Introduction

The impact of the relationship between heritable characteristics and fertility has been considered since at least Ancient Greece (Alamariu, 2023). Plato, in particular, wrote and spoke about breeding and heredity in humans and recommended the creation of a mating program to create an aristocratic 'Guardian Class' (Goering, 2014). In the modern world, Francis Galton pioneered the study of selective breeding in humans (Galton, 1869), coining the term 'eugenics' (Watson & Berry, 2009).

The first quantitative studies that assessed the selection differential for intelligence found a statistically significant negative relationship (Chapman & Wiggins, 1925; Lentz, 1927) within the United States. Meta-analyses conducted of studies, most of them within the United States, largely support these prior findings (Woodley of Menie, 2015; Reeve et al., 2018). Large studies conducted in Taiwan (Chen et al., 2017) and China (Wang et al., 2016) also suggest that dysgenic fertility exists for intelligence. Studies conducted within the Middle East also support the existence of dysgenic fertility for intelligence, but the magnitude of the relationship is somewhat weaker (Abdel-Khalek & Lynn, 2008; Abdelrasheed et al., 2022; Al-Shahomee et al., 2013).

There are some studies that do not find dysgenic fertility for intelligence. Among them is a large study of Swedish men that finds a weak positive relationship between cognitive ability and fertility (Kolk & Barclay, 2019). However, male fertility is less dysgenic than female fertility, so this relationship may not apply to the rest of the population (Reeve et al., 2018). Another study finds no relationship between fertility and intelligence in Japan and Sweden (Vining et al., 1988), however, they adjusted for parental education, which is inappropriate as the relationship between educational attainment and IQ exists even when it is tested in young children (Ritchie et al., 2015) and exists when controlling for parental SES (Hegelund et al., 2018; Herrnstein & Murray, 1994), which suggests there is a causal effect of IQ on educational attainment

To estimate the decline in intelligence, corrections for the additive heritability of intelligence must be made. Prior literature used varying estimates of .4 to .86 for the additive heritability of intelligence (Woodley of Menie, 2015). The correlation between the parental midpoint and child IQ is about .53 (Reed & Rich, 1982), which provides a rough estimate for the additive heritability of intelligence. However, this can be biased upwards by shared environmental effects that covary with parental IQ and downwards by measurement error. Classical twin studies that study individuals over the ages of 18 find no shared environmental effect on intelligence (Bouchard, 2013), and other methods (such as adoption studies) also suggest no effects of shared environment. Assuming a test-retest reliability of IQ of .9, the additive heritability of intelligence should be roughly .6.

Researchers have attempted to forecast the world IQ based on population projections and the rate at which intelligence falls (Lynn, 2011; Francis, 2022). In these studies, the decline in intelligence is assumed to be the same in all countries, though this may not be the case. Meisenberg (2008) has examined the relationship between educational attainment and fertility internationally, and found that the relationship varied between countries, and was strongest in Latin America and the Middle East, and weakest in Continental Europe. If dysgenic fertility for intelligence correlates with population size or projections, then applying the same selection differential to every country may produce a biased estimate of the world IQ by year.

Materials

We sourced data from various highly reliable sources, including all PIAAC data; all World Values Survey data; all years of the GSS; the 2001 and 2009 waves of the PISA; the 2001 PIRLS testing wave; and both NLSY waves (1979 and 1997), together with some academic literature as cited below. Only 1.5% of the effect sizes we report here were previously published elsewhere, meaning that the effect of publication bias in the present dataset is negligible. Data regarding the average age of childbirth and the population projections were collected from the United Nations.

Data on national IQs were collected from three sources: Becker (2019), Patrinos and Angrist (2018), and Lynn and Vanhanen (2012). We normalized these estimates to the distribution of national IQs, and then aggregated the resulting values to generate more reliable indicators of the construct. During this process, we manually set the IQs for Ireland (98) and China (102), as the IQ estimates seem inaccurate in at least some of this literature (see, e.g., Warne, 2022; Jensen, 2023).

From the above values we next calculated four categories of effect sizes: (1) selection differentials for IQ, (2) selection differentials for educational attainment, (3) correlations between

IQ and fertility, and (4) correlations between educational attainment and fertility. While our primary focus was on the IQ selection differentials, we deemed the other three effect sizes as informative because they can be used as proxies for the IQ selection differentials.

PISA

We derived a general factor of general ability based on PISA Reading, Math, and Science Ability scores for individuals, as follows. First, we decided not to impute missing values in order to improve the consistency of our measures. Next, we derived general factors separately by participant sex to control for potential group differences in either means or variances, which could bias the four effect sizes we intended to calculate.

Only individuals between the ages of 15 and 17 years were included in our analyses, and we made age corrections for ability using a restricted cubic spline (Harrell, 2015). We restricted the age range to prevent individuals who were either held back or were accelerated in a grade. Our aim was to adjust for this bias, as individuals within this subpopulation display ability differences that cannot be explained by age differences but nonetheless correlate with them.

The 2001 wave of PISA utilized the following four groupings to categorize parental education: “No education (0),” “did not complete secondary education (1),” completed secondary education (2),” and “completed tertiary education (3).” Individuals with more than 15 siblings were coded as missing values due to concerns about validity. In the 2009 wave of PISA, all individuals with more than six children were coded as “having six children” due to an error in the original dataset.

PIRLS

Reading Ability was used as a replacement for intelligence, as it was the only test that was available. As above with PISA, individuals with divergent ages (below the age of 9 and above the age of 11 years) were excluded from our analyses, and we again corrected for age via a restricted cubic spline. Likewise, here we also standardized scores by participant sex to avoid group differences in means or variances from biasing our results.
PIRLS coded Educational Attainment according to the ISCED standards of education - anything below ISCED 2 was coded as 1; ISCED 2 was coded as 2, ISCED 3A/3B was coded as 3,

ISCED 3C was coded as 4, ISCED 4A was coded as 5, ISCED 4B was coded as 6, ISCED 5A was coded as 7, and ISCED 5B or higher was coded as 8.

PIAAC

We estimated IQs by extracting the first general factor of the“Literacy Ability, “Numerical Ability,” and “Problem Solving Ability” variables. In countries where problem solving ability was not available [N = 3], we analyzed just the Numerical and Literary Ability scores, which were also first normed by participant sex. Individuals who were below the age of 40 were removed from the data and scores were corrected for the effect of age.

PIAAC categorizes “Educational Attainment” into seven different categories: “No education (0),” “ISCED 1 (1),” “ISCED 2 (2),” “ISCED (3),” ISCED 4 (4),” ISCED 5B (4),” ISCED 5A (Bachelor's degree; 5), “ISCED 5A (Masters degree; 6),” and “ISCED 6 <- 5, and foreign qualification (5). When calculating the selection differentials, education was controlled for age, and when evaluating the correlation coefficients, the number of children was also controlled for age. Countries such as Hungary and Singapore lacked age data, and so we excluded them from the effect sizes reported here.

GSS

We utilized the 10-item vocabulary test, “WORDSUM”, as our proxy for National IQ. Although this test’s validity (as a proxy for IQ) is questionable, the effect sizes (r = -.14) generated from this test (since 2000) do not seem to be much lower than those generated from the NLSY (r = -.18). We also normalized scores by sex and age, and we excluded individuals above the age of 40 years.

Further, we used each participant’s highest year of education as our measure of educational attainment. We then controlled for the number of children each individual had when calculating the correlation between educational attainment and fertility. Years of education was also controlled for when calculating the selection differential for educational attainment. Finally, as above, we calculated selection differentials separately by sex.

NLSY (1979 / 1997)

The Armed Services Vocational Aptitude Battery (ASVAB) was used as a proxy for cognitive ability. Scores were standardized by age and sex. Moreover, all individuals in the sample were clearly past completed fertility (ages 54-61).

The NLSY oversamples Black participants (Bureau of Labor Statistics, 2022). We dealt with this issue by assigning each Black participant a random weight, such that if a participants' weight exceeded our threshold value, we removed them from further analyses. This resulted in a sample that had a representative sample of Black people. This process was repeated 100 times; thereafter, average effect sizes were calculated and used for the analyses reported below.

Excluded studies

A total of 25 studies were excluded from the analyses reported below. We did so because of these 25 studies: (1) 13 failed to report effect sizes, (2) Six featured datasets that we already coded above, (3) Two reported effect sizes that did not seem credible (|r| > .3, even within a large sample), (4) One did not report sample sizes by sex, (5) One that did not representatively sample a country, (6) and one reported cognitive-test score reliability that was too low to be of value. Finally, when calculating effect sizes here, all studies conducted before 1970 were removed.

Concerns

The best data in the United States suggest that the selection differential for IQ is -2.42 points, while the international data suggests that it is -1.2 points. When calculating the selection differentials, the national data and academic literature is used as a reference group, which leads to the American selection differential for intelligence to be estimated at -1.97. The problem is that most of the sources of this data are American (26/29), so the magnitude of the decline may be biased, as the international data may not measure dysgenic fertility for intelligence as badly in other countries. It's unclear if the effect of international datasets is additive or multiplicative, hence, the results of both models were averaged.

In several countries, the selection differential for intelligence is negligible or positive in the international data, notably Thailand (S = 0.59), Estonia (S = 0.076), Finland (S = -0.22), Denmark (S = -0.12), and Switzerland (S = 0.03). In this case, the adjustment made to compensate for the weaker relationship in the international data may overestimate the decline in intelligence within these countries.

In the case of Thailand, the positive relationship between fertility and intelligence only comes from one effect size, which does not reach statistical significance (p = .13). In addition, the relationship between educational attainment and fertility was negative (r = -.11). In the other countries which exhibit no dysgenic fertility for intelligence, the relationship between educational attainment and fertility is close to null, the relationship between educational attainment is also close to null as well (r = -0.026 in Denmark, r = -0.043 in Switzerland, r = -0.035 in Estonia, r = -0.027 in Finland). Due to this, the dysgenic fertility for intelligence in Thailand was estimated based on its dysgenic fertility for educational attainment instead.

The strong dysgenic fertility for intelligence that is observed in Turkey, Iran, and Latin America is likely to be a true relationship. This is because the dysgenic fertility of educational attainment is also very strong in these countries, suggesting it is a robust finding.

It is unlikely that the heritability of intelligence is identical in all countries. Notably, assortative mating for educational attainment varies by country (Jensen & Kirkegaard, 2024), and intelligence and educational attainment correlate at approximately .5 (Strenze, 2014). Therefore, the additive heritability of intelligence should also be higher in countries with higher levels of assortative mating for intelligence. In addition, international Scar-Rowe effects might be suppressing the heritability of intelligence in less developed nations, leading to inflated effect sizes.

Meta-analytic methodology

The following moderators were considered**:**

- Cohort: based on parental age and study year. Calculated as years after 1900 to facilitate interpretation.
- Country: the country in which the data was collected.

- Source: Grouped into 5 categories: World Values Survey, PIAAC, PISA, PIRLS, and other. This was due to the fact that international data collection may not be as precise or consistent as national data collection, or there are differences in methodology within the datasets that are biasing the effect sizes.
- Method: effect sizes were grouped into pearson correlations, spearman correlations, and latent correlations. The reference group were the latent effect sizes.

Publication bias was not considered, as 98.5% of the data comes from unpublished sources. A random effects meta-analysis was used, as there is substantial heterogeneity between effect sizes that is not due to sample sizes.

Internationally, four types of effect sizes were calculated- selection differentials for IQ, correlations between IQ and fertility, and correlations between educational attainment and fertility. In this analysis, the selection differentials for IQ are standardized at a mean of 100 and a standard deviation of 15, while the ones for educational attainment are standardized at a mean of 100 and standard deviation of 15.

Due to the large amount of data that was available for the United States, a meta-analysis was conducted within the United States, which is available in Table 1. The analysis suggested that the selection differential for IQ is -1.51 (95% CI: [-1.32, -1.71]), though there was considerable heterogeneity (I^2 = 100%). Because of this, it would be better to consult the effect size from a high quality source. In the United States, the best source that contains completed fertility and IQ/educational attainment is the NLSY79, since all of the individuals are very close in age, it is very large (n = 11,912), has a very accurate measurement of cognitive ability (ASVAB), and all of the individuals are likely beyond completed fertility (54-61). This dataset suggests the selection differential for IQ is -2.14, reasonably higher than the meta-analytic average of -1.51. The NLSY97 is the only other source which has a higher selection differential for IQ (-2.72).

Table 1. Moderator analysis of selection differentials for IQ. *** ⟶ p < .001, ** ⟶ p < .01, * ⟶ p < .05. The reference group for the sources are NLSY datasets.

Parameter	Model 1	Model 2	Model 3
Intercept	-1.07 (0.31)***	-2.42 (0.34)***	-1.96 (0.57)***
Cohort	-0.01 (0.0067)		-0.0071 (0.0072)

International (source)		1.18 (0.44)**	1.13 (0.44)**
Other (source)		0.95 (0.35)**	0.78 (0.39)
I2	100.00%	100.00%	100.00%
R2	4.34%	18.35%	18.30%

Calculation of international differences

Moderator analyses were conducted separately for each type of effect size. National differences in each effect size calculated from different datasets always correlated positively (r = 0.1 - 0.7), as shown in Tables 2 to 4. In addition, national differences explained a substantial amount of heterogeneity in all effect sizes (40-60%), suggesting that there are international differences in selection differentials. Moderator analyses are shown in Tables 5 to 7

Table 2. Correlation matrix of national differences in correlations between educational attainment and fertility from various datasets. *** ⟶ p < .001, ** ⟶ p < .01, * ⟶ p < .05.

	PISA	PIRLS	WV
PISA			
PIRLS	.33		
WV	.43**	.62***	
PIAAC	.62**	.28	.46*

Table 3. Correlation matrix of national differences in the selection differential for IQ from various datasets. *** ⟶ p < .001, ** ⟶ p < .01, * ⟶ p < .05.

	PISA	PIRLS
PISA		
PIRLS	0.51*	
PIAAC	0.21	0.15

Table 4. Correlation matrix of national differences in the correlations between IQ and fertility. *** ⟶ p < .001, ** ⟶ p < .01, * ⟶ p < .05.

	PISA	PIRLS
PISA		
PIRLS	0.42	
PIAAC	0.44*	0.33

Table 5. Moderator analysis of the correlation between educational attainment and intelligence. The reference group for the sources are national datasets and academic literature, while the reference group for the countries is Albania. *** ⟶ $p < .001$, ** ⟶ $p < .01$, * ⟶ $p < .05$.

Parameter	Model 1	Model 2	Model 3	Model 4
Intercept	-0.27 (0.027)	-0.13 (0.012)***	-0.23 (0.012)***	-0.34 (0.047)***
Cohort	0.0025 (0.0005)***		0.0020 (0.0005)***	0.0018 (0.0005)***
Country				included
PIAAC (source)		0.046 (0.021)*	0.030 (0.021)	0.039 (0.018)*
PIRLS (source)		0.045 (0.020)*	0.022 (0.021)	0.039 (0.018)*
PISA (source)		0.012 (0.017)	-0.0031 (0.017)	0.0032 (0.016)
World Values (source)		-0.015 (0.014)	-0.021 (0.013)	0.011 (0.014)
I2	100.00%	100.00%	100.00%	99.99%
R2	5.07%	4.41%	7.19%	46.00%

Table 6. Moderator analysis of selection differentials for IQ. The reference group for the sources are national datasets and academic literature, while the reference group for the countries is Albania.. *** ⟶ $p < .001$, ** ⟶ $p < .01$, * ⟶ $p < .05$.

Parameter	Model 1	Model 2	Model 3	Model 4
Intercept	-1.73 (0.33)***	-1.85 (0.23)***	-1.86 (0.23)***	-2.26 (0.71)***
Cohort	0.013 (0.0058)*		0.00040 (0.0068)	
Country				included
GSS (source)		0.36 (0.26)	0.36 (0.28)	0.5 (0.31)
PIAAC (source)		1.45 (0.25)***	1.45 (0.26)***	1.08 (0.4)**
PIRLS (source)		0.69 (0.25)**	0.69 (0.26)**	0.54 (0.4)

PISA (source)		0.83 (0.25)***	0.83 (0.25)***	0.57 (0.4)
I2	100.00%	100.00%	100.00%	100.00%
R2	2.43%	30.14%	29.66%	51.07%

Table 7. Moderator analysis of the correlations between IQ and fertility. The reference group for the sources are national datasets and academic literature, the reference group for abilities is full scale IQ and scholastic ability, and the reference group for the countries is Albania. *** ⟶ p < .001, ** ⟶ p < .01, * ⟶ p < .05.

Parameter	Model 1	Model 2	Model 3	Model 4
Intercept	-0.14 (0.042)**	-0.23 (0.083)**	-0.14 (0.012)***	-0.2 (0.66)**
Cohort	0.0002 (0.0007)	-0.0003 (0.0008)		
Country		included		included
PIAAC (source)			0.11 (0.025)***	0.059 (0.038)
PIRLS (source)			-0.0082 (0.025)	-0.039 (0.037)
PISA (source)			-0.0027 (0.024)	-0.044 (0.038)
GSS (source)			0.011 (0.026)	0.0097 (0.028)
I2	100.00%	100.00%	100.00%	100.00%
R2	0.00%	32.45%	28.10%	58.65%

Of interest was whether some effect sizes could be used to predict others. This is because there is more extensive data regarding the selection differentials for educational attainment than the selection differentials for IQ. It appears that dysgenic fertility for IQ and dysgenic fertility for educational attainment do correlate between countries (r = .62, p < .001), as shown in Table 8.

Table 8. Correlation matrix of effect sizes between countries. Edu Corr - correlations between educational attainment and fertility, IQ SD - selection differential for IQ by country, and IQ Corr - correlation between IQ and fertility by country.

	Edu Corr	IQ SD
Edu Corr		
IQ SD	.62***	

IQ Corr	.65***	.96***

Given that the selection differentials and correlation coefficients correlated so closely between countries, all countries that did not have a selection differential for IQ but did have a correlation coefficient had their selection differential predicted directly based on their correlation coefficient between IQ and fertility.

Of interest was whether certain variables such as dysgenic fertility for education, HDI, belief in islam, national IQ, and region could predict dysgenic fertility for intelligence. This was determined using Bayesian model averaging, which selects the best models from a set of regressions that best predict the dependent variable. This was done in 3 rounds - after a round is completed, the best variable is removed from the modeling procedure and the process is repeated. This is to generate various possible methods of imputing missing values in the dataset. Based on these results, dysgenic fertility for education is the best proxy for dysgenic fertility for IQ, followed by national IQ and then s-factor. The results of this analysis are shown in Table 9.

Table 9. Bayesian model averaging results by round. Dependent variable is the selection differential for IQ by country. Posterior inclusion probability placed in brackets, estimated value placed outside of it.

Parameter	Round 1	Round 2	Round 3
National IQ	0.14 (59.5%)	0.39 (77%)	
% Islamic	0 (0%)	0 (0%)	0 (0%)
S-factor	0 (0%)	0.11 (23%)	0.48 (100%)
Dysgenic fertility for education	0.59 (100%)		
R2	0.48	0.26	0.23

Based on these results, selection differentials were imputed according to each variable. First, imputations were made based on dysgenic fertility for education, then based on national IQs, and finally the general factor of national development. If the selection differential was still absent, then estimates were made using a KNN (k = 4) algorithm that used neighboring countries as a proxy. For national IQs, estimates were only made based on a KNN (k = 4) which imputed values from neighboring countries.

Given that certain methods had the tendency to overestimate or underestimate the selection differential, the average of the two methods (imputing using education dysgenics vs imputing with HDI/national IQ) was calculated within subregions, and then the imputations were regressed to that average. A graph of both variables by country at each stage of imputations is provided in the Appendix in Figures A1 to A8.

National IQ projections

Raw selection differentials were shrunk by a factor of 0.6 to correct for the nonperfect heritability of IQ.These corrected selection differentials were then combined with mean female ages at birth and the national IQs to project the future national IQ of each nation. These national IQ projections can then be used in combination with population projections to project the IQ of the world by using the weighted mean. Some other methodological decisions and assumptions were made:

- Countries were not able to drop beyond an IQ of 55. This is because it is difficult to judge whether differences in mean IQ below a certain range are meaningful.
- Mutational load is not a factor in decreasing IQ.
- Mean parental ages are stagnant throughout the years.
- Population projections and dysgenic estimations are assumed to be accurate.
- There is no immigration.
- The additive heritability of IQ is 0.6, and does not vary by country.

Given the available projections for the racial composition of the United States, it is possible to take into account changes in racial demographics when calculating the estimates. These projections were sourced from the Pew Research center (2015), which forecasted the racial composition of the United States 50 years into the future.

The average IQ of Blacks was estimated to be 85 (Roth et al., 2001) and the average IQ of Hispanics was estimated to be 92 (Fuerst, 2023a). The average IQ of US Asians was estimated to be 105.8 based on the average SAT/ACT scores of the various Asian sub-groups, weighed by size (Wikipedia, 2023; Fuerst, 2023b). These ACT/SAT score differences appear to be consistent in size with the differences in the ABCD (Hu, 2023), so they should be reasonably accurate in determining the true IQ of US Asians as a whole.

Results

The average IQ of the world is projected to fall from 85.9 to 77.4 between 2023 and 2100, a total of 7.5 points, which translates to a decline of 1.1 points per decade, as shown in Figure 1. However, the rate at which intelligence is declining per decade is projected to fall, with the current rate being roughly 1.3 points, while the rate in 2100 is projected to be 0.8 points per decade, as shown in Figure 2. Within countries, IQ is declining by 3.92 points by decade when population size weights are used. This means that about 36% of the global decline is due to decline within countries and the remaining variance is due to decline between countries. The decline varied by region ($F = 7.7$, $p < .001$), ranging from -0.13 points per decade in Nordic countries to -0.42 points per decade in Oceania, as shown in Table 8. Projections for each country are available in Figures 3 to 5.

Figure 1. Projected world IQ by year.

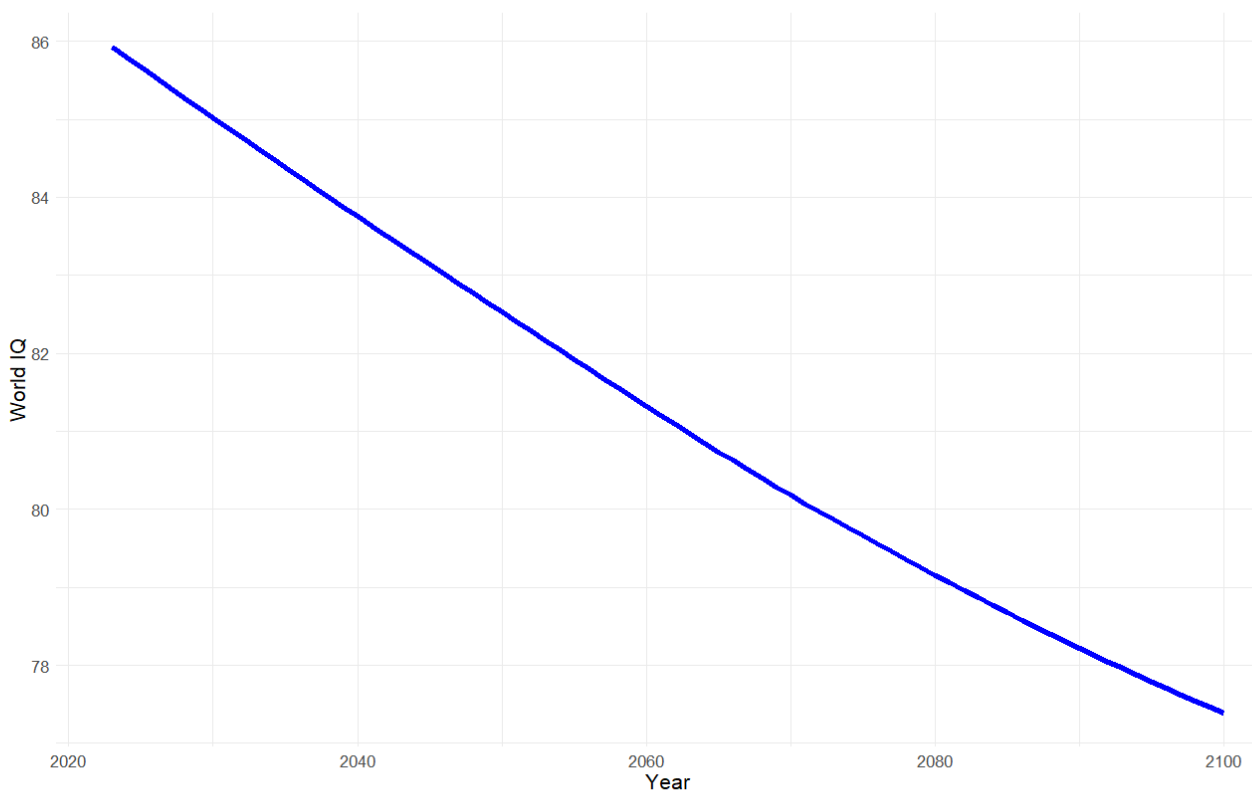


Figure 2. Projected decline in IQ per decade by year.

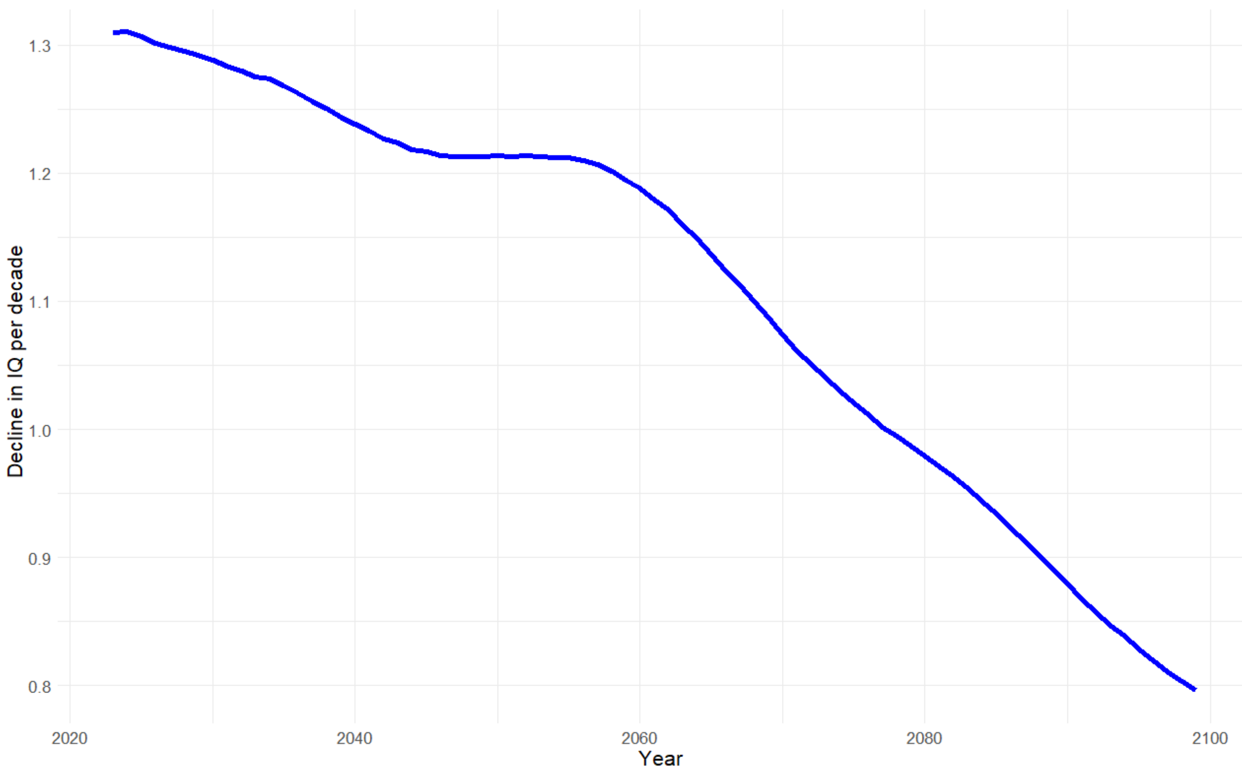


Table 8. Decline in IQ per century by region.

Region	Decline per Decade
Oceania	-0.42
Latin America and the Caribbean	-0.40
Sub-Saharan Africa	-0.40

Western Asia and Northern Africa	-0.36
Balkan	-0.33
East Asia	-0.31
Northern America	-0.27
Southern Europe	-0.26
Anglo	-0.25
Eastern Europe	-0.24
Continental Western Europe	-0.23
Northern Europe	-0.19
Western Europe	-0.19
Nordics	-0.13

Figure 3. IQ by country (2023)

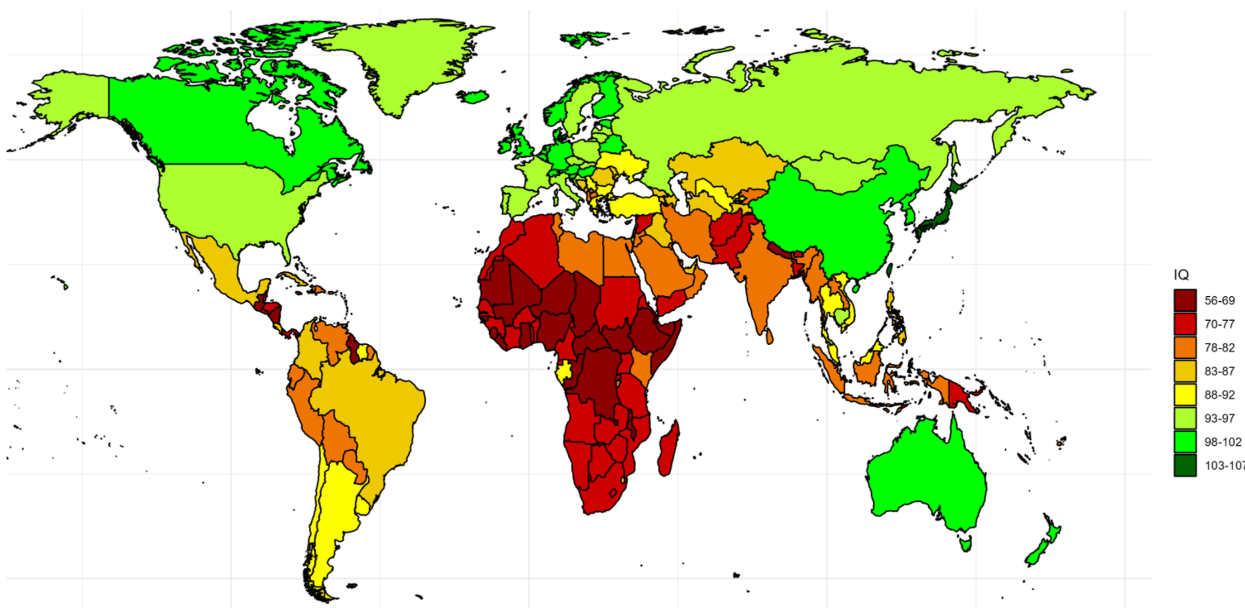


Figure 4. Projected IQ by country (2122)

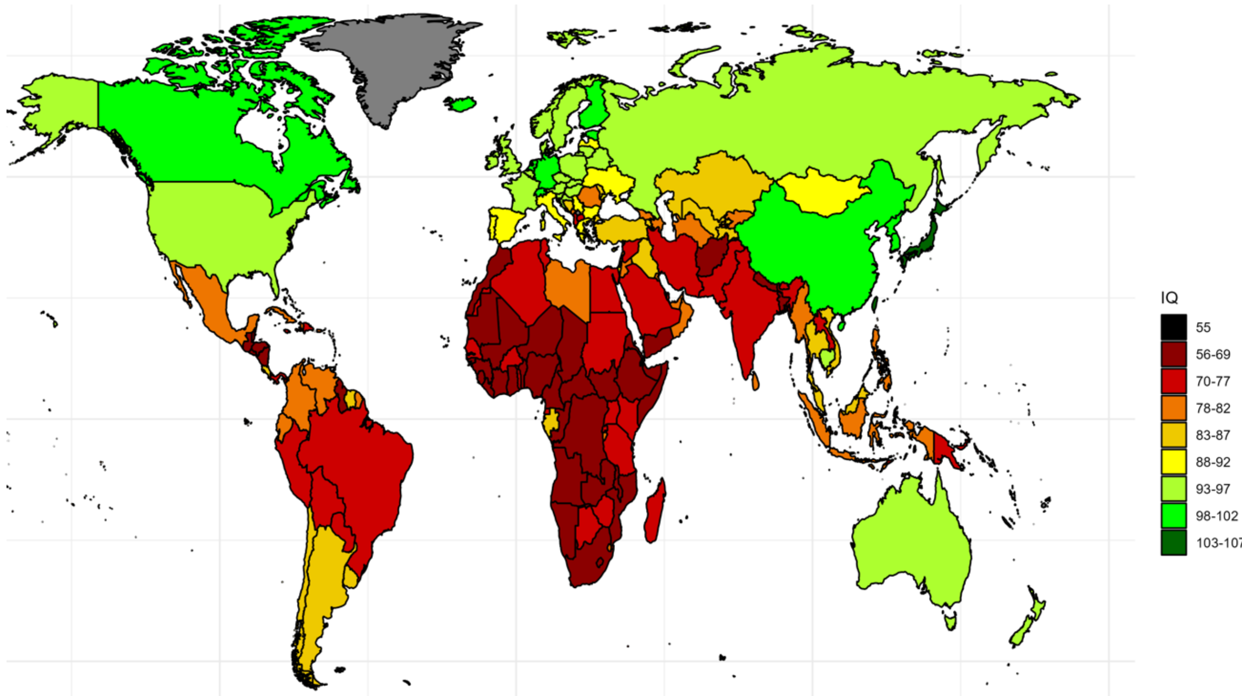
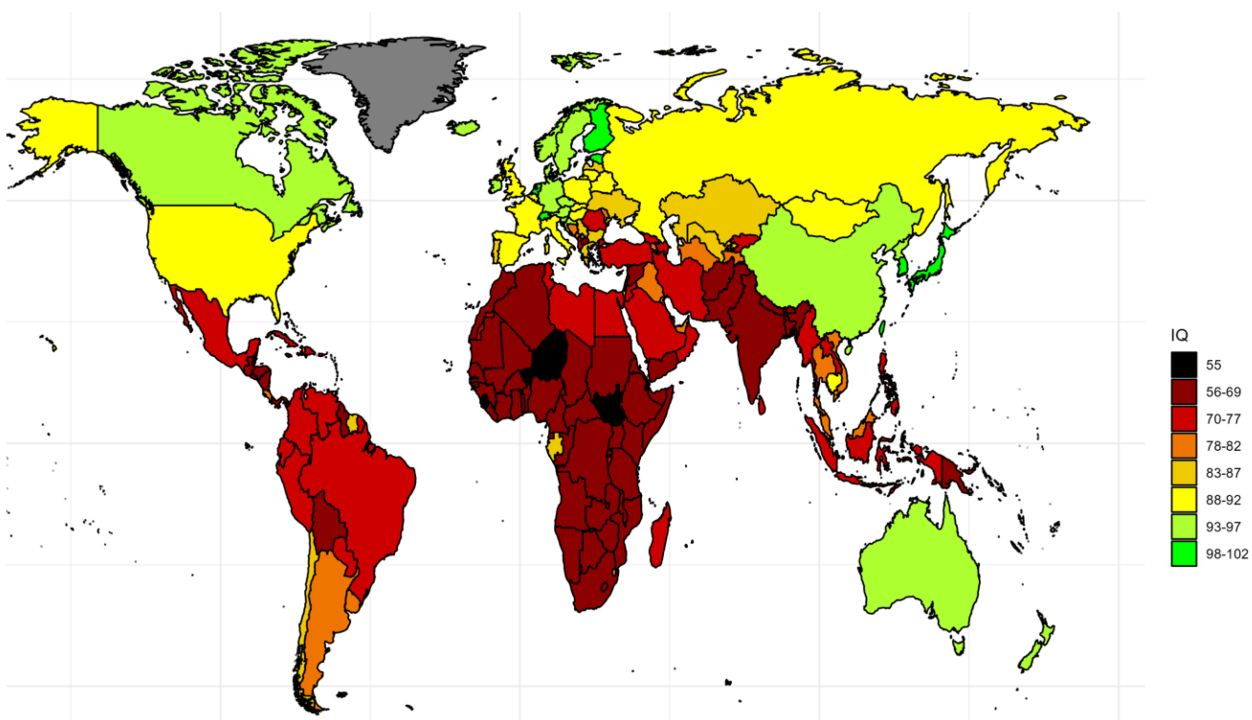


Figure 5. Projected IQ by country (2222)



The average IQ of the USA is not projected to change substantially based on changes in differences in racial demographics, as the increase in the Hispanic share of the population is offset by the increase in Asians. The magnitude of the change in national IQ between 2023 and 2065 due to changes in racial demographics is estimated to be 0.17 points, while the decline due to dysgenic fertility between that same time period is estimated to be 1.67 points. In Figure 6, the national IQ of the USA is forecasted based on both dysgenics fertility and changes in racial composition, while Figure 7 only forecasts the decline using changes in racial composition.

Figure 6. Projected national IQ of the USA based on dysgenic fertility and racial composition.

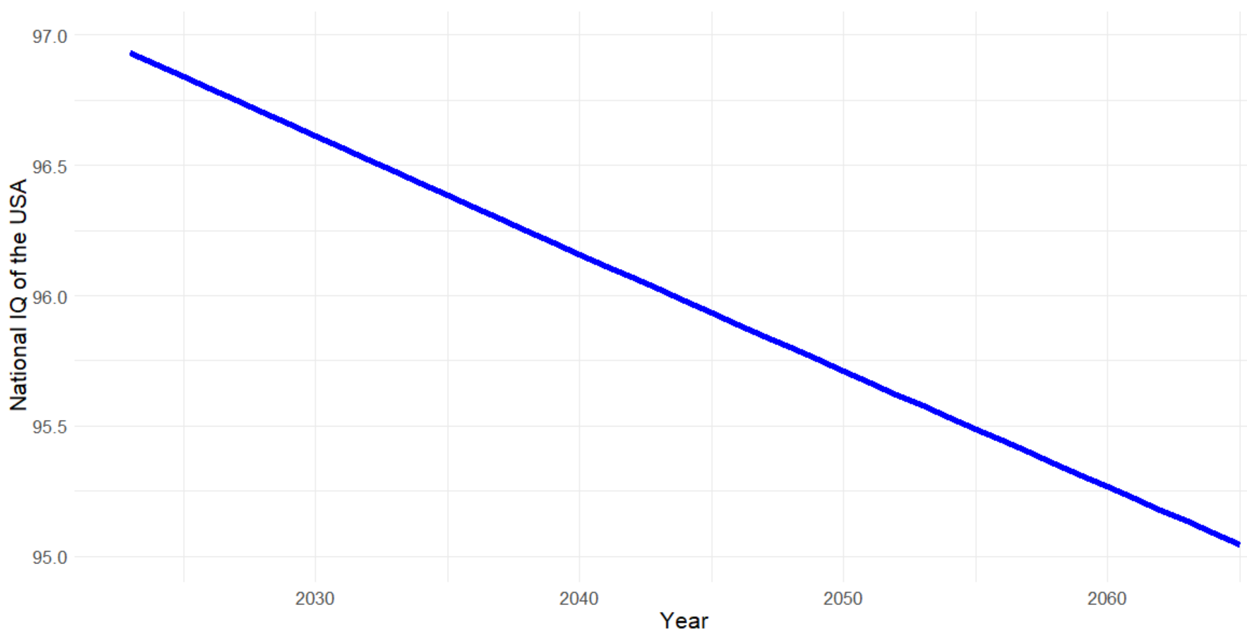
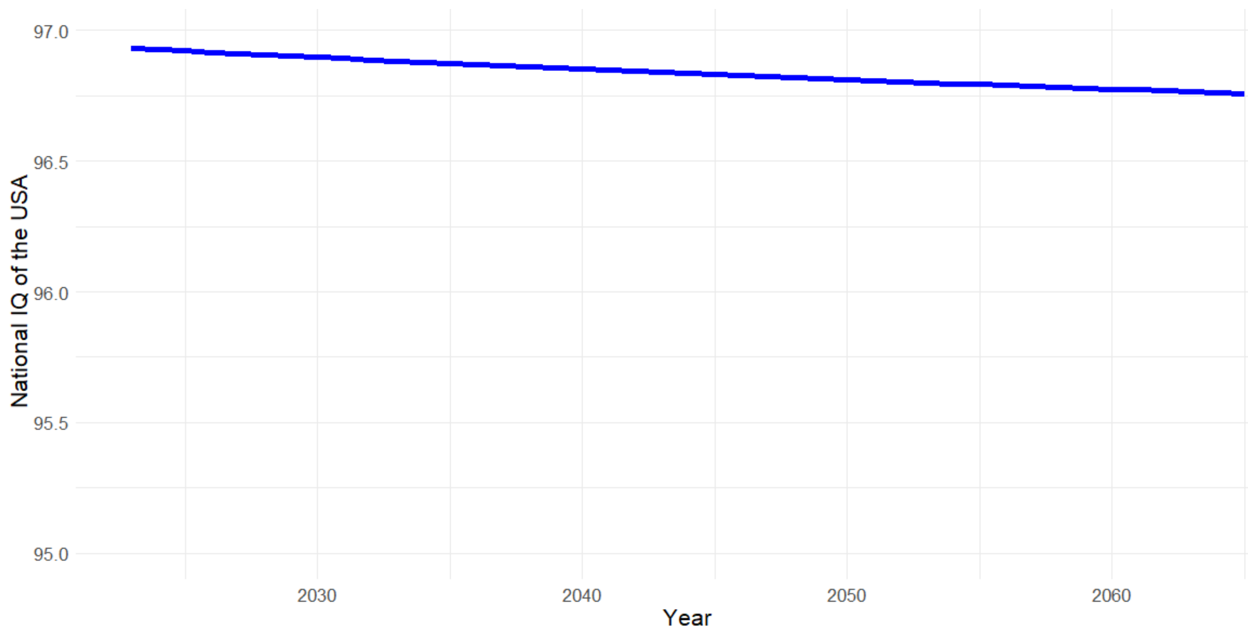


Figure 7. Projection for the national IQ of the USA, based on changes in racial composition.



Of interest was also whether selection differentials for IQ were correlated with national IQ or socioeconomic development (s-factor). To improve the reliability of the relationship, only selection differentials that were not imputed or were imputed based on the correlation between IQ and fertility were imputed. The selection differential for IQ and s-factor were correlated at .48 ($p < .001$) and the selection differential for IQ and national IQ were correlated at .51 ($p < .001$). The relationship between the selection differential for IQ and both variables is graphed in Figures 8 and 9.

Figure 8. Relationship between national IQ and selection differential for IQ.

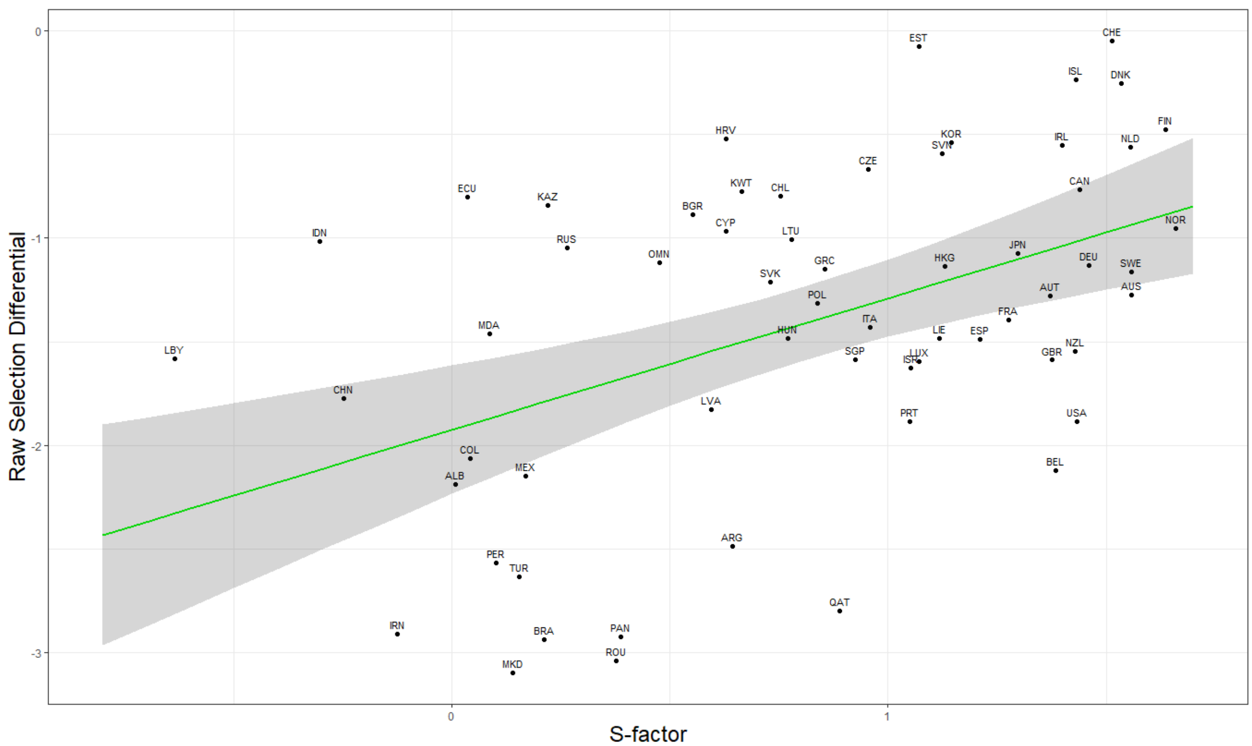
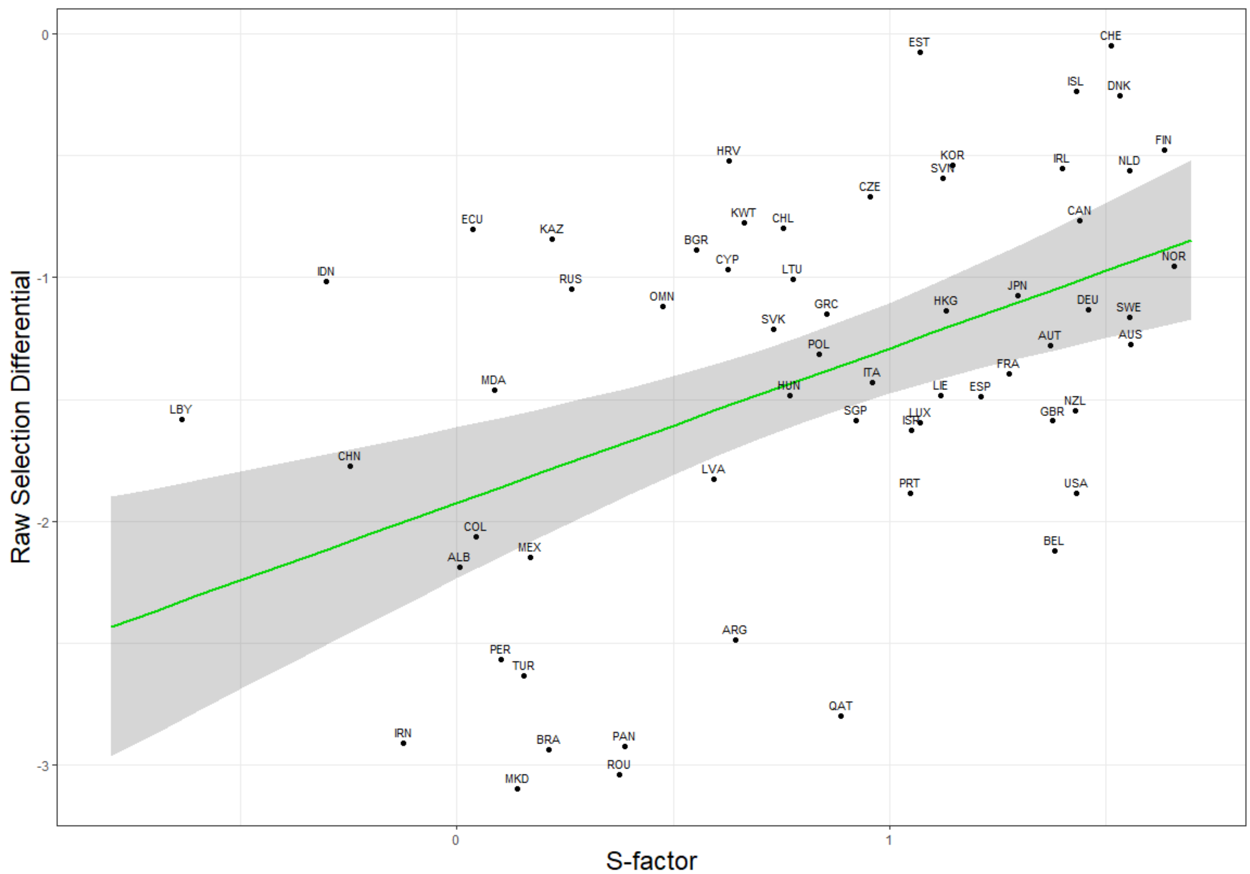


Figure 9. Relationship between s-factor and selection differential for IQ.



Discussion

The magnitude of the decline in intelligence per decade (-.392 points) within countries was in line with the previous literature (Woodley of Menie, 2015). Between countries, the size of the decline in intelligence between countries (-1.1 points) is lower than George Francis's estimate of 1.4 (2022), but higher than Lynn's (2011) estimate of 0.5 points per decade. While this study has been able to deal with some of the shortcomings of the prior literature, such as the varying estimates for the additive heritability of intelligence and the reliance on data from the United States, there are still many issues that need to be fixed:

- There is a substantial lack of high quality data that originates outside the United States, which makes the adjustment for the low quality of the international data dependent on the disparity in quality that is observed within the United States.
- Data on the relationship between cognitive ability and fertility was only available in 64 countries.
- There is still no reliable data on the additive heritability of intelligence by country.

- These estimates do not take into consideration immigration. While this does not appear to be strongly affecting the national IQ of the United States, this may not be the case for other regions such as Europe and East Asia.

Some countries are projected to fall substantially in intelligence, including Turkey, Iran, and some Latin American countries. Because national IQ is a strong cause of differences in economic growth (Francis & Kirkegaard, 2022), it is possible that these countries will exhibit a decline in national development within the next 200 years. While the development of artificial general intelligence may alleviate this decline, there are also other problems that could result from this decline in intelligence. For example, a lack of intelligence is a predictor of marital stability (Holley et al., 2006), obesity (Kanazawa, 2014), and criminality (Frisell et al., 2012), meaning that dysgenics could have negative non-economic effects.

Some researchers have raised concerns about the low IQ of individuals immigrating to the United States (Richwine, 2009). However, this study finds that changes in racial demographics are unlikely to have a significant effect on the national IQ of the USA. This disparity in findings could be due to several reasons. One could be the change in immigration patterns, with recent immigrants being more likely to come from Asia (Budiman, 2020). Another could be that immigrant IQs may be depressed due to environmental causes such as malnutrition and poor English, which are not transmitted to subsequent generations.

It is worth noting that the projections of racial demographics that were utilized constructed eight years ago, and may not adjust for recent trends. Notably, there have been recent concerns about a crisis in the southern border, with border encounters having increased vastly since 2020 (US Customs and Border Protection, 2023), which indicates that the growth of the Hispanic population may be underestimated.

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Appendix

Figure A1. IQ by Country with no Imputations.

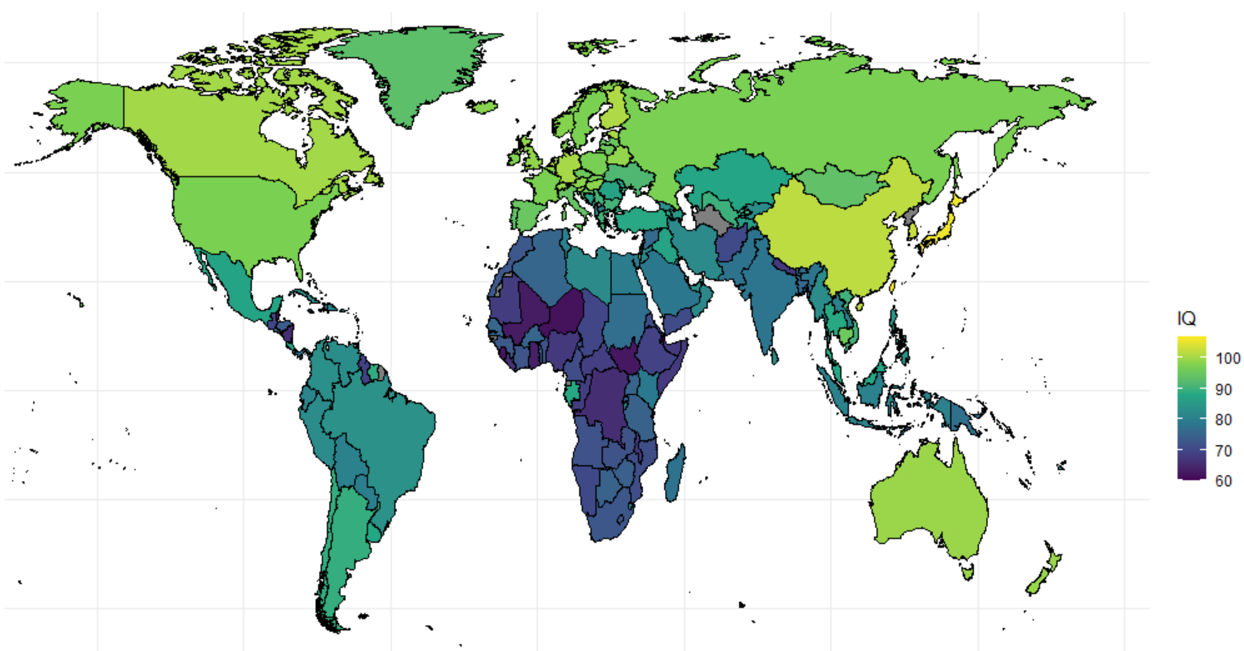

Figure A2. IQ by Country with imputed values based on neighbours.

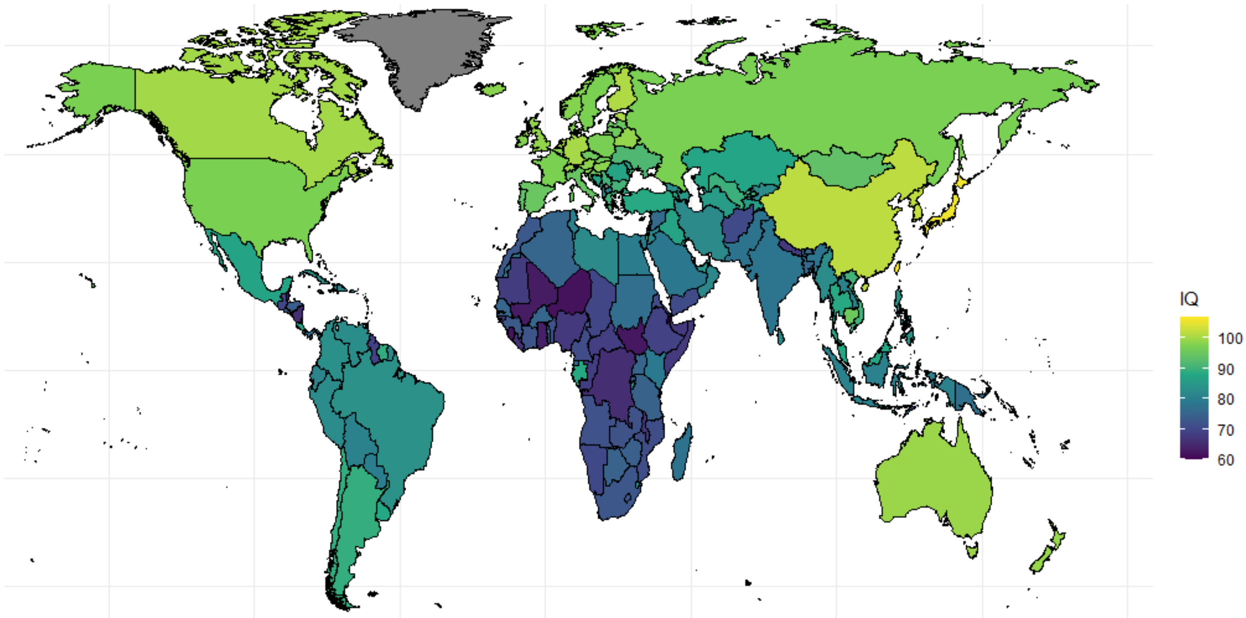

Figure A3. Selection differential for IQ by country with no imputations.

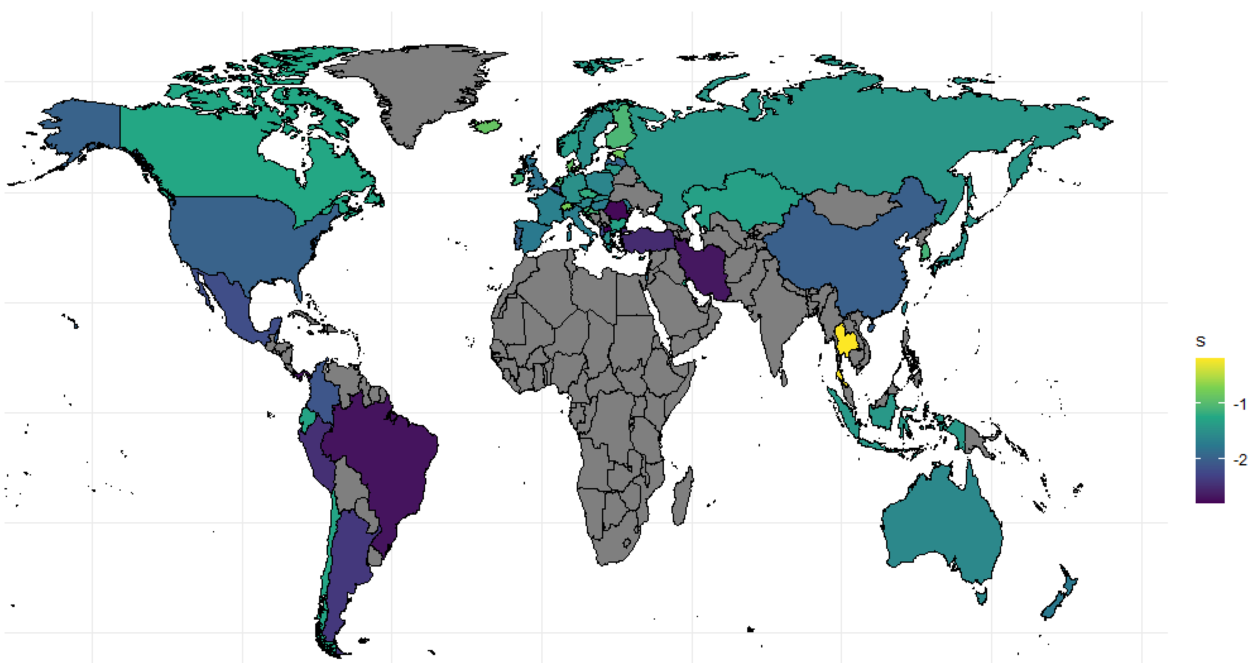

Figure A4. Selection differential for IQ by country with imputed values based on the correlation between IQ and fertility.

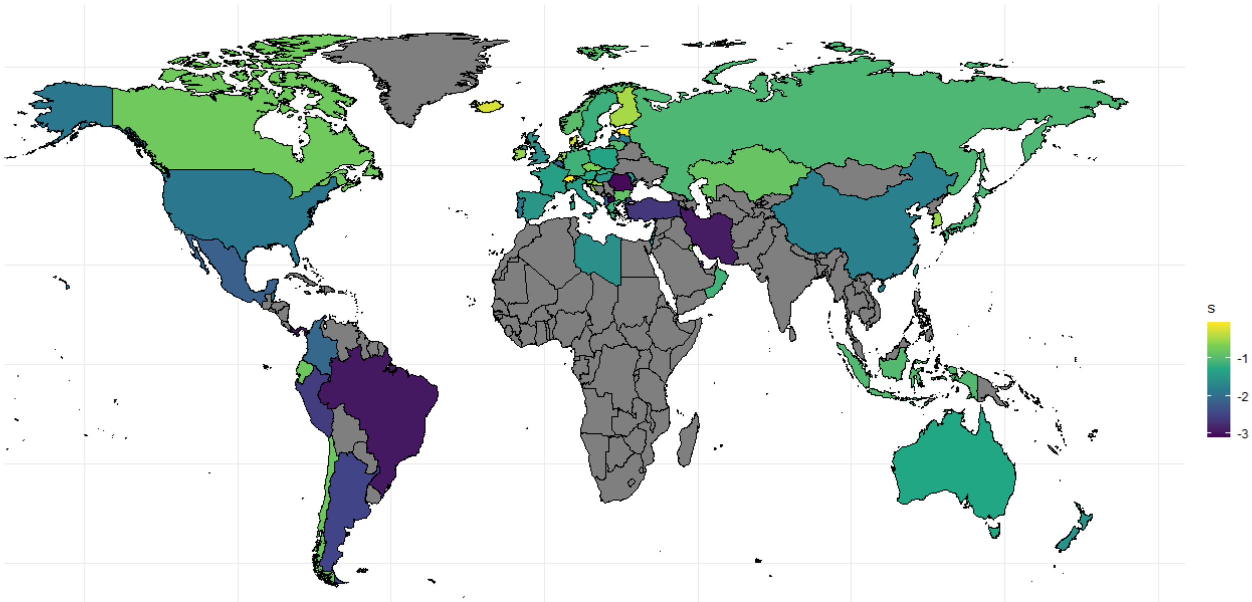

Figure A5. Selection differential for IQ by country with imputed values based on the correlation between educational attainment and fertility.

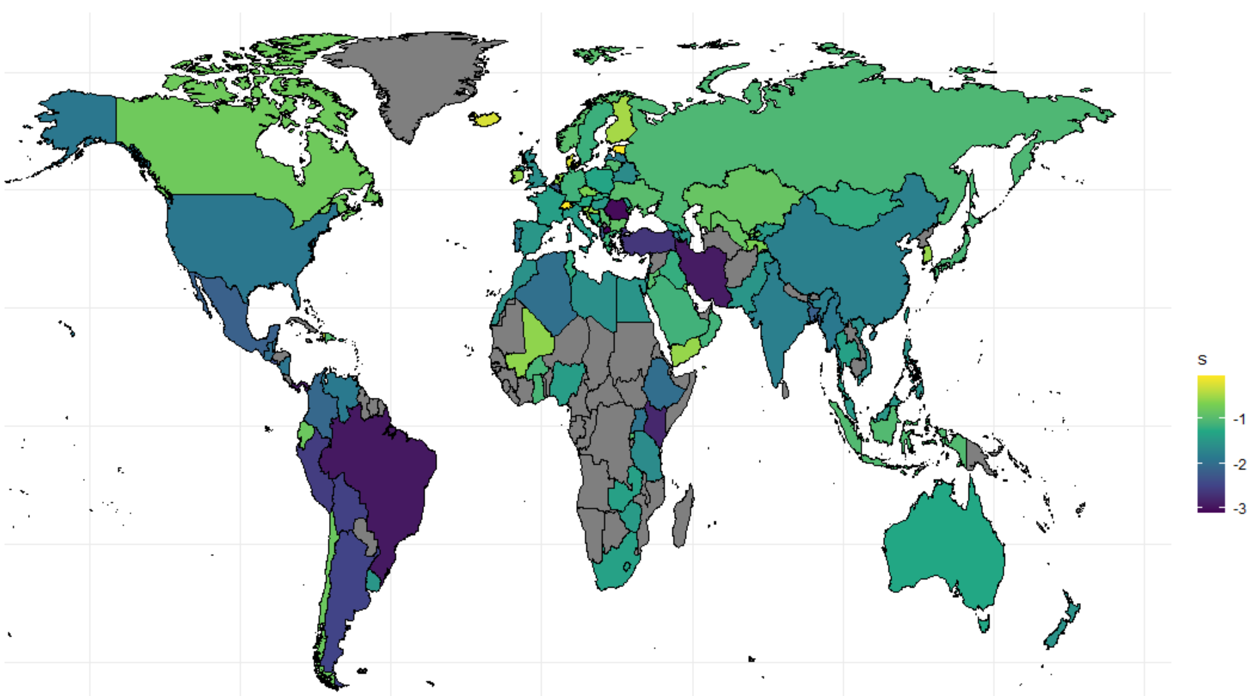

Figure A6. Selection differential for IQ by country with imputed values based on national IQs.

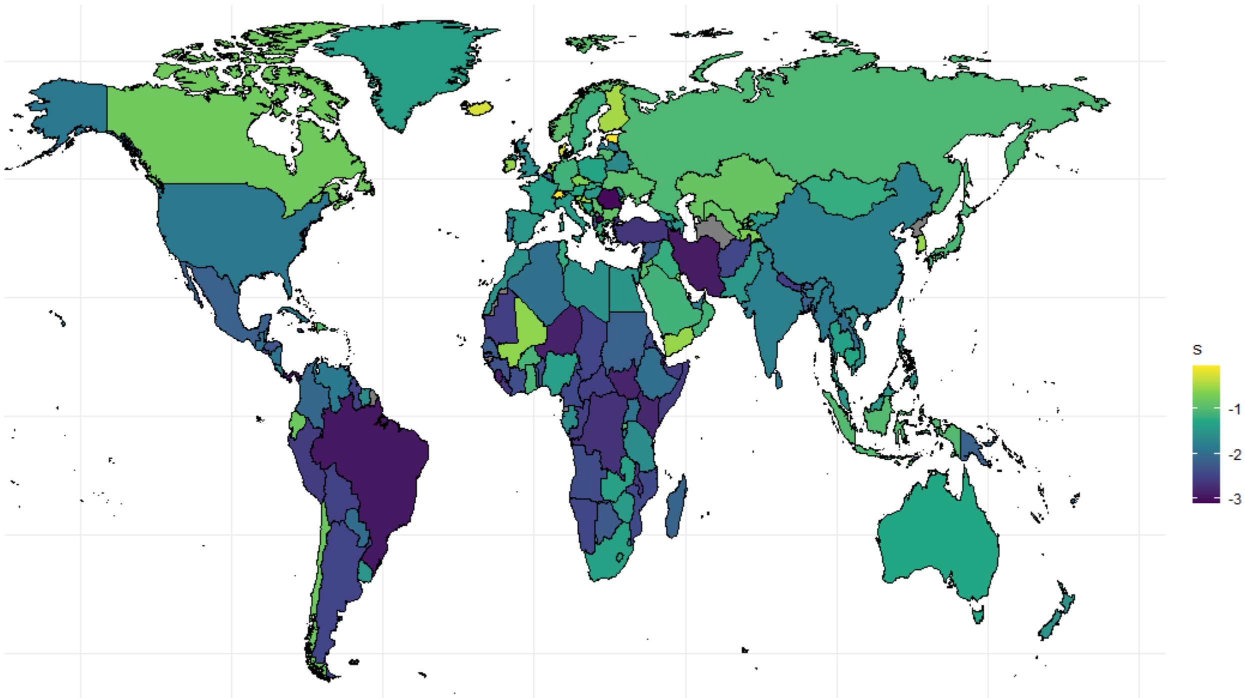

Figure A7. Selection differential for IQ by country with imputed values based on s-factor

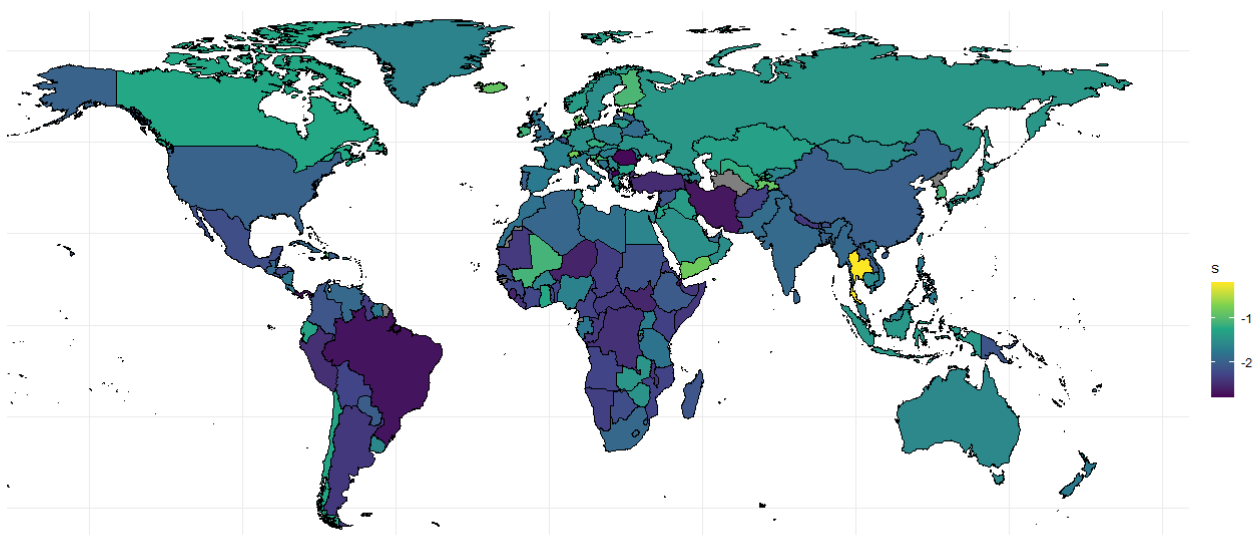

Figure A8. Selection differential for IQ by country with imputed values corrected for imputation bias within regions, and with imputations done for neighbours.

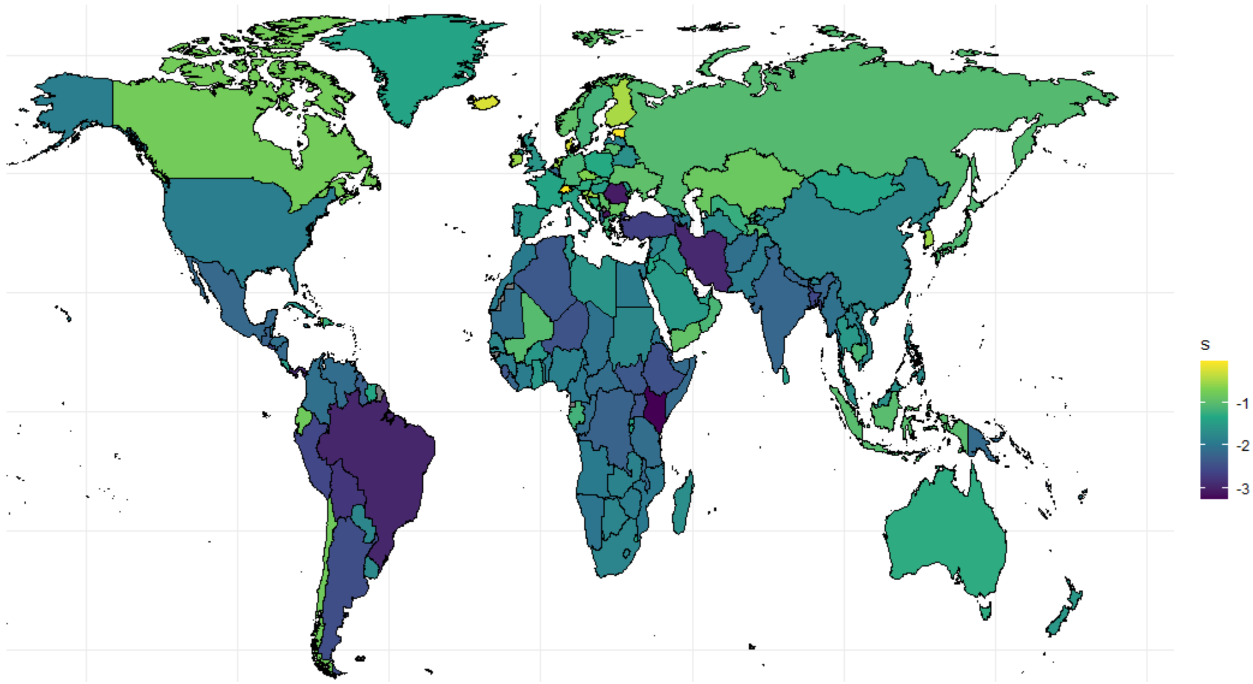

Figure A9. Correlation between educational attainment and fertility by country.

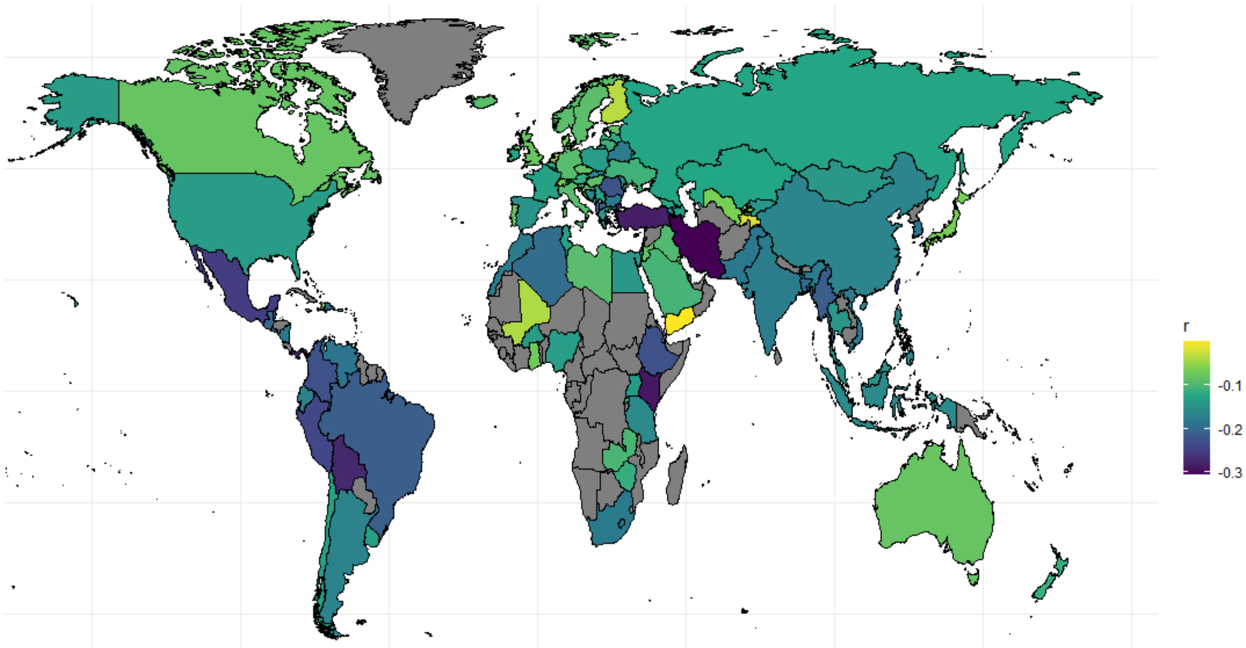

Figure A10. Decline in IQ per generation by country.