MANKIND QUARTERLY
Mankind Quarterly, 66(3), 424-427 2026 Spring Edition
ISSN: 0025-2344

Human Capital in Space and Time

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Half a century ago, as a young teenager, I was wondering about this: Why are some countries rich and others are poor? Why was Japan, a rising star at that time, a rich country although it lacked natural resources while the former Belgian Congo was poor although it was blessed with plenty of minerals? The answer I could come up with at that time was that the decisive ingredient was what I called "know how": the useful skills that the people in a country possess that make them able to build up industries and maintain efficient institutions. People acquire their human capital by learning useful skills. Therefore, I realized, we need two ingredients for an efficient economy: highly effective systems of schooling and vocational training, and the ability of young people to learn complex, difficult-to-learn skills. Only later did I learn that economists describe this "know how" as "human capital".

Among economists, Human Capital Theory has been a stock-in-trade since the early 1960s. Early economists measured human capital as highest educational degree or as number of years of school attendance, but these are measures of exposure to formal education, not measures of the quality of the product that comes out of the schools. Indeed, these measures of educational inputs or exposure have been disappointing as predictors of economic growth, which has led to much criticism of human capital theory within the ivory tower (Marginson, 2019).

The quality of the product that leaves the educational systems can be measured more directly by tests of cognitive ability. The turning point was a seminal though under-appreciated study by Erich Weede and his student Sebastian Kämpf (Weede & Kämpf, 2002) at the University of Bonn in Germany. These researchers were the first to use Richard Lynn's database of "national IQs" (Lynn & Vanhanen, 2002) as a predictor in their growth regressions. They found that there are two dominant predictors of economic growth rates: per capita GDP at the start of the observation period, and the average intelligence in the country. Countries with low initial per capita GDP (the "advantage of backwardness") and high intelligence grow the fastest. China is the best example. Countries gravitate toward a level of prosperity that is appropriate to their level of intelligence — while intelligence itself can change over time. These core results have been replicated many times since then.

Another new strand of research that became productive only after the turn of the millennium is the use of large-scale international student assessments such as the OECD's recurrent PISA (age 15 years) and PIRLS (age 10) assessments and the Trends in International Mathematics and Science (TIMSS) studies (8^{th} grade). These studies, with large, representative samples of schoolchildren, allow both comparisons between countries and the tracking of changes over time. And what is it that these assessments measure? The organizers of PISA, the most useful of the large-scale international student assessments, say this: "PISA goes beyond assessing whether students can reproduce what they have learned in school. To do well in PISA, students have to be able to extrapolate from what they know, think across the boundaries of subject-matter disciplines, apply their knowledge creatively in novel situations and demonstrate effective learning strategies." (OECD 2019, p. 5) This is a list of abilities that are otherwise described as "intelligence". Indeed, country scores averaged from student assessments such as PISA correlate with "national IQs" averaged from scores on intelligence tests at about r = .90 (Meisenberg & Lynn, 2011). Both can be used interchangeably to predict economic growth and many other outcomes (Rindermann, 2018).

Differences between countries in average scores on school achievement tests and psychometric intelligence tests can be large. There are also smaller differences between different provinces or regions within countries (Lynn et al., 2018). In general, wealthier and more "developed" countries and regions get the higher scores on both kinds of test. This issue of *Mankind Quarterly* has an article by German researcher Ronald Henss, who has studied the results of the IQB Education Trends, a national program of scholastic achievement tests that allows comparisons between the 16 federal states of Germany. Henss describes it

as Germany's domestic counterpart to the PISA studies, designed to assess cognitive differences between different parts of the country and their changes over time. The assessments span a time period from 2009 to 2024.

One first result is that even before the Covid-19 pandemic there was a very slight decline in scores, a trend that has also been observed in other European countries (see Meisenberg & Lynn, 2023, Table 2). This was followed by far larger declines in the last tests, conveniently explained by the Covid-19 pandemic. The second question is about sub-national differences. Which ones of Germany's federal states have the brightest young people, and which ones have the dullest? It depends. Overall there is an East-West gradient, with students in the eastern states being brighter than those in the West. Saxony in East Germany is the leader, and the small city-state Bremen, in North-West Germany, is lowest. Such a gradient begs for an explanation. One possibility is that the history of communist rule in the five eastern states has somehow bequeathed on them a superior educational system, but there is no evidence supporting such an explanation.

Fortunately, the data that Henss analysed have another piece of information: the proportion of schoolchildren with a migration background. That proportion varies widely between Germany's federal states, from 11.8% in Saxony to 61.3% in Bremen. Natives and immigrants in Germany show clear differences in their average scores on the IQB assessments. Taking the average of Mathematics, Biology, Chemistry and Physics across the 2012, 2018 and 2024 assessments, the Natives had an average score of 513.4. First-generation immigrants (those born outside Germany) averaged 430.4, and second-generation immigrants (those born in Germany but with foreign-born parents) averaged 464.8. The school assessment scale used here has 500 as the average, with a standard deviation of 100. Translated into the IQ scale, and assigning an IQ of 100 to the Natives, this means that first-generation immigrants, who face language barriers and other challenges, have an average IQ of 87.55. Second-generation immigrants reach an average IQ of 92.71 — better than first-generation, but still clearly below the Natives. Importantly, these are averages for all immigrants combined. The IQB data do not allow a breakdown into different origin groups, which would most likely show that immigrants from some parts of the world (Europe, East Asia?) do as well or better than the Natives, while those from other origins (Africa, Middle East?) do worse than the overall immigrant average.

When Henss controlled the IQB scores for the proportion of immigrant students, the advantage of the eastern over the western states evaporated. There is no need to invoke the superiority of the communist system to explain the high performance of the East German states. For example much of the difference between Saxony (527 on the author's Math-Science composite) and Bremen (460), a difference equivalent to 10 IQ points, is explained by the proportion of immigrants among the schoolchildren. Instead of the East-West gradient, there instead emerged a South-North gradient. Counting only German students without recent immigration history, southern states like Bavaria and Baden-Württemberg did better than expected, while northern states like Bremen and Mecklenburg – West Pomerania performed worse.

We do not know what causes this South-North gradient. Comparisons of polygenic scores for educational attainment between representative samples from the different federal states would be a necessary first step, but such a study does not seem to exist. Differences in school quality are likely to exist, but such differences would reflect the competence (i.e., intelligence) of teachers, school administrators and politicians in addition to the learning ability of the students. Here we can postulate a positive feedback: High intelligence creates effective schools, and effective schools raise intelligence even more. Such a positive feedback can amplify small genotypic differences into far larger phenotypic differences.

The lowering of average intelligence and school achievement by immigration demonstrates one major pattern of migration in today's world, which is from poor high-fertility countries with low average intelligence to rich low-fertility countries with high average intelligence. There is a strong negative correlation of about -0.80 between a country's average intelligence and its total fertility rate (TFR, the average number of children born per woman) (Meisenberg, 2009). As an empirical observation, when the average intelligence of human populations rises above about 60 or 70 by today's norms (19th century in Europe), they make the transition from "natural fertility" to controlled fertility. When the average IQ reaches about 90 (around 1970 in Europe), they slip into sub-replacement fertility. There is no obvious limit to this effect. Today many of the countries

with the highest average IQs (South Korea, Taiwan, Singapore, also Mainland China) now have TFRs below 1. This supports Oswald Spengler's (1980, p. 551) observation that "Children do not happen, not because children have become impossible, but principally because intelligence at the peak of intensity can no longer find any reason for their existence... When the ordinary thought of highly cultivated people begins to regard 'having children' as a question of pro's and con's, the great turning point has come. ... For Nature knows nothing of pro and con."

The persistence of large differences in wealth between countries is the main push factor of this mass migration, but it is also a necessity for the receiving countries. In Germany, for example, the average TFR is 1.35 children per woman overall and 1.23 among those with German citizenship. Assuming that those with German citizenship are ethnic Germans (and not all of them are), within two generations (about 60 years), the young cohorts of ethnic Germans will decline to about 35% of the original. At this rate of decline, without immigration there wouldn't be enough young people who are willing and able to care for the old in their nursing homes! Nor would it be possible to maintain an economy large enough to maintain decent nursing homes. This is the immediate reason why immigration is needed in Germany and other Western countries.

Poverty migration from low-IQ countries creates new problems for the remaining Natives in the receiving countries, but it would be wrong to blame the migrants. The ultimate problem is the unsustainability caused by the Natives' refusal to raise children. The Natives respond to this situation in the way that has become normative in their part of the world: When there are problems or when their own actions (or inaction) lead to predictable calamity for others (including future generations), they deal with it by not thinking about it, cherishing false beliefs, and denigrating those who remind them of the harsh realities. There is a fundamental difference between the modern and the postmodern stages of cultural evolution. Modern Man uses science and reason to improve the world according to his needs, focused on the real-world consequences of his actions for himself and others. Postmodern Man does not try to improve the world, is indifferent to consequences that arise for others now or in the future, and avoids confrontation with harsh realities that could disturb his emotional well-being.

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