty averse culture. More individualistic cultures are generally associated with more hedonic and psychological life satisfaction (Bobowik et al., [2011](#)). Masculinity and uncertainty avoidance as cultural characteristics for a country were associated with decreased life satisfaction in a sample of Australian immigrants (Kashima &

² Going forward, the studies by Rodriguez et al., Tang, and Wang will not be quoted every time they are mentioned given their prevalence throughout the paper. Whenever previous studies are mentioned with no reference, the text refers to these three.

Abu-Rayya, [2014](#)). Arrindell et al. ([1997](#)) used Hofstede's cultural dimensions to find that uncertainty avoidance is positively correlated with subjective life satisfaction. The study additionally found that masculinity is a positive driver for life satisfaction in poor countries and a negative one in richer countries. The Hofstede dimensions have additionally been used in studies related to immigrants' job prospects (Vinogradov & Kolvereid, [2007](#)) and entrepreneurship (Chand & Ghorbani, [2011](#)).

Despite all of this, there is little to be found in terms of the trends above when it comes large-scale cross-country analysis. Furthermore, there is no previous literature that compares immigrant characteristics to this complex of a set of indicators. It is hypothesised that the 8 indicators used will at least have a mixed impact on the LS differential between locals and migrants. Factors like freedom, children's rights, migrant integration policy and individualism are expected to negatively influence the life satisfaction gap whilst income inequality, power-distance, masculinity, and uncertainty avoidance are expected to increase it.

The home country is a metric unaccounted for in previous large-scale studies that concern the life satisfaction of migrants. Multiple studies have repeatedly emphasised the importance of this avenue of controlling. Borraccino et al. ([2018](#)) used a sample from Italy and found that immigrants from non-Western countries tend to report much lower life satisfaction. U.S immigrants encounter problems relating to their citizenship status based on their home countries (Chiswick & Miller, [2009](#)) and their children encounter emotional health problems based on similar indicators (Perreira & Ornelas, [2011](#)). Kogan et al. ([2018](#)) find that immigrants are generally happier in countries with safer social nets, but this relationship changes based on the cultural type of their home country. Angelini et al. ([2015](#)) control for confounding factors provided by the migrant's country of origin in their inquiry into the relationship between migrant assimilation and subjective life satisfaction. Once again, for the purpose of this study, there is not much research integrating the use of the country of origin with large-scale survey databases like PISA. The effects found are expected to keep their significance but change when held under additional controlling for the home country.

3. Data

3.1 Main Dataset: PISA 2018

The Program for International Student Assessment(PISA) is a widely used cross-sectional international dataset that aims to test adolescents' proficiency in reading, mathematics and science. Every three years, students from schools all around the world take standardized tests and answer detailed questionnaires. Parents, teachers, and school principals have to answer their own sets of questions every three years(OECD,[2019a](#)). Inputs from these questionnaires are put into a separate dataset, with the exception of the student and parent databases which are bundled together. This study primarily makes use of the student database, although some variables were gathered from the school database (OECD, [2019a](#)).

The PISA 2018 student dataset includes 612,004 students aged 15 to 16 prior to the testing. There are 19,811 different schools in the database, from 80 countries. After filtering the data to remove missing observations in the key variables used, the least-restrictive model contains 470,558 observations from 18,377 schools in 70 different countries. The immigrant sample constitutes 11% of observations.

PISA employs a stratified two-stage sampling design. A stratum is characterized by the type and size of a school and the gender of the pupils involved. Preliminary weights are used to calibrate student and school parameters by selecting 500 students and 100 schools from each OECD country sample. The first stage of sampling involves the general sampling weights, attributed to each student and each school. The intuition behind these weights is providing accurate population-wide estimations in order to remove external validity concerns. They account for different probabilities of selection, non-response, and oversampling of some strata for the purpose of national reporting(OECD,[2009](#)). The PISA 2018 technical report and data analysis manual heavily emphasize the importance of using these weights in estimating unbiased population coefficients (OECD, [2019c](#); OECD, [2009](#)). There are two types of sampling weights available in PISA. Student weights add up to the size of the relevant population, thus over-representing countries with a larger population of adolescents. Senate weights are re-scaled to give each country the same importance in the analysis. This paper will employ the use of student weights since the analysis involved mainly revolves around the immigrant population rather than, for instance, an OECD average. For this study alone, custom

sampling weights for immigrant populations were derived from the 2020 U.N international migration highlights (United Nations, [2020](#)). A robustness analysis will be conducted using no weights, senate weights, and custom immigrant population weights respectively.

The second stage of the sampling process revolves around computing 80 replicated samples with their own sets of weights. The intuition behind this is that students from the same school or from the same region will have more in common with students from the same area, compared to other students. While this fact does not influence the estimates, the degree of uncertainty will be much larger when not accounting for these replicates. Their main use in analysis is in obtaining unbiased standard errors. This part of the sampling process will be foregone in this paper in favor of country-level clustered robust standard errors.

Questions asked in the questionnaire can range from multiple choice (yes or no, multiple answers, one answer, Likert scale ,0-10 single item scale) to open questions. Simple indices display variables as direct arithmetic transformations of the questions. For instance, the Grade Repetition variable is based on a Yes or No question and takes values 0 and 1. Scale indices are computed using a two-parameter item-response specification or generalized partial credit models in case of variables with more categories. The values are coded as scale indices using Warm Likelihood estimates(WLE) (Warm, [1989](#)). These indices are standardized to have a standard deviation of 1 and a mean of 0. A negative value of a scale indicator implies that the subject answered less favorably compared to the sample average. For instance, the variable that describes competitiveness was coded based on two questions regarding the extent of agreement the student displayed in relation to his attitude towards competition. Answer possibilities were displayed as a 4-item Likert scale with values ranging from “strongly disagreed” to “strongly agreed”.

Data on the country of origin is technically available in the dataset, in the form of 6 letter iso-codes. This variable was used to code 62 home countries for first-generation immigrants and will be used in sensitivity analysis.

3.2 Country-level Indices

This thesis will use 8 highly renowned indicators to answer research question 3. These indicators assign different scores to each country surveyed. For the purpose of this analysis, they will strictly refer to the host country and not the country of origin. Not all countries in the

sample have scores for every indicator. The closest available score to 2018 was used for each indicator. Whenever a score is used in analysis, countries with missing observations are dropped from the estimation. See section [4.4](#) for the variables constructed from these indices. For a detailed description of the indices and the per-country score, see Tables [A1](#) and [A2](#)(Appendix A). An additional score used is the Human Development Index(HDI). This will be used as a proxy for the immigrant's country of origin.

Freedom House 2018

The Freedom House Index global freedom index assigns scores from 0 to 100 to 210 countries based on access to political rights and civil liberties, as well as individual freedoms. Countries can be classified as free (70-100), partly free (35-69), and not free (0-34), where a higher score indicates more freedom (Freedom House, [2018](#)). There are 15 countries considered not free, 18 that are partly free, and 36 that are free. This index has been criticized before, citing a neoconservative bias (Giannone, [2010](#)), but it is nonetheless a good general measure of freedom for the purpose of this study.

KidsRights Index 2018

The KidsRights index measures children's rights for 182 countries over 5 domains, namely the rights to life, health, education, protection, and the enabling of safe environments for children's rights. These 5 scores are geometrically averaged to obtain the overall KidsRights score, ranging between 0 and 1, with 1 representing a country with perfect children's rights. The scores are clustered in 5 categories with each cluster representing a similar performance level. (KidsRights, [2018](#)). Since this study is concerned with adolescents aged 15 to 16, immigrants in countries with better children's rights should in theory be happier.

Migrant Integration Policy Index 2020

MIPEX spans 56 countries and 8 policy areas of migrant integration. Its main purpose is to measure the effectiveness and tolerance of migrant integration policies around the world. The score is assigned from 0 to 100, with 100 being a country with the most favourable immigration policy. Generally speaking, scores between 41 and 100 indicate favourable migrant integration whilst scores between 0 and 40 indicate unfavourable migrant integration (Solano &

Huddleston, [2020](#)³). There are 33 countries with favourable migrant integration and 13 with unfavourable integration in the sample. Ruedin ([2015](#)) found that MIPEX indicators are very reliable in statistical analysis involved in estimating citizenship models. This index was additionally used to gauge its influence on the subjective life satisfaction of natives (Tatarko et al., [2021](#)). For the purpose of testing the third research question, this index is vital.

Gini Index

Gini coefficients are generally used to measure income inequality. The indicator ranges from 0 to 1, with a higher score indicating a higher gap between the poor and the rich in a country, in terms of income. This score is a relative metric as opposed to an absolute one. It does not say anything about the overall wealth level of a country (CIA World Factbook, [2022](#); The World Bank, [2022](#)). The sample contains 37 countries with a below-average Gini score, and 31 countries with an above-average score⁴. Hibbs and Hong ([2015](#)) found a significant effect of immigration on income inequality proxied by Gini indicators.

Hofstede Cultural Indicators

Geert Hofstede's six cultural dimensions were measured between 1980 and 2001 and are meant to represent immutable country-level characteristics that distinguish one country's culture from another's (Hofstede, [2009;2022](#)). Out of the six culture indicators, only four will be used in this study⁵. All scores are measured between 0 and 120. These indices provide enduring characteristics that may be able to explain differences in life satisfaction experienced amongst immigrants. Cultural discrepancies between migrants and natives are hypothesised to influence their difference in self-reported life satisfaction.

The Power Distance Index(PDI) represents the degree of inequality accepted by the populous with and without power. The higher the PDI score, the higher the level of general

³ Scores for Jordan, Saudi Arabia, and the United Arab Emirates are calculated in 2020. For every other country, scores were obtained during 2019.

⁴ The latest Gini score measurement was used for each available country. Whenever available, the measurement conducted by the World Bank was picked over the one made by the CIA factbook.

⁵ The Long- vs Short-Term orientation and Indulgence Vs Restraint indices are more recent, and have fewer available observations. Because of this they were left out of this analysis.

acceptance for an unequal and hierarchical distribution. This score can be seen as the citizen's willingness to accept the Gini inequality score.

The Individualism Vs Collectivism Index(IDV) measures the degree of interpersonal connection between the citizens of a country. A high IDV suggests less ties between members of society.

The Masculinity Vs Femininity score(MAS) illustrates the distribution of roles between gender roles. A high MAS indicates a higher emphasis on old gender norms and traditional roles of men and women in society.

Lastly, the Uncertainty Avoidance Index(UAI) refers to the ability of people to face anxiety. A high UAI describes a country where individuals tend to make their lives as predictable and safe as possible, with a general disdain for risk-taking.

Human Development Index 2019*

The Human Development Index(HDI) is used to estimate a nation's average realization in three dimensions of human development, namely a long and healthy life, knowledge, and decent living standards. The index is compiled into a score between 0 and 1, with 1 being the highest possible human development and 0 being the lowest. A country is considered fully developed if it's HDI is above 0.8 (United Nations Development Programme, [2019](#)). Since countries in the sample have rather good HDI scores, any score below 0.8 will be considered as belonging to a developing country. Among home countries, there are 20 developing countries and 42 developed countries. This index will only be used as a proxy for the home country of the migrant.

4.Variables Used in the Analysis

Unless otherwise specified, all variables are self-reported by students in the PISA 2018 student questionnaire. For variables calculated based on weighted likelihood estimates(WLE), positive values signify a higher-than-average incidence, with negative values illustrating a lower-than-average occurrence. They are standardized to have a standard deviation of 1 and a mean of 0(see Data section [3.1](#) for more detail). A negative value of a scale indicator implies that the

subject answered less favorably compared to the sample average. Variables are extracted from the PISA 2018 student and school datasets (OECD, [2019a](#); [2019b](#)) as well as the previously mentioned 9 country-level indices. For specific PISA questionnaire questions and their respective variable, see Appendix A, Table [A3](#).

4.1 Life Satisfaction

Life satisfaction (LS) is measured on a single-item scale from 0 to 10 and represents the answer to the question: “Overall, how satisfied are you with your life as a whole these days?” A high value signifies higher self-reported LS. The terms LS, life satisfaction and subjective or self-reported life satisfaction will be used interchangeably to describe this variable. This metric has been used in previous cross-national studies (Dinisman and Ben-Arieh, [2016](#)) and is the most popular mean of assessing life satisfaction in studies relating to adolescents (Proctor et al. [2009](#)).

4.2 Immigration Status

The original variable for migration status is categorical and takes values 0, 1, 2 for natives, second-generation and first-generation immigrants respectively. A first-generation immigrant is a person not born in the country of testing whilst a second generation immigrant has at least one parent born in another country. For the purpose of this study, immigrants are classified as both second- and first-generation. The immigration status variable takes value 0 for natives and 1 for immigrants of any kind. The intuition behind this stems from the fact that second-generation immigrants are intuitively much more similar to first-generation migrants compared to natives.

4.3 Explanatory Variables

All variables described below will be used to explain the gap in life satisfaction between natives and immigrants. Similar explanatory variables were bundled into representative categories for the sake of easier interpretation and simplicity. The PISA 2018 Technical Report (OECD, [2019c](#)) and volume three of the PISA 2018 results analysis (OECD, [2019b](#)) provide in-detail explanations for the variables described below. The chosen variables had more than 300,000 total available observations and passed a multicollinearity test with variance inflation factors (vif) between 1.01 and 2.95. For control variables used in previous analysis by

Rodríguez, Tang, and Wang that were not used in this paper and the reason for their exclusion, see Appendix [A4](#).

Demographics

This category includes gender and age. Gender is a binary variable that takes value 0 for men and 1 for women. A study by Humpert ([2013](#)) found strong differences in life satisfaction between men and women. Additionally, a study conducted in the UK by Della Giusta et al. ([2011](#)) found that men and women derive their life satisfaction from different activities. Age is a continuous variable that takes values between 15.08 and 16.33, where decimal numbers represent fractions of a year. This variable is used to account for potential endogeneity originating from differences in maturity. González-Carrasco et al. ([2017](#)) found that as a child progresses through adolescence, he experiences an overall decrease in subjective life satisfaction. This effect was even more pronounced for women.

Social Status

This includes the student's expected occupational status, family wealth, and the index of economic, social, and cultural status(ESCS). The student's future occupational status is represented by the International Socio-Economic Index of Occupational Status (ISEI) and is meant to represent the student's current level of faith in his capabilities and future aspirations. The variable takes values between 11.01(street cleaner) and 88.96(judge). Wealth and ESCS are calculated based on WLE estimates and are meant to account for familial background. The ESCS is an aggregate measure of parental education, home possessions, and parental occupational status. Wealth is a dimension that is not fully captured by this index, which is why it is included in the analysis. It is measured based on material home possessions of one's family.

School Climate

This classification includes student behavior as described by the school principal, the student's exposure to bullying, and the student's sense of belonging to the school. All three variables are WLE scale indices. The student behavior variable is the principal's opinion on whether or not student attitudes are hindering learning. A positive value of this variable signifies higher-than-average belief in students hindering the academic medium. Bullying is constructed from a

question that asks students how often they have been bullied at school in the past 12 months. The student's sense of belonging is coded from 4-point Likert scale questions asking students about their sense of belonging at school. A hostile school climate can plausibly be a good explanation for differences in life satisfaction.

School Characteristics

This includes the type of school (public or private), shortage of educational staff, and shortage of educational material. The type of school variable is equal to 0 for public schools and 1 for private schools. The shortage variables are WLE scale indices that take positive values for below average opinions on the availability of educational staff and material, as seen by the school principals. If immigrants tend to be aggregated in schools of certain levels of quality and lower quality of schooling induces lower life satisfaction, this classification should be a good explanatory variable.

Teacher Characteristics

This characterization includes 4 WLE variables: the disciplinary climate, teacher's support, teacher's behavior as perceived by the principal, and teacher's tolerance as perceived by the principal. The index of disciplinary climate was coded using student's responses to questions asking whether they enjoyed classes in their main language of instruction. Positive values indicate better-than-average enjoyment. Positive values for the teacher support variable indicate a better-than-average student perception of their teacher's support during classes. The teacher's behavior variable takes positive values for higher-than-average beliefs that teachers are generally unprepared or unfriendly, thus hindering learning. Teacher's tolerance is constructed based on the principal's view on the teachers' multicultural and egalitarian beliefs. Higher values indicate more tolerance. These variables are meant to assess whether teachers act with the same degree of fairness when faced with immigrants.

Motivation

This category contains competitiveness, resilience, and grade repetition. Competitiveness and resilience are WLE indices meant to assess the student's attitude towards competition and self-efficacy respectively. Positive values indicate a student more oriented towards competition (more self-efficacious) compared to the OECD average. Grade repetition is binary variable

coded as 0 if the student has failed at least one grade and 1 otherwise. These variables together are supposed to encapsulate the student's drive to learn and improve at school. They are subjective quality measures meant to see if there are any intrinsic differences in motivation between natives and migrants.

Self-Worth

This class is comprised of parental emotional support as perceived by the student and general fear of failure. Both are WLE scale indices. Parental emotional support is meant to assess the student's view on their parents' support for school-related activities and emotional quandaries. Fear of failure is coded based on students' failure-related anxiety. Positive values for both variables describe a student that is more satisfied with his parents' emotional support and more fearful of failure compared to the average OECD student.

Cognition

Lastly, this category includes abilities evaluated in questions about cognitive efficiency relating to summarizing and assessing credibility⁶. Summarizing is calculated based on questions that gauge the student's strategy in writing a summary. Assessing credibility is a variable that tests the student's caution when faced with a dubious request. Positive values in both variables would describe a student that ranks higher in both meta-cognition categories, compared to the OECD average.

Country

There are 70 countries in the sample⁷ when using the full sample. For the analysis conducted in research question 2, only 54 countries are used. The main specification of research question 3 uses 25 countries. Another variable was constructed from the country of birth national categories 6 digit ISO codes to represent the immigrant's country of origin. There are a total of 62 origin-countries available in the sample, and all analysis concerning them revolves around first-generation immigrants. Whenever the isolated term "country" will be mentioned in the

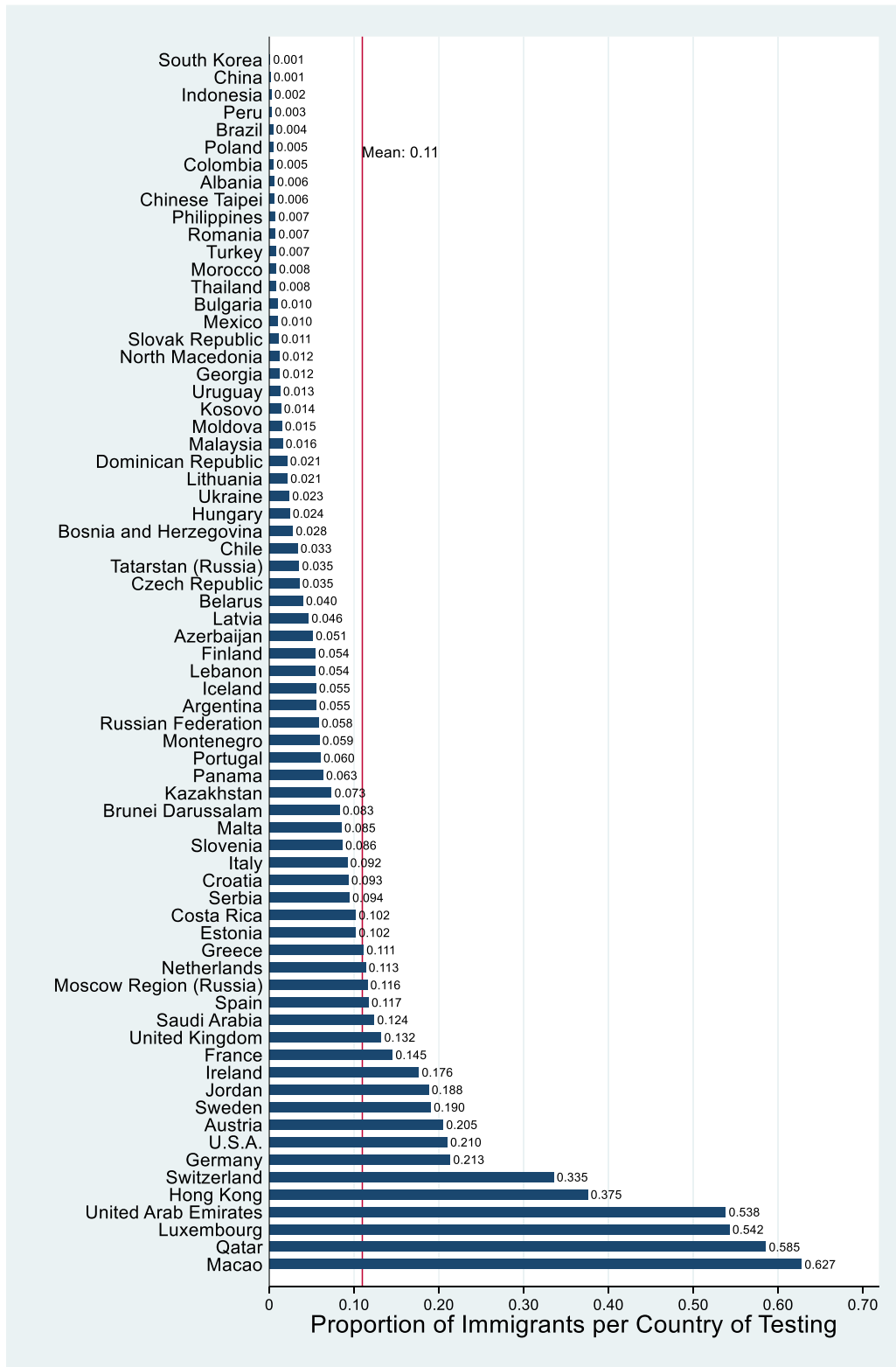
⁶ The PISA 2018 database additionally included a meta-cognition descriptor related to understanding and remembering. This variable yielded an insignificant statistic for the mean group difference between natives and migrants, which is why it was removed from analysis.

⁷ See Appendix A, Tables [A1](#) and [A2](#)

present study, it will refer to the test country rather than the country of origin. The country variable will be used to apply country-fixed effects to all models ran for research question 1 and 2 and as a robustness check for research question 3. Applying these is very important for the reliability of estimates as immigrants understandably flock towards happier countries. The country of origin variable does not have as many observations and will only be used in a future sensitivity analysis proxied by its development status. Figure [1](#) displays the proportion of immigrants for every country. Figure [2](#) displays the distribution of the immigrant population among their countries of origin.

Figure 1

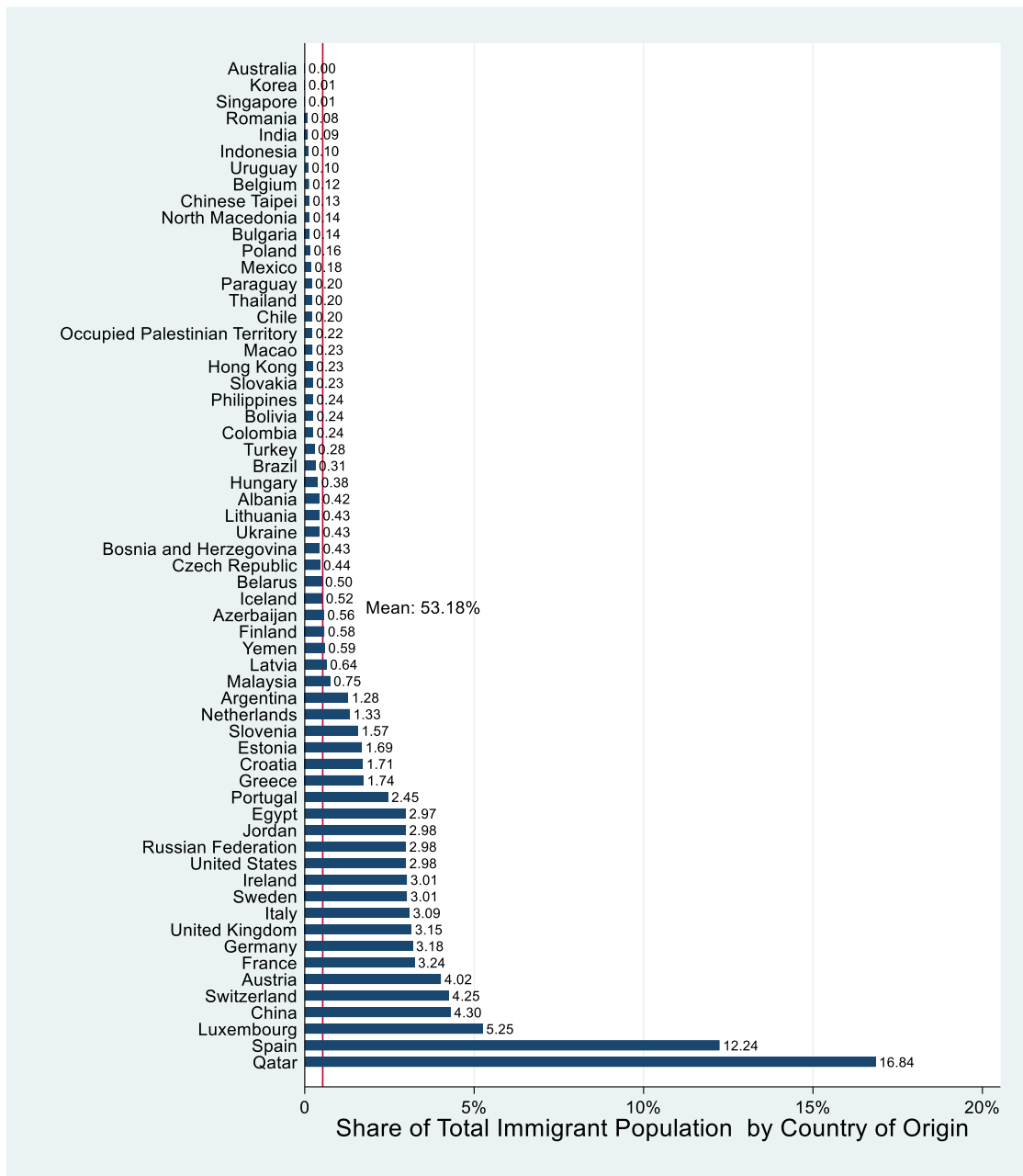
Proportion of immigrants by country of testing, ordered from lowest to highest.



Note: Proportion for country X: Immigrants in country X/ All students in country X.

Figure 2

Share of immigrant population by country of origin, ordered from lowest to highest.



Note: Proportion for country X: Immigrants from country X / Total immigrants in the sample. For instance, Portugal is the home country for 2.45% of the first-generation immigrants in the sample.

4.4 Variables Based on the Country-Level Indicators

The 8 main indices were coded as continuous variables standardized to have a mean of 0 and a standard deviation of 1. The variables are called Freedom, Children's Rights, Migrant Integration, Income Inequality, Power-Distance, Individualism, Masculinity, and Uncertainty Avoidance.

If a country did not have a score for a certain index, it has missing values for that respective index in the sample. For a more detailed description of the indices see section [3.2](#). For a per-country ranking see Tables [A1](#) and [A2](#)(Appendix A). Scores such as MIPEX and HDI had their most recent versions besides those used in this study calculated in 2014. The present study values recency more than availability previous to PISA 2018, especially because these indicators are heavily reliant on patterns such as GDP growth which primarily manifests as a steady yearly increase. The values for these indices in 2019 and 2020 are intuitively more appropriate for 2018 than those from 2014, because of the smaller time differential.

A separate variable was developed for the development status of the immigrant's country of origin. This variable takes value 0 if the country of origin is classified as a developing country(HDI<0.8) and 1 otherwise. HDI will not be used as variable in testing research question 3, as human development is a much broader country characteristic that plausibly encapsulates factors such as freedom and income inequality.

Descriptive statistics for all variables used in the analysis can be found in Table [1](#), separated by immigration status. For every variable, the proportion of immigrants lies somewhere between 10% and 13%. The last column displays t-tests and chi-squared tests for mean differences between natives and immigrants. All variables used display statistically significant differences between natives and migrants. Statistics for country-level indices are calculated based on the raw, unstandardized variables for a better context, but they will be standardized in all analysis conducted using them.

Table 1*Descriptive statistics for all variables used in the analysis, by Immigration Status.*

Variable	Natives			Immigrants			T/Chi2
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
Life Satisfaction	418,913	7.30	2.57	51,645	6.83	2.71	38.73***
Demographics							
Gender (Female=1)	418,913	0.51	0.50	51,645	0.50	0.50	3.27*
Age	418,913	15.79	0.29	51,645	15.79	0.29	-2.99***
Social Status							
Expected Occupational Status	349,771	66.17	19.41	43,743	69.38	17.98	-32.90***
Wealth	418,005	-0.52	1.19	51,581	-0.31	1.10	-38.90***
ESCS	417,391	-0.32	1.09	51,202	-0.22	1.08	-20.12***
School Climate							
Student Behavior	403,128	0.05	1.26	49,032	-0.25	1.36	48.77***
Bullying	333,445	0.05	1.05	43,925	0.14	1.06	-16.84***
Sense of Belonging	389,972	-0.04	0.98	48,984	-0.10	0.97	11.91***
School Characteristics							
Type of School (Private=1)	397,299	0.17	0.38	47,590	0.41	0.49	15,000***
Educational Staff Shortage	401,305	-0.02	1.05	48,922	-0.05	1.12	4.82***
Educational Material Shortage	400,538	0.15	1.09	48,979	-0.19	1.11	66.53***
Teacher Characteristics							
Disciplinary Climate	405,809	0.17	1.08	50,903	0.13	1.09	7.62***
Teacher Support	400,408	0.18	0.98	50,714	0.17	1.00	3.89***
Teacher Behavior	402,840	0.13	1.18	49,011	0.01	1.14	20.59***
Teacher's Tolerance	343,431	-0.06	1.06	35,298	0.03	1.02	-15.91***
Motivation							
Competitiveness	407,403	0.08	1.00	50,307	0.18	1.03	-21.47***
Resilience	399,641	0.07	1.01	49,369	0.08	1.04	-2.07**
Grade Repetition(Yes=1)	411,801	0.10	0.30	51,348	0.17	0.38	2,300***
Self-Worth							
Parental Emotional Support	364,198	-0.02	1.00	46,170	-0.05	1.03	7.24***
General Fear of Failure	403,736	-0.05	0.97	49,785	-0.01	1.02	-10.17***
Cognition							
Summarizing	386,628	-0.14	1.00	48,273	-0.13	0.99	-3.12***
Assessing Credibility	382,519	-0.19	0.98	47,615	-0.16	0.98	-6.10***
Country: 70 countries	418,913	33.41	20.20	51,645	28.18	20.43	110,000***
Country-Level Indices							
Freedom	418,913	63.31	29.59	51,645	54.61	33.90	58.48***
Children's Rights	394,806	0.78	0.10	48,442	0.79	0.10	-33.12***
Migrant Integration	284,720	48.83	14.78	35,475	47.41	17.13	16.77***
Income Inequality	408,382	35.54	6.87	51,048	34.69	7.10	26.24***
Power-Distance	254,500	60.26	18.62	30,849	57.62	21.20	23.12***
Individualism	254,500	42.40	22.27	30,849	50.65	19.81	-62.12***
Masculinity	254,500	50.60	15.88	30,849	52.53	15.45	-20.27***
Uncertainty Avoidance	254,500	70.32	20.59	30,849	65.21	19.91	41.24***
Development Home Country	322,750	0.72	0.45	32,442	0.85	0.36	-51.30***

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

5. Methodology

This study aims to illustrate the gap in life satisfaction between native and immigrant adolescents, see what factors explain this gap, and test whether this gap changes in size depending on the type of country the immigrant lives in.

5.1 Life Satisfaction Difference Between Natives and Immigrants

An Ordinary-Least-Squares specification will be used to find the difference in life satisfaction between natives and immigrants. The raw difference can already be seen in the table. Life satisfaction is regressed on immigration status, controlling for gender, age, and country-fixed effects to see if the difference holds. Other variables are not included in this specification to avoid collider bias and reverse causality. The following model is developed:

$$I. \quad LS_{ic} = \alpha_0 + \beta_1 I_{ic} + \beta_2 Gender_{ic} + \beta_3 Age_{ic} + C_c + \varepsilon_{ic}$$

(by development of home country)

-where LS_{ic} is the life satisfaction of student i in country c , measured on a single-item scale from 0 to 10. I_{ic} represents immigration status and takes value 1 for immigrants. Gender is a binary variable for males and females and age is continuous. Country-fixed effects are illustrated by C_c and ε_{ic} is meant to represent the error term. Robust standard errors will be clustered at the country level. A secondary regression will be run replacing the binary immigration variable with the categorical migration status that separates first- from second-generation immigrants. Both specifications are weighted using final student weights.

Country-fixed effects already absorb a large part of observed variation in life satisfaction, with gender and age meant to be seen as immutable characteristics that cannot be influenced by one's immigration status. Logarithmic specifications were considered for life-satisfaction and age, but they were ultimately dropped as they did not provide a substantial increase in the model's fit. Robust standard errors clustered at the country level are used to account for heteroscedasticity and the cross-country approach of the present study.

The above model will also be regressed by the immigrant's country of origin development status, as a robustness check and deeper dive into explaining differences for different types of immigrants. This essentially means that the model will be ran twice, once for immigrants from developing countries and once for immigrants from developed countries. The country of origin is an important factor in determining which types of immigrants go where. This variable is not outright controlled for because of its correlation to immigration status but it is proxied by the development variable. While not ideal, this is the best approach when it comes to accounting for the home country in PISA 2018.

5.2 Explaining the Life Satisfaction Gap

The Blinder-Oaxaca decomposition (Blinder, [1973](#); Oaxaca, [1973](#)) is employed in order to analyze the life satisfaction gap between immigrants and natives. This method splits the difference in LS in two parts, namely explained and unexplained variation. The following model will be used:

$$\text{II. } \Delta\text{LS} = \beta^*[E(X_N) - E(X_I)] + [E(X_N)(\beta_N - \beta^*) - [E(X_I)(\beta_I - \beta^*)]$$

-where ΔLS is the difference in life satisfaction between the native(N) and immigrant(I) groups. β_N and β_I are coefficient vectors estimated with the use of sampling weights, for native and immigrant subjects respectively. β^* is a non-discriminatory vector of coefficients obtained using a pooled regression that is meant to determine the discrepancy in relative significance of each explanatory domain (see section [4.3](#)) between the two groups. The explained part of the variation shows what extent of the life satisfaction differential can be attributed to dissimilarities in explanatory variables(X). The unexplained part of the variation contains omitted and unobserved variables as well as potential changes in the relevance of estimated coefficients for N and I, respectively. For the detailed regressions equation see [A5](#)(Appendix A).

This method is by no means an attempt to point towards causality, but a detailed deconstruction of the LS differential that may or may not explain why natives are happier than immigrants. This method has been previously used in analysis regarding subjective life satisfaction. Burger et al. ([2021](#)) used the Blinder-Oaxaca decomposition to analyze spatial

differences in subjective life satisfaction for Colombian citizens. Sarracino and Piekalkiewicz (2020) apply this empirical method to explain time differences in Europeans' life satisfaction around the 2008 financial crisis. Each of the 9 explanatory categories in section 4.3 will be used in an attempt to explain the life satisfaction gap.

5.3 Testing How the Life Satisfaction Gap Changes Based on Country Characteristics

Research question 3 can be seen as an attempt to dissect country-fixed effects in order to better explain their influence on the LS differential, but without stripping away valuable insight by treating each country separately.

The regression in model I will be ran with an interacted term between immigration status and one of the 8 country-level characteristics explained in section 4.4. More specifically:

$$\text{III. } LS_i = \alpha_0 + \beta_1 I_i + \beta_2 Indicator_c + \beta_3 I_i Indicator_c + \beta_4 Gender_i + \beta_5 Age_i + \beta_6 ESCS_i + \varepsilon_i$$

-where LS_i and I_i are the life satisfaction and immigration status of pupil i and $Indicator_c$ is one of the 8-country level standardized scores, namely Freedom, Children's Rights, Migrant Integration, Income Inequality, Power-Distance, Individualism, Masculinity, or Uncertainty avoidance. β_3 is the coefficient of the interaction effect between immigrant status and the country-level indicator. A one-unit increase in, for instance, Freedom, increases the life satisfaction gap between immigrants and natives by β_3 . ESCS is the index of economic, social and cultural status. Gender and age are unchanged from model I and C_c are country-fixed effects. ε_i is once again the error term. Robust standard errors will be clustered at the country level. This regression will be run separately for each of the 8 country characteristics.

The models are conducted separately for concerns relating to sample size, as not every index has the same amount of observations. Furthermore, country-fixed effects are dropped as controls from this analysis. This evidently hurts this model's causal inference but given the per-country indices and their correlation to country-fixed effects and the lack of concern for time trends in this dataset, the lack of country-fixed effects will allow the variation in country characteristics to manifest freely. This fact is supported by both studies conducted by Wang (2021) and Tang (2019). The addition of ESCS as a control is meant to account for some of the

variation left when excluding the country of testing, as recommended by the PISA data analysis manual(OECD,2009). Nonetheless, an additional specification will be displayed for each instance of model III where ESCS is replaced by country-fixed effects. This is done to gather additional insights primarily related to the main effects of immigration and indices and for robustness purposes.

$$\text{III}^*. \quad LS_i = \alpha_0 + \beta_1 I_{ic} + \beta_2 Indicator_c + \beta_3 I_{ic} Indicator_c + \beta_4 Gender_{ic} + \beta_5 Age_{ic} + C_c + \varepsilon_{ic}$$

-where C_c are country-fixed effects and all other variables are coded the same way as before. An additional multilinear regression will be employed to include all interaction effects discussed above:

$$\text{IV}. \quad LS_i = \alpha_0 + \beta_1 I_i + \gamma [X]_c + \lambda_i [X]_c + \beta_2 Gender_i + \beta_3 Age_i + \beta_4 ESCS_i + \varepsilon_i$$

(by development of home country)

-where $[X]_c$ is a vector containing all 8 indices used in the analysis and $I_i [X]_c$ is the interaction term between immigration status and country characteristic X for student i . All other variables are unchanged. This model will additionally be tested for separate influences of the home country proxied by its development status. Furthermore, the distinction specified by model III* will also be applied to model IV.

6.Results

6.1 Effects of Immigration on Life Satisfaction

This section will address the first research question. The t-test for the raw mean group difference in LS can be found in Table 1 and it is positively significant and equal to 38.73, indicating that natives experience on average higher life satisfaction. Table 2 shows the results for the regression described by model I.

Table 2*Results of multilinear regression of life satisfaction on immigration status.*

Variable	Life Satisfaction
Immigration Status	-0.293*** (0.048) ^a
Gender	-0.387*** (0.022)
Age	-0.102*** (0.034)
Country-fixed Effects	Yes
N	470,558
Number of Countries	70
R-Squared	0.05

Note: Coefficients are weighted using PISA 2018's student weights.^a *Robust standard errors are clustered at the country level and displayed in parentheses.*****P-value*<0,01, ***P-value*<0,05, **P-value*<0,1, no asterisk: *P-value* >0,1.

The coefficient is expectedly significant and negative. Immigrants self-report 0.293 lower life satisfaction than natives with similar demographic and regional characteristics. The effects of gender and age are both highly significant and negative, indicating that women and more mature adolescents experience lower life satisfaction, *ceteris paribus*. The same model shown in the previous table was stress-tested under different sampling methods. Tables [B1](#), [B2](#), and [B3](#) of Appendix B show results for model I with no sampling weights, with senate weights, and with custom-made weights for the size of a country's immigrant population respectively. The coefficient of interest oscillates between -0.211 and -0.284 with high significance, suggesting that the previous interpretation generally holds true.

Table [3](#) additionally shows the same regression for the split Immigration Status variable. Previous results hold, both first- and second-generation immigrants experience lower life satisfaction compared to natives, holding all other variables constant. The difference of being a first-generation migrant is slightly and unsurprisingly larger. When compared to each other, the two types of immigrants don't report significantly different levels of life satisfaction.

Table 3*Results of multilinear regression of life satisfaction on immigration categories.*

Variable	Life Satisfaction
First-Generation	-0.305*** (0.059) ^a
Second-Generation	-0.287*** (0.070)
Gender	-0.387*** (0.022)
Age	-0.102*** (0.034)
Country-fixed Effects	Yes
N	470,558
Number of Countries	70
R-Squared	0.05

Note: Coefficients are weighted using PISA 2018's final student weights. The immigration variable takes value 0 for natives, 1 for second-generation immigrants and 2 for first-generation immigrants.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

****P-value < 0,01, **P-value < 0,05, *P-value < 0,1, no asterisk: P-value > 0,1.*

Table 4 presents the regression in model I for first-generation immigrants from developing and developed economies respectively. The negative effect of immigration on subjective life satisfaction for first-generation immigrants seems to be fully explained by newcomers from developed economies. A plausible explanation for this may be the higher expectations associated with being born in a country with high human development or modesty and apathy correlated with coming from a less privileged economy. The low number of observations for developing countries of origin may bias the estimates in favor of individuals born in developed countries. The general conclusion of this section is that there is indeed a positive gap in life satisfaction between natives and immigrants. Amongst the first-generation type, this effect is fully explained from the perspective of migrants from developed countries.

Table 4

Results of multilinear regressions of life satisfaction on immigration status, by development of home country.

Variable	Life Satisfaction	
	Origin: Developing	Origin: Developed
Immigration Status ^c	-0.180 (0.167) ^a	-0.307*** (0.060)
Gender	-0.382*** (0.072)	-0.401*** (0.072)
Age	-0.097*** (0.048)	-0.111** (0.037)
Country-fixed Effects	Yes	Yes
N	327,636	350,306
Number of Countries	63	63
Number of Home Countries for Migrants	20	41
R-Squared	0.05	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

^b *Immigration variable compares first-generation immigrants to all other students.*

****P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.*

6.2 Blinder-Oaxaca Decomposition of the Life Satisfaction Differential

This section is focused on addressing research question 2. After running the Blinder-Oaxaca linear decomposition, coefficients were divided by the total differential in life satisfaction in order to achieve percentages of explained variation per explanatory category. Multiple control variables were grouped in categories by similarity and domain(see Table 1, Table A3), and also for a more facile understanding. See Table C1 for the relationships between life satisfaction and the explanatory variables used in the reduced sample. The results can be found in Table 5.

Table 5

Oaxaca-Blinder Decomposition: Proportion of explained variation in the life satisfaction gap between natives and immigrants.

Variable	% of Explained Variation	Robust Standard Error ^a
Demographics	0.05	0.001
Gender (Female=1)	-0.22	0.002
Age	0.26	0.002
Social Status	-12.04***	0.034
Expected Occupational Status	0.50	0.004
Wealth	-14.68***	0.038
ESCS	2.13	0.010
School Climate	-0.14	0.022
Student Behavior	-0.54	0.004
Bullying	-3.27	0.015
Sense of Belonging	3.68*	0.016
School Characteristics	3.84**	0.012
Type of School (Private=1)	-0.73	0.005
Educational Staff Shortage	0.13	0.003
Educational Material Shortage	4.43**	0.013
Teacher Characteristics	1.54	0.016
Disciplinary Climate	-2.51*	0.010
Teacher Support	3.97***	0.009
Teacher Behavior	0.29	0.003
Teacher's Tolerance	-0.20	0.002
Motivation	2.23	0.016
Competitiveness	0.24	0.001
Resilience	1.93	0.016
Grade Repetition(Yes=1)	0.06	0.001
Self-Worth	5.01*	0.019
Parental Emotional Support	1.49	0.008
General Fear of Failure	3.52	0.020
Cognition	6.48***	0.016
Summarizing	3.12***	0.007
Assessing Credibility	3.36**	0.010
Country	36.77**	0.126
Total	43.73**	0.134
N		213,364
Number of Countries		54

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

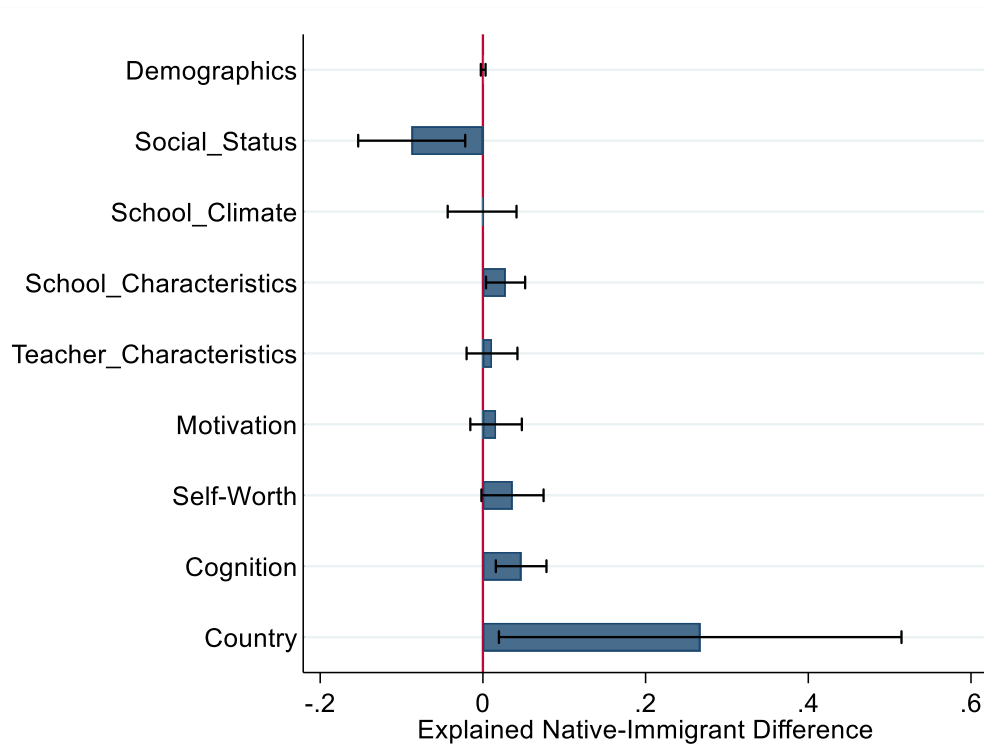
Model II explains 43,73% of the life satisfaction differential. The results suggest that differences in LS between natives and immigrants are primarily driven by social status, school characteristics, cognition, and country-level regional factors. Social status explains -12.04% of the LS gap which essentially means that higher social status leads to a smaller differential. This effect is almost entirely driven by the familial wealth component of social status, suggesting that adolescent immigrants are generally wealthier than natives and that this higher social status leads to more self-reported life satisfaction. This is consistent with results found in section [6.1](#), and with the fact that 85% of first-generation immigrants come from developed countries and mostly travel to developed countries. This seems to be the plausible explanation, especially because wealth is positively correlated with life satisfaction. School Characteristics account for 3.84% of the difference. This effect is mostly driven by the fact that schools that primarily host immigrants experience a more severe shortage of educational material. They are additionally positively correlated to life satisfaction. Cognitive ability is another highly significant predictor that accounts for a 6.48% share of the differential. This positive difference and the negative correlation between cognition and life satisfaction suggest that immigrants find it easier to concentrate on summarising and assessing credibility or are outright better at effectuating the tasks. This intuitively may follow from the fact that immigrants are pressed harder to effectuate learning activities which may negatively influence their life satisfaction in return. This is also consistent with the wealth effect found earlier. Country dummies account for 36.77% of the difference. The high robust standard error explains why this coefficient is not significant at 1% significance level, suggesting that differences between countries are significant in explaining the LS gap in immigration status but too varied. Dissecting these country fixed effects into specific factors is the job of research question 3. Teacher support and the disciplinary climate cancel each other out, suggesting that the immigrants' general perspective of supportive teachers is that they are involved in unfriendly disciplinary climates. This is consistent with the fact that both variables are positively correlated with self-reported life satisfaction. They tend to describe their teachers as being more unsupportive but derive more satisfaction from the disciplinary climate itself. Self-Worth poses slight significance and is driven by both higher fear of failure and lower parental emotional support. Immigrants display a lower sense of belonging at school. This variable accounts for 3.68% of explained variation. As a whole, the school climate does not influence the LS differential, but the lack of a sense of belonging poses slight significance at a 10% level. Positive correlations between

emotional support and the sense of belonging with life satisfaction as well as the negative relationship between fear of failure and satisfaction justify the above results.

To conclude this section, the life satisfaction gap between natives and immigrants is primarily explained by higher wealth in immigrant families and anxiety proxied by cognitive dissonance. Other factors that help explaining the gap include a high shortage of educational material at the school, lack of belonging, and other country-related factors. Figure 3 synthesises the above table and discussion.

Figure 3

Explained variation in the life satisfaction gap between natives and immigrants.



6.3 Interaction Terms for the 8 Indices and Immigration Status

This section is concerned with research question 3 and will test models III (III*) and IV. All the regressions included below will be presented in two versions. The first column of each table is meant to represent the main regressions described in the [Methodology](#) section. The second

columns will show the same regressions, but excluding the index of economic, social, and cultural status(ESCS) in favor of country-fixed effects. Main coefficients are not indicative of what is being tested in this section but are included for clarity. Interaction terms will be considered significant for the purpose of this study if they display significance at a significance level of 5%. If the sign and significance are replicated in the country-fixed effects model, that will be treated as an additional reason to claim causality. The models focused on are still the ones displayed in the first columns of the tables. The number of observations are slightly different between the two specifications of the same model. This should not be an issue⁸. Tables [6](#), [7](#), [8](#), and [9](#) show the separate interacted regressions terms of model III for immigration status and freedom, children’s rights, migrant integration policy and income inequality respectively.

Table 6

Results of multilinear regressions of life satisfaction on interacted immigration status and freedom.

Variable	Life Satisfaction	
Immigration Status	-0.362*** (0.051) ^a	-0.284*** (0.050)
Freedom	-0.044 (0.135)	-2.968*** (0.029)
Immigration Status x Freedom	-0.197 (0.118)	-0.022 (0.042)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	464,889	466,848
Number of Countries	69	69
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018’s final student weights.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

^b *Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.*

****P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.*

⁸ For certainty, models with an equal amount of observations were tested resulting in very similar estimates.

Table 7

Results of multilinear regressions of life satisfaction on interacted immigration status and children's rights.

Variable	Life Satisfaction	
Immigration Status	-0.304** (0.127) ^a	-0.222*** (0.059)
Children's Rights	0.062*** (0.129)	-2.811*** (0.007)
Immigration Status x Children's Rights	0.048 (0.032)	-0.039 (0.032)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	437,684	439,538
Number of Countries	64	64
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table 8

Results of multilinear regression of life satisfaction on interacted immigration status and migrant integration policy.

Variable	Life Satisfaction	
Immigration Status	-0.252** (0.102) ^a	-0.234*** (0.059)
Migrant Integration	-0.135** (0.058)	-0.884*** (0.007)
Immigration Status x Migrant Integration	-0.092* (0.054)	-0.067 (0.040)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	318,537	320,195
Number of Countries	46	46
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table 9

Results of multilinear regression of life satisfaction on interacted immigration status and income inequality.

Variable	Life Satisfaction	
Immigration Status	-0.395*** (0.090) ^a	-0.255*** (0.047)
Income Inequality	-0.003 (0.085)	-1.482*** (0.010)
Immigration Status x Income Inequality	-0.192* (0.052)	-0.099* (0.052)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	457,486	459,430
Number of Countries	68	68
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

^b *Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.*

****P-value < 0,01, **P-value < 0,05, *P-value < 0,1, no asterisk: P-value > 0,1.*

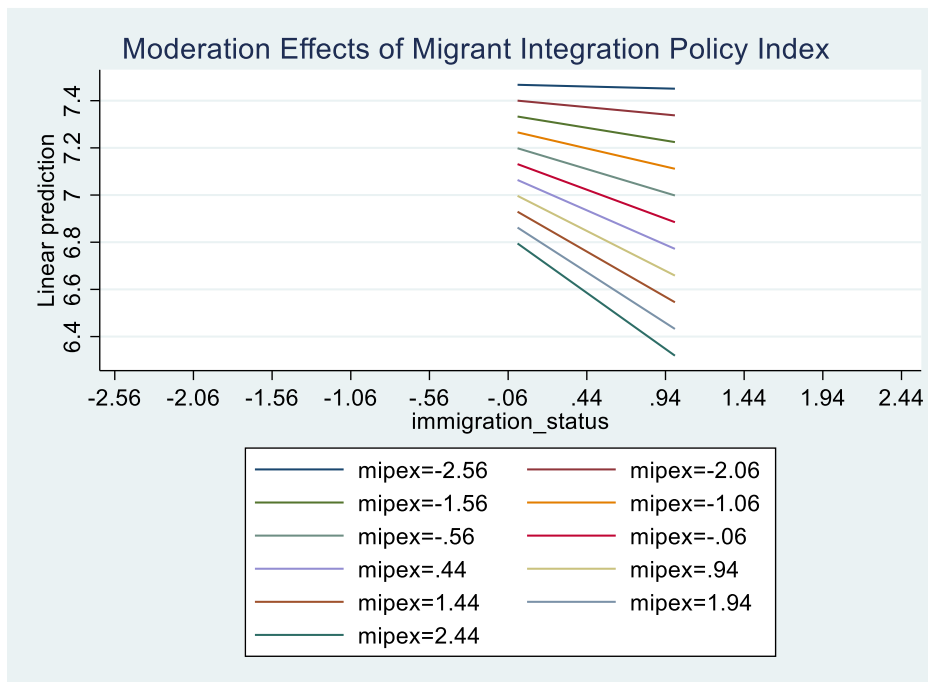
For the purpose of interpreting interaction effects, column 1 of Table 9 will be used as an example without worrying about significance. Being an immigrant results in 0.395 lower self-reported life satisfaction whilst an increase in one standard deviation in the income inequality Gini score decreases a student's life satisfaction by 0.003 points. Additionally, increasing income inequality by one standard deviation decreases the life satisfaction gap between natives and immigrants by 0.192 points.

Adding country-fixed effects significantly changes the coefficient for the main index variables. This change can be justified by a much larger spread in variation captured by the robust standard errors. The effect of Immigrant Status generally holds consistent at a negative level of significance. A correlation can be inferred at most for the interacted terms for migrant integration and income inequality, suggesting that higher values of these variables decrease the gap in LS. The life satisfaction gap is larger in countries with better migrant integration policies and higher income inequality. Interaction terms of immigration with freedom and children's rights are insignificant, suggesting that these country characteristics have no bearing on the LS difference. For the purpose of robustness, Table D1 of Appendix C shows Table 8's version

for the 2014 variant of the Migrant Integration Policy Index. Figures 4 and 5 show moderation effects for migrant integration policy and income inequality, they are the graphical representations of column 1 of Tables 8 and 9.

Figure 4

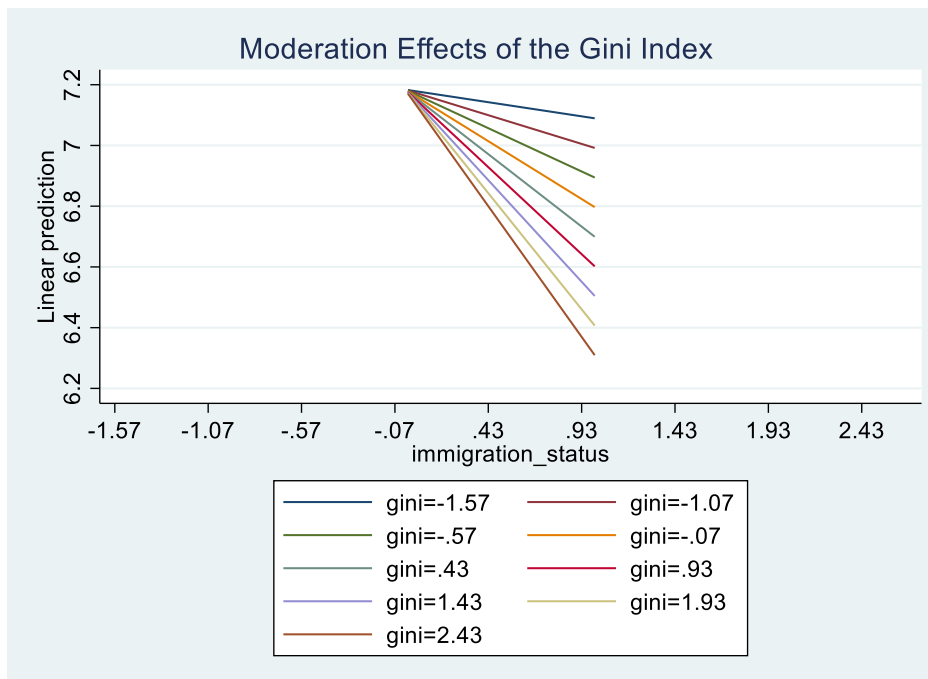
Moderation effects of migrant integration policy.



Note: Figure displays the marginal change in life satisfaction when immigration status changes, keeping migrant integration policy at different constant values.

Figure 5

Moderation effects of income inequality.



Note: Figure displays the marginal change in life satisfaction when immigration status changes, keeping income inequality at different constant values.

Regression results for the four Hofstede cultural dimensions of Power-Distance, Individualism, Masculinity, and Uncertainty Avoidance are found in tables [10](#), [11](#), [12](#), and [13](#).

Table 10

Results of multilinear regression of life satisfaction on interacted immigration status and power-distance relationships.

Variable	Life Satisfaction	
Immigration Status	-0.291*** (0.102) ^a	-0.350*** (0.065)
Power-Distance	0.218** (0.084)	0.142*** (0.030)
Immigration Status x Power-Distance	-0.036 (0.084)	-0.057 (0.062)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	283,968	285,349
Number of Countries	38	38
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table 11

Results of multilinear regression of life satisfaction on interacted immigration status and individualism.

Variable	Life Satisfaction	
Immigration Status	-0.118 (0.122) ^a	-0.271*** (0.089)
Individualism	-0.166*** (0.053)	-0.087*** (0.025)
Immigration Status x Individualism	-0.078 (0.064)	-0.026 (0.054)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	283,968	285,349
Number of Countries	38	38
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table 12

Results of multilinear regression of life satisfaction on interacted immigration status and masculinity.

Variable	Life Satisfaction	
Immigration Status	-0.357*** (0.103) ^a	-0.281*** (0.053)
Masculinity	-0.008*** (0.156)	-0.349*** (0.033)
Immigration Status x Masculinity	-0.228 (0.142)	-0.057 (0.059)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	283,968	285,349
Number of Countries	38	38
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table 13

Results of multilinear regression of life satisfaction on interacted immigration status and uncertainty avoidance.

Variable	Life Satisfaction	
Immigration Status	-0.322** (0.133) ^a	-0.331*** (0.060)
Uncertainty Avoidance	0.037 (0.144)	0.236*** (0.025)
Immigration Status x Uncertainty Avoidance	0.196 (0.127)	-0.035 (0.061)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	283,968	285,349
Number of Countries	38	38
R-Squared	0.01	0.05

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Insignificance is reported for all cultural country characteristics. The evident explanation is that the country of testing's culture does not influence the gap in immigrants' and natives' self-reported life satisfaction. Other potential explanations may involve the lower amount of countries in the sample and the contentious nature of the immutability claim posed by the 4 Hofstede cultural indicators. The regressions so far were allocated more omitted variable bias for the sake of keeping more observations in the model. Model IV is the model of interest when attempting more accurate inference and is displayed in Table [14](#).

Table 14

Results of multilinear regression of life satisfaction on interacted terms of immigration status and all 8 country-level indices.

Variable	Life Satisfaction	
Immigration Status	0.189 (0.169) ^a	-0.119 (0.103)
Freedom	0.450* (0.255)	0.505*** (0.023)
Children's Rights	0.236* (0.114)	-1.259*** (0.012)
Migrant Integration	-0.186 (0.154)	1.184*** (0.010)
Income Inequality	0.148 (0.110)	-0.248*** (0.052)
Power-Distance	0.482* (0.259)	1.554*** (0.033)
Individualism	0.089 (0.148)	1.746*** (0.043)
Masculinity	0.136 (0.172)	0.494*** (0.041)
Uncertainty Avoidance	-0.206 (0.240)	0.039 (0.032)
Immigration Status x Freedom	-0.327 (0.206)	0.194** (0.085)
Immigration Status x Children's Rights	0.058 (0.119)	0.011 (0.054)
Immigration Status x Migrant Integration	-0.149 (0.213)	-0.044 (0.054)
Immigration Status x Income Inequality	0.157 (0.130)	-0.023 (0.106)
Immigration Status x Power-Distance	-0.409* (0.220)	0.050 (0.091)
Immigration Status x Individualism	-0.149 (0.184)	-0.173 (0.127)
Immigration Status x Masculinity	-0.289* (0.149)	-0.090 (0.060)
Immigration Status x Uncertainty Avoidance	-0.149 (0.244)	-0.326** (0.133)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	210,813	211,998
Number of Countries	25	25
R-Squared	0.03	0.06

Note: Coefficients are weighted using PISA 2018's final student weights.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

^b *Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.*

****P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.*

With the mean in variance inflation factors of 3.34 and the maximum value of 5.80, there are no multicollinearity concerns for the above model. While these effects should be more promising in terms of causal accuracy, once again a correlation can at most be inferred for the interacted terms with masculinity and power-distance. The coefficients are both negative and indicate that countries with more acceptance for hierarchal inequality and a higher emphasis on masculinity decrease the life satisfaction differential. Model IV's version of the robustness specification that tests for differences in the development status of the immigrant's home country can be found in Table [15](#). The table compares immigrants from developing vs developed countries to all natives in the sample.

Table 15

Results of multilinear regression of life satisfaction on interacted terms of immigration status and all 8 country-level indices, by development of home country.

Variable	Life Satisfaction	
	Origin: Developing	Origin: Developed
Immigration Status	0.843*** (0.271) ^a	0.391 (0.327)
Freedom	0.670*** (0.139)	0.671*** (0.139)
Children's Rights	0.452*** (0.097)	0.453*** (0.097)
Migrant Integration	0.228 (0.173)	0.227 (0.173)
Income Inequality	0.039 (0.106)	0.040 (0.106)
Power-Distance	0.615*** (0.183)	0.615*** (0.183)
Individualism	-0.181 (0.108)	-0.181 (0.108)
Masculinity	0.270** (0.127)	0.270** (0.127)
Uncertainty Avoidance	-0.599*** (0.151)	-0.599*** (0.151)
Immigration Status x Freedom	-0.814*** (0.259)	-0.513*** (0.152)
Immigration Status x Children's Rights	-0.961** (0.402)	-0.222** (0.105)
Immigration Status x Migrant Integration	-0.003 (0.337)	-0.567*** (0.187)
Immigration Status x Income Inequality	-0.224 (0.233)	-0.296 (0.277)
Immigration Status x Power-Distance	-0.052 (0.458)	-0.428* (0.235)
Immigration Status x Individualism	1.005* (0.509)	-0.129* (0.205)
Immigration Status x Masculinity	-0.065 (0.388)	-0.396** (0.145)
Immigration Status x Uncertainty Avoidance	0.474*** (0.210)	0.169 (0.222)
Controls ^b	Yes	Yes
Country-fixed Effects	No	No
N	172,352	186,358
Number of Countries ^b	24	24
Number of Home Countries for Migrants	11	31
R-Squared	0.04	0.04

Note: Coefficients are weighted using PISA 2018's final student weights.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

****P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.*

In the case of first-generation immigrants from developing countries, highly significant coefficients are found for the interactions of immigrant status with freedom and uncertainty avoidance. Contrasting this with previous analysis, excluding the effect of the immigrant's home country may have resulted in the effects displayed above cancelling each other out. A one standard deviation increase in the test country's freedom score decreases the life satisfaction gap between natives and immigrants by 0.814 points on the single item scale, for immigrants from developing countries. This would suggest that immigrants from developing countries are happier in freer countries. Another positive and significant interaction is the one for uncertainty aversion. An immigrant born in a developing country that lives in a country with more aversion to the unknown reports lower LS compared to an equivalent migrant in a country with less uncertainty avoidance. More aversion to uncertainty can be interpreted to mean more avoidance of the unknown and strange, which immigrants are a part of to an extent. Countries with better children's rights host happier immigrants from developing countries. This effect is expected, especially because the sampled immigrants are adolescents. A slight correlation can be inferred individualism, suggesting that countries more focused on communitarian values are better for immigrants in terms of life satisfaction.

The effects of freedom and children's rights hold for immigrants from developed economies, but to a lesser extent. The interaction for migrant integration is highly significant and completely changes significance, indicating that unlike migrants from poor countries, immigrants from rich countries are happier in economies with better immigrant integration. Masculinity has a negative effect on the LS differential, indicating that it is a more important factor in changing the gap in life satisfaction for rich immigrants. The previous effect found in Table [14](#) seems to be explained by developed immigrants. A slight correlation for power distance indicates its positive effect in reducing the inequality in life satisfaction. Individualism maintains the same level of low significance but changes sign, indicating that collectivist societies host less satisfied migrants from developed countries. For the country-fixed effects regressions of the model in the above table, see table [D2](#) of Appendix C. The model does not confirm all findings, but it does take a backseat to the main model discussed above.

6.4 Summary of Results

Immigrant adolescents experience lower life satisfaction compared to adolescent natives. There appears to be a small difference in the life satisfaction of first-generation migrants, compared to the last generation. For first-generation immigrants only, the life satisfaction difference only manifests for those born in developed countries. This native-immigrant gap in life satisfaction is primarily explained by lower support from teachers experienced by immigrants and differences between host countries. Other factors that may add to this explanation are a shortage of educational material in immigrant-dense schools, a lower self-worth and sense of belonging, and conflicting teacher-student relationships. Counter-explanations are higher wealth of migrants and cognitive dissonance between natives and immigrants. For the general effect, the economic, legal, and political factors tested for have no bearing on the LS differential. When it comes to cultural dimensions, conflicting results with generally low levels of significance lead to the conclusion that more research is warranted in the fields of power-distance and masculinity. The insignificant effects are masked by the difference in home countries and by extension, privilege. No real conclusions can be drawn for second-generation migrants alone.

Amongst first-generation immigrants from developing countries, uncertainty avoidance and individualism are destination country-level factors that seem to increase the subjective life satisfaction differential. Children's rights, freedom, and masculinity are factors that decrease the life satisfaction difference. Freedom, children's rights, migrant integration policy, power-distance, and individualism decrease the LS differential for immigrants from developed countries.

7. Discussion

The negative immigrant-native gap in life satisfaction is supported by the general scientific consensus as well as the papers of Tang and Wang. Rodríguez et. al found no difference in life satisfaction between the two groups, but the analysis conducted in their study only revolved around students in Spain. The finding that there are no generational effects on life satisfaction does not have much bearing on the purpose of this study, but it is reflected in Wang's paper. Curiously enough, Tang finds generational gaps in life satisfaction across different countries, both positive and negative.

Over two thirds of host countries and observations are associated with high development status. Furthermore, the same ratio holds for home countries of first-generation immigrants. This is not highly inaccurate to the actual population, as more than two thirds of immigrants are born in developed countries, as highlighted by the 2022 World Migration Report (McAuliffe & Triandafyllidou, [2022](#)). This implies that most immigrants in the sample travelled to and from developed countries. This insight is helpful in explaining why the only segment of first-generation immigrants that seem to be affected by lower life satisfaction is that of travelers from developed economies.

The fact that happiness is a relative measure associated with certain privileges or lack thereof has been documented before (Veenhoven, [1991](#)). Individuals from better environments can find more reason to complain about mundane factors. There is also an intrinsic link between democratization and the human development level of a country (Regan & Henderson, [2002](#)). Underdeveloped systems are generally more repressive. A more repressive system cultivates a fear of unjust retaliation and can create the incentive to misreport in surveys (Strosberg et al., [2013](#)). In addition, the actual movement across different levels of development is very small in this sample. Immigrants from developed countries have an additional predilection for indisposition when faced with discrimination. The self-selection of high-skilled individuals into immigration is also highlighted by the OECD's comparative review of immigration ([2006](#)).

This additionally explains the negative wealth gap between natives and immigrants. First-generation immigrants mostly travelled from developed countries and display higher levels of wealth that would allow for this transition. Travelers from developing countries primarily travelled to other developing countries. Furthermore, the 2017 Kauffman Entrepreneurship index indicates that immigrants have higher rates of entrepreneurship than native-born Americans (Morelix et al., [2017](#)). Additionally, the Partnership for a New American Economy ([2011](#)) showed that 40% of Fortune 500 companies had a founder that was a first-generation or second-generation immigrant. While seemingly paradoxical, this family wealth gap is supported by the literature.

Higher displayed ability of immigrants in cognitive situations is also consistent with previous research on immigrant-native cognitive disparity (Weber et al., [2015](#)), but not with language mastery on cognition (Dunn, [2016](#)), and the negative affectation of environment-induced anxiety on cognitive capacity (Robinson et al., [2013](#)). Despite this, this study concludes

that adolescent immigrants in the PISA 2018 database do indeed display higher levels of cognition. This is strengthened by the positive relationship between cognition and wealth (Lillard & Willis, [2001](#)).

Tang, Wang, and Rodríguez additionally showed how some of these factors induce less life satisfaction in migrant populations. The [2006](#) OECD immigration report confirms this study's findings when it comes to lower perceived educational material availability. Immigrants are clustered in schools with a large population of other immigrants, which seem to face social disadvantages. The same study finds differences in school climate proxied by teacher behavior between natives and migrants. In combination with the study by Braun et al. ([2020](#)) regarding teacher emotion regulation and its effect on life satisfaction, the findings relating to school climate are also supported by more broad literature.

When it comes to country-level factors changing the LS differential, this study reports insignificance when it comes to both cultural differences and economic and legal descriptors. Notable exceptions may be represented in the form of masculinity and power-distance, which warrant further investigation. While these findings may contradict some general literature available on the matter, the truth is that there is not much scientific consensus in regards to these metrics. Furthermore, a relevant part of available academic literature does not use the measurements used in this study, risking different results due to measurement differences or inadequacies. Studies like that of Tatarko et. al ([2021](#)) and Hadjar and Backes ([2013](#)) confirm the general tendency towards life satisfaction provided by better migrant integration policy. These findings are more insightful when looking at the results found when differentiating between quote-on-quote “poor” and “rich” immigrants.

Insignificance turns to significance for some interacted coefficients, suggesting a masking of the true effect due to a bundling of two importantly different types of immigrants. In studies testing economic, legal, political, social, and cultural country characteristics, the presence of the home country as a distinction is generally missing. The land is even more barren if we consider studies specifically using subjective life satisfaction as an outcome.

Freedom is a country-level indicator that decreases the life satisfaction gap between natives and migrants from both developing and developed countries. This falls in line the general idea that freedom increases life satisfaction (Oishi et al.,[2009](#)). The effect is smaller for immigrants

from developed economies, suggesting that it is much more important in the life satisfaction differential of less fortunate immigrants. Better children's rights decrease the gap in LS for both types of immigrants. This is consistent with findings that adolescents born in regions with a lesser extent of child care are less satisfied (Migliorini et al., [2019](#)). This is especially important and natural since the sampled individuals are adolescents. Intuitively, better children's rights can represent a reason for emigrating in the first place, so the smaller effect is justified for migrants from developed economies. Migrant integration policies were only shown negatively influence the gap for "developed" immigrants. This falls in line with the Tatarko et al. and Hadjar and Backes studies. Some findings that this metric does not impact the LS gap may be justified by a larger sample of less privileged immigrants (Hendriks & Bartram, [2016](#)). This does suggest that a discrimination effect takes place when implementing migration policy, and that it tends to favor the more privileged immigrant. Income inequality is not a significant predictor for any type of immigrant.

Power-distance is theorized to slightly decrease the LS gap in immigration. This finding is one of the few supported by previous models in this paper. Individualism is significant for both types of migrants, but it curiously changes sign. More individualism is worse for migrants from developed countries and better for immigrants from developed states. This falls in line with the general belief that individualism is associated with more developed, capitalist countries (Turner, [1988](#)). Newcomers from developed countries are happier in places with more emphasis on masculinity. This effect is missing for travelers from developing countries. This contradicts previous literature. A possible interpretation would be that developing countries are more masculine in nature (Santow, [1995](#)), and an immigrant would be less satisfied in a similarly masculine environment. A culture for uncertainty aversion is generally a culture of safety and predictability, justifiably increasing the gap in life satisfaction. This supports previous literature (Kashima & Abu-Rayya, [2014](#); Arrindell et al., [1997](#)), but the separation by country of origin is of high relevance. It is also worth noting that first-generation immigrants in the sample are quite young, despite them not being born in the host country.

This study comes with its own limitations. Firstly, the second stage of the two-staged sampling design used by PISA was not used in favor of clustering standard errors at the country level. The importance of using replicates is heavily emphasized by the PISA data analysis manual (OECD, [2009](#)). The errors estimated are still considered to be reliable and more

relevant given the cross-country setting, but they would be regarded as biased from the OECD standpoint. Secondly, despite numerous attempts to equalize results across the same observations, this study has worked with unequal amounts of observations for different models. This was done to achieve the most accurate possible estimates in every isolated regression, but comparisons between models become more difficult under different amounts of observations. Thirdly, while this paper repeatedly emphasized the use of origin country as a control, the construction of this variable in the PISA datasets is rather rigid, only permitting this study to proxy a binary variable for its development status. This was additionally done because of the unreasonable amount of absorption reached when using home country-fixed effects. Furthermore, this study is informative when it comes to immigrants that travel between the same types of country by development, but actual developing-developed movement is very low in the sample used, thus making this not have much insight on factors such as intergenerational mobility and exposure to radically new environments. Finally, the single-item life satisfaction measurement scale is rather simplistic, at least compared to some WLE indices available in the PISA datasets, such as happiness and subjective life satisfaction. This metric was still opted for in order to better capture on-the-moment feelings reported by students.

General suggestions for future research include better parametrization of home country influences and more emphasis on differences between poor and affluent immigrants. Particular effects of interest are the discriminatory effect of migrant integration policy differences between first-generation immigrants based on their age and memory. For research involving PISA, a historical analysis looking at discrepancies in life satisfaction gaps across time using more than one database would provide much insight when it comes to comparing sets of migrant generations between each other. The technical implementation and usage of a method that integrates country-clustered standard errors in the OECD replication process would additionally be insightful in producing completely unbiased standard errors. Finally, other cross-sectional databases such as PIRLS and TIMSS (International Association for the Evaluation of Educational Achievement, [2022](#)) should be comparatively tested in tandem with PISA to see if the results hold.

Studies such as this one may provide useful insight when it comes to policy-making. Shifting the focus of education towards tolerance may be more useful than implementing nation-wide policies. Factors that influence inequality are more-often than not of an emotional

and environmental nature. Helping students understand why inequality takes place and providing them with instruments to understand their cultural biases is a better method of achievement true integration. Furthermore, understanding why the immigrant's country is different and why this may provide insufficiencies in non-discriminatory policy-making is the next step politicians should take in understanding this field.

8. Conclusion

The aim of this paper has been to estimate the native-immigrant adolescent gap in life satisfaction at a cross-national level, decompose it into a set of potential explanatory factors, and show whether the host country poses significant differences in the life satisfaction differential, whilst integrating the influence of his country of origin. OLS regressions and a linear decomposition method were applied to the PISA 2018 dataset in the analysis. There seems to be a significant gap in life satisfaction between natives and immigrants. This gap can be mainly explained by factors such as wealth, the immigrant's school, and cognitive differences. Economic, political, social and cultural country-level indicators have a mixed effect on the gap, primarily influencing it when taking the immigrant's home country into account. The main strength of this thesis is its methodological accuracy in narrowing down the gap in self-reported life satisfaction. Its main weakness is its very broad scope. The findings of this study may prove helpful in policy-making and statecraft, shifting focus away from general immigration policies to perhaps cultivating tolerance and understanding inequality. Future research can expand on this paper by focusing on the country of origin's influence in studies using large-scale cross-sectional data.

Compliance with Ethical Standards

The author declares that there is no conflict of interest.

References

- Albrow, M., Eade, J., Washbourne, N., & Durrschmidt, J. (1994). The impact of globalization on sociological concepts: Community, culture and milieu. *Innovation: The European Journal of Social Science Research*, 7(4), 371-389. <https://doi.org/10.1080/13511610.1994.9968418>
- Amit, K., & Riss, I. (2014). The subjective life satisfaction of immigrants: Pre-and post-migration. *Social Indicators Research*, 119(1), 247-264. <https://doi.org/10.1007/s11205-013-0492-7>
- Angelini, V., Casi, L., & Corazzini, L. (2015). Life satisfaction of immigrants: does cultural assimilation matter?. *Journal of Population Economics*, 28(3), 817-844. <https://doi.org/10.1007/s00148-015-0552-1>
- Arrindell, W. A., Hatzichristou, C., Wensink, J., Rosenberg, E., van Twillert, B., Stedema, J., & Meijer, D. (1997). Dimensions of national culture as predictors of cross-national differences in subjective life satisfaction. *Personality and Individual Differences*, 23(1), 37-53. [https://doi.org/10.1016/S0191-8869\(97\)00023-8](https://doi.org/10.1016/S0191-8869(97)00023-8)
- Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *The Journal of Human Resources*, 8(4), 436–455. <https://doi.org/10.2307/144855>
- Bradshaw, J., & Rees, G. (2017). Exploring national variations in child subjective life satisfaction. *Children and youth services review*, 80, 3-14. <https://doi.org/10.1016/j.childyouth.2017.06.059>
- Braun, S. S., Schonert-Reichl, K. A., & Roeser, R. W. (2020). Effects of teachers' emotion regulation, burnout, and life satisfaction on student life satisfaction. *Journal of applied developmental psychology*, 69, 101151. <https://doi.org/10.1016/j.appdev.2020.101151>
- Bobowik, M., Basabe, N., Páez, D., Jiménez, A., & Bilbao, M. (2011). Personal values and life satisfaction among Europeans, Spanish natives and immigrants to Spain: Does the culture matter?. *Journal of Happiness Studies*, 12(3), 401-419. <https://doi.org/10.1007/s10902-010-9202-1>
- Borraccino, A., Charrier, L., Berchiolla, P., Lazzeri, G., Vieno, A., Dalmaso, P., & Lemma, P. (2018). Perceived life satisfaction in adolescent immigrants: it matters where they come from. *International journal of public health*, 63(9), 1037-1045. <https://doi.org/10.1007/s00038-018-1165-8>
- Burger, M., Hendriks, M. & Ianchovichina, E. Happy but Unequal: Differences in Subjective Life satisfaction across Individuals and Space in Colombia. *Applied Research Quality Life* (2021). <https://doi.org/10.1007/s11482-021-09954-2>

- Clark, L. R., Brasseur, C., Richmond, D., Getson, P., & D'angelo, L. J. (1997). Are adolescents accurate in self-report of frequencies of sexually transmitted diseases and pregnancies?. *Journal of Adolescent Health*, 21(2), 91-96.
[https://doi.org/10.1016/S1054-139X\(97\)00042-6](https://doi.org/10.1016/S1054-139X(97)00042-6)
- Chand, M., & Ghorbani, M. (2011). National culture, networks and ethnic entrepreneurship: A comparison of the Indian and Chinese immigrants in the US. *International Business Review*, 20(6), 593-606. <https://doi.org/10.1016/j.ibusrev.2011.02.009>
- Cheruvilil, K. S., Soranno, P. A., Weathers, K. C., Hanson, P. C., Goring, S. J., Filstrup, C. T., & Read, E. K. (2014). Creating and maintaining high-performing collaborative research teams: the importance of diversity and interpersonal skills. *Frontiers in Ecology and the Environment*, 12(1), 31-38. <https://doi.org/10.1890/130001>
- Chiswick, B. R., & Miller, P. W. (2009). Citizenship in the United States: The roles of immigrant characteristics and country of origin. In *Ethnicity and labor market outcomes*. Emerald Group Publishing Limited. [https://doi.org/10.1108/S0147-9121\(2009\)0000029007](https://doi.org/10.1108/S0147-9121(2009)0000029007)
- CIA World Factbook. (2022, May 2). *Gini Index coefficient – distribution of family income* [Data Set]. Retrieved May 2, 2022, from <https://bit.ly/3liWtge>
- Della Giusta, M., Jewell, S. L., & Kambhampati, U. S. (2011). Gender and life satisfaction in the UK. *Feminist Economics*, 17(3), 1-34.
<https://doi.org/10.1080/13545701.2011.582028>
- Diener, E. (2009). Subjective life satisfaction. *The science of life satisfaction*, 11-58.
https://doi.org/10.1007/978-90-481-2350-6_2
- Dinisman, T., & Ben-Arieh, A. (2016). The characteristics of children's subjective life satisfaction. *Social indicators research*, 126(2), 555-569.
<https://doi.org/10.1007/s11205-015-0921-x>
- Dunn, J. (2016). Language and cognition. <https://bit.ly/3MpJx4f>
- Finnvold, J. E. (2019). How income inequality and immigrant background affect children's use of mental healthcare services in Oslo, Norway. *Child Indicators Research*, 12(6), 1881-1896. <https://doi.org/10.1007/s12187-018-9614-8>
- Freedom House (2018). *Freedom in the World 2018 Scores* [Data set].
<https://freedomhouse.org/report/freedom-world/2018/scores>
- Giannone, D. (2010). Political and ideological aspects in the measurement of democracy: the Freedom House case. *Democratization*, 17(1), 68-97.
<https://doi.org/10.1080/13510340903453716>

- González-Carrasco, M., Casas, F., Malo, S. *et al.* Changes with Age in Subjective Life satisfaction Through the Adolescent Years: Differences by Gender. *J Happiness Stud* **18**, 63–88 (2017). <https://doi.org/10.1007/s10902-016-9717-1>
- Hadjar, A., & Backes, S. (2013). Migration background and subjective life satisfaction a multilevel analysis based on the European social survey. *Comparative Sociology*, *12*(5), 645-676. <https://doi.org/10.1163/15691330-12341279>
- He, J., Cai, Z., & Fan, X. (2017). Accuracy of using self-reported data to screen children and adolescents for overweight and obesity status: A diagnostic meta-analysis. *Obesity Research & Clinical Practice*, *11*(3), 257-267. <https://doi.org/10.1016/j.orcp.2017.03.004>
- Heckman, J. J. (2008). The case for investing in disadvantaged young children. *CESifo DICE Report*, *6*(2), 3-8. <https://www.econstor.eu/handle/10419/166932>
- Heizmann, B., & Böhnke, P. (2019). Immigrant life satisfaction in Europe: the role of social and symbolic boundaries. *Journal of ethnic and migration studies*, *45*(7), 1027-1050. <https://doi.org/10.1080/1369183X.2018.1438252>
- Hendriks, M. (2015). The happiness of international migrants: A review of research findings. *Migration Studies*, *3*(3), 343-369. <https://doi.org/10.1093/migration/mnu053>
- Hendriks, M., & Bartram, D. (2016). Macro-conditions and immigrants' happiness: Is moving to a wealthy country all that matters?. *Social Science Research*, *56*, 90-107. <https://doi.org/10.1016/j.ssresearch.2015.11.006>
- Hendriks, M., Burger, M., Ray, J., & Esipova, N. (2018). Do international migrants increase their happiness and that of their families by migrating. *World happiness report*, 44-65. <https://worldhappiness.report/ed/2018/>
- Hibbs, B., & Hong, G. (2015). An examination of the effect of immigration on income inequality: A Gini index approach. *Economics Bulletin*, *35*(1), 650-656. <http://www.accessecon.com/Pubs/EB/2015/Volume35/EB-15-V35-I1-P69.pdf>
- Hofstede, G. (2009). *Geert Hofstede cultural dimensions*. [http://taylortraining.com/clients/mcc/Hofstede_Cultural_Dimension_Explained\(external\).pdf](http://taylortraining.com/clients/mcc/Hofstede_Cultural_Dimension_Explained(external).pdf)
- Hofstede, G. (2022, May 1). *Dimension Data Matrix* [Data]. Retrieved May 1,2022, from <https://geerthofstede.com/research-and-vsm/dimension-data-matrix/>
- Humpert, S. (2013). Gender differences in life satisfaction and social participation. *International Journal of Economic Sciences and Applied Research*, *6*(3), 123-142. <https://www.ceeol.com/search/article-detail?id=272609>

- International Association for the Evaluation of Educational Achievement (IEA). (2022, May 25). *TIMSS & PIRLS International Study Center*. Retrieved May 15, 2020, from: <https://timssandpirls.bc.edu/>
- Jack, G. (2010). Place matters: The significance of place attachments for children's life satisfaction. *British Journal of Social Work*, 40(3), 755-771. <https://doi.org/10.1093/bjsw/bcn142>
- Jerrim, J., Lopez-Agudo, L. A., Marcenaro-Gutierrez, O. D., & Shure, N. (2017, June). To weight or not to weight? the case of PISA data. In *Proceedings of the XXVI Meeting of the Economics of Education Association, Murcia, Spain* (pp. 29-30). <https://2017.economicsofeducation.com/user/pdfsesiones/025.pdf>
- Kahneman, D., & Krueger, A. B. (2006). Developments in the measurement of subjective life satisfaction. *Journal of Economic perspectives*, 20(1), 3-24. <https://bit.ly/3Li4o8c>
- Kashima, E. S., & Abu-Rayya, H. M. (2014). Longitudinal associations of cultural distance with psychological life satisfaction among Australian immigrants from 49 countries. *Journal of Cross-Cultural Psychology*, 45(4), 587-600. <https://doi.org/10.1177/0022022113519857>
- KidsRights (2018). *KidsRights Index 2018* [Data Set]. KidsRights Foundation. <https://www.kidsrights.org/research/kidsrights-index/reports-and-publications/>
- Klocke, A., Clair, A., & Bradshaw, J. (2014). International variation in child subjective life satisfaction. *Child Indicators Research*, 7(1), 1-20. <https://doi.org/10.1007/s12187-013-9213-7>
- Kogan, I., Shen, J., & Siegert, M. (2018). What makes a satisfied immigrant? Host-country characteristics and immigrants' life satisfaction in eighteen European countries. *Journal of Happiness Studies*, 19(6), 1783-1809. <https://doi.org/10.1007/s10902-017-9896-4>
- Ladouceur, R., Bouchard, C., Rhéaume, N., Jacques, C., Ferland, F., Leblond, J., & Walker, M. (2000). Is the SOGS an accurate measure of pathological gambling among children, adolescents and adults?. *Journal of Gambling studies*, 16(1), 1-24. <https://doi.org/10.1023/A:1009443516329>
- Lee, B. J., & Yoo, M. S. (2017). What accounts for the variations in children's subjective life satisfaction across nations?: A decomposition method study. *Children and Youth Services Review*, 80, 15-21. <https://doi.org/10.1016/j.childyouth.2017.06.065>
- Leong, C. H., & Ward, C. (2006). Cultural values and attitudes toward immigrants and multiculturalism: The case of the Eurobarometer survey on racism and xenophobia. *International Journal of Intercultural Relations*, 30(6), 799-810. <https://doi.org/10.1016/j.ijintrel.2006.07.001>

- Lillard, L. A., & Willis, R. J. (2001). Cognition and wealth: The importance of probabilistic thinking. *Michigan Retirement Research Center Research Paper No. WP, 7*. <http://dx.doi.org/10.2139/ssrn.1084559>
- Lopez, J., & Hillygus, D. S. (2018). Why so serious?: Survey trolls and misinformation. *Why So Serious*. <http://dx.doi.org/10.2139/ssrn.3131087>
- McAuliffe, M., & Triandafyllidou, A. (2022). 1 Report Overview: Technological, Geopolitical and Environmental Transformations Shaping Our Migration and Mobility Futures. *World Migration Report, 2022(1)*, e00022. <https://onlinelibrary.wiley.com/doi/abs/10.1002/wom3.22>
- Migliorini, L., Tassara, T., & Rania, N. (2019). A Study of Subjective Well-Being and Life Satisfaction in Italy: how are Children doing at 8 years of Age?. *Child Indicators Research, 12(1)*, 49-69. <https://doi.org/10.1007/s12187-017-9514-3>
- Morelix, A., & Russell-Fritch, J. (2017). Kauffman index 2017: Growth entrepreneurship national trends. <http://dx.doi.org/10.2139/ssrn.3080706>
- Neto, F., Moreno, R. P., & Chuang, S. S. (2011). Psychological aspects of immigration among youth living in Portugal. *Immigrant Children, 193*. <https://bit.ly/3PCg1KL>
- Nijenhuis, J. de, Jong, M. J. de, Evers, A., & Van Der Flier, H. (2004). Are cognitive differences between immigrant and majority groups diminishing?. *European Journal of Personality, 18(5)*, 405-434. <https://doi.org/10.1002/per.511>
- Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review, 14(3)*, 693–709. <https://doi.org/10.2307/2525981>
- OECD. (2006). *Where immigrant students succeed: A comparative review of performance and engagement in PISA 2003*. Paris: OECD Publishing. <https://bit.ly/3yKDPpG>
- OECD (2009), *PISA Data Analysis Manual: SPSS, Second Edition*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/9789264056275-en>.
- OECD (2019a), *PISA 2018 Database* [Data set]. PISA, OECD Publishing, Paris. <https://www.oecd.org/pisa/data/2018database>
- OECD (2019b), *PISA 2018 Results (Volume III): What School Life Means for Students' Lives*, PISA, OECD Publishing, Paris. <https://doi.org/10.1787/acd78851-en>.
- OECD. (2019c). *PISA 2018 technical report*. Paris: OECD Publishing. <https://www.oecd.org/pisa/data/pisa2018technicalreport/>
- Oishi, S., Diener, E., Lucas, R. E., & Suh, E. M. (2009). Cross-cultural variations in predictors of life satisfaction: Perspectives from needs and values. In *Culture and well-being* (pp. 109-127). Springer, Dordrecht. https://doi.org/10.1007/978-90-481-2352-0_6

- Perreira, K. M., & Ornelas, I. J. (2011). The physical and psychological life satisfaction of immigrant children. *The Future of Children*, 195-218.
<https://www.jstor.org/stable/41229017>
- Phinney, J., Horenczyk, G., Liebkind, K., & Vedder, P. H. (2001). Ethnic identity, immigration, and life satisfaction: An interactional perspective. *Journal of social issues*, 57(3), 493-510.
<https://scholarlypublications.universiteitleiden.nl/access/item%3A2860490/view>
- Pickett, K. E., & Wilkinson, R. G. (2015). Income inequality and health: a causal review. *Social science & medicine*, 128, 316-326.
<https://doi.org/10.1016/j.socscimed.2014.12.031>
- Proctor, C. L., Linley, P. A., & Maltby, J. (2009). Youth life satisfaction: A review of the literature. *Journal of happiness studies*, 10(5), 583-630.
<https://doi.org/10.1007/s10902-008-9110-9>
- Regan, P. M., & Henderson, E. A. (2002). Democracy, threats and political repression in developing countries: are democracies internally less violent?. *Third World Quarterly*, 23(1), 119-136. <https://doi.org/10.1080/01436590220108207>
- Robinson, O. J., Vytal, K., Cornwell, B. R., & Grillon, C. (2013). The impact of anxiety upon cognition: perspectives from human threat of shock studies. *Frontiers in human neuroscience*, 7, 203. <https://doi.org/10.3389/fnhum.2013.00203>
- Rodríguez, S., Valle, A., Gironelli, L. M., Guerrero, E., Regueiro, B., & Estévez, I. (2020). Performance and life satisfaction of native and immigrant students. Comparative analysis based on PISA 2018. *Journal of Adolescence*, 85, 96-105.
<https://doi.org/10.1016/j.adolescence.2020.10.001>
- Ruedin, D. (2015). Increasing validity by recombining existing indices: MIPEX as a measure of citizenship models. *Social Science Quarterly*, 96(2), 629-638.
<https://doi.org/10.1111/ssqu.12162>
- Santow, G. (1995). Social roles and physical health: the case of female disadvantage in poor countries. *Social Science & Medicine*, 40(2), 147-161. [https://doi.org/10.1016/0277-9536\(94\)E0069-5](https://doi.org/10.1016/0277-9536(94)E0069-5)
- Sarracino, F., & Piekalkiewicz, M. (2021). The role of income and social capital for Europeans' life satisfaction during the 2008 economic crisis. *Journal of Happiness Studies*, 22(4), 1583-1610. <https://doi.org/10.1007/s10902-020-00285-x>
- Silk, J. S., Steinberg, L., & Morris, A. S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child development*, 74(6), 1869-1880. <https://doi.org/10.1046/j.1467-8624.2003.00643.x>
- Solano, G., & Huddleston, T. (2020). *Migrant Integration Policy Index 2020* [Data Set].
<https://www.mipex.eu/play/>

- Strosberg, M. A., Gefenas, E., Loue, S., & Philpott, S. (2013). Building research ethics capacity in post-Communist countries: Experience of two Fogarty training programs. *Journal of Empirical Research on Human Research Ethics*, 8(5), 28-39. <https://doi.org/10.1525/jer.2013.8.5.28>
- Tatarko, A., Jurcik, T., & Hadjar, A. (2021). How migration policy shapes the subjective life satisfaction of the non-immigrant population in European Countries. *Journal of Cross-Cultural Psychology*, 52(3), 316-333. <https://doi.org/10.1177/00220221211001531>
- Tang, Y. Immigration Status and Adolescent Life Satisfaction: An International Comparative Analysis Based on PISA 2015. *J Happiness Stud* 20, 1499–1518 (2019). <https://doi.org/10.1007/s10902-018-0010-3>
- The Partnership for a New American Economy. (2011, June). *The “New American” Fortune* 500. <https://bit.ly/3Mpy0C4>
- The World Bank. (2022, May 2). *Gini Index* [Data Set]. Retrieved May 2, 2022, from https://data.worldbank.org/indicator/SI.POV.GINI?name_desc=false
- Turner, B. S. (1988). Individualism, capitalism and the dominant culture: A note on the debate. *The Australian and New Zealand Journal of Sociology*, 24(1), 47-64. <https://doi.org/10.1177/144078338802400103>
- UNICEF. (2021, April). *Child Migration*. UNICEF. <https://bit.ly/3yIqiii>
- United Nations Development Programme. (2019a). *Human Development Index (HDI) 2019*. United Nations. <https://worldpopulationreview.com/country-rankings/hdi-by-country>
- United Nations Development Programme. (2019b). *Human Development Report 2019*. Human Development Index. United Nations. <http://hdr.undp.org/en/composite/HDI>.
- United Nations. (2020). *International Migration 2020 Highlights*. United Nations. <https://www.un.org/en/desa/international-migration-2020-highlights>
- Veenhoven, R. (1991). Is happiness relative?. *Social indicators research*, 24(1), 1-34. <https://doi.org/10.1007/BF00292648>
- Vinogradov, E., & Kolvereid, L. (2007). Cultural background, human capital and self-employment rates among immigrants in Norway. *Entrepreneurship and Regional Development*, 19(4), 359-376. <https://doi.org/10.1080/08985620701223213>
- Wang, Z. (2021). Mind the gap: Examining migrant-native disparities in reading performance and subjective wellbeing among 15-year-old students in different education systems. *International Journal of Educational Research Open*, 2, 100087. <https://doi.org/10.1016/j.ijedro.2021.100087>
- Warm, T. A. (1989). Weighted likelihood estimation of ability in item response theory. *Psychometrika*, 54(3), 427-450. <https://doi.org/10.1007/BF02294627>

Weber, S., Appel, M., & Kronberger, N. (2015). Stereotype threat and the cognitive performance of adolescent immigrants: The role of cultural identity strength. *Contemporary Educational Psychology*, 42, 71-81.
<https://doi.org/10.1016/j.cedpsych.2015.05.001>

Appendix

Appendix A: Auxiliary Descriptive Statistics

Table A1

Descriptive statistics for the first 4 indices and country scores.

Statistic/Country ⁹	FreedomHouse	KidsRight	MIPEX	Gini
N	466,848	439,538	320,195	459,430
Mean	64.06	0.79	48.67	35.44
Standard deviation	30.16	0.11	15.06	6.90
Min	7	0.38	10	24.6
Max	99	0.97	86	53.9
Nr. of available countries	69	64	46	68
Countries				
Albania	68	0.79	43	33.2
Argentina	83	0.85	58	42.9
Austria	94	0.88	46	30.8
Azerbaijan	12	0.78	-	26.6
Belarus	21	0.75	-	25.3
Bosnia and Herzegovina	55	0.83	-	33
Brazil	78	0.71	64	53.4
Brunei Darussalam	28	0.79	-	-
Bulgaria	80	0.84	40	41.3
Chile	94	0.87	53	44.4
China ^a	14	0.68	32	38.5
Chinese Taipei	93	-	-	33.6
Colombia	65	0.80	-	51.3
Costa Rica	91	0.76	-	48.2
Croatia	86	0.84	39	29.7
Czech Republic	93	0.85	50	25
Dominican Republic	67	0.72	-	41.9
Estonia	94	0.84	50	30.3
Finland	10	0.91	85	27.3
France	90	0.90	56	32.4
Georgia	64	0.79	-	35.9
Germany	94	0.91	58	31.9
Greece	85	0.82	46	32.9
Hong Kong	59	-	-	53.9
Hungary	72	0.81	43	29.6
Iceland	95	0.97	56	26.1
Indonesia	64	0.69	26	38.2

⁹ Austria, China, The Czech Republic, Finland, France, Georgia, Ireland, Lebanon, Luxembourg, Malaysia, The Netherlands, North Macedonia, Qatar, South Korea, Sweden, and Ukraine are dropped from the Blinder-Oaxaca decomposition.

Statistic/Country ⁹	FreedomHouse	KidsRight	MIPEX	Gini
Ireland	96	0.82	64	31.4
Italy	89	0.75	58	35.9
Jordan	37	0.80	21	33.7
Kazakhstan	22	0.83	-	27.8
Kosovo	52	-	-	-
Latvia	87	0.88	37	35.1
Lebanon	43	0.82	-	31.8
Lithuania	91	0.71	37	35.7
Luxembourg	98	0.79	64	35.4
Macao	-	-	-	38.5
Malaysia	45	0.87	-	41.1
Malta	92	0.88	48	28.7
Mexico	62	0.82	51	45.4
Moldova	61	0.78	47	25.7
Montenegro	67	0.79	-	38.5
Morocco	39	0.75	-	39.5
Moscow Region (Russia)	20	0.74	31	37.5
Netherlands	99	0.91	57	28.1
North Macedonia	58	0.79	42	33
Panama	83	0.69	-	49.8
Peru	73	0.81	-	41.5
Philippines	62	0.74	-	42.3
Poland	85	-	40	30.2
Portugal	97	0.95	81	33.5
Qatar	24	0.88	-	41.1
Romania	84	0.66	49	35.8
Russian Federation	20	0.74	31	37.5
Saudi Arabia	7	0.47	10	45.9
Serbia	73	0.82	50	36.2
Slovakia	89	0.72	39	25.2
Slovenia	93	0.90	48	24.6
South Korea	84	0.76	56	31.4
Spain	94	0.95	60	34.7
Sweden	10	0.87	86	30
Switzerland	96	0.94	50	33.1
Tatarstan (Russia)	20	0.74	-	37.5
Thailand	31	0.86	-	34.9
Turkey	32	0.83	43	41.9
U.S.A.	86	-	73	41.4
Ukraine	62	0.72	48	26.6
United Arab Emirates	17	0.76	29	26
United Kingdom	94	0.38	56	35.1
Uruguay	98	0.83	-	39.7

^a China represents the four provinces from mainland China (i.e., Beijing, Shanghai, Jiangsu, and Zhejiang) that took part in PISA 2018.

Table A2*Descriptive statistics for the 4 Hofstede cultural indices and country scores.*

Statistic/Country	Power Distance	Individualism	Masculinity	Uncertainty Avoidance
N	285,349	285,349	285,349	285,349
Mean	59.97	43.29	50.81	69.76
Standard deviation	18.94	22.17	15.84	20.58
Min	11	11	5	29
Max	104	91	88	112
Nr. of available countries	38	38	38	38
Countries				
Albania	-	-	-	-
Argentina	49	46	56	86
Austria	11	55	79	70
Azerbaijan	-	-	-	-
Belarus	-	-	-	-
Bosnia and Herzegovina	-	-	-	-
Brazil	69	38	49	76
Brunei Darussalam	-	-	-	-
Bulgaria	-	-	-	-
Chile	63	23	28	86
China ^a	80	20	66	40
Chinese Taipei	58	17	45	69
Colombia	67	13	64	80
Costa Rica	35	15	21	86
Croatia	-	-	-	-
Czech Republic	57	58	57	74
Dominican Republic	-	-	-	-
Estonia	-	-	-	-
Finland	33	63	26	59
France	68	71	43	86
Georgia	-	-	-	-
Germany	35	67	66	65
Greece	60	35	57	112
Hong Kong	68	25	57	29
Hungary	46	55	88	82
Iceland	-	-	-	-
Indonesia	78	14	46	48
Ireland	28	70	68	35
Italy	50	76	70	75
Jordan	-	-	-	-
Kazakhstan	-	-	-	-
Kosovo	-	-	-	-
Latvia	-	-	-	-
Lebanon	80	38	52	68

Statistic/Country	Power Distance	Individualism	Masculinity	Uncertainty Avoidance
Lithuania	-	-	-	-
Luxembourg	-	-	-	-
Macao	-	-	-	-
Malaysia	104	26	50	36
Malta	-	-	-	-
Mexico	81	30	69	82
Moldova	-	-	-	-
Montenegro	-	-	-	-
Morocco	-	-	-	-
Moscow Region (Russia)	-	-	-	-
Netherlands	38	80	14	53
North Macedonia	-	-	-	-
Panama	95	11	44	86
Peru	64	16	42	87
Philippines	94	32	64	44
Poland	68	60	64	93
Portugal	63	27	31	104
Qatar	-	-	-	-
Romania	-	-	-	-
Russian Federation	-	-	-	-
Saudi Arabia	80	38	52	68
Serbia	-	-	-	-
Slovakia	-	-	-	-
Slovenia	-	-	-	-
South Korea	60	18	39	85
Spain	57	51	42	86
Sweden	31	71	5	29
Switzerland	34	68	70	58
Tatarstan (Russia)	-	-	-	-
Thailand	64	20	34	64
Turkey	66	37	45	85
U.S.A.	40	91	62	46
Ukraine	-	-	-	-
United Arab Emirates	80	38	52	68
United Kingdom	35	89	66	35
Uruguay	61	36	38	100

^a China represents the four provinces from mainland China (i.e., Beijing, Shanghai, Jiangsu, and Zhejiang) that took part in PISA 2018.

Table A3*PISA 2018 variables and their respective questionnaires and questions.*

Variable	Questionnaire	Question(s) ^a
Life Satisfaction	Student	ST016
Immigration Status	Student	ST019
Demographics		
Gender (Female=1)	Student	ST004
Age	Student	ST003
Social Status		
Expected Occupational Status	Student	ST114
Wealth	Student	ST011-ST012
ESCS	Student	ST005-ST008 , ST011-ST015
School Climate		
Student Behaviour	School	SC061
Bullying	Student	ST038
Sense of Belonging	Student	ST034
School Characteristics		
Type of School (Private=1)	School	SC013
Educational Staff Shortage	School	SC017
Educational Material Shortage	School	SC017
Teacher Characteristics		
Disciplinary Climate	Student	ST097
Teacher Support	Student	ST100
Teacher Behaviour	School	SC061
Teacher's Tolerance	School	SC166
Motivation		
Competitiveness	Student	ST181
Resilience	Student	ST188
Grade Repetition(Yes=1)	Student	ST127
Self-Worth		
Parental Emotional Support	Student	ST123
General Fear of Failure	Student	ST183
Meaning in Life	Student	ST185
Cognition		
Summarising	Student	ST165
Assessing Credibility	Student	ST166
Country of Origin^b	Student	ST019

^a Some questions are more complex and involve many sub-questions and some variables are derived from multiple questions/sub-questions.

^b Initially coded as 6-letter iso codes.

A4: *Previously used PISA variables and the reason they are not included in this study.*

Scores in Reading, Mathematics, and Science: These variables are computed based on 10 sets of plausible values. They were excluded from analysis because of their unclear influence on life satisfaction and the requirement that they are used in conjunction with PISA replicate weights, a requirement repeatedly emphasized by the PISA data analysis manual that this study foregoes for robust standard errors clustered at the country level. Currently, there are technical issues in place that do not permit for the implementation of both.

Anxiety, Exercise, Daily meals with parents, and Talking with parents: Excluded because of their low amount of available observations (below 80,000).

Happiness: High correlation with the life satisfaction variable which is believed to not provide any explanatory insight due to similar implications. The question “Thinking about yourself and how you normally feel, how often do you feel happy?” should prompt similar answers to the question regarding life satisfaction.

Language use at home: Meant to test if the individual speaks a different language at home. This variable was heavily correlated with other explanatory variables used in the analysis, variables such as meta-cognitive indicators and especially immigrant status.

School-fixed effects: There are 18,377 schools in the full sample of this study. It is both computationally heavy and explanatorily inefficient to use this. Furthermore, final student weights at least account for school-related external validity concerns.

A5: *Blinder-Oaxaca Decomposition in detail.*

$$\begin{aligned} \Delta LS_{ic} = & \alpha_0 + \beta_1 \text{Demographics}_{ic} + \beta_2 \text{SocialStatus}_{ic} + \\ & \beta_3 \text{SchoolClimate}_{ic} + \beta_4 \text{SchoolCharacteristics}_{ic} + \\ & \beta_5 \text{TeacherCharacteristics}_{ic} + \beta_6 \text{Motivation}_{ic} + \beta_7 \text{SelfWorth}_{ic} + \\ & \beta_8 \text{Cognition}_{ic} + C_c + \varepsilon_{ic} \end{aligned}$$

-where ΔLS_{ic} is the life satisfaction differential between natives and migrants, and the other 8 explanatory categories are as defined in Table 1. C_c are country fixed effects coded as country dummies.

Appendix B: Robustness Checks for Different Sampling Weights

Table B1

Results of multilinear regression of life satisfaction on immigration status, unweighted.

Variable	Life Satisfaction
Immigration Status	-0.284*** (0.051) ^a
Gender	-0.416*** (0.036)
Age	-0.070*** (0.021)
Country-fixed Effects	Yes
N	470,558
Number of Countries	70
R-Squared	0.06

Note: Coefficients are unweighted.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table B2

Results of multilinear regression of life satisfaction on immigration status, weighted using senate weights.

Variable	Life Satisfaction
Immigration Status	-0.211*** (0.037) ^a
Gender	-0.431*** (0.022)
Age	-0.074*** (0.034)
Country-fixed Effects	Yes
N	470,558
Number of Countries	70
R-Squared	0.06

Note: Coefficients are weighted using PISA 2018's senate weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

***P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.

Table B3

Results of multilinear regression of life satisfaction on immigration status, weighted using custom immigrant population weights.

Variable	Life Satisfaction
Immigration Status	-0.221*** (0.051) ^a
Gender	-0.429*** (0.073)
Age	-0.085*** (0.027)
Country-fixed Effects	Yes
N	470,558
Number of Countries	70
R-Squared	0.08

Note: Coefficients are weighted using sampling weights for immigrant population per-country derived from the 2022 World Population Review.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

****P-value<0,01, **P-value<0,05, *P-value<0,1, no asterisk: P-value >0,1.*

Appendix C: Robustness Check for Blinder-Oaxaca Decomposition

Table C1

Oaxaca-Blinder Decomposition: Relationships between life satisfaction and explanatory variables.

Variable	Life Satisfaction	Robust Standard Error ^a
Demographics		
Gender (Female=1)	-0.306***	0.057
Age	-0.143**	0.054
Social Status		
Expected Occupational Status	-0.002	0.002
Wealth	0.005	0.038
ESCS	0.048	0.043
School Climate		
Student Behavior	0.030	0.031
Bullying	-0.129***	0.042
Sense of Belonging	0.374***	0.036
School Characteristics		
Type of School (Private=1)	0.020	0.073
Educational Staff Shortage	-0.093*	0.054
Educational Material Shortage	0.201**	0.080
Teacher Characteristics		
Disciplinary Climate	0.161***	0.051
Teacher Support	0.215***	0.025
Teacher Behavior	0.002	0.024
Teacher's Tolerance	0.010	0.014
Motivation		
Competitiveness	-0.049***	0.013
Resilience	0.356***	0.048
Grade Repetition(Yes=1)	-0.078	0.073
Self-Worth		
Parental Emotional Support	0.345***	0.042
General Fear of Failure	-0.318***	0.025
Cognition		
Summarizing	-0.105***	0.015
Assessing Credibility	-0.133***	0.015
N		213,364
Number of Countries		54
R-Squared		0.162

Note: Coefficients are weighted using PISA 2018's final student weights.

^a *Robust standard errors are clustered at the country level.*

****P-value*<0,01, ***P-value*<0,05, **P-value*<0,1, no asterisk: *P-value* >0,1.

Appendix D: Robustness Checks for Interacted Regressions

Table D1

Results of multilinear regression of life satisfaction on interacted immigration status and migrant integration policy as calculated by the 2014 Migration Policy Index.

Variable	Life Satisfaction	
Immigration Status	-0.244** (0.117) ^a	-0.193*** (0.060)
Migrant Integration 2014	0.015 (0.140)	-2.189*** (0.007)
Immigration Status x Migrant Integration 2014	-0.169 (0.117)	0.003 (0.052)
Controls ^b	Yes	Yes
Country-fixed Effects	No	Yes
N	319,443	321,097
Number of Countries	46	46
R-Squared	0.01	0.06

Note: Coefficients are weighted using PISA 2018's final student weights.

^a Robust standard errors are clustered at the country level and displayed in parentheses.

^b Gender and age for both columns, column 2 adds the index of economic, social, and cultural status.

Table D2

Results of multilinear regression of life satisfaction on interacted terms of immigration status and all 8 country-level indices, by development of home country, using country-fixed effects.

Variable	Life Satisfaction	
	Origin: Developing	Origin: Developed
Immigration Status	0.047 (0.193) ^a	0.272 (0.175)
Freedom	1.571*** (0.053)	3.633*** (1.209)
Children's Rights	-0.699*** (0.004)	0.083 (0.439)
Migrant Integration	0.734*** (0.001)	-0.046 (0.453)
Income Inequality	2.072*** (0.013)	6.357*** (2.628)
Power-Distance	1.093*** (0.006)	0.671** (0.238)
Individualism	-0.206*** (0.004)	-3.714* (2.046)
Masculinity	-1.106*** (0.012)	-4.416** (1.950)
Uncertainty Avoidance	-1.406*** (0.005)	-4.106** (1.578)
Immigration Status x Freedom	0.244 (0.242)	0.046 (0.106)
Immigration Status x Children's Rights	-1.703** (0.692)	0.010 (0.051)
Immigration Status x Migrant Integration	1.142** (0.336)	-0.243** (0.113)
Immigration Status x Income Inequality	-0.698** (0.201)	-0.286 (0.199)
Immigration Status x Power-Distance	-0.329 (0.513)	0.191 (0.121)
Immigration Status x Individualism	-0.286 (0.805)	-0.321** (0.147)
Immigration Status x Masculinity	0.858 (0.565)	-0.040 (0.070)
Immigration Status x Uncertainty Avoidance	0.237 (0.166)	-0.437*** (0.134)
Controls	Yes	Yes
Country-fixed Effects	Yes	Yes
N	173,198	187,610
Number of Countries	24	24
Number of Home Countries for Migrants	11	31
R-Squared	0.06	0.06

Note: Coefficients are weighted using PISA 2018's final student weights.

^a *Robust standard errors are clustered at the country level and displayed in parentheses.*

****P-value < 0.01, **P-value < 0.05, *P-value < 0.1, no asterisk: P-value > 0.1.*