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10 Tracking and educational inequality in health in later life

- The role of educational systems in shaping health inequalities has received little attention
- Tracking, as one important property of educational systems, is associated with larger educational disparities in subjective and objective health
- The currently built policy databank SPLASH provides information and indicators on educational systems across European countries and policy changes over time

10.1 Educational tracking and health inequalities

Social conditions that shape processes of cumulative disadvantage over the life course heavily depend on the structure of the welfare state and vary cross-nationally. Although the role of the healthcare system gains significant attention in the literature on socio-economic disparities in health, the educational system is rarely considered. The initial empirical evidence on the importance of the educational system in shaping health inequalities comes from Mazzonna (2014), who showed that country-average years of education are related to health inequality. Carstensen and Jungbauer-Gans (2016) went one step further and theorized in detail how properties of the educational system, such as standardization and stratification, affect health levels and health inequality. We build on these considerations by arguing that one specific property of educational systems – tracking – reinforces the relation between education and health.

Following Kerckhoff (1995, 323), we define tracking as the extent of 'separation of students into specialized schools and ability groups'. Drawing on recent studies, we assume that the extent of tracking of an educational system is higher when the age at first selection into higher or lower educational tracks is lower, the relative length of the tracked curriculum is longer and the number of different school types that exist at age fifteen is higher (Bol and Van de Werfhorst, 2013).

Theoretical arguments and empirical findings provide a rational as to why educational systems with higher levels of tracking may generate a stronger link between education and health. We term them the stronger selection, the intermediate goods and the deprivation explanation.

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First, the stronger selection explanation: In countries with higher levels of tracking, parental privilege might have a stronger influence on educational attainment (Brunello and Checchi, 2007). The younger the children are when decisions for school tracks need to be made, the higher the parental influence. Higher educated parents then pave the way into a higher education. Such a stronger positive selection of the highly educated may also relate to a stronger health advantage and, thus, a stronger link between education and health.

Second, the intermediate goods explanation: The higher the level of tracking, the stronger is the impact of education on adult socioeconomic status (i.e. employment probability, income, prestige or wealth; Bol and Van de Werfhorst, 2013). Such a stronger link between education and the intermediate goods that affect health may reinforce the link between education and health.

Third, the deprivation explanation: A higher level of tracking may exacerbate the negative effects of low educational achievement on health. Higher levels of tracking and, thus, a high selectivity in the educational system may exacerbate relative deprivation experiences, stigmatization processes and, thus, the psychological stress and burden from failure of those with low education. Higher psychological stress and the burden of having a lower education may reduce health and, thus, broaden the health gap between the lower and the higher educated (Carstensen and Jungbauer-Gans, 2016). As a result of these partly intertwined social processes, we expect that educational systems with higher levels of tracking generate stronger education-specific health inequality.

10.2 Data and method

This study uses data from SHARE Waves 1 to 6 from 15 countries (Sweden, Denmark, Germany, Luxembourg, the Netherlands, Belgium, France, Switzerland, Austria, Spain, Italy, Estonia, the Czech Republic, Slovenia and Israel). Furthermore, we concentrate on non-institutionalized individuals aged 50 to 85 years. Our analytical sample consists of 43,645 individuals with an average participation in 3 waves, resulting in 130,987 person-years; see Table 10.1 for descriptive statistics by country. We ran wave and country pooled regressions with country fixed-effects (Table 10.2).

We use two health measures as outcome variables. Self-perceived health, measured on a five-point scale ranging from 1 (poor) to 5 (excellent), provides a comprehensive and subjective health measure. In addition, physical impairment is used as an objective health measure and consists of self-reports on needing assistance with six activities of daily living (ADL).

Table 10.1: Descriptive Statistics by Country.

Country	Health (mean)		Education			Tracking	$N_{persons}$
	Sphus	noADL	Primary	Secondary	Tertiary		
SE	3.40	0.90	0.21	0.48	0.31	−1.06	3,023
DK	3.57	0.90	0.08	0.48	0.44	−.93	3,133
DE	2.85	0.84	0.01	0.68	0.31	1.79	3,441
LU	3.08	0.86	0.25	0.56	0.19	0.76	648
NL	3.17	0.92	0.09	0.62	0.29	0.97	1,926
BE	3.07	0.80	0.15	0.52	0.33	1.04	3,993
FR	2.89	0.84	0.32	0.47	0.22	−0.48	3,254
CH	3.40	0.94	0.09	0.77	0.15	−0.24	2,194
AT	3.08	0.85	0.12	0.64	0.25	1.75	3,392
ES	2.74	0.80	0.54	0.35	0.11	−0.80	4,070
IT	2.79	0.82	0.46	0.46	0.08	0.18	3,524
EE	2.21	0.74	0.04	0.74	0.22	n.a.	3,773
CZ	2.67	0.82	0.12	0.75	0.13	1.67	4,394
SI	2.71	0.80	0.08	0.75	0.17	0.76	2,163
IL	3.32	0.86	0.26	0.40	0.35	−0.13	717
Total	2.95	0.91	0.20	0.57	0.23	0.39	43,645

Note: All descriptives are clustered at the person level.
Source: SHARE Wave 1–6 release 6.1.0, Tracking indicator by Bol and Van de Werfhorst (2013).

Table 10.2: Pooled LPM Regression with Education-Country Interactions.

	Self-perceived health	No physical impairment
Education (ref: primary)		
secondary	0.340***	0.046**
	(0.038)	(0.014)
tertiary	0.544***	0.073***
	(0.044)	(0.014)
Country dummies	x	x
Country*Education interactions	x	x
Observations	130,987	130,987
R^2	0.211	0.053

Note: Beta coefficients reported. Standard errors are clustered at the person level and are reported in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Unweighted sample. Controlled for gender, birth cohort, parental status during childhood, health conditions during childhood, period effects, panel conditioning and panel attrition.
Source: SHARE Wave 1–6 release 6.1.0.

Educational attainment is measured by ISCED-97 and is divided into three categories (ISCED level 0–1 refers to primary, 2–4 to secondary and 5–6 to tertiary).

As a measure of the extent of tracking of the educational system, we use a relative tracking index developed by Bol and Van de Werfhorst (2013). The authors combine OECD indicators from 2002 and 2005 and a measure by Brunello and Checchi (2007) and derive the index using a factor analysis. This latent concept of tracking comprises three variables: age at first selection into higher or lower educational tracks, relative length of the tracked curriculum and the number of different school types that exist at age fifteen. The tracking index is available for all countries in our sample, besides Estonia. We prefer tracking during the historical time when our respondents attended school (1940–1970) but do not have this information available. However, the educational expansion and significant educational reforms, such as the extension of compulsory schooling in the last century, do not necessarily imply changes in educational tracking. Bol and Van de Werfhorst (2013) showed that, over time, this tracking index varies significantly between countries but little within countries.

In all models, we control for gender, birth cohort before, during or after World War II, parental socio-economic status during childhood, self-perceived health, having two or more diseases and illnesses during childhood and school performance at age 10 in mathematics and language. Parental socio-economic status during childhood is constructed as an index based on principal component analysis following Mazzonna (2014) and includes parental education, the financial situation of the household at age 10 and the rooms-per-person ratio of the household at age 10. We expect period effects of the financial crisis in 2009 and control whether the interview was conducted before 2009. We also control for ageing as age deciles and its squared term. We account for panel conditioning in all models using an indicator for the first participation and for panel attrition by including a dummy if the respondent dropped out of the sample (alive or unknown) or died during the observation period (reference is stayed in the panel). In all models, we include country-fixed effects for the entire sample.

10.3 Results

In a first step, we ran pooled linear probability models (LPM) with binary outcomes on '*very good/excellent health*' (versus *poor, fair* and *good* on the self-perceived health scale) and '*not reporting any physical impairment*' (out of the six potential limitations) with country fixed effects. This approach allows for a

comparison of the magnitude of the coefficients. Although the coefficients of objective health were smaller than for subjective health, especially for tertiary education, they showed significant disparities between low and high education. Therefore, qualitatively, the objective and subjective measures revealed the same conclusions on health inequality, and our results were in line with the general tendency that subjective measures showed larger inequalities than objective measures.

In a second step, we graphically explore the association of our baseline results from the pooled sample with a tracking indicator to descriptively investigate one precise institutional measure. In Figure 10.1 and Figure 10.2, the country-specific education effect on health (more specifically, the average marginal effect of tertiary education with reference to primary education for each country) is contrasted with the degree of educational tracking in each country. The results show that the educational health gap indeed relates to the level of tracking of the national educational system. The association appears regardless of whether we use subjective or objective health measures.

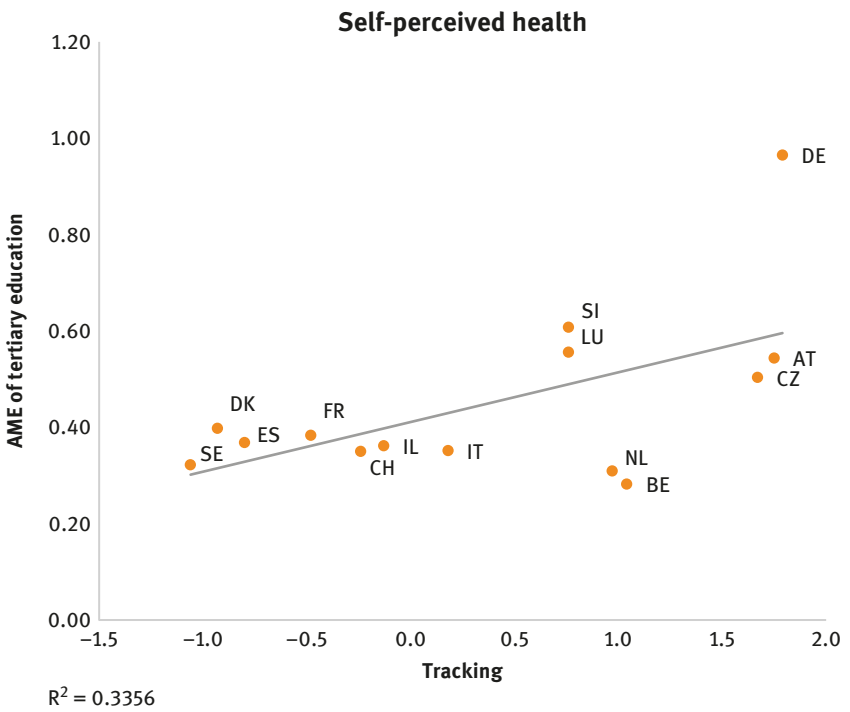

Figure 10.1: Education-health gap and tracking for subjective health (self-rated health).
Source: SHARE Wave 1–6 release 6.1.0.

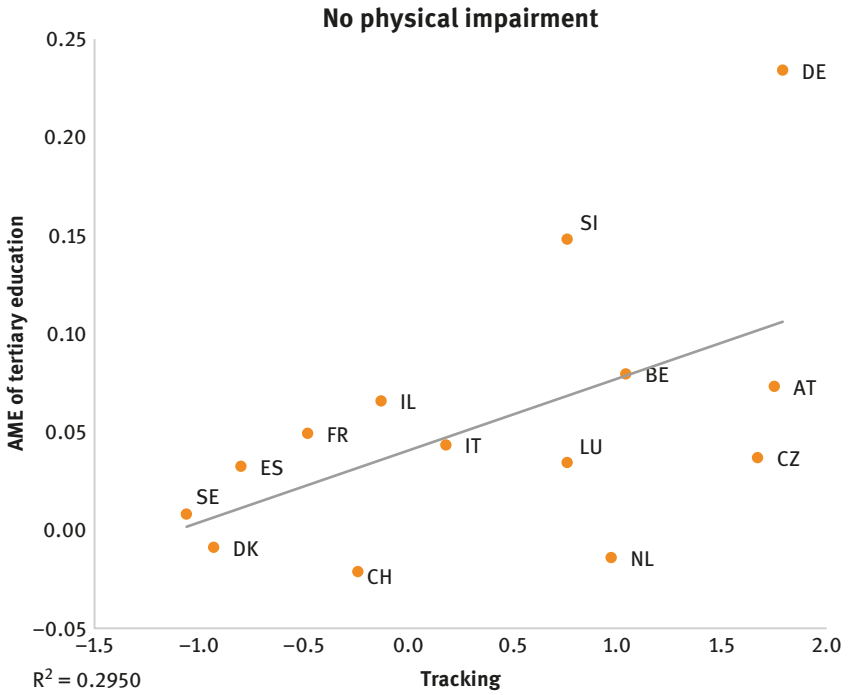

Figure 10.2: Education-health gap and tracking for objective health (no physical impairment).
Source: SHARE Wave 1–6 release 6.1.0.

10.4 Conclusion

This paper provides theoretical considerations and the first empirical evidence on the relation between educational tracking and educational inequalities in health. The descriptive analysis clearly has methodological drawbacks.

One limitation relates to (unobserved) heterogeneity. Our descriptive approach does not preclude the possibility that country characteristics relate to tracking and brings about stronger education health gaps at older ages. For example, countries with higher degrees of tracking may also be those with higher proportions of private healthcare, and inequalities in access to healthcare may generate a stronger link between education and health.

To tackle this issue, future research could employ a multilevel analysis with cross-level interactions between tracking at the country level and educational attainment at the individual level. When the number of countries is sufficiently large, such an empirical strategy allows for controlling of country-

specific characteristics, thereby accounting for time-constant, country-specific observed heterogeneity. Starting Wave 7, the number of countries participating in SHARE increased to 28, which enables the analysis of a broad range of countries in the upcoming waves. A further, perhaps even more promising, approach could use historical changes in tracking that reflect the education system when the respondents were of schooling age. Such inter-cohort variations within countries allow for within-country analyses that allow accounting for observed time-variant and unobserved time-constant heterogeneity.

New data collection projects give reason to hope that the basis for such analyses will soon be available. The promising new research project SPLASH (Social Policy and Law Shared Database) is currently establishing a large policy databank on European countries that dates back in time and will incorporate information on educational systems. Further research could use the SPLASH indicators to employ the empirical strategies previously sketched out.

Furthermore, future research should attempt to disentangle different explanations for the reported association between tracking and education-specific health inequality at older ages. To examine the importance of the selection explanation, scholars could investigate how much of the larger education health gap in countries with higher levels of tracking relates to greater selectivity of those with higher education than those with lower education. To scrutinize the intermediate goods explanation, scholars could include a variety of adult socioeconomic status measures in the analysis to investigate how much of the larger education health gap in countries with higher levels of tracking relates to stronger education-specific differences in intermediate goods that affect health. To investigate the importance of the deprivation explanation, scholars could examine the role of education-specific differences in relative deprivation experiences, stigmatization processes and psychological stress in explaining tracking variations in the educational health gap.

Having said this, this contribution also has important strengths. This study outlines the theoretical mechanisms for why higher levels of tracking may exacerbate the link between education and old age health. Furthermore, this study sketches empirical strategies and their respective assumptions. Finally, this study is the first to show descriptive evidence that allows for the cautious conclusion that such a relation could exist for both objective and subjective health. If future research shows that this relation is robust, our findings imply that higher levels of tracking generate inequalities that go a long way and may even increase health inequalities in old age.

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