Education systems and inequalities

INTERNATIONAL COMPARISONS

Edited by
Andreas Hadjar and Christiane Gross

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We hope that readers will find this volume inspiring.

INTRODUCTION

Education systems and inequalities

Andreas Hadjar and Christiane Gross

Background

Education systems have become one of the most debated subjects of political intervention. At the end of the 19th century, national or federal education systems were institutionalised, and in the 20th century they received even more attention. Sharp increases in awareness followed by political debates, and finally more or less efficient political reforms often occurred in the aftermath of perceived 'educational catastrophes'. Politicians and scientists mainly confess to the failure of education systems when fears involving the economic potential of society increase. There are two famous examples that have indirectly (the first) and directly (the second) affected educational policies: the 'Sputnik shock', after the Soviet Union launched the first successful satellite in 1957, with the Western industrialised countries' fear of being outperformed by the Eastern bloc, and the 'PISA shock', after the first testing series in the framework of the Organisation for Economic Co-operation and Development (OECD) PISA programme (Programme for International Student Assessment) and the discovery that even many highly industrialised countries have strong deficits with regard to the cognitive potential of 15-year-old students who were performing below average in a global comparison of competencies. Both situations were accompanied by increased (economic) fear that the education systems of the countries were not able to provide the cognitive potential or human capital needed to maintain or increase economic prosperity (see Hadjar and Becker, 2009 with regard to the educational expansion). A minor – but from our sociological perspective even more important – argument that is also voiced with regard to perceived education deficits is that 'more education' would also help to abolish educational inequalities, or systematic variations in elements of educational attainment structured by ascriptive factors such as class, gender or ethnicity, and increase the potential of citizens to actively participate in democratic society. Dahrendorf (1965) sees

education as a civil right and speaks of it as a 'step into a modern world of enlightened rationality' (Dahrendorf, 1968: 24). What followed was a tremendous increase in the public awareness of education systems, leading to manifold political attempts to improve the institutional settings of education systems and curricula to produce skills resources.

In reforming their education systems, different countries and even sub-regions followed very different paths. While some countries tried to push 'excellence', to support students whow were performing well in particular, and to segregate school students – a common feature in the highly stratified education systems of Germany or Austria – others tried to compensate for deficits in the acquisition of education, abolish inequalities and bring people of very different backgrounds into comprehensive schools (for example, the less stratified Scandinavian countries). In other regions of the world, with a rather collectivist orientation, a highly standardised comprehensive schooling was always perceived as the *voie royale* to high achievement (for example, Asian education systems); however, abolishing inequality and improving the educational level of a society can go hand in hand. While the low performance of an education system is often due to the very low performance of specific risk groups in this education system (for example, the working class), equalising the opportunities of different groups in the education system means supporting those risk groups with the positive consequence of an increased overall performance of the education system. Drawing on this argument, which surely relates to more complex mechanisms than those outlined in this introduction, a main objective of this book is to evaluate how the design of education systems has an impact on educational inequalities and inequalities in status attainment and life chances by exploring theoretical arguments and empirical findings.

The book's theme

This peer-reviewed reader on education systems, educational inequalities and educational returns focuses on questions of how and via which social factors and processes characteristics of educational systems shape educational inequalities and inequalities in status attainment and life chances along different axes of inequality (social origin, gender, ethnicity/immigrant background, as well as other less well-studied factors such as ability, region or religion) and – following the latest developments in inequality research – certain intersections or so-called 'intersectionalities' (for example, male working-class migrants). Beyond inequalities in educational attainment, this book also focuses

on returns on education: that is, life chances based on the educational certificates and skills acquired. This involves detailed analysis of links between different levels of analysis (macro-level/society, meso-level/institutions and micro-level/individuals). Such characteristics include their institutional settings, programmes, and the societal conditions associated with characteristics of the education system (overall inequality level, welfare regime and so on).

Institutional settings are conceptualised in terms of incentive and opportunity structures, as well as in terms of limitations to educational attainment. These macro- and meso- structures in concert determine the advantages and disadvantages in educational opportunities of different social groups, and therefore educational inequalities. According to the latest developments in inequality research, such as the cumulative advantage/disadvantage hypothesis and the intersectionality approach, stronger disadvantages at the intersection of different axes of (educational) inequality, that accumulate over the course of a life, are to be expected.

The macro-level factors of education systems that are more or less significant include the degree of stratification (age of selection, number of tracks and so on), vocational specificity (general versus vocation-specific trainings), and degree of standardisation of schooling, teacher education and educational certificates, as well as the existence of programmes to increase the permeability of higher education (for example, alternative access opportunities for universities). Education systems are linked to other macro-factors of the societal context, such as migration regime, welfare regime, gender regime and value climate (value of education, acceptance of inequality, perceptions of justice and so on). Analysing these research issues requires a strong comparative perspective: comparisons of different countries or regions, but also longitudinal or historical analyses comparing the change in education systems and educational inequalities, education-related inequalities in status attainment, and life chances over time. When analysing change and persistence, different temporal dimensions can be taken into account: (birth) cohort (for example, cohort-specific educational aspirations and opportunities), period (for example, educational reforms), and age (for example, educational attainment embedded into the life cycle). Different countries (for example, less stratified Scandinavian countries versus highly stratified countries such as Germany or Austria) are taken into account in terms of educational settings and their consequences for educational inequalities.

In the chapters of the book, readers are invited to gather information regarding the following questions: How can education systems be

characterised? What distinguishes one from another? How are the characteristics of education systems linked to the characteristics of social systems (for example, welfare regimes)? How do education systems and their characteristics shape educational inequalities? How do the different characteristics of education systems impact educational inequalities along different axes of inequality (social origin, gender, ethnicity/immigrant background, ability and so on) and at certain intersections? How do the different characteristics of education systems shape the link between education, the labour market and further life chances in terms of monetary and non-monetary returns on education? What are the social mechanisms behind these macro and micro links between an education system and inequalities?

The book's strategy, innovative potential and content

The book is a reader on education systems and inequalities, and covers a broad state of research in different fields involving different perspectives, but also including more detailed presentations of specific findings with regard to how the design of education systems shapes differences in the educational attainment of students from different social origins (class), differences between men and women (gender), and differences between migrants and non-migrants, as well as between specific ethnicities. It also looks at the issue of how education systems shape monetary and non-monetary returns on education. The volume is directed towards an international scientific audience, policy makers and the broader public – since reform of education systems and the search for the 'ideal' institutional settings for teaching and learning are at the centre of current public debates all over the world. The book and its chapters take a strong comparative approach: at the core is an international comparison of education systems. Rather than compiling chapters on different countries, the chapters include comparisons involving two different approaches. The first strategy involves the consideration of a larger number of countries, and analysis directly via multi-level modelling on the basis of large quantitative datasets regarding how country-specific education system characteristics impact educational inequalities (that is, the advantages and disadvantages of certain groups). The second strategy employed in this book is the comparison of only some countries regarding their conceptual and institutional macro-characteristics of education systems and inequalities.

What does this book add to previous accounts? The innovative potential of this volume, which is extremely topical in these times of intensified educational reform all over the world, relates to the following

issues. It brings together state-of-the-art research on education systems, educational inequalities and returns on education from Europe, America and beyond, employing a strong comparative perspective. The links between education systems, educational inequalities and inequalities in status attainment and life chances are explicitly covered. The book attempts to combine both macro-level perspectives that focus on education systems and micro-level perspectives that focus on individual inequalities. It centres on the macro–micro link – the impact of macro-factors in the educational system on educational inequalities and returns on education. While most of the studies (and also most chapters in the book) on educational attainment and educational inequalities focus on social origin, the book considers three axes of inequality (social origin, gender and immigrant background), and combinations of the axes of educational inequalities, or so-called 'intersectionalities' (for example, working-class boys, migrant girls). The book brings together scientists of different perspectives and disciplines. This range of disciplines includes sociology, history, political sciences, educational sciences and economics. The book will also contribute to the advance of comparative methods, with a focus on model strategies regarding the impact of contextual characteristics on outcomes and effects at the individual level. Issues to be discussed include the harmonisation of different datasets and measurements.

The book is structured in four sections: following this introduction, a theory and methods section (Chapters 1-6) includes chapters on theoretical frameworks that appear to be meaningful for the analysis of education systems, inequalities and conceptual considerations of the evolution of education systems. This section also includes chapters on methodological issues in the comparison of education systems with regard to inequalities, specifically issues of intersecting inequalities, of measuring institutional characteristics and of the statistics of multi-level analyses. A second part (Chapters 7-10) focuses on how education systems shape educational inequalities in terms of differences in educational attainment. Axes of inequalities considered in this regard are class (social origin), gender and immigrant background/ethnicity and ability/disability. The third part (Chapters 11-14) deals with monetary and non-monetary returns on education, such as labour market returns and health, along the axes of social origin, gender and immigrant background. Finally (Chapter 15, Conclusions), political implications and scientific conclusions are drawn from the different accounts assembled in the book.

The book chapters

The section on theory and methods starts with a chapter by Christiane Gross, Heinz-Dieter Meyer and Andreas Hadjar, who present a general theoretical framework for the analysis of influences on the education system (the macro-level of society), at the institutional level (classroom and schools) and on individual inequalities (micro-level) based on the concepts of institutionalised embeddedness and path dependency, and the structural-individualist approach of Coleman (1990). Theorising the question of how macro- and meso-level characteristics affect individual determinants of inequalities, they apply Boudon's (1974) concept with regard to educational inequalities, to a different axis of inequality and present concepts that link education, the labour market and general life chances.

Susanne L. Robertson and Roger Dale follow a critical perspective of comparative education research, questioning the comparability of education systems across borders in a 'globalising' world. While challenging most of the taken-for-granted knowledge in this field, they contribute to an important discussion on what can be assumed and what research goals should be set.

The chapter by Christiane Gross, Anja Gottburgsen and Ann Phoenix introduces an intersectional theoretical perspective, implying an extensive consideration of the social context of action (contextuality) and the multidimensional axes of inequality and their intersections. They show the conceptual and methodological implications of this perspective for the analysis of education systems and educational inequalities by presenting qualitative and quantitative research strategies, including qualitative comparative analysis (QCA). They conclude with a comparison of the different methodological paradigms, and by discussing strengths and weaknesses of the methodological approaches regarding intersectionality.

Thijs Bol and Herman G. van de Werfhorst deal with the methodological issue of how to measure the main characteristics of education systems: timing and methods of tracking students, the provision of vocationally specific skills by the education system, and the degree of (nationwide) standardisation in an educational system. Developing new indicators based on various sources of data (OECD, UNESCO, TIMSS [Trends in International Mathematics and Science Study], PISA and Eurydice), the authors examine the relationship between these three characteristics of education systems for equality of opportunity, student skills, the allocation of students to the labour market and preparation for active participation in society.

Hartmut Esser investigates why two-level models that examine the effect of post-elementary school ability sorting on achievement in secondary school show different results from three-level models examining the same effect. He shows what theoretical and methodological pitfalls should be avoided in order to estimate the effect of ability sorting on achievement in a proper way, and how important it is to include the school/classroom level in the analysis.

Christiane Gross concludes this section by reflecting on how the impact of education systems can be analysed quantitatively, employing comparative analyses and multi-level techniques. She explores both the comparative approach, including only a small number of countries, and the multi-level approach, and reflects on the main methodological issues. Questions she raises and answers include: (a) why, when and how to centre variables (grand-mean versus group-mean), (b) how to tackle missing data (unit and item non-response), (c) when to use random slopes versus fixed slopes, (d) how to apply regression diagnostics in multi-level models, (e) when to adopt robust standard errors, and (f) how to interpret interaction and cross-level effects.

The next part of the book covers the influence of the education system on educational inequalities, that is, the advantages and disadvantages for educational attainment along different axes of inequality. The first axis under consideration is social origin. Gabriele Ballarino, Fabrizio Bernardi and Nazareno Panichella focus on differences in educational attainment related to family background (parental education) and how these inequalities are affected by education system features, namely the stage of educational expansion and design of the education system (stratification, standardisation, vocational specificity). They theorise and empirically analyse these characteristics in terms of constraints that limit individual choices with regard to schooling.

Andreas Hadjar and Claudia Buchmann deal with gender inequalities in educational attainment. They discuss gender differences at different points within educational careers, considering historical and contemporary patterns in industrialised societies. A major issue relates to the question of why gender differences in secondary schooling reversed during the 20th century and where –that is, in which types of education system – this reversal was most pronounced. Finally, the authors present the results of their own multi-level analyses with regard to the impact of education and social system characteristics on gender inequalities in the attainment of a university entrance certificate.

Jaap Dronkers and Roxanne Korthals analyse PISA data with regard to achievement inequalities related to migration backgrounds, and how these are structured by the education system characteristic of

stratification. The influence of education system characteristics is estimated separately for native-born students and first- and second-generation students, showing different results depending on migration status.

This section concludes with a chapter by Julia Biermann and Justin Powell, who deal with a rather under-researched and mostly neglected element of inequality: dis/ability. This chapter addresses the question of how education systems shape the disadvantages of those with 'special educational needs' (SEN), in particular for children and youth with impairments and disabilities. The level of disadvantage this heterogeneous group faces depends on the existence and quality of institutionalised education and social welfare programmes. To elaborate on the system–inequality links, the authors employ comparative neo-institutional analysis, focusing on the cases of Germany and Nigeria.

The section on the way education systems shape inequalities in status attainment and life chances begins with a chapter by Andreas Hadjar and Rolf Becker on the meritocratic triad: the links between social origin and education, and the links between class of origin and education and class of destination (status). After looking at the impacts of how characteristics of the educational system such as stratification, standardisation and vocational specificity structure inequalities in educational and status attainment are theorised, the state of research is discussed and the authors' own empirical multi-level results are presented. A core assumption is that educational and social inequality is stronger in stratified education systems than in less stratified systems.

Concetta Mendolicchio focuses on gender inequalities in the labour market. Bringing in a strong economic perspective, she studies differences in outcomes in the labour market, specifically gender differences in the level and distribution of wages. Finally, she presents her own empirical results based on a dataset for 12 countries, and considers the impact of several institutions on gender-specific returns on education.

Migration-specific inequalities are dealt with by Irena Kogan, who focuses in her chapter on labour market integration problems among immigrants. With the general assumption that the labour market value of education depends on the strength of the link between education and occupation, she empirically tests the hypothesis that returns on host-country education among immigrants should be greater in countries with more vocationally/occupationally oriented education systems.

In the final chapter of this section, Johann Carstensen and Monika Jungbauer-Gans explore how education systems shape the link between education and health as a non-monetary return to education. Based

on a theorisation of the mechanisms behind the education–health link, they discuss how school context (classroom composition, teacher behaviour) and the macro-context of education systems structures health inequalities.

The final part of the volume consists of two chapters. Jutta Allmendinger reviews the current state of research on the impact of education systems with regard to the difficult questions of whether there is an ideal education system and what this should look like. In dealing with this question, others questions have to be asked – including the crucial question of how we measure the success of an education system. The author gives a clear answer relating to normative thoughts about educational justice.

Christiane Gross and Andreas Hadjar then have their final word as editors, summarising the main debates and the main findings readers may take from the book.

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ONE

Theorising the impact of education systems on inequalities

Christiane Gross, Heinz-Dieter Meyer and Andreas Hadjar

Introduction

Recent research has shown the strong impact that the institutional settings of educational systems have on educational inequalities and, via education, on inequalities in manifold life chances (labour market chances, income, health, political participation and so on). The main characteristics that have been determined as driving forces are stratification (tracking), standardisation and vocational specificity. Tracking in terms of a stratified course system accounting for student talents and abilities in each subject is discussed regarding the student age at the beginning of different school tracks (times of selection) and with regard to within-school and between-school tracking. Stratification (also known as external differentiation) refers to the selection of students into distinct educational pathways (schools or classrooms) with differing aspiration levels. Standardisation is linked to issues such as school equipment, the level of school autonomy and the existence of central examinations. Vocational specificity is related to the question of how the education system and its institutions are linked to the occupational system and the labour market. These characteristics of education systems may vary between countries, but also between regions within countries, or even between schools. They may serve as clues as to how heterogeneity and diversity is managed in the daily school routine. Often they reflect a nationwide strategy that has a variety of effects, from tackling to tolerating social inequalities, or even fostering them. So the conceptual and empirical challenge is to separate the effect of country attributes, such as income inequality or welfare state regime, from effects of characteristics of education systems.

When we speak of an *education system*, we refer to institutional settings in which processes of education are embedded. Such institutional settings include schooling systems at different levels (pre-schooling, primary and secondary schooling), but also vocational training and

higher education systems. Crucial to the analysis of inequalities is the structure of the education system, in particular the available education institutions, how they can be accessed, how people can transit from one to another educational stage, and how they can move between parallel institutions (for example, upper secondary general versus upper secondary vocational education). Institutional settings thus also structure educational pathways and imply 'normal' pathways. *Educational inequalities* are systematic variations in several aspects of educational attainment structured by ascribed attributes of students derived from their social group memberships, such as gender, ethnicity, immigrant background and class (axes of inequality). Following the concept of Jacobs (1996), educational inequalities can relate to: (a) access to education (for example, educational institutions), (b) experiences/learning processes (for example, well-being in school, learning behaviour), and (c) outcomes of education (educational success, for example, competencies, school marks, certificates). What is not covered by the term 'educational inequalities' are inequalities in monetary and non-monetary educational returns that are also influenced by education system characteristics (see Müller and Shavit, 1998). When dealing with the question of how different societal groups can transfer their educational investments into valuable labour market positions, income or well-being, we refer to *inequalities in returns on education*.

The research issue of the impact of education systems on inequalities appears as a macro-micro-problem, and thus we will start from a multi-level perspective. First, we adopt a historic perspective to show how current education systems have been developed over a long period of time and how they serve as deep-seated national myths. The variety of path dependencies is illustrated by two examples – the United States and Germany. In a second step, we present the macro-meso-micro-model that follows the model of structural-individualist explanation by Coleman (1990). Based on the macro-meso-micro-model, we describe how characteristics of education systems at the macro-level, and school characteristics at the meso-level influence the relevance of individual attributes (of students, their parents and teachers) to the educational attainment of students. Afterwards, we deal with explanations of educational inequalities at the individual level. In this section, theories explaining educational attainments according to personal characteristics are presented, followed by explanations of unequal monetary and non-monetary educational returns. Aggregating individual educational attainment and returns, we conclude at the macro-level with implications for social reproduction and social change.

Development of educational systems – institutional embeddedness and path dependencies

Education is a highly institutionalised or 'embedded' process (Weber, 1949; Granovetter, 1985; Meyer and Rowan, 2006; Meyer, 2011). At the macro-level, the embedding factors include not only the usual suspects, such as a country's formal laws and policies, but also less tractable and tangible social forces, such as shared beliefs or belief systems (about what constitutes a proper education), traditions and the unique historic events that catalysed fractious groups to form the founding coalition from which new educational institutions took shape. This historically grown amalgam of institutions and institutionalised practices rarely distributes educational opportunities evenly across the groups and classes comprising a nation. Even where the public school was founded on an explicit commitment to equality, social groups acting in the context of institutional factors may set in motion a train of intended or unintended effects that conspire – sometimes against the will of all participating actors – to reproduce inequality. Although such inequalities may well originate from the political will of dominant groups, they may, through long processes of institutionalisation, become part of a country's accepted and 'taken-for-granted' macro-structure or 'grammar of education' (Tyack and Cuban, 1995), which may persist despite sincere and repeated efforts to change them.

Two cases in point are the educational systems of Germany and the United States. While pronounced educational inequalities continue to be prevalent in both countries, their respective shape and effect differ significantly. Americans continue to reject forms of educational inequality quite acceptable in Germany (for example, a tripartite school system), while accepting forms of inequality that Germans find repugnant (for example, inequality along residential lines and income). The reasons for these different articulations of educational inequality at the macro-level are most readily understood by means of historical-comparative study of educational institutionalisation and path dependence.

After becoming familiar with the concept of embeddedness, it will be useful to ascertain the meaning of an 'institutional path' and 'path dependence.' For our purposes here, we define an institutional path as a 'distinct, stable, interlocking set of institutions with a long life expectancy that exerts great inertial pull on the behaviour of social actors and constrains their future options' (Meyer, 2011: 190). While often shaped by idiosyncratic events or historical 'accidents', education within one country may confront rather different challenges

or opportunities than in another. Lipset (1996: 24) suggests a useful simile according to which an institutional path is formed through:

> a nation's history starting as a game in which the dice are not loaded at the beginning, but then become biased in the direction of each past outcome […]. Each time the dice comes up with a given number, the probability of rolling that number again increases.

Path dependence emphasises the importance of fine-grained historical analysis to understand *lock-in effects* (Shapiro and Varian, 1999). Institutions not only lock in certain practices and behaviours, but also beliefs. Once evoked to legitimise an institution, ideas and beliefs are institutionalised, and switching from one set of beliefs to another is very difficult, if not impossible (Meyer, 2009).

Institutionalised inequality in Germany and the United States

Germany and the United States provide useful cases in point. While comparable in many respects (economic development, large territorial nation state, Western democratic orientation emphasising individual rights and equal opportunities) and while sporting a long history of shared cultural and educational interaction and learning, educational institutions and inequality take a remarkably different shape in both countries (see Table 1.1).

Germany: founding crisis and narrative

From the founding of the Prussian school system in 1810 to the late 1960s, Germany had three distinctive educational tracks. The *Gymnasium* provided a classical education for the elite and was the prerequisite for university. The *Volksschule* ('school for the [common] people') was attended by the majority of students, who were prepared for a life in the trades. An intermediate type of school, the *Realschule*, focused on technical training for the whitecollar trades.

The basic outlines of the German school system emerged during a brief period of reform led by Wilhelm von Humboldt (1767–1835). Humboldt became the head of education reform after Prussia was dealt a devastating defeat by Napoleon on 4 October 1806 at Jena. While 1806 marked the moral defeat of a budding nation, it also opened a window of opportunity for change. Once in office, Humboldt used the power of the Prussian state bureaucracy to conduct a centralised policy

Table 1.1: Institutionalised inequality and path dependence: a Germany–US comparison

	United States	**Germany**
Founding crisis	Mid-19th-century mass immigration	Military and political defeat and national humiliation at Jena 1806
Founding narrative	'Common School'	'*Bildung*'
Role of government	Weak	Strong
Role of local community	Strong	Weak
System structure	Single-path primary, middle, high school plus internal tracking	External tracking in tripartite vocational, technical, elite system (*Hauptschule*, *Realschule*, *Gymnasium/Gesamtschule*)
Traditional educational objective	Civic and economic participation	Preparation for vocational, technical, academic careers
Policy for special needs children	Rights-based inclusion	Needs-based special tracking
Key policy initiatives	Choice, vouchers, charter schools, accountability	Comprehensive high school (*Gesamtschule*); accountability; inclusion
Constraints on equal opportunity	Cumulative disadvantages of class (lack of financial capital) and race/ethnicity, amplified by strong spatial segregation	Disadvantages from lack of cultural capital, amplified by *Hauptschule* as '*Restschule*' disproportionately attended by immigrant children

of educational change pivoting on the notion of *Bildung*, a concept of education for cultural self-perfection through lifelong engagement with culture, knowledge and the arts.

One of its underlying assumptions was that, throughout their lives, individuals are engaged in a struggle between higher and lower selves, higher and lower inclinations. For the higher inclinations to win, a continuous struggle for self-perfection is required. Humboldt contrasted his idea of *Bildung*, which he linked to the Greek idea of virtue and to the Anglo-Saxon model of happiness: 'The ancients devoted their attention more exclusively to the harmonious development of the individual man, as man; the moderns are chiefly solicitous about his comfort, his prosperity, his productiveness. The former looked to virtue; the latter seek for happiness' (Humboldt, 1966 [1791]: 69).

United States: founding crisis and narrative

Inspired by the Prussian education system, the educational reformer Horace Mann began a campaign to replace the loose, unregulated, fragmented and decentralised New England school system with a uniform, centralised, coherent and common one. The 'Common School' became shorthand for this uniquely American view of schooling, to uplift and assimilate a culturally heterogeneous population, with a denominational version of Protestantism as the shared ideological platform. The first purpose of the Common School promoters was greater equality and social justice. As Horace Mann (1849: 55) put it:

> According to the European theory, men are divided into classes – some to toil and earn, others to seize and enjoy. According to the Massachusetts theory, all are to have an equal chance for earning, and equal security in the enjoyment of what they earn.

This change meant centralisation, secularisation and taxation – three big departures from a tradition of decentralised, locally controlled schooling. Inevitably, such a project would run into strong resistance by anyone who opposed centralisation, secularisation of the school's religious mission and higher taxes (see Meyer, 1996, 2006, 2011).

To many Americans of the early 19th century, the Common School idea was an open invitation to secularise education and place it under the control of central government. Since its implementation implied higher taxes, expanded government and weaker religious impact, the groups who resisted the Common School included poor rural towns which had no money to support a more comprehensive system of schools. Opponents saw centralisation as a threat to their local self-government – a sentiment that became institutionalised in the American idea of 'local control' of public education. The key levers for this were community-based lay school boards and the financing of schools through local property taxes (which vary dramatically with the wealth of a local community).

A key event in the acceptance of a centralised and secularised, tax-supported public school was the mid-19th-century mass immigration, which made continuation of the gradual assimilation of newcomers through the established institutions of church and township impossible. Not only were the immigrants too numerous to be readily absorbed into American culture, but their cultural and ethnic origins also put them directly at odds with the dominant Anglo-Saxon Protestants.

The rhetoric of social reformers like Horace Mann, who described the Common School as a 'great equalizer of the condition of men; source of civilisation, of economic prosperity' (1891: 233) suddenly fell on fertile ground. The American public school became institutionalised as a Common School, and one that was locally governed and controlled.

The longue durée: persistence of different origins and purposes of public schooling in the two countries

The public school is organised in a decentralised manner in the US, and is centralised in Germany. It is 'common' in one, and tripartite/elitist in the other, espousing a philosophy of equality in the former and of class distinctions in the latter. Where Americans founded an institution that was to be a Common School, based on principles of organisational efficiency, schooling in Germany was institutionalised in the name of *Bildung*. While the Common School strives to make better citizens for a better republic, *Bildung* is focused on the self-perfecting individual.

Importantly, these different macro-origins shape educational thinking and policy in the two countries to this day. In Germany, the *Hauptschule* – widely decried as '*Restschule*' for the marginal and marginalisable – continues to evade thoroughgoing reform. Authoritative contemporary studies of the German system attest that '[b]asically, the traditional three-tiered system of secondary education has been kept' (Brauns and Steinmann, 1999: 18).

These differences also continue to cause differences in the toleration of educational inequality. While Americans could never imagine tolerating a three-tiered public school system that sorts students at a young age into occupational tracks, they continue to find inequality along local-spatial lines quite acceptable, which is something Germans cannot relate to. Similarly, Americans see easy private exit from compulsory public schooling as acceptable and even desirable, while Germans strongly and even harshly enforce common public schooling with virtually no private alternatives. Unsurprisingly, there is also much greater acceptance of market- and 'choice'-based policy schemes in the United States than in Germany.

Path dependence sheds light on one of the most persistent puzzles in educational policy: the intractability of educational inequality and the weak impact of equity-oriented legal, political and policy reforms on education practice. This is because educational inequalities are produced and reproduced in a context of path dependent institutional

arrangements and accepted shared beliefs of '*longue durée*' (Anderson-Levitt, 2003).

> When the same problems persist despite changes of leadership and many successive reform efforts, the inescapable conclusion is that the problem is built into the basic [institutional] arrangements […]. Many reform initiatives appear plausible but are quickly marginalized or worn down by the existing system of habits and incentives. (Hill, 1999: 422)

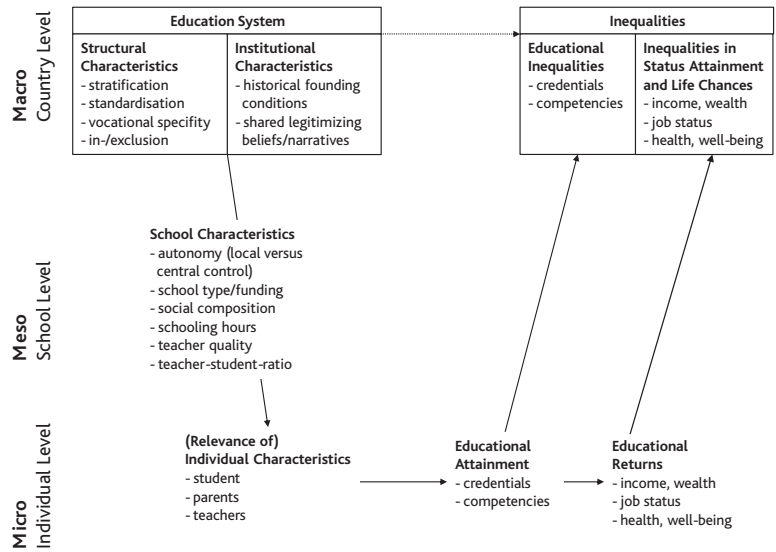
Explaining the effect of educational systems on inequalities: the macro-meso-micro-model

As outlined above, the analysis of education systems and educational inequalities, as well as inequalities in status attainment and life chances, requires a multi-level perspective that takes into account the links between certain levels. Such a perspective is implied by the structural-individualistic explanatory schema by Coleman (1990), which is based on previous models by McClelland (1961). The main idea of this concept is that societal phenomena impact individual situations and actions, and that these individual actions – with more or less intended as well as unintended consequences – impact the societal level. The links between macro-level (society) and micro-level (individual) are mediated via the meso-level of institutions.

Based on these ideas, we developed the *macro-meso-micro-model of education systems and inequalities* (see Figure 1.1) where we situate the general education system characteristics and inequalities at the macro-level. The meso-level refers to school characteristics and how schools or other educational institutions enact policies and regulations. The educational system (linked to educational policies) affects each individual's situation via the meso-level. Institutional settings frame resources that facilitate the acquisition of education, determine available educational pathways and institutions, and thus also impact cost-benefit calculations and the educational decisions of individuals. How the individual educational level affects the socio-structural placement (such as chances of employment, income, marriage and social class position) or cultural elements (worldview, social values, lifestyle and so on) is also influenced by factors at higher levels. According to the logics of aggregation, the sum of individual consequences and decisions eventually affects social structure (that is, change of occupational patterns) and culture (that is, change of values) at the level of society.

With regard to our research issue, a major outcome at the macro-level is the prevalence of social inequality in a society.

Figure 1.1: Education system and inequalities: macro-meso-micro-model



Education systems, school characteristics and the relevance of individual characteristics

Research into *education systems* from a social inequality perspective often centres on three macro-characteristics: stratification, standardisation, and vocational specificity or orientation (Allmendinger, 1989; Müller and Shavit, 1998; Pfeffer, 2008; van de Werfhorst and Mijs, 2010). *Stratification* – or what Bol and van de Werfhorst (2013) call 'external differentiation' – refers to the number of different school types that exist in parallel, and is linked to different chances of attaining a higher-level degree (for example, upper secondary school degree). Highly stratified education systems are characterised by the early selection of children into different tracks or streams, few chances to switch between tracks, and a strong influence of social origin on prospects of access to the different, hierarchically ordered school types. Hopper (1968: 30) stresses that how education systems structure their selection processes, namely the degree of stratification, is their most important feature, in particular within industrial societies.

Stratification or external differentiation appears to foster educational inequalities, as individuals are selected into distinct school tracks or educational pathways in highly stratified education systems which produce differential pathways with differential educational and life chances. Class- or gender-specific educational decisions and resources, or those related to immigrant background or/and ethnicity can come into play. The earlier the selection takes place, the less is known about the potential of the student and the more educational decisions of the parents or teachers are based on stereotypes about the potential of different groups (class, gender and ethnicity). Distinct educational tracks (schools, classrooms) mean differential developmental and socialisation milieus. If low-achievers originating from disadvantaged backgrounds in highly stratified systems gather in low educational tracks or classrooms, these environments tend to lack peers who could provide help and motivation to others in terms of social capital. Teachers in such settings employ and encourage lower aspiration levels. As educational decisions in highly stratified systems require information about the different pathways, children originating from families with low information resources generally follow the paths of their parents (see Pfeffer, 2008; Hadjar and Berger, 2010; van de Werfhorst and Mijs, 2010; Bol and van de Werfhorst, 2013). The association between educational attainment and educational returns in the form of job status and income is also assumed to be stronger in more highly stratified education systems. Allmendinger (1989) and Müller and Shavit (1998) theorise that in highly stratified education systems, educational certificates more clearly indicate the achievement and the cognitive potential of an applicant. In such education systems employers rely much more on educational certificates.

Standardisation is related to variability in the quality of education between *schools* and regions, and addresses issues such as the level of educational spending by schools and regions, whether schools are centrally or locally governed, and the existence of standardised and centralised teacher education. Standardisation refers to 'the degree to which the quality of education meets the same standards nationwide' (Allmendinger, 1989: 233). The highest standardisation level with regard to nationwide structures and achievement-based college access is to be found in Asian countries (Park, 2013; Tam and Jiang, 2014) – if the private sector of (additional) 'shadow education' (Bray and Lykins, 2012) is not taken into account – while European education systems are also seen as rather standardised and the US is perceived as less standardised (Müller and Shavit, 1998) where state, region and school matters more than elsewhere.

A high standardisation may come with a lower level of educational inequality, since if schools are equally equipped and teachers are equally trained, the educational institution school students attend does not matter as much as it does in less standardised education systems. As a high degree of standardisation in an education system implies that (due to similar teaching competencies and practices, similar school equipment and similar curricula in certain educational institutions) educational certificates are reliable indicators of an applicant's skills, this also results in less discrimination according to personal characteristics. Again, as employers can base their hiring decisions much more on educational certificates in standardised education systems, the link between educational certificates and labour market chances and income is stronger – and thus, also, the reproduction of inequalities (Allmendinger, 1989; Müller and Shavit, 1998).

Vocational specificity refers to the connection between educational institutions and the professional sphere. Bol and van de Werfhorst (2013: 6) prefer speaking of 'vocational orientation' as 'the extent to which education provides students with vocational skills, and the specificity of these skills'. In a highly vocation-specific system, (vocational) educational institutions impart skills and knowledge that are specific to particular occupations, and therefore prepare students for specific occupational fields. In systems with low vocational specificity, students attain general skills and knowledge at school, with specific skills acquired 'on the job'; vocational orientation or specificity can take various forms, however. While in most countries vocational skills are provided in broad fields in schools (for example, technical schools), other countries base their vocational education on dual systems where students learn in both educational institutions and firms at the same time. Bol and van de Werfhorst (2013: 14) differentiate two dimensions of vocational orientation: (a) the 'extent to which vocational education is institutionalised in a country', measured by the percentage of students enrolled in (upper secondary) vocational education of any kind, and (b) 'how the vocational training system is set up' and 'which learning takes place in a dual (school-based and work-based) form' with regard to the vocational specificity, measured by the percentage of upper secondary students enrolled in a dual system.

Vocational specificity appears to be a two-sided coin. On the one hand, as vocationally specific education systems are often highly stratified, they are prone to educational inequalities. On the other hand, in those education systems, less privileged groups at least have a chance to acquire a qualified vocational qualification, while in systems with no vocational specificity, working-class students, for example, have

much lower chances since they compete with students from privileged backgrounds (Müller and Shavit, 1998).

Another characteristic worth considering relates to the *selection procedure* and the actors involved in it, whether the parents, the teacher or a school committee decides the type of school a child transits to. Choice-driven education systems (for example, Jackson et al, 2012) with a high level of parental involvement in the tracking decision are associated with more educational inequalities, as the educational aspirations of parents are highly influential in track placement. As a consequence, the socioeconomic status of students' parents is of higher relevance in choice-driven education systems. It should be noted, however, that teacher's judgements are also not free of stereotyping and involve a degree of subjectivity.

School characteristics with a presumed impact on inequalities with regard to different kinds of axes of inequality include school autonomy, school type (private versus public schools; see Jungbauer-Gans and Gross, 2011), social composition of students, schooling hours (per day and duration of the summer break), teacher education (secondary or post-secondary institutions versus tertiary institutions), governance of the schooling system (financing, governance structures, evaluation procedures and so on) and the existence of policy programmes to decrease inequalities (see Jungbauer-Gans, 2004), such as mentoring programmes or internal differentiation (team teaching, support lesson schemes).

Theorising the impacts of education system characteristics on educational inequalities requires a general assumption: for us, this is the idea that mechanisms of the reproduction of inequalities at the individual level are embedded in education systems as institutional settings. This relates to questions such as whether or not an education system compensates for class-specific resources and class-specific perceptions of the utility of different educational pathways.

Explaining educational inequalities on the individual level

How *individual characteristics influence educational attainment* can be basically explained by Boudon's (1974) concept of the primary and secondary effects of social origin, which is based on a general sociological theory of educational inequalities. Primary effects are differences in educational achievement that are linked to group-specific resources. In terms of the capital approach of Bourdieu (2011 [1986]), disadvantages in educational attainment in the sense of such primary effects relate to a lack of cultural capital (for example, books,

educational level of the parents), social capital (social networks, peer and parental support), and economic capital (financial resources). Secondary effects relate to group-specific educational decisions at certain points of educational transition (for example, from lower secondary school to an upper secondary school track, from upper secondary education to tertiary education) that are based on cost-benefit evaluations against the background of resources and constraints (Breen and Goldthorpe, 1997; Stocké, 2007). According to such rational theory of educational decisions (Becker, 2003: 4), the decision about an educational track (for example, an upper secondary educational track leading to a university entrance certificate) depends on educational motivation (perceived benefit from a particular educational track, and the extent and probability of status decline if this track is not chosen) and investment risk (costs and expected probability of successful completion of this educational track). The original concept of primary and secondary effects (Boudon, 1974) applies explicitly to inequalities related to social origin, focusing on the working class with their lack of resources (for example, lack of networks of people who support learning activities; primary effects) and their lower perception of the benefit of higher educational tracks and their higher perception of the risk of failure (secondary effects). The 'institutional knowledge' – on which educational decisions are based – also varies by class and immigrant background (for example, Stanton-Salazar and Dornbusch, 1995). The educational decisions of peers may also be included in the cost-benefit evaluation of students, which may foster the influence of social origin on school choice assuming homophily in the development of social networks (McPherson et al, 2001).

Several theoretical approaches focus on the effect of expectations. Very early work has shown, for instance, the self-fulfilling prophecy effect of *teacher expectations* on student educational achievement. Rosenthal and Jacobson (1968) demonstrated the so-called *Pygmalion effect*: teachers in a public elementary school were told that some of their students were 'growth spurters' due to the results of a Harvard test, while in fact those students had been randomly chosen. As a result, the students in the experimental group ('growth spurters') showed a significantly higher IQ gain after one year than students of the control group, with younger children (and their teachers) being more sensitive to the manipulation of expectations. The mediating effect of age may additionally explain why early tracking fosters social inequality along social origin, as upper-class students are expected to have higher competencies in general. In this research tradition, recent studies explain differentials in skills along, for example, gender and

ethnic background, under the label *stereotype threat effect*. 'Stereotype threat is being at risk of confirming, as self-characteristic, a negative stereotype about one's group' (Steele and Aronson, 1995: 797). Aronson et al (1999) have shown that 'stereotype threat requires neither a history of stigmatisation nor internalised feelings of intellectual inferiority, but can arise and become disruptive as a result of situational pressure alone'. They confronted white males taking a maths test by announcing they would compare them with Asians, who are stereotyped to excel in mathematics. People from the US think highly of the educational performance of Asian students in general, not only in mathematics. In line with expectation derived from the theory, the American white males performed worse in this situation due to the stereotype threat effect. While Ganley and colleagues (2013) argued that the stereotype threat effect is in fact a methodological artefact driven by publication biases, Appel et al (2015) conducted a meta-analysis with both published and unpublished papers, showing a robust effect of stereotype threat with no significant effect from publication status on the effect size.

Explaining inequalities in labour market and life chances on the individual level

Turning the focus on the association between *educational attainment and educational returns*, one general economic approach to conceptualising this association is the *human capital theory* (Becker, 1964). Education appears to be a crucial investment. An additional investment in education, every additional year spent in educational institutions, leads to an increase in educational returns such as income. Central to this argument is the 'cognitive capital' that stands behind formal educational certificates and that can be transformed into productivity. Education improves cognitive abilities, correlating with a higher productivity and a higher worth in the production process that is credited by employers with a higher salary. An investment in higher education is worth it, if the benefit (income, status, prestige) is higher than the effort (years of education with low or no income; see Schultz, 1992; Becker, 1993).

Signalling and filter theories (Arrow, 1973; Spence, 1974) conceptualise educational certificates as signs of the productivity, motivation and achievement of an individual. Employers assume that people with higher educational qualifications are suitable for jobs with high job specifications and high wages. If an increasing number of job applicants possess higher educational qualifications such as an A-levels or a university degree, the signalling effect of these qualifications decreases.

Both human capital theory and signalling theory focus on individuals, and neglect the structural conditions of the education system and the labour market.

The *job competition model* of Thurow (1979) recognises the importance of mechanisms of (internal) labour markets explicitly, and therefore links signalling and filter theories with labour market theories. The core assumption is – following signalling theories – that educational certificates serve as signals and indicate the degree of learning ability and learning motivation of the applicant, and the extent to which the employer has to invest in further training for the applicant. Individuals with a high educational certificate occupy privileged positions regarding the competition for status and income on the labour market. According to the *labour queue thesis* of Thurow (1979), people can improve their positions in the queue to obtain eligible jobs by investing in higher educational certificates.

With regard to inequalities in returns on education, we have considered only theoretical frameworks that focus on monetary returns and labour market positions, as those theories provide the main bridge between education and life chances, however, education has several consequences with regard to non-monetary life chances, via two major mechanisms. On the one hand, education comes with cognitive skills that facilitate everyday activities, such as living a healthy life or political participation. On the other hand, educational qualifications imply a certain status and income level that also increases life chances (see Hadjar and Becker, 2009: 17). Reducing complexity, we will refrain here from discussing numerous theories regarding the links between education and non-monetary returns on education, such as political participation opportunities, well-being, health or marriage, however, *social production function theory* (Ormel et al, 1999) may provide a general framework from which to start the elaboration of non-monetary returns on education, and in particular of subjective well-being, as a universal life goal. According to the concept developed by Lindenberg (1996), subjective well-being is produced via five first-order instrumental goals: stimulation (maintaining a certain arousal level), comfort (living in comfortable conditions), status (a privileged position within the societal hierarchy accompanied by a certain control over resources), behavioural confirmation (doing the right things in terms of what one expects from oneself and what significant others expect) and affection (involving in emotional relationships with friends, family and spouses). Although education is strongly linked to status acquisition, it is also a major resource for all other first-order goals. Being more educated facilitates opportunities to undertake stimulating things (for

example, with regard to leisure time activities or work), and a higher educational level also generally correlates with a higher income which can be used to provide comfort. A higher education may also mean better understanding of what particular groups expect with regard to voiced attitudes and behaviour. Finally, more highly educated people are able to build an efficient social network and increase their likelihood of marriage (affection) (see also Gross et al, 2011, for monetary and non-monetary returns on education).

Inequalities at the macro-level: reproduction and social change

Aggregating inequalities at the micro-level leads us to the structure of the macro-level, which again works as a contextual determinant for further processes. In their landmark study of inequality and public health, Wilkinson and Pickett (2010) provide powerful data showing the negative effect that social inequality has on a wide spectrum of measures of well-being, including education. Educational outcomes are negatively affected by increased inequality through a variety of mechanisms, including:

- less social cooperation, greater mistrust and higher divorce rates, all of which weaken the elementary fabric of social and community life;
- lower mental and physical health of children and adults, which decreases the ability to learn;
- heightened anxiety and stress levels, which decreases the sense of security needed for learning and retention (stress increases cortisol levels in the brain, associated with fear and fight/flight responses, while lowering dopamine and serotonin levels, associated with attention, problem solving and mood);
- generalised social frustration resulting from greater aspiration–realisation gaps (lower income strata in unequal societies achieve less relative to their aspirations), which increases pessimism and cynicism, and impairs cognitive performance via mechanisms of lowered self-image and stereotype threat;
- lower social mobility, which reduces the availability of reference group examples of success through educational achievement;
- increased spatial segregation of rich and poor, which decreases quality of life and increases 'bicycling' behaviour (submissiveness towards superiors, violence towards subordinates);
- increased gaps in 'cultural capital' and greater frequency of snobbery and (self-) discrimination leading to cultural distancing;

- reduced public spending on education and a decrease in public spiritedness around education as a project of social solidarity.

As the imperative of equal educational opportunity is virtually universally accepted, certainly in the economically developed world, we typically think of education as a prime lever to decrease such social inequalities and increase intra- and intergenerational mobility. But, as a result of entrenched institutional idiosyncrasies and variations that different nations face, there are often intractable (albeit different) obstacles towards its realisation.

Summary and outlook

The extent of educational inequality and inequality in general on status attainment and life chances in society, as well as shared cultural beliefs at the macro-level, are the result of educational processes at the meso- and micro-levels.

The impression that remains at the end of this chapter, that finding a consistent theoretical framework to explain how education systems shape educational inequalities, inequalities in status attainment and life chances, is challenging. Although the Coleman (1990) model, the structural-individualist explanation, appears to be suitable for theorising the macro-/micro-levels link, the theoretical elements bridging specific education system characteristics and advantages and disadvantages in educational and life chances remain a patchwork. A fruitful start may be to ask for individual sources of inequalities and, in a second step, consider how these links are affected by education system characteristics. The reflection needed to solve our research issue centres on the following questions. Does an education system provide the best conditions for the acquisition of education for all, and does it compensate for resource deficits? How can educational investments be turned into status, prestige, income and non-monetary returns on education; can disadvantages caused by low education be compensated for in later life?

In the end, the classical question of whether schools and the education system as a whole are the great equalisers, and whether they are able to compensate for inequalities related to family background (as proposed by Coleman, for example) or if schools are the main driving force of social reproduction of inequalities (as assumed by Bourdieu, for example) has to be reformulated. Which characteristics of education systems promote equal life chances, life chances independent of a

student's ethnicity, socioeconomic and immigrant background, gender and further dimensions of vertical and horizontal inequality?

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TWO

Comparing education policies in a globalising world: methodological reflections

Susan L. Robertson and Roger Dale

Introduction

This chapter explores the methodological challenges in comparing education policies in a globalising world. We begin with the claim that, for the most part, education policies, programmes and practices have been, and continue to be, located in national territorial spaces, although this does not mean the global element is absent. Rather it was possible to detect a 'thin' global policy regime in the years following the Second World War until the 1980s. With the advance of neoliberalism as a global political project, there has been a thickening of regional and global policy making activity arising from, and in turn driving, the transformation of national and sub-national education spaces, policies and outcomes. Such transformations have generated important challenges for researchers of education, largely because education policies are no longer primarily 'national' or indeed made by national states.

Our aim in this chapter is to sketch the contours of the changes that have taken place in the governance of education systems as a result of global processes, and the challenges this presents us with regard to how we study and compare education policies. We do this by way of four 'isms' which we problematise as litmus tests of global educational change. We then raise the question of critical comparison and suggest two conflicting ways that it can be used to study the nature, form and outcomes of education policies. In the final section of the paper we offer three (not exhaustive) methodological reflections – each with a different dimension through which to explore global education processes; 'time', 'space' and 'logics of governing' in education policy making.

'Isms'

We start by pointing out that, in order to study and compare global education policies, we need to be mindful of the conceptual categories we use – in large part because although the name of a category might remain the same, the meaning of that category (for example state, nation, education, university) may well have changed. We refer to the practice of deploying these same categories without asking questions about the meaning of that category, as methodological 'isms' (Robertson and Dale, 2008). The basis of the way we understand and seek to use the term 'isms' comes from Herminio Martins (1974), who coined the term 'methodological nationalism'. He sees it as representative of 'a general presumption [in sociological analysis] … that the "total" or "inclusive" society, in effect the nation-state, be deemed to be the standard, optimal or even maximal "isolate" for social analysis' (Martins, 1974: 276, quoted in Chernilo, 2006: 7). His notion of a 'general presumption' captures the essence of what we mean by 'isms'. These categories are treated in a 'pre-theoretical' way; that is, they are too obvious in their (assumed unchanging and unchanged) form to require explicit theorising, despite the fact that wider institutional arrangements and social relations in the world are changing. We refer to these as 'isms'; they are fixed, frozen and taken for granted, and as a result they act as an important restriction on the scope and targets of investigation. The four 'isms' we will discuss here are methodological nationalism; methodological statism; educationism; and spatial fetishism.

Methodological nationalism tends to equate 'society' with 'the nation' and while this may well have described a particular reality at a particular time, increasingly this is far from the case (Dale, 2005: 126). This is exacerbated by the tendency to juxtapose an unreconstructed methodological nationalism with underspecified conceptions of 'globalisation' in a zero-sum relationship. As the globe has taken on more functions and power, this has been assumed to be at the expense of a new disempowered state; in many instances, however, the national state has itself been a major force in advancing regional and global projects, for instance Germany in relation to Europe, or the United States in relation to the rise of the World Trade Organization, and the development of the General Agreement on Trade in Services to push forward the development of a globally competitive services economy.

Methodological statism is the tendency to assume there is a particular *form* intrinsic to all states. Methodological statism tends to take the version of the 'state' found in 'Western democracy' as '*the* organizing

principle of political modernity' (Fine, 2003: 460, quoted in Chernilo, 2006: 12). For Chernilo (2006: 12) this constitutes the 'rather mythical image of the nation state as the final and necessary form of social and political organisation in modernity'. As a result it makes *political* rather than economic or cultural boundaries the dominant means of differentiating societies from each other. This in turn sets distinct limits on both the basis, and thus the product, of useful comparison.

In a globalising era, however, the particular combination of responsibilities and activities that nation states have been assumed to be responsible for can now be seen as historically contingent rather than functionally necessary, or even optimal, to the point where questions can be raised about the 'implications of a world in which the mutually reinforcing relations of territory, authority and societal interests and identities can no longer be taken for granted' (Ruggie, 1993: 9).

The depth of the penetration of these kinds of assumptions in the social sciences is summed up by Ruggie (1993: 143) as displaying 'an extraordinarily impoverished mind-set […] that is able to visualize long term challenges to the system of states only in terms of entities that are institutionally substitutable for the state'. The point here is not to suggest that the state as an actor is unimportant; rather it is to focus upon, first, the way the Westphalian state represents itself as a universal form rather than a particular representation that has been universalised and, second, the way the state itself, as a historically and culturally shaped project and container of power, has evaded close intellectual scrutiny. In relation to this first point, of the universalisation of the form of the state, this has made investigations into, for example, the rise of the European Union as a different state form, difficult (see Shore, 2006). On the other hand, we limit our understanding of the cultural, political and economic specificities of the Chinese state by looking at it through Western eyes (Jacques, 2009).

Methodological educationism refers to the tendency to regard 'education' as a single category for purposes of analysis, with an unproblematically accepted set of common objectives, as well as shared knowledges, practices, assumptions and outcomes. This state of affairs has probably arisen because education continues to be the central project in modernising societies. Educational systems are almost invariably seen as rationalising social projects whose universal expansion necessarily brings improvement and emancipation. This results in education being treated as abstract, fixed, absolute, ahistorical and universal, when, for instance, no distinctions are made between its use in terms of purposes, processes, practices, and outcomes. In flattening 'education' in this way, the basis of rigorous comparison is not only made invisible but also

denied. Fundamentally, 'educationism' is the product and instantiation of analyses based on examining definitions and examples, rather than on examining the range of what is *done* in the name of these definitions – which, crucially, may be unintended as well as intended. It is assumed to be ameliorative, without raising any questions to do with the forms and outcomes of the attempts at amelioration. So, the crucial point for us here is that 'education' requires explanation rather than being taken for granted.

Our final 'ism' is *spatial fetishism*. Brenner (2003: 38) describes *spatial fetishism* as 'a conception of social space that is timeless and static, and thus immune to the possibility of historical change'. Failing to problematise space, or to see that space is constituted by, and constitutive of, social relations and structures, is a problem for the analysis of education policy more generally, and global education policy more specifically. Put a different way, most education policies are aimed at re/organising and re/ordering social relations through structures and strategies. As a result, education policies, concerned as they are with structures and social relations, are always spatial in some way.

It is also evident, however, that some spatial arrangements do not matter in terms of their outcomes, while others do. For instance, global policies such as school choice typically do matter, for they will have very different spatial implications for families; not all families will have the financial resources, time or conditions of work to move children across the city so as to access a school that might be the 'best choice' (Ball et al, 1995). Other families will face not having a choice, as their village or town only has one school. Space also matters in the organisation of learning and, indeed, some education policies might involve, as their intended purpose and outcome, the separation of social groups – smart kids in science streams versus the less-smart kids in general streams; girls in girls-only schools, boys in boys-only schools and so on.

If we add the category 'global' to our analysis, we need to ask: what kind of category is it? What work does it enable/disable in relation to the national or local as alternative scales from which strategic projects of rule are launched? In this case, we are interested in the education policy work advanced by those actors operating with a global-scale horizon. In some cases this scale enables people to act in rather more omnipotent ways – with the globe invoked as a higher form of authority and rule. In other cases, the globe enables policy projects to advance quickly – unencumbered by institutions and other actors who might have different views about the probity or not of these policies. Rescaling is thus a useful spatial move for education policy makers. For the comparative theorist, the questions to be asked are: what is the

role of space in global policy, and how might we compare the different capacities of policy actors to engage spatially?

Critical comparison

There are two main ways that we can approach 'comparison'. On the one hand, we can ask: *in what contexts is it useful, to whom, and for what purposes*? On the other hand we might ask: *what does it tell us about the relationships between the different contexts and outcomes – what elements can be identified as important and how*? The differences between these two sets of questions are important in understanding the contribution of comparison in addressing issues of the governance of education. In the first case, comparison is used as a 'resource'; a contribution to the achievement of particular ends. In the second case, comparison becomes the 'topic' of enquiry. In the first case, the findings themselves are taken to provide the explanation; in the second, they generate further sets of questions. The best example of the difference between these two approaches is the use of large, quantitative cross-national datasets. Those using comparison as a resource take this data for granted, and ask what we can learn from them. Those deploying comparison as a research topic/question ask: on what bases were these data compiled, and what is thus being compared?

This is an important issue in understanding global governance in and of education. In the first case, comparison itself becomes a tool of global governance, with comparison seen as a *resource*, whereas in the second case, comparison becomes the *topic* of investigation into how, over time and space, global governance strategies are advanced, with what outcomes, and so on. The first sees comparison as a tool for providing generalised solutions, the second as a means of generating explanations.

In adopting this second 'topic'-oriented approach regarding critical comparison of global education policies, we need to ask ourselves: what exactly are we comparing? In our view this is an ontological and epistemological, *as well as* a methodological, question. By this we mean that in considering comparison methodologically, we are also making decisions about how we think the social world works, and what might count as a means of knowing that world. Does the social world operate according to a set of regularities, and in the world of global education policy, are we able to bring those regularities into view and decide on what causes what? Positivists are likely to argue yes, this is the case. Others might argue that the social world is simply the social construction of individuals. Understanding global education

policy using this set of assumptions means exploring how individuals shape their own understandings around – for instance, a global policy – and from there comparisons can be made between different social constructions. Interpretivists are likely to place the weight of their approach on how meanings are constructed about experiences of events or social phenomena – such as how does one make sense of world-class universities, or systems of audit? Or do we argue that there is more to the social world than what we see, and that these less visible structures and conjunctions of possibilities, shape what it is possible to think, say and do, and so therefore have effects?

This latter – broadly critical realist – approach is the one we favour, in that we take the view that social realities are socially stratified, and that the causal mechanisms and powers shaping events are not necessarily visible to the researcher, although the outcomes are (Sayer, 2000). Working backwards to determine the relationship between outcomes, mechanisms and causal powers is an important procedure for a critical realist researcher. Now let's complicate things by asking: what might a critical realist compare? Here we find George Steinmetz's (2004) work very helpful. Steinmetz (2004: 372) argues that comparison often 'operates along two dimensions – events and structures, corresponding to one of the main lines of ontological stratification of the social-real'. While positivists tend to focus on 'events' and view social systems as fixed and closed:

> critical realists insist on the ontological difference between events and mechanisms and on the ubiquity of contingent, non-recurrent, conjunctural determination of events within open systems like the social. This means that even events incomparable at the phenomenal level still may be amenable to explanation in terms of a conjuncture of generative causal mechanisms. (Steinmetz, 2004: 372)

Our comparison will thus be at the level of our *explanations* of the underlying causal processes and mechanisms at work, and their outcomes – in this case, explanations for who gets what in relation to education. A critical realist approach to comparing global education policies would thus focus attention on the conjuncture of causal mechanisms and their outcomes, and it is our explanations of these processes at work that sits at the heart of critical comparison. We will return to this in our conclusion. For now, let's explore what might be gained by using different dimensions – time, space, governing tools and power – as a basis for comparison.

Three critical methodological reflections on global education policies

In this section we develop three methodological reflections around different dimensions through which comparisons can be made. These are by no means exhaustive, rather, they are meant to encourage us to think imaginatively, systematically, and critically, about the different ways comparative research on global education policies can be carried out.

Methodological reflection 1: *The value of temporal comparisons – global teacher policy – from 'thin' to 'thick' globalisation of education*

One way to compare education policies is by using *time* as a variable. From there we can decide whether to compare synchronically (in time) or diachronically (across time), or both. By *synchronic* comparisons of global education policies we mean comparing, for example, different global institutions, and how these organisations have sought to shape an education policy issue during a particular temporal frame – such as between 2000 and 2015. Alternatively, we can compare an issue over time *diachronically*, and ask: in what form, shape, and at what scale, was this education issue framed, and what role did the global scale play over a given set of time periods – for instance in the post-Second World War period until 2000, and from 2000 until 2015. If one was ambitious, both these temporal investigations into a policy issue, and the changing distribution of power and authority between policy actors, could be very revealing. The world does not stand still in education, and one of the most interesting developments in the education policy world has been the rise of global actors in shaping policy over the past decade, and the governing tools and instruments that have been developed to enable this.

Consider this policy question: *has the governing of teacher's work changed over time and what, if any, role have international agencies played in this*? The first move, of course, is to look back in time to determine whether, indeed, international agencies had any role in shaping policy for teachers. After all, the development and growth of education systems has been tightly bound to the rise of the nation state. A second move would be to establish which international agencies took it upon themselves to shape teacher policy, and from there ask: when, why and how?

Digging a little deeper, we begin to see that although national and sub-governments were the key shapers of teacher policy, this did not mean the international agencies were silent or disinterested. Indeed two international agencies over the period 1950–2000 were very interested in teacher policy at the global level; UNESCO and the ILO (International Labour Organization) (Robertson, 2012). While respecting the right of Member States of the United Nations (UN) system to determine teacher policy, they nevertheless published an ILO/UNESCO Recommendation in October 1966 setting out the rights and responsibilities of teachers, including international standards for their initial preparation and further education, recruitment, employment and so on. As a Recommendation, it did not have the weight of authority or legal 'bite' that one might see behind a sub/national teacher policy, and this meant that governments in national settings could ignore the guidance. Connell (2009) suggests that this resulted in a broad range of approaches in national settings as to how teachers were prepared, what power and autonomy they might have in their schools, and so on.

Further investigation reveals that there was an accepted status quo among the international agencies regarding teacher policy until around 2000, when agencies such as the OECD (Organisation for Economic Co-operation and Development) (2000, 2005, 2009), and more recently the World Bank (2003, 2011), became very active in stating their concerns, framing issues and solutions, and promoting participation in data collection (benchmarking and indicators) exercises. The important issue for the comparative researcher is to find out what might explain this sudden close scrutiny, and to determine whether, if at all, and how this has altered teacher policy and practice in national settings. A critical theorist is also likely to consider what this shift means for teachers. Does it place new limits on teachers as workers regarding control over their labour? Or does it open possibilities for new forms of professionalism and engagement? Does the presence, and agenda, of the World Bank and the OECD set in train a rather different set of dynamics around teacher policy and, if so, how and with what outcomes for teachers?

As we have shown elsewhere (see Robertson, 2012, 2013), the OECD and the World Bank have entered the teacher policy space – legitimating their presence by arguing that teachers and teaching matter to pupil performance, and that pupil performance matters to developing globally competitive economies. This line of argument has been given weight by other global actors who have become prominent in the education policy field, including the global education firm

Pearson Education, the global consulting firm McKinsey and Co., (Barber and Mourshed, 2007; Mourshed et al, 2010), and foundations such as the Bill and Melinda Gates Foundation. Paradoxically, this global conversation has not involved teachers in any significant way, although it should have done so via their global union, Education International. Instead, the OECD seems to have acquired a relatively strong voice in framing the nature of the problem and its solution, and is currently attempting to speak directly to teachers through its specially designed toolkit for teachers. Rather than a conversation that teachers might have with their sub/national unions and sub/national Ministries of Education based on respecting their expertise and professional autonomy (as in earlier times), teachers are now given a one-size-fits-all set of guidance notes to operationalise by the OECD (2014), and at the same time are made acutely aware of the fact that they have also been given a ranking in a system of global comparative performance.

This short account – exploring ways to compare a global education policy using time – reveals the insights that can be gained from using such a lens. Time, of course, is always linked to space – and actors are always located in time and space. By looking at global education in this way, we are able to appreciate that even in the post-Second World War years there was 'thin' global governance. From 2000 onwards we can see a 'thickening' of global governance in that the global actors now dominate the framing of teacher policy. Elsewhere we have developed this analysis more fully (see Robertson, 2012, 2013). For the purpose here, it is sufficient to point to the ways in which we are able to see shifts in the scales (local, national, global) that have become more powerful in determining types of education policies, and to offer robust and reflective explanations.

Methodological reflection 2*: The value of comparing spatial recalibrations – rescaling education policy making*

We have argued earlier that space matters in education policy analysis (Robertson, 2010). We also pointed out that it matters, in that it focuses attention on what kind of spaces we are comparing, and how also how space itself is being strategically used to advance education policy. Put a different way, the comparative researcher is being asked to compare the difference that space makes – in this case globally – in advancing, or not, a particular set of education policies.

At this point it is helpful to introduce the idea of scale; a spatial term which refers to the level at which particular kinds of institutions and actors concentrate – and from there seek to organise or govern

social, political and economic activities (Smith, 2000). In the previous reflection we argued that the global scale houses institutions that engage in framing and shaping education policy – but until recently their influence was fairly weak, largely because these institutions lacked authority and legitimacy. Education policy was regarded as the preserve of nation states. From the 1980s onwards, however, major changes began to take place within and between nations, as a new political project, informed by neoliberal ideas, began to be rolled out in countries such as the UK, USA, Chile, New Zealand and Australia.

The globalising of neoliberalism has had major consequences for the form, scope and purpose, of much education policy, as it was used to bring in what Peter Hall (1989) calls 'third order' changes. By third order changes he means a radical rupture in the ideational base that informs the what, who and how of policy projects. In this case, introducing neoliberalism into what were mostly Keynesian inspired social orders meant: (a) setting policies to work on aligning education more closely with the economy; (b) making education into a competitive services sector; (c) introducing policies that aimed to encourage a more competitive entrepreneurial identity; and (d) rewarding institutions for acting in more economically efficient ways (Dale and Robertson, 2013).

Bringing in a new social and economic order, however, is not straightforward. Previous ways of organising social life, and the norms that ensured these ways of life were reproduced, are challenged and transformed into new practices with rather different logics, forms of reason and outcomes. In doing so, education spaces and their constitutive social relations, are also reworked in new ways.

One way to try to advance a new political project is to rescale (Robertson et al, 2002). By this we mean that actors might relocate their activities to a new scale, or cede some of their authority to this scale, so as to drive forward new political initiatives. In the 1980s and 1990s, decentralisation or devolution policies became a favoured set of globalised education policies, aimed at using the local scale to advance initiatives, such as school-based management or single line budgets, while keeping power centralised. In this case, local communities, schools and departments were asked to take on the responsibility for education policies aimed at generating competition and efficiencies, overseeing the work of teachers, aligning schools with the needs of local business, ensuring that the department acted as a competitive unit and so on.

Policy making capacity – or some element of sovereignty – was also moved above the nation state, to the regional and the global level,

so as to advance particular projects with rather different interests. A good example here is the Bologna Process – an education policy that emerged in 1999 which has had a huge impact on reshaping the architecture of the higher education sector in Europe, as well as bringing in a new competency approach to learning. The initial move to rescale came from the French Minister for Education, Claude Allègre – who was particularly frustrated with the difficulties of creating change in the French academy. With universities being turned to as a means of generating a competitive knowledge economy, dealing with 'recalcitrant' academics willing to take to the barricades was quite a challenge (Ravinet, 2005). In 1998, Allègre used the celebrations surrounding the 800 years since the establishment of the Sorbonne, to announce the launch of a European Higher Education Space. At this point, only four countries were part of this agreement – Italy, Germany, the UK and France. In 1999, the Sorbonne Declaration morphed into the Bologna Process – an agreement ratified by 29 European countries. Since signing, the Bologna Process has grown rapidly in membership and reach – with 47 members and others who declare themselves Bologna compliant.

There are many interesting angles that a comparative scholar might be interested in here with regard to this kind of regional space. How does one regional project – such as the European Higher Education Area, compare with other regional projects, where the capacity to govern higher education is being rescaled? The South East Asian Higher Education Area, and Mercosur in Latin America are interesting points of comparison here. We might also ask other questions. What is the relationship now between these new regional scalar projects and their capabilities, and institutional and national levels of education governance? Who gets to operate on which scale, and what are the outcomes for these different actors of any differences? How is policy making arranged in these new scalar projects where authority and legitimacy might be differently mobilised? Are all members of the supra-regional project treated the same, and if there are differences, how might we account for them? Are there convergences across these regional projects and, if so, through what mechanisms and with what outcomes? If there are differences and similarities, what are the political, economic, cultural and technological reasons for this? In our view any one of the questions from this array would offer a fascinating exploration for the comparative scholar in bringing scalar processes into view and using space as an entry point for comparing the changing strategies, structures and social relations that arise from a particular kind of education policy.

Methodological reflection 3: *The value of comparing governing logics – the OECD and its global indicators*

As we noted earlier, 'comparison' can be used in a range of ways when looking at education policy. At its simplest and *least* useful, it entails looking at two different entities, for instance countries, and asking how they are different from each other. This can provide fascinating contrasts, but it tells us little if anything about the nature of those differences and what, if anything, we can learn from them. More recently and relevantly, considerable importance has been placed on what we have referred to as 'competitive comparison', using comparison to construct a ranking of particular entities across particular qualities (Robertson, 2012). The OECD's Programme of International Student Assessment (PISA) is the obvious example here (Meyer and Benavot, 2013), however, here again, the use of comparisons for ranking tells us little about the substance of the policies and practices that produced them; they cannot, for instance, identify the *reasons for* any important differences. One key explanation for this is that 'simple' comparison between practices does not enable us to recognise the different rationales on the basis of which they are carried out, or what we will refer to here as the 'logics' informing them.

The way we will do this is to consider the nature of the OECD's interventions in the education field over the past 60 years or so. We will describe very briefly the nature of the intervention and then the logic(s) that seem to be informing it. We should also note that, in seeking logics, we must also consider the *purposes* of programmes, since the two are closely linked, although rarely explicitly so; in doing this, however, it is important to identify the OECD's main priorities for education. Very broadly, following Rizvi and Lingard's analysis (2009) of Papadopoulos' (1994) history of the OECD's work in education, we can distinguish three main periods; in the 1960s, the main emphasis was on the 'quality' of education; in the 1970s, equality of opportunities and democratising education; and in the 1980s, the focus shifted to alignment with economic policy (and it is important to note that the term 'globalisation' is not mentioned in Papadopoulos' 1994 book). This brief history indicates which issues were of greatest concern to OECD members (and it is important to note that the OECD's agenda is formally determined by its members, whose voting strength tends to be related to the size of their contribution, with the USA and Japan contributing over half the total funding).

One of the first OECD programmes to concern education was manpower forecasting. This arose in the context of post-war recovery, and its logic was based on an assumed link between the level of qualified

manpower and economic growth. This was underpinned by a pervasive attachment to the logic of 'human capital formation', based on the inference that labour could be treated as a form of capital, and that its output could be enhanced through education.

A second logic deployed by the OECD can be found in the method of peer review that became prominent in the 1970s. This was based on the logic of 'lesson learning' from one's peers (countries). Reviews of national systems were carried out by experts from other countries, and fed back to those in the reviewed countries, with the idea that they would note practices elsewhere that might be usefully adopted.

More recently – and following the creation of a separate Directorate for Education in 2002 – logics have tended to go in three related directions. The first was an 'ideological vocabulary of reform', which followed the success of neoliberal politics in the USA and UK in particular. This set of reforms emphasised: (1), the need to limit government intervention and to base governance on what was known as New Public Management (which essentially meant that states should be governed as far as possible on the basis of market principles); (2) the use of growing technical expertise in monitoring (taking the place of the earlier logic of peer review); and (3) quantification in shaping education policy via the Indicators of Education Systems (INES) project (see Bottani, 1996). It is interesting to note that these might be seen in different ways as key elements that came together to form PISA. They represent a common logic of suspicion of 'politics', on the one hand, and the need to provide accurate information for the organisation of, not just the economy but also the whole field of public administration, on the other.

It should be evident now that PISA did not appear from nowhere, but rather emerged on ground already well prepared for it, through programmes such as INES. It goes beyond them in a number of ways that are, in turn, based on distinctive logics. In a nutshell, what PISA provides is a tool for *evaluating education systems worldwide* by testing the skills and knowledge of 15-year-old students. Its 2012 PISA results were drawn from round 510,000 students spread across 65 countries representing about 28 million 15-year-olds globally (OECD, 2012).

Most importantly, PISA rests on what might be called a 'nominalist' logic; that all entities *called* 'national education systems' must necessarily have sufficient in common for it to be possible to diagnose them with the same set of tools, and to offer advice based upon those findings. From a comparative policy perspective, the most basic flaw in the use of the PISA data arises directly from this, because, as we noted in the 'critical comparison' section above, the findings are themselves taken

as sufficient explanation of national educational states of affairs; they constitute explanations rather than themselves requiring explanation, and this in itself shifts the focus away from their causes and onto the consequences that are manufactured through the PISA instruments.

Three other significant features of the logics informing PISA may be discerned. PISA rests on a logic of (especially statistical) expertise, and education policy is no longer seen as best served by deliberations between variously informed and interested parties. It promises to provide an accurate account of the 'health' of education systems, and offers remedies that will be universally valuable – such as evaluation systems. Finally, it paves the way for the logic of competitive comparison across particular dimensions of education (Meyer and Benavot, 2013). It is this latter logic – which is particularly powerful in that it draws upon complex modalities of power – such as time horizons (improvement for the next round) being always visible and palpable, on emotions such as shame or pride, and on the ways in which vertical space (above and below) are used as ordering devices – despite the fact that these differences are often very slight between rankings, or indeed that the entity being compared cannot really be properly compared (Shanghai as a proxy for China, compared to Australia, or indeed Brazil). In terms of critical comparison, then, what we are interested in comparing are the logics and how they work, and whether, how, by whom and with what outcomes for governing global education policy these logics change over time.

Conclusions

Comparison is, above all, about problematising rather than taking for granted, and in this case it is about problematising phenomena that we have come to call global education policies. As we have argued, by comparing things that are familiar to us with things with the same name in other places, we learn that there are different understandings of the same things in different places, at different times, with different origins and meanings. More briefly, comparison produces *the possibility* of difference and, it might be hoped, a desire to understand and explain those differences. A major issue for comparative approaches is thus to examine the relationships between nominally similar phenomena, and here, too, a critical comparative approach to global policies is valuable, not only in distinguishing meanings and uses, but in seeking to *explain* the likely causes of those differences. If this second step may not always be possible, the recognition that the same names are given to different phenomena in itself helps us to problematise those phenomena, rather

than take them for granted or assume that they 'must' somehow be comparable.

Finally, we suggest that it is also very useful in thinking about global education policy to ask: who compares and for what purposes? Recognising Novoa and Yariv-Mashal's (2003) excellent account of the possible purposes of comparison, which contrasts with its use as a form of enquiry, requires us to recognise that there are sides to be taken and that this has consequences for our analyses. These are important questions when considering 'global' education policies – and this is especially the case when we recognise that a failure to problematise not only results in the status quo being taken for granted, but also taken as an acknowledged fact.

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THREE

Education systems and intersectionality

Christiane Gross, Anja Gottburgsen and Ann Phoenix

Introduction

Education remains one of the most important determinants of social inequalities across generations and the life course, and educational systems are the main places for generating these disparities (see Coleman et al, 1966; Boudon, 1974; Bourdieu, 1986; Barone and Schizzerotto, 2011).[1] Empirical research into education identifies particular social groups that are particularly at risk of poor performance in various educational systems. Being *male*, being from *migrant backgrounds* and the *lower social classes* have repeatedly been found to be disadvantageous for the attainment of educational qualifications; by themselves, however, none of these axes of inequality are sufficient to explain educational disparities. Instead, they operate simultaneously and are mutually constitutive (Gillborn and Mirza, 2000). The concept of intersectionality helpfully emphasises this simultaneity. From an intersectional point of view, social inequality is not only determined multidimensionally along different axes of inequality – such as gender, migration, socioeconomic background, age, disability and so on – but emerges particularly in the intersection of these axes as they mutually constitute each other within social contexts such as the family, school or the labour market.

This chapter analyses the ways in which intersectionality advances understandings of educational systems and educational inequalities. Our contribution is structured as follows. The next section briefly introduces the concept of intersectionality and gives an overview of current quantitative and qualitative empirical educational research which investigates the effects of the interplay of gender, migration and class on educational outcomes. The following section shows how an intersectionality approach can be applied to qualitative and quantitative research to understand educational systems and educational inequalities.

It evaluates the strengths and weaknesses of each perspective and includes a section on qualitative comparative analysis (QCA), since this relatively new method fits well with intersectional theorisation and quantitative approaches. The concluding section suggests that future educational research could make greater use of mixed-method designs to enhance the strengths and minimise the weaknesses of each approach.

An intersectionality perspective on educational systems and educational inequalities

Intersectionality approach

The vast number of intersectionality-related publications from different disciplines shows that the concept of intersectionality currently enjoys high popularity, integrating different strands of gender research, queer, migration and inequality research, as well as different theoretical perspectives (for example, constructivist, deconstructivist and socio-structural) (McCall, 2005; Collins and Chepp, 2013). Originating in Black feminist critiques in the 1970s and 1980s, one of its main features is its strong political impetus to analyse systems of power, including discrimination and inequalities (for example, gender, 'race'/ethnicity, class, ability, sexual orientation and identity, and so on) (Lutz et al, 2011; Collins and Chepp, 2013: 60). Intersectionality therefore serves as an 'analytical tool or a sensitivity to capture and engage contextual dynamics of power' (Cho et al, 2013: 788). The far-reaching potential of the concept and its popularisation may well result from its theoretical and empirical openness (Phoenix and Pattynama, 2006; Davis, 2008).

The term 'intersectionality' was introduced by the US legal scholar, Crenshaw (1989), who illustrated how the manifold experiences black women had of discrimination were distorted by a one-sided focus on a single category of social inequality (either 'femaleness' or 'blackness', 1989: 139), that was 'greater than the sum of racism and sexism' (1989: 140).

Multidimensionality and *contextuality* are central issues for intersectionality, since social inequality cannot be grasped with unidimensional models (Brah and Phoenix, 2004: 76; Collins and Chepp, 2013: 60). Intersectional analysis focuses on the complex, fluid and mutually constitutive interrelations between 'multiple dimensions and modalities of social relations and subject formations' (McCall, 2005: 1771). It does not essentialise descriptions of what people are like, but contextualises them in the historical, societal and structural processes that create categories and power relations, individually and collectively.

The current prevailing view holds that categories or social locations are produced and reconstructed in fluid and dynamic ways in a variety of social processes (Cho et al, 2013: 786; Collins and Chepp, 2013: 61), occur both at a structural societal level (macro-level), and are created interactively as identity constructions at the micro- and meso-levels. They are also reproduced (stereotypically) at the level of discourse in the form of symbolic representations such as shared values, norms and cultural systems. Several scholars therefore propose intersectional multi-level analyses (for example, Choo and Marx Ferree, 2010; Winker and Degele, 2011; Anthias, 2013).

The lines of difference or axes of social inequality that are operative thus depend to a large extent on the object of enquiry – the level that is being examined and the context in question. The categories studied may differ with respect to socio-structural disadvantages at the macro- or meso-level, or at the micro-level in relation to the interactive creation of identities or symbolic representations. Not all categories of social inequality are activated in each context, but they are embedded in situational, institutional and structural contexts which affect the strength and direction of their impact (McCall, 2005: 1785).

It is now commonplace for *intersectional analyses* to focus on differences and commonalities, as well as privileges and disadvantages that result from individual and group multiple social locations within their associated power relations (Collins and Chepp, 2013). McCall (2005) was one of the first researchers to examine intersectionality as it is employed in different kinds of research. In her focus on research approaches to positioning in social categories, she made it clear that, while intersectionality has more often than not been researched using qualitative methods, it has also been researched quantitatively. She identified the following three forms of intersectionality research that eschew and deconstruct pre-given social categories such as gender, class and race (*anticategorical complexity*); analyse differences and similarities within a single social category at a micro-level (*intracategorical complexity*); or focus on multiple inequalities between socially constructed groups (*intercategorical complexity*) that are particularly suitable for quantitative research. More recent publications have addressed qualitative, quantitative and mixed methods (Dubrow, 2008; Grace, 2014; Hankivsky, 2014; Rouhani, 2014), focusing on categorical complexity.

State of research

From an intersectional perspective, educational inequalities result from multidimensional inequalities that systematically and unequally

establish relations of, for example, gender, class and migration. These inequalities emerge in specific societal educational contexts, from simultaneous membership in multiple, socially constructed locations, in society generally and through schools as institutions populated by pupils, teachers and parents 'doing difference or deference' (West and Fenstermaker, 1995).

In education research, as in other fields of enquiry, quantitative and qualitative approaches mostly work in isolation from each other. In the following, however, we present findings from both quantitative and qualitative research regarding the interplay of gender, migration and social class, rather than polarising them.

Young people with *migrant status from the lower social classes generally* attain lower educational qualifications and linguistic and mathematical competences, however, there are different patterns of disadvantage for different groups of migrants in different educational systems (Pong and Hao, 2007 ; Levels et al, 2008; Alba and Waters, 2011; for East Asia see Hannum et al, 2010). According to Heath and Brinbaum (2007), a Turkish background is particularly disadvantageous in Belgium, Germany, the Netherlands and Norway. The same applies to North African descent in Belgium, France and the Netherlands, and Mexican origin in the USA. Pakistani background is disadvantageous in Norway and the UK, as is Caribbean descent in England and Wales. Young people from certain migrant backgrounds perform better than, or comparably with, those without migration backgrounds, such as young people of Indian descent in Norway and in the UK, Chinese origin in the UK or Greek origin in Germany.

Being male from a migrant background is associated with poor educational qualifications and competence levels, but these vary for different groups of migrants (Feliciano and Rumbaut, 2005; Portes and Rumbaut, 2007; Støren and Helland, 2010; Pinar, 2011; Takenoshita et al, 2013). Equally, *being male from a lower socioeconomic background* is particularly disadvantageous in relation to both educational qualifications and the acquisition of skills (Buchmann et al, 2008; Breen et al, 2010; Gong et al, 2014). The acquisition of skills is particularly poor for boys, but not girls, who come from the lower social classes (Legewie and DiPrete, 2012).

Being male with a migrant and low socioeconomic status (SES) has a strong negative impact on educational outcomes. The intersection of these three categories is generally discussed using descriptive statistics and much of this kind of research has been done in the British context (for example, Grant and Sleeter, 1986; Gillborn and Mirza, 2000; Grant and Zwier, 2012; for commensurate qualitative analyses see Bhopal

and Preston, 2012; Wright, 2013). In a descriptive analysis of the results of the UK national examinations taken by 16-year-olds from 1988 to 1995, Demack et al (2000) show that boys with migration backgrounds and low SES consistently achieve the lowest scores and graduation rates, while girls of Indian descent and higher social status more frequently obtain higher scores; however, Strand (2014) points out that among working-class students, minority ethnic groups gain significantly better achievement scores at age 16 than white British students (with the exception of black Caribbean boys who do not differ from white British boys). Among middle-class young people, Indian and Chinese students outperform white British students. Dekkers et al (2000) traced the educational progress and success of a cohort in the Dutch educational system that entered secondary school in 1989. Educational attainment measured in 1995, indexed by the number of years needed to gain an entrance certificate for university education, showed similar patterns to Strand (2014): Dutch boys from low socioeconomic, non-migrant backgrounds fared worse than boys from migrant backgrounds and low SES.

Similar findings pertain in the US to people of Mexican descent (Covarrubias, 2011). The interplay of gender, social class and migration backgrounds is also confirmed for the comparison of different education systems. In China the urban–rural division contributes most to education inequality, followed in decreasing significance by social stratification division, gender disparity and regional gaps (Lai et al, 2014; Yang et al, 2014). Analyses of international PISA (Programme of International Student Assessment) data indicates that social class, in intersection with gender and migrant status, particularly strongly affects adolescent reading skills and mathematical attainment (Gottburgsen and Gross, 2012; Gross and Gottburgsen, 2013).

Comparable results have been obtained in qualitative research in the UK (Archer, 2003; Connor, 2006; Phoenix, 2008; Qin, 2006) and the US (for example, Briscoe, 2009; Ramirez, 2012). In an interview study of black, middle-class Caribbean parents, Gillborn et al (2012) illuminate one set of processes through which these findings are produced. The parents reported that they considered teachers to (1) systematically express lower expectations concerning the performance and educational attainment of the children, despite their social class background; (2) use stronger disciplining and critique of girls and boys, which discourages them; and (3) consider black boys to be at particular risk of poor attainment.

Employing intersectional approaches in research on educational systems and inequalities

Most empirical studies within intersectionality frameworks employ qualitative data techniques. Since there is widespread acceptance of intersectionality in qualitative research we discuss it briefly; however, while quantitative data techniques are becoming increasingly popular in intersectionality research, it is not currently well understood how an intersectionality framework can be applied using quantitative methods. We therefore show how intersectionality can be applied to quantitative methods in more detail. We then discuss how the qualitative comparative method is particularly suited to intersectionality research. The section concludes by comparing the strengths and shortcomings of these three approaches to intersectionality research.

Intersectional perspectives and qualitative methods

One reason that qualitative methods have been considered particularly apposite for intersectional research is because both are concerned with analysing and representing the complexity and richness of everyday lives (McCall, 2005; Hunting, 2014). Qualitative intersectional studies tend to examine the processes involved in constructing and reproducing multiple social identities and their (non-additive) performative combination (in the sense of doing difference at a micro-level). They involve the use of multiple methods including interviews, biographic narrations or ethnographic studies. Given the plurality of intersectional qualitative research methods, the discussion below does not suggest ways to conduct qualitative intersectional research, but instead gives examples of such research. It focuses on how intersectionality relates to research design in three ways: (1) intersections designed into the research as part of the research question; (2) emergent everyday intersectional complexities; and (3) intersections that arise as a by-product of secondary analysis.

One study that exemplifies how *intersections can be designed into the research process as part of the research question* is the first UK study of black Caribbean middle-class family priorities and strategies in relation to the education of their children (Rollock et al, 2015). The aim of the study was to explore the impact of the intersections of race and class on parental understandings of education, and their strategies for supporting their children's education. Semi-structured interviews were conducted with 62 parents in professional or managerial occupations who self-defined as black Caribbean, with a child aged between 8

and 18 years. Not surprisingly, the findings show the intersections of racialisation and social class; however, they also show their intersections with gender, disability and generation. In McCall's (2005) terms, the research is both intracategorical (focusing on the black middle classes) and intercategorical, making (sometimes implicit) comparisons with the white middle classes and the black working classes. The intersectional perspective allowed the researchers to conclude that the black middle classes exist in an 'amorphous space between the White middle classes and the Black working class', where they experience a sense of dislocation and discomfort in aligning with the 'middle class' label while facing subtle, often covert racism in teacher assumptions about their children's abilities (Rollock et al, 2015: 171). The parents developed creative strategies for opposition to racism and the 'concerted cultivation' of, and transmission of, cultural values and practices, to their children.

Kofoed's (2008) fieldwork, conducted in a sixth grade class in Denmark, focused on *emergent intersectional complexities*. She observed break times and lessons, studying the communication between pupils during class, mapping their social relations and conducting narrative interviews with all members of the class. The pupils were encouraged to talk about their everyday lives and to reflect on specific events, social relations and positioning, particularly processes of inclusion and exclusion and how 'pupilness' was constructed at school.

Kofoed (2008) drew on notions of intersectionality and discussed her observation of one daily ritual at school – the selection of players for football games. She found that this ritual indicates and ensures the transition from lesson to playtime, and was how the pupils policed each other, negotiated hierarchies and constructed community and otherness. This negotiation was done through the calling out of the names of the boys chosen, which reiterated notions of who the attractive pupils were. The repetition of the ritual reproduced differences that were already established within the school, such as who 'the skilled players' were, who were always male and white, without this ever having to be made explicit.

Finally, as an example of *intersections that arise as a by-product of secondary analysis*, Haavind et al (2015) reanalysed a focus group transcript from four Chinese girls at a multicultural school in California, originally interviewed in the 1990s. In the process of secondary analysis, the authors took an anticategorical intersectionality approach (McCall, 2005) to examining school culture from the girls' perspectives, with a particular focus on their emotional processing. The method used for

the secondary analysis involved joint, close reading and a great deal of small group discussion of the girls' accounts over a six-week period.

The new analysis found that the girls experienced their social identity categories as linked with group divisions and hierarchies in school in ways that were painful and exclusionary. In the focus group, however, they created more pleasurable narratives and were supportive of each other. The girls considered that the category 'Chinese girls' was incommensurate with 'cool', but their ability to speak an additional shared language and achieve highly allowed them to categorise others as 'stupid'. In the group, they were able to laugh about the racialised teasing they reported, even though this teasing hurt their feelings. They drew on cultural discourses about fighting racism to turn their hurt into anger. The findings demonstrate how 'multiple categories of difference and inequality cut across and inflect one another' (Haavind et al, 2015: 302).

Quantitative methods

Quantitative methods are increasingly applied within the intersectionality approach (for example, Covarrubias, 2011; Rouhani, 2014; Strand, 2014) and are able to foster understandings of differences and inequalities (Scott, 2010; Spierings, 2012) in terms of the main principles of the approach: multidimensionality, intersectionality and contextuality.

Multidimensionality conceptualises more than one dimension of inequality as impacting educational outcomes. In the quantitative paradigm, multivariate regressions are designed to estimate the impact of numerous variables on one outcome variable.

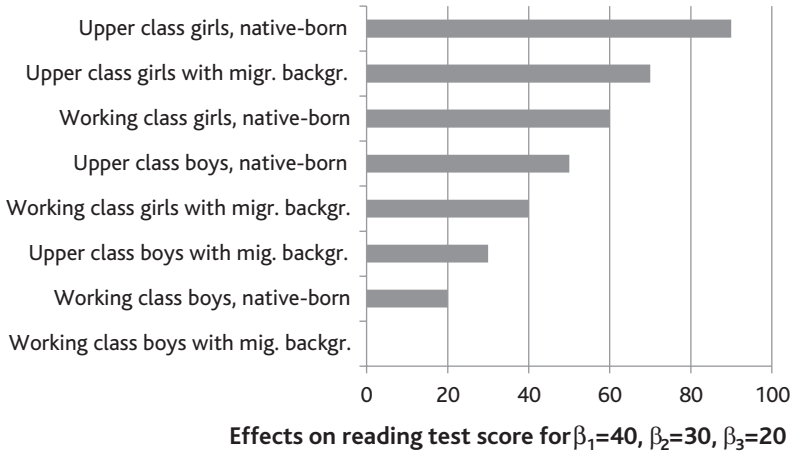
To give an example with a simple linear regression, the PISA competence score (outcome variable Y) of students can be estimated in relation to several determinants, for example, by three dichotomous variables gender (X_1), class (X_2) and migration background (X_3):

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \quad (1)$$

> … with the coefficients β_1, β_2, β_3 describing the impact of each dimension/variable on the outcome while all other dimensions are kept constant (*ceteris paribus* condition), and
>
> … with the error term ε accounting for the fact that it is a probabilistic (and not deterministic) equation and showing how large the deviations from the estimated value are.

Although the above formula describes a simple additive model, and these are usually criticised by intersectionality researchers (Hancock, 2007; Bowleg, 2008), it can analytically explain the simultaneous penalty faced by working-class boys with migrant backgrounds by adding up the negative effects of gender, class and migration background. Note that there is no additional interaction term needed to show that these boys fare worse in the educational system compared to middle-class boys, or working-class girls with migration backgrounds (see Figure 3.1). The addition of single main effects serves to show the differing educational performance or discrimination levels of each specific group. Additional interaction terms are needed when the (dis-)advantage of groups is higher/lower than the addition of the main effects of, for example, gender, class and migrant backgrounds.

Figure 3.1: Additive regression model with main effects



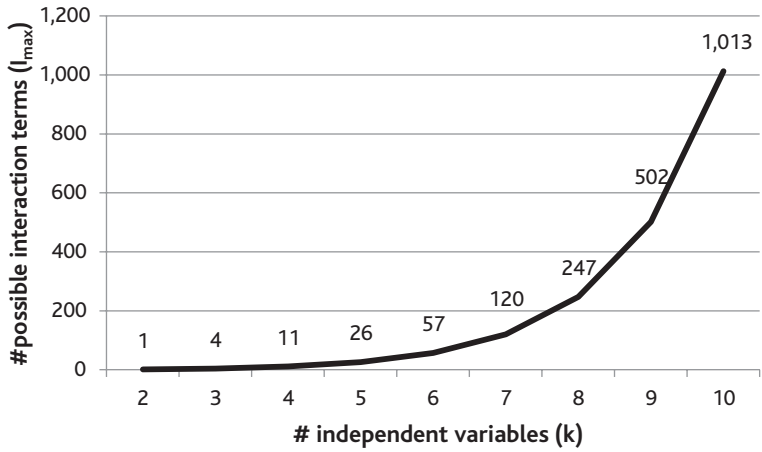
Intersectionality in terms of the fact that individual situations depend on multiple group memberships that may have compensating, additive or multiplicative effects, requires all possible interaction terms to be built into quantitative approaches (McCall, 2005; Choo and Marx Ferree, 2010).

Note that the number of possible interaction terms I_{max} increases exponentially with the number of independent variables (k):

$$I_{max} = 2^k - k - 1 \qquad (2)$$

Figure 3.2 illustrates the application of this formula. Models with five or more covariates quickly become too complex to be feasible. With the growing number of interaction terms to be tested, the need for datasets with a large number of cases becomes obvious (Dubrow, 2008). How the main effects and interaction effects impact on the outcome variable can be best illustrated is shown in Gross (this volume, which provides further technical and use-oriented advice).

Figure 3.2: Number of possible interaction terms by number of independent variables



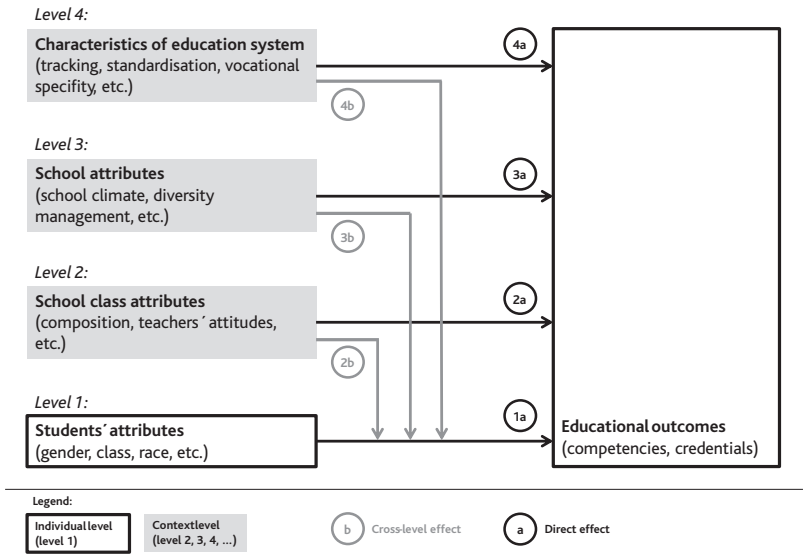
For educational outcomes, *social context* plays a crucial role. Pupils are nested within school classes, which are nested within schools, which are located in an educational system. Multi-level analyses make it possible to include all this information on different levels at the same time (and there are dangers in omitting school-level characteristics, as discussed by Esser, this volume).

Contextuality within the intersectionality approach can, however, be understood in a double sense: *first*, contextual attributes on multiple levels may have a direct effect on educational outcomes such as student competencies or credentials (see Figure 3.3, effects 2a, 3a, 4a). These effects can be modelled as covariates at higher levels.

Second, attributes of the social context may influence the way individual attributes affect educational outcomes. For example, in educational systems with early tracking, working-class background may have a stronger impact on receiving education credentials than in education systems with no or late tracking. These effects can be

modelled within multi-level models as cross-level effects (see Figure 3.3, effects 2b, 3b and 4b).

Figure 3.3: Direct and cross-level effects on educational outcomes in a four-level model



Qualitative comparative analysis

QCA, developed by Ragin (1987, 2000, 2008), is most applicable for samples of 10–50 cases. The method is based on Boolean algebra and set theory and focuses on cases, not on the impact of variables as in the quantitative approach. Although the term itself defines it as a qualitative method, it can be seen as a third strand beyond the qualitative and quantitative paradigms (see Schneider and Wagemann, 2014 for a detailed introduction to the state-of-the-art).

How does QCA work? Cases are expressed as combinations of conditions (configurational approach) leading to an outcome, C (for example, educational credentials). This data can be shown in a 'truth table' (see Table 3.1).

The first row presents three cases ($N = 3$), which are members of the condition sets F (for example, female) and A (for example, member of the autochthonous population) and H (for example, of high socioeconomic background). This combination is expressed as FAH, with capital letters for membership and small letters for non-membership, but in this example, other combinations also lead to the

Table 3.1: Truth table with three conditions

	Conditions			Outcome	
Row	**F**	**A**	**H**	**C**	**N**
1	1	1	1	1	3
2	1	1	0	1	5
3	1	0	0	0	1
4	1	0	1	0	4
5	0	1	1	1	3
6	0	0	1	1	2
7	0	1	0	0	1
8	0	0	0	0	6

Source: Following Schneider (2006) with different conditions.
Hypothetical data
F: Female
A: Autochthonous (no migration background)
H: High socioeconomic background (SES)

outcome (which is expressed by the term 'equifinality'), which are called primitive expressions (see shaded rows 1, 2, 5 and 6). These combinations are connected with a logical OR (+) and are expressed in the following form:

$$FAH + FAh + fAH + faH \rightarrow C \qquad (3)$$

In our hypothetical example the outcome of attaining an educational credential (C) is the logical consequence of one of the combinations of the left side: being a female, autochthonous student with high SES (FAH) OR a female, autochthonous student without high SES (FAh) OR a male, autochthonous student with high SES (fAH) OR male student with migration background and high SES (faH). In the next step of logical minimisation the primitive expressions are reduced to so-called prime implicants by omitting redundant conditions (for example, the primitive expressions FAH and FAh can be reduced to the prime implicant FA). This step is shown in the following table.
The result of the first minimisation step can be shown using the following expression including all prime implicants:

Table 3.2: Prime implicant chart

	Primitive expressions			
Prime implicants	FAH	FAh	fAH	fAH
FA	X	X		
AH	X		X	
fH			X	X

Source: Following Schneider (2006) with different conditions.
Hypothetical data
F: Female
A: Autochthonous (no migration background)
H: High socioeconomic background (SES)

$$FA + AH + fH \rightarrow C \quad (4)$$

In the next step only the prime implicants that are needed to present all primitive expressions are included. As the prime implicant AH (see shaded row in Table 3.2) is not needed to present all primitive expressions (because they are already covered by FA or fH) AH can be omitted for the most parsimonious solution:

$$FA + fH \rightarrow C \quad (5)$$

Ragin (1987: 98) sums up the major steps to reduce complexity as follows '(1) construct the truth table, (2) determine the prime implicants, and (3) use the prime implicant chart to select the essential prime implicants (if maximum parsimony is desired)'. Usually the detection of sufficient conditions would follow this procedure, and positive outcomes can be explained in a different way to negative outcomes, as QCA is an asymmetric approach.

This example presents an ideal case with no logical contradictions, the same combinations (for example, two working-class girls with migrant backgrounds) resulting in different outcome values (for example, the first of those two girls graduates, the second drops out) (Ragin, 1987: ch. 7). All conditions and the outcome are dichotomous (membership or non-membership) in this example, which represents the Crisp-Set QCA (csQCA). The concept of dichotomous membership is – like dummy variables – not the best instrument to represent the various diversities implied by intersectionality research, and is at best suitable for the intercategorical branch only.[2]

Comparing the strengths and shortcomings of the three approaches

Table 3.3 offers some basic information for a comparison of the methodological paradigms presented in this section. The basic strength of the qualitative approach with regard to intersectionality research is the ability to cover anticategorical, intracategorical and intercategorical complexity (McCall, 2005), while quantitative research is only feasible within the intercategorical branch (see Winker and Degele, 2011) and QCA within the inter- and intracategorical branch. Quantitative and QCA research often operationalises complex constructs such as gender and migration background by oversimplifying them. In consequence, they frequently work with dichotomous or continuous variables, whereas qualitative research is able to account for more complexity. This very complexity, however, may pose problems when presenting the results to a general audience and/or policy makers. In this regard, the quantitative approach may be most persuasive: for example, discrimination can be approximated by controlling for performance level and by both arguing on the basis of statistical significance and the representativeness of the results. In other words, the discriminatory effect can be found in the population from which the random sample was drawn with an error probability that can be specified (for example, smaller than 5%).

Regarding the strengths of QCA, Hancock (2013) – to our knowledge the only scholar to date applying QCA within an intersectionality framework – makes four arguments about how QCA is well-matched to the assumptions of intersectionality:

1. QCA provides the ability to configure cases with full acknowledgement of the confounding of dimensions.
2. QCA may lead to an improvement of operationalisation by focusing on cases not variables.
3. QCA accounts for the fact that there are multiple paths to one outcome.
4. QCA enables better examination of qualitative data.

We would like to add four further reasons:

1. QCA is specialised in the configuration of group memberships and accounts for multiple memberships.
2. The different ways in which the impact of group membership on outcomes depends on social context can be modelled with QCA.

Table 3.3: Comparison of approaches

	Qualitative approach	Quantitative approach	Qualitative comparative analysis (QCA)
Focus	Cases	Variables	Cases
Methods of reasoning	Inductive	Deductive	Inductive
Research goal	Generate new findings, development of theories or conceptual understanding	Testing hypotheses, examining the impact of variables on outcomes, finding statistical significance based on representative samples	Finding necessary and sufficient conditions for positive and negative outcomes
Data collection methods	Interviews, observations, group discussions, etc.	Surveys, experiments, observations, etc.	Interviews, register data on country level (aggregate data), etc.
Data format	Text (words); images etc.	Datasets (numbers)	Truth tables (numbers)
Data analysis techniques	Text interpretation, hermeneutic	Techniques mainly based on inferential statistics, multi-level modelling	Boolean algebra
# cases	≤20, more cases possible but time-consuming to analyse	>30, the more, the better; statistical power depends on sample size and effect size	10–50, less or more are technically feasible, but can be problematic due to missing case knowledge
***Strengths* in general**	Ability to develop new theoretical arguments and find new dimensions of inequality based on analyses	Ability to generate representative results, measures of (statistical) significance	Suitable approach for middle-range-N data, ability to measure quality of results, accounting for limited diversity
***Strengths* concerning intersectionality perspective**	Ability to manage anticategorical, intracategorical and intercategorical approaches, strong focus on cases with possibility to account for specificity of people's circumstances	Strong persuasive power for policy makers, test for non-additivity assumption with interaction terms feasible (ability to test statistically whether dis/advantage can be explained by multiple group memberships in an additive form)	See bullet points 1–8 in this section
***Shortcomings* in general**	Results are not representative, generally poor persuasive power for policy makers	Relevant dimensions have to be known in advance, theory development based on empirical results is less frequent	Method is poorly known even in science, applicability with small-N and large-N data is eventually limited
***Shortcomings* concerning intersectionality perspective**	Combinations of numerous dimensions cannot be generalised due to limited case numbers and non-representative samples	Need to oversimplify complex categories such as gender or ethnic background for operationalisation, ignoring of limited diversity, anticategorical and intracategorical branch of the paradigm cannot be examined adequately	Need to oversimplify complex categories in membership and non-membership (even in fuzzy-set QCA), anticategorical branch of the paradigm cannot be examined adequately

3. QCA enables accounting for limited diversity, which is always an issue when combining numerous dimensions of inequality.
4. QCA is an asymmetric approach meaning that the outcome (for example, graduation) can be explained by other factors that the non-outcome (for example, no graduation/drop-out).

In light of these different weak spots and strengths, using mixed-method designs and combining qualitative and quantitative approaches would seem to be a fruitful approach.

Conclusion

The assumptions associated with the concept of intersectionality (multidimensionality, intersectionality and contextuality) help to generate rich research insights into systematic differences in educational outcomes along social locations and the intersections of multiple social identities. The fact that, with few exceptions, quantitative research rarely adopts avowedly intersectional perspectives on educational inequalities seems to be because empirically verifiable hypotheses, which are necessary to quantitative education research, have generally not been proposed. In contrast, qualitative empirical analyses aim to examine educational inequalities inductively. Our suggestions about how to implement the concept of intersectionality in qualitative and quantitative methodology, as well as in the QCA framework, provide a glimpse into what education research from an intersectional perspective could look like. We hope these suggestions, together with the examples provided above, may stimulate the adoption of intersectional perspectives in quantitative education research.

As our comparison of qualitative, quantitative and QCA research strategies shows, these strategies have different strengths and weaknesses for intersectional enquiry. Future empirical education research could make greater use of mixed-method designs in order to elaborate on the educational inequalities that emerge at the intersection of multiple social identities and groupings (see also Hancock, 2007; Griffin and Museus, 2011).

Notes

[1] We thank Claudia Buchmann and Antje Buche for helpful comments on an earlier version of this manuscript and Jonas Buche for his suggestions for improving the QCA section. We thank Katarina Laskowski and Sophie Petzelberger for searching the literature.

[2] For conditions with partial memberships and to face the critique on dichotomous categorisation within the csQCA approach, Fuzzy-Set QCA allows partial membership (Ragin, 2000, 2009) and Multi-Value QCA (mvQCA) allows for multinomial conditions (Cronqvist and Berg-Schlosser, 2009).

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FOUR

Measuring educational institutional diversity: tracking, vocational orientation and standardisation

Thijs Bol and Herman G. van de Werfhorst

Introduction

Comparative research on education developed tremendously in the past decade. We have come to learn a great deal about cross-national differences in the effect of education on labour market outcomes (Shavit and Müller, 1998; Breen and Buchmann, 2002; Müller and Gangl, 2003; Bol and van de Werfhorst, 2013), in levels of student achievement (Hanushek and Woessmann, 2005; Jenkins et al, 2008) and in effects of social origin on educational achievement (Brunello and Checchi, 2007; van de Werfhorst and Mijs, 2010). In understanding this cross-national variation, researchers have proposed three different institutional characteristics that drive these outcomes: the placement of students in different educational tracks, the extent and the specificity of the vocational skills provided by a system, and the extent to which an educational system is standardised (Allmendinger, 1989; Shavit and Müller, 1998; Kerckhoff, 2006; Levels et al, 2014).

This chapter studies associations between these three characteristics of educational systems and four central 'functions' of education. Functions, in this understanding, should be seen as the outcomes on the basis of which we can judge whether educational systems function well. Typically, comparative research has examined educational inequality, skill optimisation and allocation to the labour market as central functions of education. Given the aims of educational systems to improve equal opportunities, to optimise the attained skill level and to provide skills relevant for work, these are three important domains with impacts on institutions that should be identified. In addition to these three functions, which have been examined before, we study the impact of educational institutions on a fourth central function

of education: to socialise youngsters into society at large, by creating active citizens who actively participate in society.

Three institutional dimensions of educational systems

Comparative stratification research has proposed three dimensions into which educational systems can be classified cross-nationally: the extent of tracking students with different levels of scholastic ability, the extent to which systems provide vocationally specific skills, and the level of nationwide standardisation of regulations, funding and examinations (Allmendinger, 1989; Kerckhoff, 1995; Shavit and Müller, 1998; Horn, 2009). We follow this literature and classify educational systems in these dimensions (albeit sometimes with two indicators for one dimension).

Level of tracking

Educational systems differ in the extent to which students are placed in different educational tracks. Between these tracks it is clear which is the higher and which is the lower educational track (Allmendinger, 1989). Tracking, also defined as the level of stratification of an educational system in earlier research (for example, Shavit and Müller, 1998), mainly takes place in secondary education, although there is tracking in post-secondary education as well (Shavit et al, 2007). It is important that our focus for this dimension is on tracking *between* educational programmes,[1] instead of the differentiation of students *within* different streams or tracks within the same educational programme. Arguably, systems that track between educational programmes have more manifest forms of separating students on the basis of ability than internally differentiated systems, because such systems are characterised by separation for the full curriculum, often in separate school organisations, and for the duration of multiple years.

Level of vocational orientation

A second dimension in which educational systems differ is their level of vocational orientation: the extent to which education provides students with vocational skills, and the specificity of these skills. Education can supply students with general and specific skills, and the balance between these two differs across educational systems. The specificity of skills in education is mainly associated with vocational programmes, where the emphasis lies on learning highly (work-)specific skills. While the prevalence of vocational education differs across educational systems,

there is just as much variation in the specificity of the skills that are taught in vocational educational programmes. Many educational systems provide vocational programmes in a few broad fields, while other educational systems provide students with job-specific skills by offering a dual system in which institutionalised education and working in firms are combined. Both are categorised as vocational education, but the skills that are provided in the dual system are more specific than those in broad vocational programmes. As a result, the dual system is said to be particularly useful to provide students with specific work-relevant skills (Breen, 2005). Educational systems thus differ in the extent and the form of their vocational training programmes and whether they offer a dual system (Shavit and Müller, 1998; Müller and Gangl, 2003). Systems that are highly vocational provide students with specific skills, while less vocational systems produce more generally skilled students.

Level of standardisation

All educational systems in all countries are to a certain degree standardised, which is defined as 'the degree to which the quality of education meets the same standards nationwide' (Allmendinger, 1989: 233). Standardisation is achieved through institutions such as the use of central exams, uniform curricula, the same training for teachers and standardised budgets. We distinguish between two forms of standardisation: standardisation of input and standardisation of output (see Rowan, 1990).

Standardisation of input refers to the extent to which schools have limited control over the input in education. Examples of such standardisation are restrictions for schools on what they teach and how they teach it. Some countries, such as Greece or Jordan, regulate the textbooks that are used for courses, while others give more autonomy to schools.

Standardisation of output describes the extent to which educational performance (the output) is tested against external standards. It tells us the extent to which schools are held accountable for their performance (Horn, 2009). This could, for example, be assessed by a national inspectorate or other regulatory institutions, but the most important institution is centralised exit examinations. Central examinations lead to the standardisation of the educational system as it obliges schools to teach their students what is examined in the central exams. Pioneering work on this topic has been done by Bishop (1997) and Woessmann (2000, 2005). Bishop argues that we must specifically look at curriculum-based external exit exams (CBEEEs) which guarantee a

high level of standardisation over the output of education. One could also think of other elements of standardisation, such as the extent to which placement in different curricula is binding, as opposed to resulting from free choice, or homogeneity in the quality of teacher qualifications.

Central functions of education

Education can be seen to have four central functions in contemporary societies (see also Fend, 1974; van de Werfhorst and Mijs, 2010), to: (a) allocate students to the labour market, (b) optimise skills, (c) promote equality of opportunity and (d) socialise students into society at large. An educational system that performs well in these aspects is perceived as well-functioning educational system.

(a) An educational system can be said to be well-functioning if graduates of different levels of education are well-prepared for the labour market. They have obtained relevant skills for their working life, and employers are well-informed about those skills and are willing to reward them. In this way, the labour market opportunities of school leavers are optimised, as well as the production of firms.

(b) The second function in which an educational system's performance can be assessed concerns the extent to which the system optimises student skills. Students differ with regard to their learning abilities, and education optimises these abilities. An educational system can be seen as well-functioning if the educational achievements of students are maximised, given a particular budget for education.

(c) The third function of education is that it can optimise equal opportunities for children of different social backgrounds. Educational systems can be seen as well-functioning if they minimise inequality of educational opportunity. This is not to say that educational systems are able to fully eliminate educational inequalities, as inequalities partly result from family processes in which educational policy cannot interfere, but if two educational systems differ in the extent to which they either increase or reduce inequalities, the system that reduces inequalities can be seen as, *ceteris paribus*, a better functioning system. Although this function of education highlights equality of opportunity rather than equality of outcomes, studies have shown that both forms of equality are strongly linked (Duru-Bellat and Suchaut, 2005).

(d) The fourth function of educational institutions is to socialise youth into civic engagement. Socialisation involves increasing commitment to, and involvement in, the society of which youngsters will be part. Through schooling, students are informed about regional, national and

supranational institutions (for example, legal or political institutions), obtain knowledge on current affairs, develop democratic attitudes (or other political attitudes in non-democratic states) and improve their social skills. All these civic qualities will help students to be involved with societal issues at large, helping them to become active citizens. A well-functioning educational system not only optimises these qualities but also minimises variations between students within them. A common view in political philosophy is that the only legitimate criterion for justice in the relationship between the state and its citizens is equality (for example, Verba et al, 1995; Miller, 1999). An educational system that 'socialises selectively', by increasing inequalities in civic and political engagement, is thus harmful to democratic equality and may be seen as malfunctioning.

Within a given educational institutional structure, some of these four functions may be more easily met than others. A system that focuses on skill optimisation may, for example, perform less well when it comes to equality of opportunity (Brunello and Checchi, 2007). This implies that, in the design of educational institutions, governments have to face policy trade-offs when a particular institution serves one function but harms another (van de Werfhorst and Mijs, 2010). Another trade-off is that between labour market preparation and equality of opportunity (Bol and van de Werfhorst, 2013). It is well known that a strong vocational educational sector helps youngsters in the transition process from the educational system to the workplace. For instance, youth unemployment is lower in countries with a strong dual system (Breen, 2005). On the other hand, several studies have shown that the specific skills acquired in a dual system are not always beneficial. In the later life course, specific skills turn out to be associated with lower rates of employment (Hanushek et al, 2011). People from a dual system are also more often stuck in poorly paid jobs (Korpi et al, 2003). There still is a significant social class effect on choice for vocational versus generic types of schooling, however. If people enrolled in vocational secondary have fewer opportunities to enrol in tertiary education, strongly vocationally oriented systems may increase social class differences in the attainment of a tertiary-level degree.

Combining educational institutions and central functions of schooling

In this chapter we study the four functions of education and their connection to the three educational institutional dimensions. In Table 4.1 we summarise the hypothesised relationships between educational institutions and the four core functions of education.

Table 4.1: Summary of hypothesised relationships between educational institutions and four central functions of education*

		Labour market allocation	Skill optimisation	Equality of opportunity	Socialisation
Tracking				Hypothesis 3: –	Hypothesis 4: –
Vocational orientation	Vocational enrolment	Hypothesis 1a: +			
	Vocational specificity	Hypothesis 1b: +			
Standardisation	Standardisation of input		Hypothesis 2b: –		
	Standardisation of output		Hypothesis 2a: +		

Notes
* +: Evidence points to the task benefiting from strengthening this institutional variable.
–: Evidence points to the task being impeded by strengthening this institutional variable.

Concerning the first function of education, preparing for the labour market, it is expected that more vocationally oriented educational systems provide students with specific skills, which should make the education-to-work transition easier. We therefore hypothesise that the school-to-work transition happens smoothly the more vocationally oriented a country's educational system is. Usual indicators for how effective education is in allocating students in the labour market are the level of youth unemployment (Breen, 2005) and the length of the school-to-work transition (Wolbers, 2003). We expect these effects for both the prevalence of vocational education (*Hypothesis 1a*) and the vocational specificity (*Hypothesis 1b*).

The second task is skill optimisation. Several studies have showed that the level of standardisation of output of an educational system enhances student performance (Bishop, 1997; Horn, 2009). A first rationale is that students are willing to work harder if they know that the degree they are working for has a higher value. This is believed to be the case in educational systems where the output is standardised by using, for example, exams (Spence, 1975; Stiglitz, 1975). A second reason is that because the government monitors the quality of education more in more standardised educational systems, the performance increases. Earlier research found significant effects from the level of standardisation of output on student performance (Bishop, 1997; Hanushek and Raymond, 2004; Fuchs and Woessmann, 2007). We therefore expect that in educational systems in which output is standardised, average student performance is higher (*Hypothesis 2a*), however, with

regard to input, it has been argued that weak standardisation leads to higher performance due to higher levels of competition between schools (Woessmann, 2003). So *Hypothesis 2b* is that higher levels of standardisation of input lead to lower average school performance.

The third function of education is to enhance equality of opportunity. In systems where the choice of educational programme is made earlier, and has more severe consequences because of the rigid form of selection in separate school organisations for the duration of multiple years, it is likely that parents play a relatively large role in educational decision making (Erikson and Jonsson, 1996; Lucas, 2001; van de Werfhorst and Mijs, 2010). Given that the distribution of achievement is strongly related to school type, social origin is relatively important in one's place in the distribution of student performance in more strongly tracked educational systems (*Hypothesis 3*). This is particularly the case because early-tracking systems structure the allocation of students of different socioeconomic groups into schools, thereby increasing between-school variability and decreasing within-school variability of achievement (Bol et al, 2014; Le Donné, 2014).

Finally, a function of educational institutions is to socialise students into civic engagement. It is plausible that tracking has a negative impact on commitment to active citizenship. It prevents communication between groups that are strongly separated on the basis of social and ethnic background, and communication is central to the development of critical citizens. Hyland (2006) has, for example, argued that the more heterogeneous composition of school classes leads to more equality in democratic attitudes and values on political participation. Janmaat and Mons (2011) demonstrate that the variability in civic competencies is greater in countries with a tracked educational system. It is likely that students in these academic programmes are trained in civic competencies related to critical thinking, whereas students in vocational programmes receive little education with regard to the skills that are relevant for political awareness, and knowledge of democratic institutions (Ten Dam and Volman, 2003; van de Werfhorst, 2014). We therefore expect that tracking leads to lower levels of active citizenship (*Hypothesis 4*).

Measuring educational systems

We created standardised indicators for the maximum number of countries on which we were able to collect data. The score of a country on this standardised indicator is therefore fixed, and is independent of whether a country is part of one particular empirical analysis or not.

We performed separate factor analyses for each dimension (as opposed to a single factor analysis for all dimensions of educational systems), as this maximises the number of countries used in the construction of an indicator for the specific dimension.[2] With factor analysis, a technique that allows us to summarise multiple empirical indicators into fewer scales, we are able to measure the three dimensions of educational systems by using several indicators that signal whether a country scores high or low on that particular dimension.

Level of tracking

The level of tracking is constructed by performing a factor analysis on three country-level variables: the age of first selection (OECD, 2005); the length of the tracked curriculum as a percentage of the total length of compulsory education (Brunello and Checchi, 2007); and the number of distinct school types that are available for typical 15-year-old students (OECD, 2005). Together these three variables give a comprehensive view of tracking, and pay attention to all theoretical aspects of the dimension: the timing, the length and the number of school types. The eigenvalue of the resulting factor was 1.76.

Level of vocational orientation

The level of vocational orientation is divided in two variables: the prevalence of vocational enrolment and the specificity of the vocational education. The reason we chose this less parsimonious way of summarising the vocational orientation of the educational systems has to do with the specific role of specific skills that are taught in the dual system (especially regarding the allocation of students in the labour market), which is emphasised by several studies (for example, Breen, 2005).

The first indicator of vocational orientation concerns the share of students that are enrolled in vocational programmes in upper secondary education. To measure the prevalence of vocational education we use two distinct sources, as measured by the Organisation for Economic Co-operation and Development (OECD, 2006) and by UNESCO.[3] To reduce measurement error we used both indicators instead of just one and perform a principal factor analysis to create a new index of enrolment in vocational programmes. The eigenvalue of the factor that stood out was 1.84, and the factor loadings were saved as regression scores.

In addition to the prevalence of vocational enrolment, another element of vocational education examines more deeply how strongly linked the vocational training system is to the labour market. In particular, vocational education and training systems differ in the extent to which learning takes place in a dual (school-based and work-based) form. The existence of a dual system tells us a great deal about the provision of specific vocational skills. In a dual system students learn and work at the same time, based on the idea that the necessary skills for a job are best learned on the job. Instead of only focusing on learning in the context of a school, the context of the employer is at least as important. The strength of the dual system is measured by a single indicator: the percentage of students in upper secondary education who are in the dual system (OECD, 2007).

Level of standardisation

Following the theoretical section, we operationalise the level of standardisation in two different variables: standardisation of input and standardisation of output. Standardisation of input deals with the (lack of) autonomy of schools and the extent to which they can decide by themselves how and what they teach. This is an important category for the level of standardisation: the more schools are alike in terms of teaching methods and curriculum, the more standardised an educational system is. When schools cannot decide themselves how they organise their education, there will be greater similarities in student knowledge in different schools. In the 2006 data from the Programme for International Student Assessment (PISA), school principals were surveyed on topics that concern the standardisation of input.

We aggregated three questions at the country level (with the lowest score being the most autonomous and the highest score being the most standardised), and a principal factor analysis was performed on these variables. These variables concerned the extent to which schools are autonomous in (1) choosing textbooks, (2) the course content and (3) the courses that are being offered.[4] All variables ranged from zero (low level of standardisation of input) to one (high level of standardisation of input), which resemble the proportion of principals in a country who answered the questions positively. A principal component factor analysis resulted in one factor with an eigenvalue of 2.14.

The second index of standardisation is standardisation of output, measured by the existence of centralised exit exams. Central examinations have direct bearing on the accountability of schools. In

the classification of central examinations we follow the five criteria proposed by Bishop (1997: 260): exams should have real consequences and not only be symbolic; degrees issued after exams are tested against an external standard; the central examinations are organised by discipline; there is some differentiation in the possible outcome of the exam; it concerns secondary school students and covers almost the entire secondary student population.

Standardisation of output is a dummy variable: when there are central exams in secondary education a country scores a one. Two sources of data were used in determining the existence of central exams. The first source of information was the section on examinations, qualifications and titles in the European Glossary on Education (Eurydice, 2004). The second source utilises earlier research on this topic by Woessmann (2005) and Woessmann et al (2009: 123). Their data is based on the accounts of national experts and is not a completely dichotomous variable. Following Woessmann et al (2009: 123), in four countries (United States, Germany, Canada and Australia) the percentage of regions where central examinations exist is used for the analysis.

Summary

In the online appendix all five indicators and the underlying variables are shown for as many countries as we could find data for.[5]

Figure 4.1 plots the indicators of tracking and vocational orientation two by two. Tracking is positively, but far from perfectly, correlated with the two indicators of vocational education.

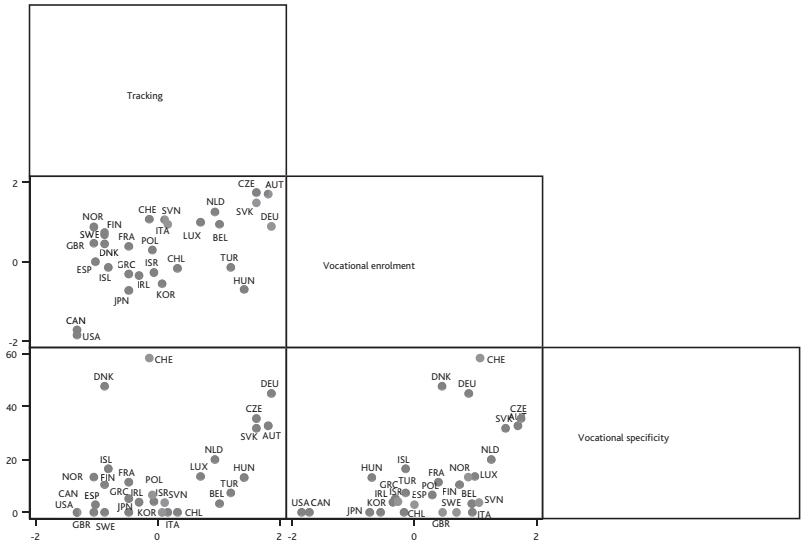
Figure 4.2 shows the two indicators of standardisation (input and output). It shows that standardisation of input is found both in countries with and without standardised examinations.

Data and methods

In the previous section we presented the three dimensions of educational systems, the five variables that we created for these dimensions, and the ways in which these are related. Now we turn to the question of the extent to which these indicators are related to central functions of education: allocating students to the labour market, sorting efficiently to maximise learning, offering equal opportunities, and socialising youngsters into society at large by stimulating active citizenship.

To study this we performed OLS (ordinary least squares) regressions and used the indicators we established for the three different dimensions as independent variables. We used multivariate regressions so that we were

Figure 4.1: Scatter plot of tracking, vocational enrolment, and vocational specificity

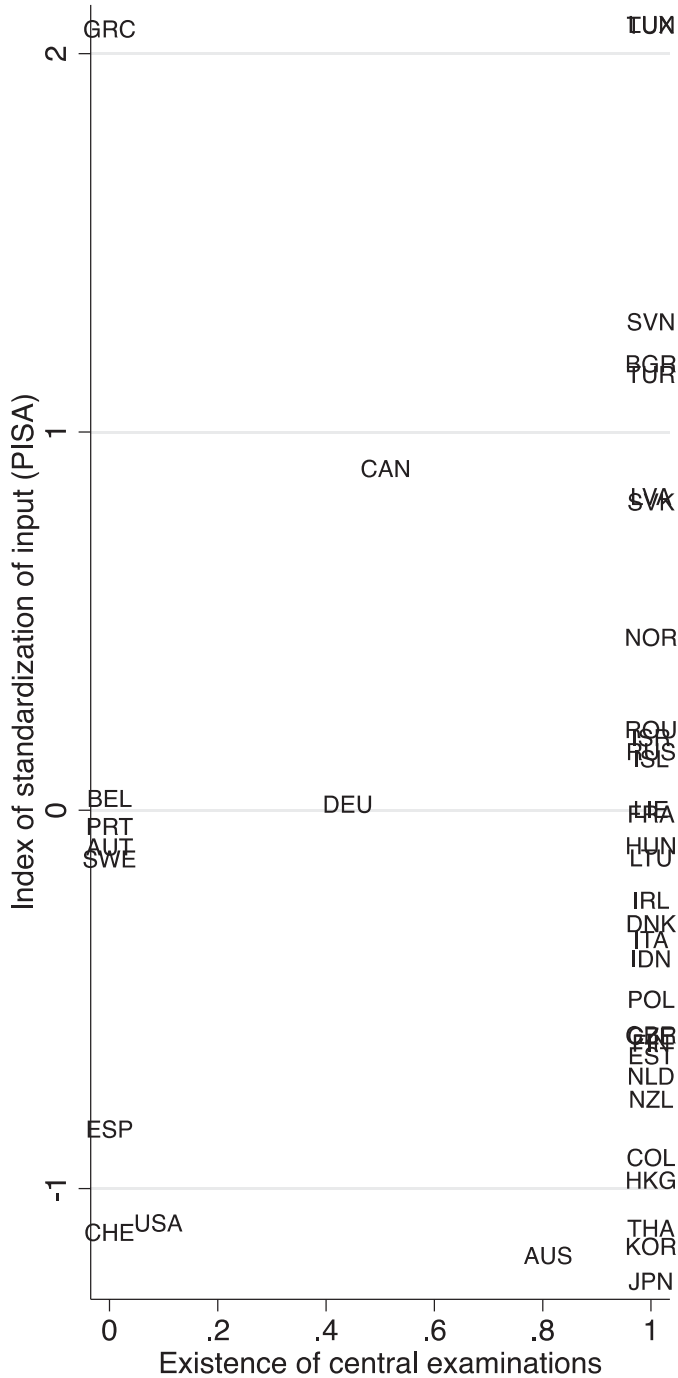


able to estimate effects of educational systems, net of other country-level factors. It is important to note that our analyses were carried out using country-level information only, and therefore are not suitable as the basis for strong individual-level claims; however, the analyses mainly aimed to test the validity of our indicators, and to provide a broad picture of the relationship between the institutional variables and central outcomes of education systems. Although we report the significance of the OLS results, we do not attach much value to them in this design.

To measure the allocation function of education we use two variables (see Bol and van de Werfhorst, 2013). First, we focused on the level of youth unemployment as a ratio of adult unemployment. The youth unemployment ratio was derived from the UNESCO online database and is based on data from the year 2002. The second variable we used was the average duration of the school-to-work transition, as measured by the OECD in the Employment Outlook of 2008 (OECD, 2008b: 72). When educational systems function well according to labour market allocation, this should be shown by low youth unemployment and a short duration between leaving school and entering the labour market.

Skills optimisation, the second function of education, is measured by using the average score of a cognitive test. We used a country aggregate of data from the PISA 2009 study, a large country-comparative

Figure 4.2: Standardisation of input and of output in selected countries



performance survey. We used the aggregate country score on the PISA 2009 mathematics test. The results we present later are very similar to results using the score of the PISA 2009 science or reading test as dependent variables.

The third function of education, relating to equality of opportunities, was also measured with data from PISA 2009. On the basis of that survey we calculated the effect of social origin on performance. The indicator used takes the difference between the average performance of the mathematics tests of children who grew up in a high social class environment (top decile) and the average performance on the mathematics test of children who grew up in a low social class environment (bottom decile). A higher score on this indicator means a larger class-based gap in the score on the mathematics test (see Bol and van de Werfhorst, 2013).

The final function of education, related to preparing youth for active civic engagement, is measured by the level of participation in voluntary organisations other than a religious, sports, leisure, political organisation or a trade union. We used the data of the International Social Survey Programme (ISSP) of 2004, where a special section was dedicated to citizenship. We aggregated individual scores of the dummy variable (participation = 1) at the country level.

All results were controlled for the percentage of GDP (gross domestic product) per capita that is spent on each student in secondary education (World Bank Data)[6] to make sure that we were not measuring an effect of resources instead. The results for the two dependent variables associated with labour market allocation (youth unemployment ratio and length of school-to-work transition) were also controlled for the strictness of employment protection, since this is well known to affect the transition from school to work (for example, Nickell, 1997).

Results

The labour market allocation function of education, assessed by the youth to adult unemployment rate and the length of the school-to-work transition, is related to the educational institutional variables in Table 4.2.

In Model 1 we see that four indicators are significantly related to the youth/adult unemployment ratio. Tracking and vocational specificity decrease the extent to which youth are unemployed, whereas the standardisation of input and vocational prevalence are positively related to youth unemployment. When we control our findings for government spending on education and the strictness of employment

Table 4.2: Relationships between educational system and labour market outcomes

	Youth unemployment ratio		School-to-work transition (years)	
	(1)	(2)	(3)	(4)
Tracking	-0.28*	-0.17	0.13	0.09
	(0.11)	(0.14)	(0.19)	(0.26)
Vocational prevalence	0.38**	0.31	-0.91*	-0.90*
	(0.12)	(0.15)	(0.30)	(0.33)
Vocational specificity	-0.02*	-0.02*	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Standardisation of input	0.14	0.15	-0.00	0.01
	(0.20)	(0.21)	(0.34)	(0.40)
Standardisation of output	0.22*	0.19	0.02	-0.06
	(0.10)	(0.12)	(0.19)	(0.25)
Government spending on education		0.07		-0.03
		(0.05)		(0.17)
Employment protection legislation		0.17		0.16
		(0.21)		(0.43)
Constant	2.60**	1.43	3.84**	3.78
	(0.19)	(0.88)	(0.35)	(2.58)
R2	0.56	0.60	0.63	0.64
Observations	27	26	17	17

Note
Based on calculations with data from the online appendix.
† $p<0.10$, ** $p<0.05$, *** $p<0.01$

protection, two results remain. First, we find that in countries where the educational system provides students with highly job-specific skills in the form of a dual system, there are relatively fewer unemployed youngsters. Second, and more surprisingly, we find a negative effect from vocational prevalence. Only the dual system, and not just any form of vocational education, thus enhances the integration of youngsters into employment (see also Breen, 2005; Bol and van de Werfhorst, 2013). The results shown in Model 2 confirm Hypothesis 1b, but we do not find evidence for Hypothesis 1a with this dependent variable.

The results of the regression with the average length of school-to-work transition as the dependent variable, are shown in Models

Table 4.3: Relationships between educational system and inequality and civic engagement

	Average score on maths test		Class-based difference on maths test		Civic participation	
	(5)	(6)	(7)	(8)	(9)	(10)
Tracking	-3.99	0.95	15.30*	13.33†	-0.08**	-0.05†
	(5.37)	(6.40)	(5.73)	(7.25)	(0.02)	(0.02)
Vocational prevalence	2.22	0.15	-2.45	-1.22	0.01	0.01
	(6.23)	(6.25)	(6.64)	(7.07)	(0.03)	(0.02)
Vocational specificity	0.30	0.18	0.00	0.04	0.00*	0.00
	(0.34)	(0.36)	(0.36)	(0.41)	(0.00)	(0.00)
Standardisation of input	1.96	3.02	-0.45	-1.29	0.01	0.02
	(10.41)	(10.26)	(11.10)	(11.61)	(0.04)	(0.04)
Standardisation of output	-11.19**	-8.65	0.50	-0.67	0.04	0.04
	(5.19)	(5.25)	(5.53)	(5.94)	(0.03)	(0.03)
Government spending on education		1.61		-0.36		0.02†
		(2.39)		(2.70)		(0.01)
Constant	2.60**	1.43	3.84**	3.78	493.05**	476.28**
	(0.19)	(0.88)	(0.35)	(2.58)	(9.97)	(28.36)
R2	0.25	0.21	0.30	0.27	0.46	0.56
Observations	28	27	28	27	23	23

Note
Based on calculations with data from the online appendix.
† $p<0.10$, * $p<0.05$, ** $p<0.01$

3 and 4. Both indicators of vocational orientation have a negative association with the average time it takes to find a job, but only the effect of vocational prevalence is strong enough to be statistically different from zero. When an educational system is more vocationally oriented the time it takes to find a job is shorter, but this effect is particularly driven by the prevalence of vocational education rather than the specificity of the skills that are taught. When more students are enrolled in programmes where they acquire job-specific skills, the number of years before students enter their first job is lower. By using this dependent variable we confirm Hypothesis 1b, and find no evidence to substantiate Hypothesis 1a.

The second function of education is to optimise student skills, in order to enhance later productivity. There are several ideas about how

educational systems influence the performance of students. The most important characteristic of educational systems argued to affect student performance is standardisation. Table 4.3 shows the outcomes of the regression analysis.

With respect to skill optimisation, we only find significant coefficients of standardisation of input. When schools are more standardised, average performance is lower (Model 5). This is in line with our Hypothesis 2b, where we argue that a high level of standardisation of input decreases room for competition between schools. Our results confirm the findings by Woessmann (2003), although in Model 6 the effects disappear. The effect of central exams, the standardisation of output, is positive in both models, but does not reach statistical significance. Contrary to earlier findings we do not find support for Hypothesis 2a, which assumed a positive effect of standardisation of output on average performance.

The third function of education is to promote equality of opportunity between social classes. Models 7 and 8 shows the regression results of educational dimensions on the difference between PISA mathematics performances of higher and lower class children. The results show that tracking is positively associated with inequality of opportunity, although the effect size decreases when we add different control variables (Model 8). The difference in performance between students from a higher social class and students from a lower social class increases as educational systems are more differentiated (tracking). When students are separated into a greater number of different tracks (streams) at a younger age, social background determines to a large extent where they end up. Our Hypothesis 3 is thus confirmed: more tracking is associated with the stronger influence of socioeconomic class on science test scores.

The final function of education is to prepare students for active civic engagement. We hypothesised that tracked educational systems in particular may be harmful in this regard, as they increase the separation of students on the basis of social background. The results, using participation in voluntary associations as the dependent variable, are shown in Models 9 and 10 of Table 4.3. As expected we find a negative association between tracking and the average participation in voluntary associations, although the effect decreases when adding the two control variables, indicating that civic participation is also associated with other country-level factors. The more tracked an educational system, the less likely people are to be 'active' citizens; we therefore find support for Hypothesis 4. For all other education variables the effects are very small and not significant. How an educational system

is organised, at least with regard to tracking, seems related to the socialisation function of education.

Conclusion

We set two goals for this chapter: (1) to conceptualise the different dimensions of an educational system, and (2) to see how these dimensions are related to four central functions of education. We argued that three dimensions can be distinguished in educational systems: the extent to which they are tracked, their vocational orientation and their level of standardisation. These three dimensions turned out to be distinguishable with different sources of macro-data which led to five institutional variables that are useable in future research. The five variables are created for a large number of countries.

We also showed that dimensions of educational systems are related to four central functions of education. Not all functions are performed equally well by each educational system. This means, for example, that school leavers in educational systems with a strong vocational orientation on average will be allocated to the labour market sooner, and that in more tracked educational systems the educational opportunities of lower class children are lower. We found a negative effect in the standardisation of input on the performance of students. More autonomous schools seem to enhance the performance of students. Our final results showed that the level of tracking within an educational system influences the civic behaviour of citizens: in countries with a differentiated educational system participation in voluntary associations is lower than in countries where educational programmes are not stratified.

These results should, however, be interpreted with caution: no micro-level mechanisms were empirically tested and the country-level regression results cannot provide evidence for such mechanisms. The results of this study do, however, show that several dimensions of educational systems are very important for extremely different functions of education. It is therefore important to measure educational systems correctly and with more universal and replicable measures, and only then can the studies of the importance of educational systems on differing outcomes be compared.

We hope the current study will inspire researchers to contribute to an emerging research agenda about institutional effects on student outcomes, in at least three directions. First, scholars should be explicit about the educational outcome(s) they find, and how these are associated with other central, perhaps conflicting, 'functions' of

schooling. Given the policy relevance of the findings of this literature, scientists can be explicit in describing trade-offs that policy makers face, if strengthening one function of education comes at the cost of another. Second, when using multi-level data, more can be done to trace the mechanisms that explain the patterns of association that are demonstrated. In the current chapter we cannot say much about causal effects, let alone the precise mechanisms of how individual behaviour responds to the institutional environment. Third, future researchers may want to take a dynamic, rather than static, view of institutional variations between countries. Many educational systems have changed in the past decade, regarding the institutional dimensions we propose. Early tracking has sometimes been replaced by comprehensive school systems, standardised tests seem to be emerging in many more contexts, and societies are adapting their vocational training systems. The implications of these policy changes are often unclear.

Notes

[1] In defining an educational programme we follow UNESCO: 'Educational programmes are defined on the basis of their educational content as an array or sequence of educational activities which are organized to accomplish a pre-determined objective or a specified set of educational tasks' (UNESCO, 2006: 11).

[2] All the specific references, the sources of the data we use and the detailed variables underlying our indicators are available at www.thijsbol.com.

[3] We accessed the online UNESCO database on 16 May 2012.

[4] Although in the original survey several answer options were possible (decided by principal, decided by school board and so on), we recoded the variables as 1 = decisions made at state or country level and 0 = decisions made at school level.

[5] See www.thijsbol.com for the online appendix.

[6] Data was accessed via data.worldbank.org (17 May 2012).

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FIVE

Sorting and (much) more: prior ability, school effects and the impact of ability tracking on educational inequalities in achievement

Hartmut Esser

The problem

There is hardly a country without educational inequalities based on social origin. The results of sociological research on inequality in general, international comparative studies, and some systematic comparisons between national studies, however, reveal clear differences (see *inter alia*, Kao and Thompson, 2003; Müller and Kogan, 2010: 252ff.; Hanushek and Wößmann, 2011). From the very beginning, the various hypotheses of the causes for cross-country differences have suggested the vital importance of *educational systems*, which differ considerably in terms of their institutional design both internationally and regionally. The core of the discussions on educational systems consists of a question concerning the specific effects of *differentiation* according to achievement ('ability tracking') as compared to *integration* with a largely common learning, possibly even up to the end of compulsory education.

Ability tracking is justified by the presumption that a homogenisation of learning environments in terms of performance and/or dispositions is advantageous – including for academically weaker pupils. The argument in opposition to such sorting is that less talented pupils could no longer benefit from the more favourable learning environment of an integrated school and would possibly perform worse due to an assignment to lower valued types of schools, entailing stigmatisation and negative self-perception. This will particularly apply if the differentiation is empirically also a matter of *stratification*: a vertical sorting, for example, into more academic general education in contrast to non-academic, specific or vocational education, varying in terms

of the curricula's demands and the qualifications and certificates, which are connected with different levels of prestige and career opportunities (see Allmendinger, 1989: 239ff.; Meier and Schütz, 2007: 5ff.; van de Werfhorst and Mijs, 2010: 409ff.; Betts, 2011: 343ff.). The empirical evidence seems to be clear: pupils apparently display *no* higher achievement in cases of differentiation, but the effect of social origin, and thus educational inequality, is reinforced when compared to integration without institutional sorting. It is therefore *not* appropriate to refer to a trade-off between social permeability and the level of achievement in cases of a differentiated educational system. All (recent) reviews of the state of research agree on this: 'it can be widely *taken for granted* that early tracking is furthermore associated with the generation of *more* educational inequality with particular disadvantage for *lower* class and *migrant* families' (Müller and Kogan, 2010: 227, emphasis added).

Right from the start there have nevertheless been doubts about these results of the what is called the *standard approach* and findings diverging from the standard result were also obtained: the results were not as clear as they seemed to be, they could not be interpreted as causal effects – despite all precautions to control for unobserved heterogeneity – and they even changed dramatically when other approaches were used and when other comparison times and conditions were considered, such as, in particular, abilities, education and achievement *prior* to the transition to secondary school or conditions for subsequent developments at school and on the labour market (see also the final section of this chapter; see also, with special regard to children from immigrant families, Esser, 2016a: chs 5 and 6). A particularly serious objection involves the basic design of the standard approach (for reviews see, *inter alia*, Hanushek and Wößmann, 2006; Meier and Schütz, 2007: 19ff., 24; Wößmann, 2009: 30ff.; Müller and Kogan, 2010: 225ff.; van der Werfhorst and Mijs, 2010: 417ff.; Alba et al, 2011: 401ff.; Betts, 2011: 367ff., 377; Hanushek and Wößmann, 2011: 31f.; Teltemann, 2015: 141ff.) In the analyses only *two* different levels are considered – the individual level of children and families on the one hand, and the level of countries or educational systems on the other hand. It would be necessary, however, to consider *schools* and *school classes* as separate levels, because they finally mediate the effects of the regulations of the educational systems, including first and foremost the desired homogenisation of the learning environments by ability tracking. Including the social composition of schools and school classes in the analysis indeed changes the results substantially (Dunne, 2010: 86ff; Dronkers et al, 2011: 24ff., Tables I and II, 2012: 23ff., Tables I and II;

Bol et al, 2014: 20ff.). In terms of differentiated educational systems there are clear effects in the *proportion* of children within schools and school classes with a higher social status, but simultaneously the effect of *individual* social origin *weakens*. Accordingly, and quite differently from what the standard results suggest, individual social permeability for better achievement is *higher* in terms of differentiation and early sorting, as compared to integration and a 'longer common learning'. Table 5.1 displays the main differences of the result of this *DVD approach*[1] in contrast to the standard result for two typical contributions of the different approaches (see the cells that are highlighted grey).

Table 5.1: Effects of school-composition by social origin on achievement in differentiated and integrated educational systems

	Standard approach	DVD approach
Social status	**31.2**	**22.1**
Proportion of higher status within school	...	**29.8**
Differentiation	1.1	**-20.9**
Differentiation · Social status	**1.6**	**-14.7**
Differentiation · Proportion of higher status within school	...	**46.6**

Notes: OLS-coefficients; standard approach according to Wößmann et al (2009: 106ff., Tab. 7.A2); DVD approach according to Dunne (2010: 94, Tab. 4.4); bold p > 0.01

The following contribution addresses two questions. *First*: is it important for the identification of effects of ability tracking to disentangle sorting- and school effects (as the DVD approach does) or do we already know enough without doing that (as the standard approach suggests)? *Second*: both approaches use data from the various PISA (Programme for International Student Assessment) studies, which have the (unique) advantage of allowing international comparisons of the effects of educational systems on achievement. PISA data, however, are missing any information on ability before the process of sorting (and/or achievement at the end of elementary school, marks and recommendations). This may have serious consequences for estimates of the effects of ability tracking, which would apply to all approaches up to now, which have used PISA data to estimate the effects of social origin on achievement in secondary school, including the standard *and* the DVD approach. To demonstrate the possible consequences of missing prior abilities and/or school effects for estimations of effects of ability tracking, this contribution starts, in the section below, with a theoretical model of the general causal mechanisms so as to explain

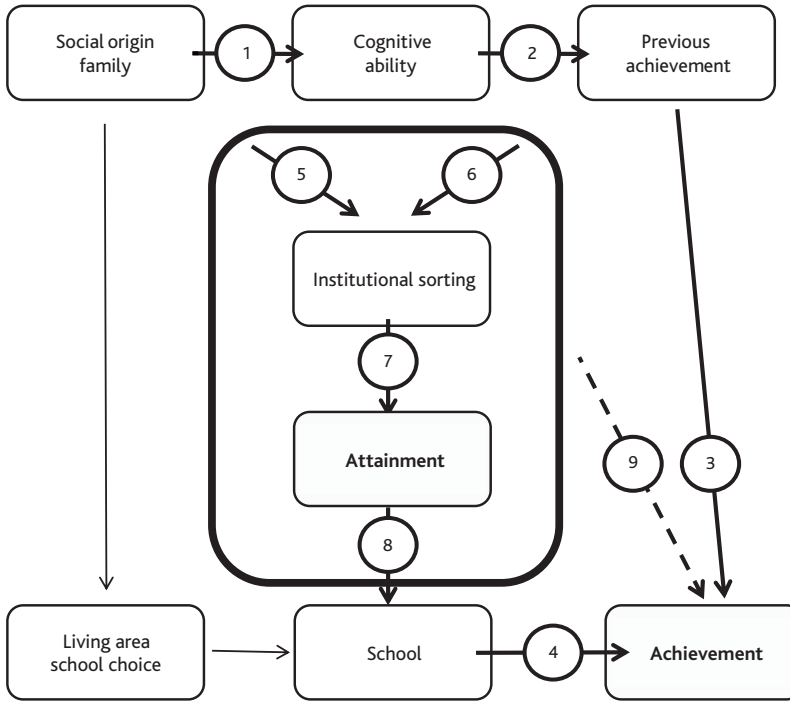
differences in scholastic achievement. It is the framework for identifying several typical pitfalls and caveats for the empirical detection of effects of ability tracking on attainment and achievement (the following section). Against this background, the standard approach and the DVD approach in particular are compared and evaluated in the next section. The final section summarises the results and compares them with other currently available empirical evidence for the clarification of hitherto open questions.

The Model of Ability Tracking

Educational systems are the regulations and organisational structure of a certain society's or region's educational institutions (see Gross et al, in this volume). Three specific elements are of vital importance (Allmendinger, 1989: 233ff.; Kerckhoff, 2001; van de Werfhorst and Mijs, 2010: 409ff.; Hanushek and Wößmann, 2011: ch. 4; Teltemann, 2015: chs 4.1 and 6.1). *First* is the institutionally intended *input*. This includes, in particular, the time that educational institutions require ('time on task') and institutionally regulated quantitative and qualitative investments (for example, financial expenditure, class sizes, the quality of schools and teacher qualifications). *Second* is the *differentiation* of educational tracks, as the division of educational tracks, in particular according to (prior) ability or prior achievement, or according to different educational contents as compared to integration without such a division. *Third* is the internal *organisation* of the educational institutions with regard to teaching, the evaluation of children's achievement by teachers and the external organisation with regard to parents and superior authorities. Educational systems are assumed to influence the level of educational attainment and achievement on the one hand ('efficiency'), and the social (and ethnic) inequalities in educational success on the other ('equity'), through different regulations and organisational structures. To understand why this should be the case it is necessary to relate the *specific* features of educational systems *systematically* to the *general* mechanisms so as to explain differences in the levels and in the effects of social (and ethnic) origin on attainment and achievement.

Figure 5.1 summarises such a general model. It is called the Model of Ability Tracking (MoAbiT; Esser, 2016a, 2016b). In essence it is about two issues: differences in educational *attainment* and the associated educational tracks, graduation and certificates on the one hand, and differences in the acquired skills and *achievement* according to social origin on the other hand, where attainment constitutes the essential

Figure 5.1: The Model of Ability Tracking



intervening process to mediate effects of social origin on achievement through differences between differentiated and integrated educational systems.

The early development of cognitive abilities within the *family* is the basis for *all* other processes (Path 1). Then follows the development of early school-related skills, possibly already at preschool, up to the end of primary school (Path 2). The most important individual conditions for achievement in (lower) secondary education (and subsequent education) are the *cognitive abilities* developed in family, preschool and elementary school, as well as *achievement before* sorting. The causal mechanism is the higher efficiency of learning for a given input for children with higher cognitive abilities and prior achievement (Path 3). The context of the *school* in (lower) secondary education, then, constitutes the institutional learning environment for the subsequent achievement. This always involves certain *school effects*, which are generally connected with differences in incentives and opportunities for learning in terms of the various characteristics of school and school classes (Path 4; see the following section and the final section on the various characteristics of schools and school classes).

Paths 1, 2 and 3, then, describe the influence of the family and the prior institutional impact on current achievement, and Path 4 depicts the current institutional impact. Together they constitute the *basic model* of explaining achievement and the influence of social origin in this process. In addition, other influences on children's achievement and school characteristics may be important. Examples are living environments, the assignment to school districts, and the parents' choice of place of residence and school.

The basic model contains no further characteristics of educational systems. It serves as a reference for all variations in educational systems. Implicitly, the model assumes an *integrated* educational system: there is *no* particular division of educational tracks through regulations of the educational system. In the case of *differentiation*, *institutional sorting* into different types of schools and educational tracks becomes particularly important.

This institutional sorting is, however, programmatically, but not always empirically based on prior achievement at primary school and the respective recommendations by the teaching staff. Depending on the specific rules of the educational system for differentiation, parents have the opportunity for an independent decision on the further educational track (Path 5), and, depending on the concrete organisation, the teaching staff can deviate from sorting strictly according to achievement. For example, they may have stereotyped expectations and efforts based on children's social origins with regard to their achievement, but, above all, with regard to the assessment of the achievement in the form of marks and recommendations (Path 6).

Accordingly, one can specify three different effects for the generation of differences in institutional sorting according to the children's social origin: the *primary effects* of generating differences in cognitive skills and school-related achievement in the family immediately prior to institutional sorting; *secondary effects* of parents' educational decisions, which may deviate from actual achievement and teacher recommendations; and *tertiary effects* of the stereotyped expectations of teachers with consequences for their efforts and evaluations in marks and recommendations according to the social origin of the children.[2] In respect of the effects of social origin, the institutional sorting, then, is the combined result of two different processes: *first*, the *development* of children's *achievement* until the end of elementary school resulting from early primary effects on the one hand (Path 1) and from subsequent additional institutional influences from pre- and elementary school on the other hand (Path 2); and, *second*, independent from that, *deviations* in the sorting process strictly according to prior achievement either due

to secondary effects of parental decisions (Path 5) or to tertiary effects of teachers' socially biased expectations, efforts and evaluations (Path 6).

Sorting *strictly* according to achievement is, therefore, more likely to occur in the case of weak primary, but especially of absent secondary and tertiary effects. In addition, the weights of the effects may vary according to the conditions and rules of the educational systems: via the *input*, which compensates for or reinforces primary effects, in case of *differentiation* via restricting or allowing parents' freedom of choice in terms of secondary effects, and in terms of tertiary effects, higher and lower selectivity according to the objective achievement as regards the *organisation* of schools.

The sorting process completed in this way then determines – almost logically – the differences in children's educational attainment (Path 7).

From this results, in turn – again almost logically – a different *composition* of *schools*, particularly with regard to achievement, but also through primary, secondary and tertiary effects with regard to pupils' social origin in case of differentiation as compared to integration (Path 8). External differentiation due to the educational system always generates institutionally different *types of schools*, such as the German *Hauptschule*, *Realschule* and *Gymnasium*, or schools with a rather academic or professional, or a rather general or specific orientation in their respective curricula. Other changes may accrue through institutional sorting, although these changes by no means occur logically, but empirically, and are at least partly institutionally intended. They may change a differentiation that was rather intended to be horizontal into a *stratification* of schools and educational tracks: more or less demanding curricula, differences in school equipment, quality and prestige, in the teachers' qualifications and efforts with regard to their lessons, as well as differences in their expectations and evaluations. These possible side-effects are, however, *not* necessarily tied to differentiation according to abilities and achievement. They have to be controlled statistically, if the aim is identifying the effects of (horizontal) differentiation of educational tracks with regard to achievement and to separate the specific effects of *ability* tracking from those of (vertical) stratification by social origin.

The processes of an institutional sorting according to achievement, which *differ* from the general basic model and from the integration, are summarised in Figure 5.1 in the bordered box.[3] More precisely, it represents what accounts for the effects of educational systems, particularly for the differentiation and institutional sorting, and what possibly modifies the relations compared to the basic model. The *total* effect of educational systems thus consists of an *indirect* effect of

institutional sorting (Paths 5 to 6) and (additional) school effects on the one hand, *and* a possibly remaining *direct* effect (Path 9) on the other hand. If one is interested in separating the effects of ability sorting from those of stratification, it will become necessary to disentangle the direct and the indirect effects and the separate influences of ability and social origin.

Five caveats

In this context, there are (at least) five problem areas, which give rise to caution in readily accepting certain results of empirical analyses regarding the effects of educational systems. This has to do with the especially challenging requirements for an adequate translation of the theoretical model into empirical assessments of the effects of educational systems.

(1) Analyses of educational systems often consider social origin as merely a condition in the sorting process and for school effects. A common reason for this is that, for example in PISA-based studies, necessary data on the prior development of abilities or the intellectual composition of the schools and school classes is not available. Without control of prior abilities and the composition of schools and school classes by (prior) abilities, however, the effects of social origin and of abilities are *statistically confounded*, and social origin functions in that case, perhaps, unwittingly, as a kind of proxy measure for ability – if only by primary effects of social origin on abilities and achievement in elementary schools, which exist in all educational systems. This results inevitably in an overestimation of the effect of social origin (individual and as school composition) as compared to that of achievement through differentiation. In this way, the expected positive effects of ability sorting may be attributed to an increase in social inequality through differentiation – although everything is possibly a (desired) consequence of the ability tracking. It is a case of omitted variable bias: an (extremely) relevant external condition is missing and all estimations may be distorted. The solution is very simple: one has to empirically measure and statistically control for social origin *and* abilities wherever they occur in the model: before sorting, during sorting and with regard to school effects. This information is not always available, however, or considered in analyses.

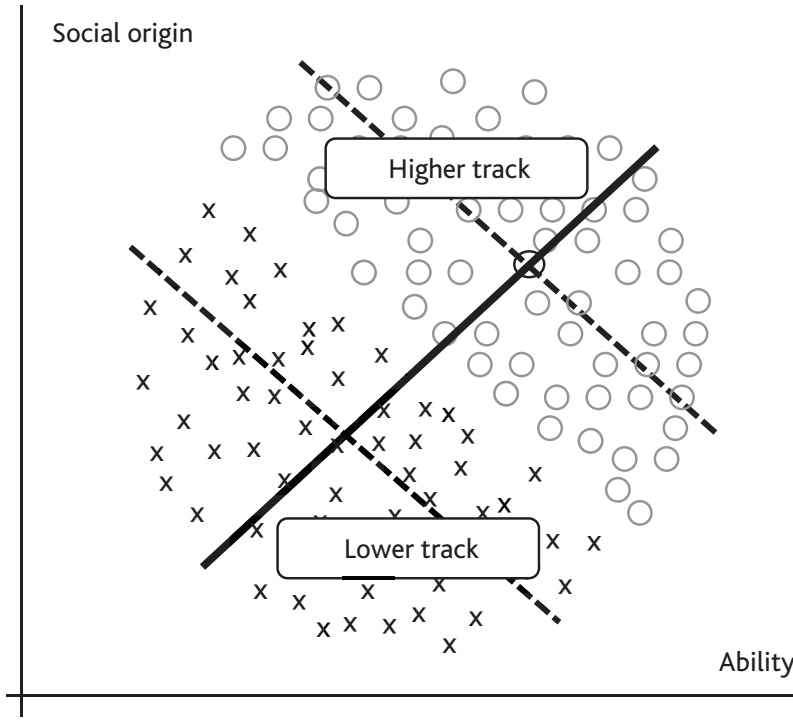
(2) As a result of primary, but particularly of secondary and tertiary effects, one can expect more or less strict sorting by ability within differentiated systems. Assignment to educational tracks according to abilities may thus be more or less *confounded* with social origin: a

'high ability school' (such as a gymnasium) does not really consist of the most talented children in this case (mainly from upper classes), and intelligent children (mainly from lower class families) are falsely sorted into 'low ability schools'. If the various school types also differ with respect to other properties, such as curricula, quality, qualification and the effort of teachers, differences by social origin may occur which are not the result of ability tracking, but of other influences favouring upper-class children. If secondary and tertiary effects are not controlled, especially, this will result – as described above for the omission of prior achievement – in an underestimation of the effects of prior achievement and in an overestimation of those of social origin. For identifying the *specific* effects of *ability* tracking one would, therefore, have to preferably control for all the conditions, which amplify or reduce the effects of social origin. For example, early preschool attendance reduces primary effects, the binding character of teacher recommendations in terms of parent decisions reduces secondary effects, and strict selectivity according to achievement by teachers reduces tertiary effects. Again, information on prior achievement, but preferably also on marks and recommendations, would be required to control for the possible secondary and tertiary effects of social origin, but also institutional features of the input for a given educational system, such as the institutionalised supply of high quality preschool education.

(3) The fact that social origin and achievement are possibly confounded with regard to the sorting process additionally generates a serious selectivity bias in estimating the effects of differentiation. If sorting according to achievement and social origin takes place simultaneously, stratified types of schools will emerge analytically. Figure 5.2 illustrates the point: the true covariation between social origin and prior abilities may be zero, but after sorting for *both* characteristics there is a (strong) negative relationship *within* the separated schools.

It is a case of the so-called *collider-problem*. This arises when *several* causes exist for *one* effect, and when one can (or did) not identify the causal relationships between these issues, for example, due to the fact that data for achievement during the sorting process was not available (Morgan and Winship, 2007: 67ff.; Morgan, 2012: 31ff.). The wrong inference about a negative relationship is a case of individualistic fallacy: the wrong conclusion from (co-)variances *within* school types on the total (co-)variance by ignoring the (co-)variances *between* school types. It is the main problem when analysing contextual effects in cases, where 'selective migration' or other kinds of sorting into the contextual units take place. The solution is again controlling the effects on sorting

Figure 5.2: Covariances between and within school types in cases of simultaneous sorting according to social origin and achievement[1]



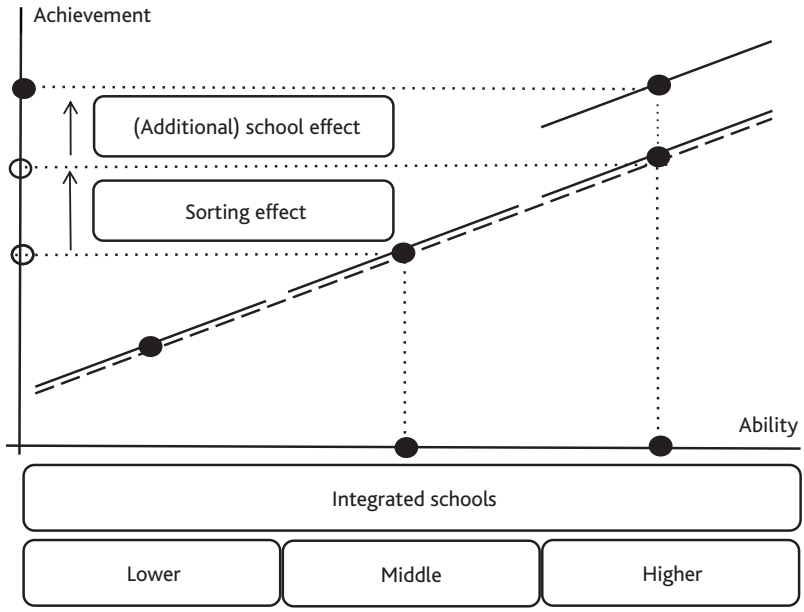
Note
* According to Morgan and Winship (2007: 67, Figure. 3.4).

(and subsequently on achievement) in terms of social origin *and* prior achievement.

(4) A frequently ignored problem in identifying specific *contextual effects* of differentiation according to achievement is that one *cannot* assume effects from the educational system due to sorting into different school types alone. Institutional sorting per se does not change pupil achievement or the influences of social origin, which also exist in integrated systems. In the first instance, sorting is nothing more than a subdivision of children who differ in their cognitive skills and prior achievement into separate school types, although the school types may have different labels (for example, *Hauptschule*, *Realschule*, *Gymnasium*). As illustrated for the collider-problem in Figure 5.2 already, sorting merely leads to a decomposition of the total (co-)variance into one division between school types and another within them. There have to be *additional* school effects on achievement in order to refer to the special effects of differentiation by institutionally sorting children of

different abilities and/or social origin into different schools or school classes. This is outlined in Figure 5.3.

Figure 5.3: Effects of educational systems: sorting and school effects

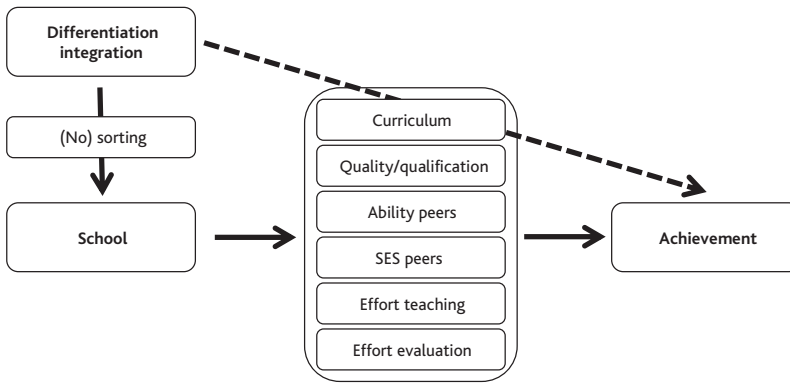


A positive effect of the school type on children's higher cognitive abilities is assumed in the illustration. This would correspond to the hypothesis of the justification of ability tracking, and is also to be expected on the basis of the theoretical model's assumptions: a learning environment that is homogenised in terms of achievement increases the efficiency of a given exposure that is determined by a curriculum. It should be noted that this effect has to occur empirically *in addition* to the school effects that are *also* expected in an integrated system in order to ascribe it to the educational system. Differences in the schools in terms of curricula, quality, prestige, intellectual and social composition, and corresponding school effects, occur in an integrated school system, too. This is why only internationally or regionally *comparative* studies of educational systems can answer the question of whether this is the case or not. The mere statement, for example in the national analyses of PISA data, that certain school effects occur, is *no* evidence for special effects of differentiation as compared to integration.

(5) In addition to the effects of homogenisation according to achievement, there may be *further* mechanisms of school effects. In order

to identify the specific effect of ability tracking it is therefore necessary to control for these effects as well. This is depicted in a simplified way in Figure 5.4 for the effect of differentiation on achievement through institutional sorting and five other possible school effects.

Figure 5.4: Variants and mechanisms of school effects



The six variants of school effects and their impact on achievement can be arranged according to the three aspects of the educational system (see the first section of this chapter): variations in the *input* through different curricula and equipment of schools, variations in learning environments through homogenising *differentiation* according to achievement and social origin, and variations in *organisation* that refer to the teacher's efforts in terms of their teaching and careful evaluations. As before, it is essential to statistically separate the effects of homogenisation according to achievement (highlighted in bold) from other effects in order to determine whether ability sorting has the intended positive effect or whether other characteristics of schools and school classes are confounded and create the misleading impression that differentiation by ability is more or less inherently confounded with the stratification of school environments.

Most empirical contributions which analyse specific effects of educational systems, and especially those referring to differentiation vs. integration, suffer from one or the other of these problems. We use the Model of Ability Tracking and the list of five caveats, to explain the awkward deviance between the standard result and the DVD puzzle as far as possible and in more detail, and to evaluate the merits and shortcomings of the respective approaches. We will see that a definitive answer, however, cannot be given, at least at the moment: there is no dataset available which allows consideration of all five relevant

constructs of the theoretical model in international comparisons: achievement, social origin, abilities before, ability sorting and schools resp. school classes. More than a preliminary impression can however be derived from more recent attempts, which tried to overcome, at least partially, the shortcomings mentioned.

Standard approach and DVD puzzle

According to the standard result, ability tracking does not yield better achievement, but results in a stronger impact of social origin on educational success as compared to integration. The standard approach makes no assumptions about the specific effects of the composition of schools and school classes, because it does not take this level into account. In the DVD puzzle, *unlike* the standard result, the effects of the social composition of schools are taken into account. By doing so, the differences in achievement according to *individual* social origin are found to be considerably *smaller* when the educational system is differentiated as compared to an integrated system, and clear effects are seen from the composition of schools and school classes in terms of social origin and an increase of variances at the bottom (and the top) (see on this point, the first section of this chapter).

The practical significance of this result becomes immediately apparent: children from lower strata would, much as in the standard result, benefit (considerably) from integration, because they would not lag behind as much in their achievement due to the reduction of variances and the avoidance of really 'bad schools' by integration. With a certain social *de*-segregation of schools and school classes, they could, however, obtain *better* achievement than in integrated schools and school classes (see the dotted horizontal line in Figure 5.5). An optimal solution for overcoming the disadvantages of children from lower social strata in marginalised 'bad schools' particularly, would therefore be *differentiation* according to achievement and a placement in (higher status) schools with their better learning conditions by quality and qualifications – if not to turn the 'bad' schools of low achievers into 'good' ones by investment in the quality of schools and the qualifications and motivation of teachers. This would at least help to decrease the often observed link between differentiation in achievement and stratification according to social origin in educational success.

For this reason, the different findings do not refer to an irrelevant detail, but to the core of the debate on educational systems. But is this result also conclusive? We will address seven possible questions and objections against the background of the theoretical specifications of the Model of

Ability Tracking and the methods used in the empirical analyses of both approaches.

(1) The differences between the standard result and the DVD puzzle have little to do with the fact that important conditions were not considered. Both approaches include the most important conditions of families and single countries, and aspects of educational systems that have something to do with input and school organisation are tested in the standard approach as well (see the first section of this chapter for the list of the most important contributions on this point), however, unlike the DVD approach, the standard approach does not consider the composition of schools any further, either according to achievement or to social origin.

(2) Following the Model of Ability Tracking, it is of vital importance to include the school level and to separately analyse the effects of the composition according to achievement and social origin, because each systematic effect of differentiation presupposes *additional* school effects, apart from the effects of institutional sorting (see the previous section and this section). In this respect, the standard approach *cannot* grasp a fundamental aspect of the causal mechanisms for possible system effects: peer effects through the composition of schools and school classes according to achievement and/or social origin.

(3) The standard result therefore merely describes the *total* causal effect of differentiation, which consists of the *indirect* effect of differentiation through sorting (via Paths 5 to 8 in Figure 5.1), the various school effects (Path 4 in Figure 5.1), and a possible *direct* (residual) effect (Path 9 in Figure 5.1). Admittedly, the results of the standard approach to this total causal effect of differentiation are *not* biased. This would only be the case if the omitted variable was *exogenous* to the other effects. School effects, however, relate to *endogenous* mechanisms of *mediation* between educational systems and achievement.

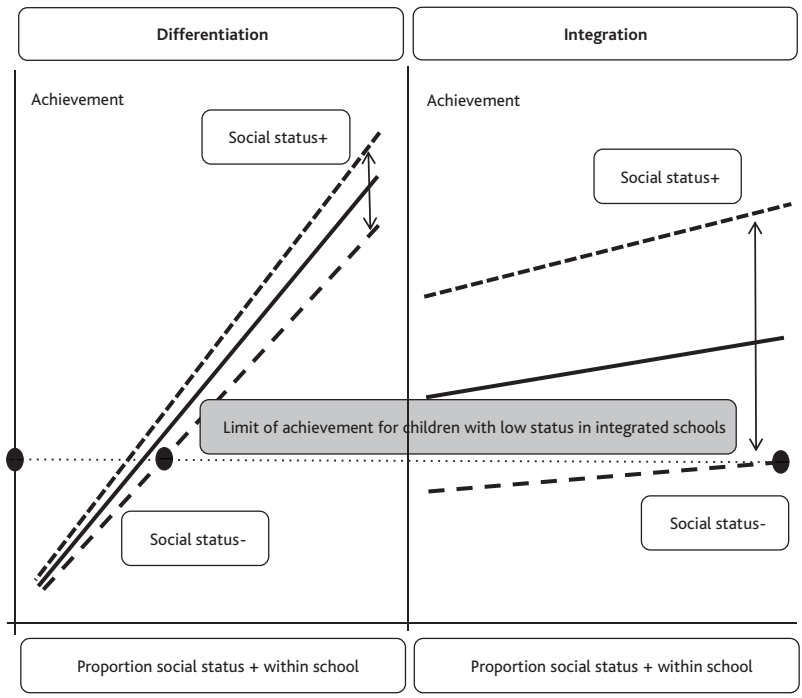
(4) The inclusion of the school level in the DVD approach is, therefore, anything but unnecessary. Only consideration of the school level reveals the processes within schools and school classes as important mediating mechanisms: quality and quantity of input, not least the possible positive effects of ability sorting, and a better organisation of schools. In addition, it is an area in which further interventions are most likely to be possible.

(5) By omitting the school level the standard approach assumes implicitly that additional school effects were always already present with institutional sorting. In this case a separate consideration of, for example, peer effects would result in a misleading *overcontrol* and, thus, the (unbiased) estimation of the total causal effect of differentiation would be the appropriate approach. One might well support this assumption, if there was only one *single* mechanism for the intervening school effects. This is, however,

certainly not the case (see previous two sections): the educational track's curriculum, school equipment and quality, teacher qualifications and efforts, composition according to achievement and social origin, all represent such mechanisms. There can certainly be no talk of overcontrol.

(6) An objection to the DVD approach is that its counterintuitive result of higher social permeability in the case of differentiation might be nothing more than an analytical consequence of institutional sorting (according to achievement) and the associated decomposition of (co-) variances lacking any underlying substantial processes (for example, the use of privileges and demonstration of superiority by children from upper social strata in socially integrated schools and school classes). This objection is obvious: sorting into different educational tracks necessarily involves the decomposition of the total (co-)variances into one part *between* school types and one *within* them with the *total* (co-)variance possibly remaining *unchanged* (see Figure 5.5). The decrease in the (co-)

Figure 5.5: Differential effects of social origin in cases of differentiation and integration according to the DVD approach



Note
Modified and complemented according to Dunne (2010: 92, Fig. 4.2, and 98, Fig. 4.5); lines refer to the top 25%, middle 50% and lowest 25% in individual social status of children for various proportions of children with high social status in schools for differentiation and integration of the educational system.

variances within the school types in the case of differentiation would be nothing more than the *analytical* consequence of considering the school levels *and* institutional sorting according to achievement. This does not necessarily mean that differentiation results in a higher social permeability, however. In order to prove *that*, the effects of sorting according to achievement *and* those according to social origin would have to be taken into account *simultaneously*.

(7) This applies similarly to another related objection: simultaneous sorting according to achievement and social origin causes a selectivity bias for estimating the correlation between social origin and achievement. The unexpected negative correlation between social origin and achievement in cases of differentiation may, therefore, again be nothing more than a mere analytical consequence of the underlying collider-problem (see Figure 5.2). The solution would be the same as before: closing the 'back door' in the causal relationship between social origin and prior achievement by estimating also the primary effects and development of academic skills prior to sorting.

A short conclusion

Against this background, both approaches and the different findings can be evaluated in a straightforward manner, even if not all the questions raised can actually be answered in view of the available results. First of all, it should be noted that the standard result must by no means be wrong or misleading, and that the DVD puzzle is by no means the only correct answer. Not all objections and questions can indeed be resolved conclusively, because the necessary analyses are (still) missing; however, it has also become clear that in order to evaluate the effects of differentiation according to prior ability it is absolutely necessary to include the composition of schools and school classes according to ability *and* social origin in the analyses. As is the case for the separation of sorting effects from school effects, it would also be necessary here to include prior ability (and/or prior achievement) in the analyses, otherwise there is a high risk that theoretically expected positive effects of *ability* tracking could be attributed erroneously as higher effects of social origin and a stronger social impermeability by ability tracking.

Unfortunately, these questions cannot be readily answered by the currently available contributions on the standard result and the DVD puzzle: analyses of both approaches are based on data from the PISA studies, which lack information on prior achievement. For this reason, even after long years of internationally comparative empirical educational research, the effects of educational systems – and here, in

particular, differentiation according to achievement – and, therefore, how they contribute to the explanation of educational inequalities, still cannot be definitely determined. Actual evidence from analyses that try to *include* prior achievement overall suggests that there were virtually no, or at best inconsistent, effects of ability tracking on achievement (in terms of the standard approach; see Brunello and Checchi, 2007: 833, 14; Waldinger, 2007; Horn, 2013: chs 6 and 7; Merry, 2013: 243ff.; in terms of the DVD approach see Dronkers, 2014: 9–10, 8; and in general Esser, 2016a: chs 5 and 6). This is already evident in contributions which refer to analyses that statistically control for the institutional conditions for more or less *strict* ability tracking: an earlier and more achievement-related input (via preparatory preschools), restrictions of parent choices, both a selectivity that is more strongly oriented towards children's objective achievement and the explicit inclusion of the composition according to achievement within schools: institutionalised limitations of primary, secondary and tertiary effect reduce effects of social origin not only considerably, but sometimes eliminate them completely or even reverse them (on attainment: Neugebauer, 2010; Dollmann, 2011; Gresch, 2012; on achievement: Marks, 2005; Korthals, 2012; Ditton, 2013; Verwiebe and Riederer, 2013; Bol et al, 2014; Dronkers, 2014; Dronkers and Korthals, in this volume). When abilities *before* sorting were also controlled, considerable (additional) positive effects of (strict) ability sorting are observed (Esser and Relikowski, 2015). According to the Model of Ability Tracking this is exactly what is to be expected.

Notes

[1] The acronym 'DVD' is composed of the initial letters of author's names of their respective contributions: Dronkers, van der Velden and Dunne.

[2] The denotation of these three effects follows and extends the well-known distinction between primary and secondary effects by Raymond Boudon, for explaining educational inequalities in terms of educational *attainment* and *sorting* (Boudon, 1974: ch. 2; for further background information and various types of this distinction see Jackson, 2013: 3ff.). Primary and secondary effects relate to the process of institutional sorting (according to achievement) through *the family's* influences. The extension to 'tertiary' effects refers to *additional* effects of the social origin on the sorting process via the context of *school*: Do *teachers'* attitudes vary according to children's social origin, possibly with consequences for children's achievement itself, but particularly for the evaluations in terms of marks and recommendations based on achievement?

[3] Paths 1 and 2 and 5 to 7 in Figure 5.2 correspond to the model by Erikson et al (2005: 9732, Fig. 2a) for explaining inequalities in educational *attainment*. They refer to social origin as 'class', to prior achievement as P, and to the transition to secondary school as G in case of differentiation. The model by Erikson et al does *not* consider subsequent *achievement* in secondary school (on this see Morgan, 2012: 19ff; Jackson, 2013: 18f., Fig. 1.2).

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SIX

Data analysis techniques to model the effects of education systems on educational inequalities

Christiane Gross

Introduction

Examining the impact of education systems on educational inequalities raises several methodological questions.[1] The first main question concerns the choice between two general research strategies: the comparative approach and the multi-level approach.

The *comparative approach* (CA) involves studies that consider only a few countries and compare both the characteristics of the education system and educational inequalities in the outcome dimension, such as competencies and educational credentials. This strategy allows for a detailed presentation and analysis of the education systems involved and is delineated in the next section.

The *multi-level approach* (MLA) involves studies that analyse data at multiple hierarchical levels: country, school, class and individual. Usually, the data analysed is provided in the form of large-scale surveys, such as the Programme for International Student Assessment (PISA) or the Programme for the International Assessment of Adult Competencies (PIAAC). These surveys include data from numerous countries, as multi-level analysis requires a certain number of macro-units. As a result, the analysis is restricted to those characteristics of education systems that are available for all countries involved – or at least most of them (see Bol and van de Werfhorst, this volume). Conducting multi-level analysis requires some further understanding of econometrics and raises some issues that are discussed in in the third section.

The first alternative under consideration (CA) allows us to provide an in-depth description of each education system, and the second alternative (MLA) serves as a strategy for determining significant

effects while using sketchy variables to describe education systems in a standardised manner.

Comparative approaches

The CA typically includes small-*N* studies or case studies, and medium-*N* studies that have been recently analysed by qualitative comparative analysis (QCA). Performing a comparative analysis with a few countries requires two main decisions: which countries should be included and which methods should be applied? These questions are deeply confounded as will be shown next. I will start with (a) classical comparative methods and modern conjunctions with small-*N*s or two-country-comparisons, move on to (b) QCA and medium-*N* studies, and show (c) a possible means of combining case studies with quantitative methodologies.

(a) Classical *comparative methods* are based on the work of Mill (2014 [1843]) who distinguishes the method of difference and the method of agreement. According to both methods, the decision of *which countries* to consider should be derived from causality arguments. According to the *method of difference* countries could be chosen that are similar in all other relevant aspects (whatever these may be), except the education system, so that the variance of the educational inequality in a country can be ascribed to the impact of the education system in a causal way by holding everything else constant (*ceteris paribus* condition). Clearly this is an ideal scenario that can only be approximated. Unobserved heterogeneity at country level or ignoring variance at school level may lead to falsely assuming a significant effect of the education system (or of its characteristics), or at least to an overestimation of these effects (see also Esser, this volume, on the danger of ignoring school-level variance). Table 6.1 illustrates the scenario of an ideal country choice within the method of difference with hypothetical data. Austria and France are both countries with conservative welfare state regimes, have a high wealth or GDP (gross domestic product) per capita, and medium income inequality. Where Austria has a highly stratified education system, the stratification of the French education system is low. As a result, the low educational inequality in France could be perfectly explained by the stratification of the education system, as the other possible determinants are being held constant by country choice. Again, the postulation of a causal effect is problematic as we have to consider unobserved heterogeneity (maybe a fifth independent variable such as schooling hours can explain the variance in the outcome).

Table 6.1: Hypothetical data structure for *method of difference*

Country	Wealth of the country	Welfare state regime	Income inequality	Stratification of education system	DV: Educational inequality
Austria	high	conservative	medium	high	high
France	high	conservative	medium	low	low

The *method of agreement* follows the logic that if two countries are completely different except in one independent variable, then one dependent variable thus implies a causal relationship between the independent and the dependent variable. As an example, we can again consider two countries – for example Brazil and France – which differ in many characteristics such as country's wealth, welfare state regime and income inequality, but both have a highly stratified education system and a high degree of educational inequality (see Table 6.2). Again, it can be assumed that a highly stratified education system is a cause of high educational inequality.

Table 6.2: Hypothetical data structure for *method of agreement*

Country	Wealth of the country	Welfare state regime	Income inequality	Stratification of education system	DV: Educational inequality
Brazil	low	no welfare state	high	high	high
France	high	conservative	medium	low	low

Both classical methods face similar critique, as they both try to detect a single cause for an outcome, which is rather unusual, as often multiple determinants affect an outcome (van der Heijden, 2014). A more modern extension of Mill's methods, *The Logic of Comparative Social Enquiry* by Przeworski and Teune (1970) is illustrated by van der Heijden (2014) in a very comprehensive way: Przeworski and Teune (1970) combine case- and variable-oriented strategies and focus on the within-variance of systems on different levels, such as organisation or individual, and create the most-similar-system design and the most-different-system design. Levi-Faur (2004) suggests combining Mill's methods and the two-system designs by Przeworski and Teune (1970) to generate four types of inferential techniques. The question of which countries to select could also be solved in a pragmatic manner: to include those countries for which detailed, valid and comparable data about education systems are available. Of course this strategy is a

second-best option, but valid and comparable data is mandatory for a proper analysis.

(b) The strength of *QCA* relates especially to medium-*N* studies. QCA is perfectly compatible with quantitative data, especially with data at country level, and samples of 10–50 cases (see Gross, Gottburgsen and Phoenix, this volume, for a short introduction to QCA logic). The method developed by Charles Ragin (1987) is based on Boolean algebra and set theory, and aims to detect necessary and sufficient conditions for outcome events. The advantage of QCA over conventional quantitative methods is that it discusses limited empirical diversity,[2] allows for equifinality[3] and is able to explain outcomes in an asymmetric manner.[4]

(c) Estimating conventional models for each country (see Table 6.3) is one possibility for combining case analysis with inference statistics. In this hypothetical case linear regressions have been estimated for each country, but the question is, are the effects of a father's and mother's years of education actually smaller in France than in Austria and Germany? The Chow Test, developed by Gregory Chow (1960), can give an answer. It tests the null hypothesis that coefficients are equal in linear regressions, meaning that they do not differ significantly (see Allison, 1999; Breen et al, 2013, for nonlinear models).

Another (very similar) strategy is to estimate one model with a sample including all three countries with k–1 dummy variables for countries (with k being the number of subsamples/countries) and interaction effects for interesting covariates such as parental education and country dummy variables (such as 'years of father's education × France').[5] The last approach would be basically equal to a multi-level

Table 6.3: Hypothetical conventional regresson models for each country*

DV: Educational attainment	Austria coeff. (p-value)	France coeff. (p-value)	Germany coeff. (p-value)
Constant	0.25 (0.98)	0.35 (0.70)	0.30 (0.86)
Gender	0.00 (0.99)	0.01 (0.89)	-0.01 (0.98)
Years of education (father)	0.25* (0.02)	0.23 (0.06)	0.26* (0.05)
Years of education (mother)	0.42** (0.00)	0.22* (0.02)	0.45** (0.00)
R^2	0.21	0.15	0.22
N	2000	2000	2000

model with fixed slopes and a random intercept for between-country variance (see Figure 6.1, left side in the next section).

In general, studies using the CA are as good as the theory upon which they are based. Choosing different countries or introducing different covariates may easily show how robust the results actually are. Both causal interpretation and representativeness of the results are at least problematic. In other words, the researcher must consider the trade-off between high internal validity with an in-depth-knowledge of a few cases, and low external validity, in drawing conclusions for all/many countries by generalising results and vice versa (van der Heijden, 2014).

Multi-level approach

If the criterion of external validity and drawing general conclusions with regard to the impact of education systems on inequalities is emphasised, the MLA is more appropriate. Luke (2004: 17ff.) postulates three possible reasons for using multi-level models (MLMs) instead of conventional linear regression models: theoretical, empirical and statistical arguments. These three reasons will be exemplified by educational research:

Data usually shows a nested data structure in education research: for example students (level 1) are nested within classes (level 2) that are nested within schools (level 3), that are nested within countries (level 4).[6] An additional level for time per student/respondent is needed at level 1 (with students at level 2 and so on) for panel data. When a research question includes testing the impact of variables on a higher level (context variables), MLMs need to be applied for *theoretical* reasons, which are most important (Luke, 2004: 22). If a great deal of the variance of the outcome variable is explained by group membership on a higher level (indicated by a high intra-class correlation) – as in most education studies – this is the *empirical* argument to use MLMs. The violation of the basic assumption of the independence of cases in clustered data such as PISA is a major *statistical* reason[7] to use MLMs. Ignoring this clustering would lead to a higher probability of assuming a significant effect where there is none – meaning committing a Type I error (Thomas and Heck, 2001).

Gross, Gottburgsen, and Phoenix (this volume) give a short introduction to the basic principles of MLMs and how they can be applied to study the effects of education systems on educational inequalities. The following sections address researchers who have a basic understanding of MLMs and face the following questions when applying them.

The section on MLA begins with two issues of data management: why, when and how to centre variables and how to tackle missing data (covered in the first two subsections). As a second step, issues in the model strategy, such as the decision about whether to use fixed or random slopes and how to perform regression diagnostics in MLMs (the third and fourth subsections), are presented. The contribution concludes with issues in interpreting results, with a discussion concerning the decision between adopting robust versus conventional standard errors and the question of how to interpret interaction terms and cross-level effects (the fifth and sixth subsections).

Why, when and how to centre variables

Centring variables is a data management procedure where the mean is subtracted from a variable so that the (new) variable shows deviation scores. Subtracting the global mean is called 'grand-mean centring', whereas using the group-mean is called 'group-mean centring' or 'context centring'. Centring variables is often seen as a harmless procedure but it has remarkable consequences (Bickel, 2007: 134) especially in MLMs (Paccagnella, 2006).

In a linear regression without any interaction terms, squared/cubed variables, and without nested data, centring affects only the intercept, as the intercept equals the dependent variable with all covariates being zero (that is, being on average). In regression models with interaction terms, grand-mean centring can be applied to avoid multicollinearity[8] between squared/cubed covariates or interaction terms and variables used to create them (Preacher, 2003; Bickel, 2007: 134). This holds also for MLMs with interaction and cross-level effects (Bickel, 2007: 137; Paccagnella, 2006). An additional reason to work with grand-mean centred variables in MLMs is that adverse effects resulting from a strong correlation of random intercepts and random slopes can be avoided (Kreft and Leeuw, 1998; Wooldridge, 2013). When applying MLA all independent variables should be centred (Bickel, 2007: 135f.). Whether to use grand-mean centring or group-mean centring is a theoretical decision (Kreft et al, 1995; Luke, 2004: 52; Wu and Wooldridge, 2005; Enders and Tofighi, 2007). Grand-mean centring is the best choice if the impact of level-two covariates, such as the impact of standardisation on student educational attainment, is the research focus (Enders and Tofighi, 2007), but it can affect falsely significant cross-level effects (Hofmann and Gavin, 1998). Group-mean centring can be useful when the distinction between within-group and between-group regressions is of interest (often the case for growth

curve models based on longitudinal data), if the so-called 'frog pond effect' is of interest (Luke, 2004: 52; Hox, 2010: 68), which focuses on an individual's deviation from a group, or if the unbiased impact of a level-one covariate is the main interest (Enders and Tofighi, 2007). Please note that in random coefficient models centring of Level 1 predictors also affects the interpretation of Level 2 predictors and the variance of the random intercept, and not just the interpretation of the coefficient of the transformed variable (Luke, 2004: 49; Wu and Wooldridge, 2005; Enders and Tofighi, 2007).

Centring knowledge and advice can be summed up as follows:

a. When using MLMs centre all predictor variables (Bickel, 2007: 140). Binary and categorical variables can be centred as well – especially those without a meaningful zero-point (Luke, 2004: 52).
b. Although there are statistical reasons for centring, the decision about a centring method should be based on theoretical arguments and the main research question (Kref et al, 1995; Luke, 2004: 52; Wu and Wooldridge, 2005; Enders and Tofighi, 2007).
c. Choose the centring method based on the research question and on how the results are to be interpreted. If you do not have special arguments for a centring method, use grand-mean centring (suggested by Snijders and Bosker, 2003; Luke, 2004; Bickel, 2007: 140; Hox, 2010).
d. The choice between group-mean and grand-mean centring depends on which effects are the main interest. With a focus on Level 1 predictors and cross-level effects, group-mean centring seems to be more useful, whereas grand-mean centring is beneficial with a focus on Level 2 predictors, or those on higher levels (Enders and Tofighi, 2007).
e. The interpretation of the intercept depends on the centring method. Grand-mean and group-mean centring will generate similar values for the fixed part of the intercept, while using raw scores (uncentred variables) leads to a completely different value (Bickel, 2007: 140).
f. Using grand-mean centring or raw scores will produce the same fixed part of a Level 1 random slope, and using group-mean centring will produce a different value. No matter which of the three strategies is applied, a Level 1 random slope can be interpreted in the same way (Bickel, 2007: 140).

g. Both centring methods help to reduce the intercept-by-slope covariance and thus help to control disturbing correlations between random components (Bickel, 2007: 140).

How to tackle missing data

Two types of missing data can be distinguished: unit and item non-response. Typically unit non-response is managed with weighting strategies whereas item non-response is mostly tackled by multiple imputation (Spiess, 2008: 77). Weighting may be conducted either to compensate for unit non-response or for disproportional sampling strategies.

Completely randomly missing units only decrease statistical power, whereas non-randomly missing units should be treated with more care. If the missing mechanism is known, for instance with disproportional samples, weighting can be conducted, with the weight compensating for the missing probability. One example would be to oversample students with migration backgrounds in order to have enough statistical power for estimations with these subsamples or to oversample groups that are known for lower participation probability in order to reach a representative sample. Using weights is especially necessary to describe a sample or subsample. Different weights are provided when using multi-level data in education research, such as PISA data, to compensate for missing data on different levels such as at school or student level. For MLMs, usually no weighting is used when units are missing (completely) at random.

In general three patterns of missing data can be distinguished (Rubin, 1976; Schafer and Graham, 2002):

- *Missing completely at random (MCAR)*: The missing data is a random sample of the whole data. The missingness probability does not depend on observed or unobserved data.
- *Missing at random (MAR)*: The missingness probability does not depend on unobserved data. The MAR assumption (and MCAR as a special case of MAR) is rather keen and only plausible in cases with 'planned missingness' (Schafer and Graham, 2002).
- *Missing not a random (MNAR)*: The missingness probability depends on unobserved data.

Data that is MCAR is generally uncomplicated to treat. Standard solutions such as 'case deletion' (also known as 'listwise deletion' and 'complete case analysis') reduce power, but do not bias results.

Nevertheless, with MLMs the power-loss argument becomes even more important, as one missing value in a covariate on group level may affect the loss of thousands of cases on Level 1 with standard procedures. Even with MCAR data one should think about strategies so as to use all the known data by imputing missing data. A test of whether multivariate data is MCAR is provided by Little (1988) and is implemented in Stata.

Data that is MAR cannot be analysed by standard procedures but imputation techniques can be applied. The most appropriate method is multiple imputation, as originally proposed by Rubin (1978). The idea of multiple imputations is that for each missing value (within independent variables or the dependent variable) a point estimator is calculated and a distribution (usually a normal distribution)[9] is assumed based on an imputation model. From this distribution a number of k plausible estimates are randomly drawn. Usually the number of estimates k is between 5 and 10 (Peugh and Enders, 2004), but with increasing computer power multiple imputations with even larger ks can be observed. The higher the number of imputations k, and the lower the share of missing data λ, the higher the efficiency of the estimate with $(1 + \lambda/k)^{-1}$ compared to an estimate with an infinite number of k (Rubin, 1987; Schafer and Graham, 2002). As a rule of thumb, to determine k, Royston (2004: 239) suggests selecting k 'to be large enough such that the CV [coefficient of variation, 100 * standard deviation divided by mean] of the confidence coefficient for the worst-case parameter is < 5%'. While the 'worst-case parameter' is usually the variable with the highest share of missing values, control variables do not have to be considered, as a correct confidence interval is not the main interest (Royston, 2004).

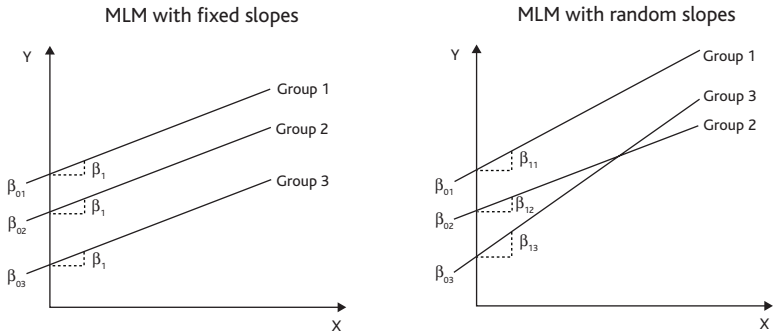
The higher the share of missing values the greater the need for missing data strategies such as multiple imputations. Using (multiple) imputations seems strange for a very high share of missing data, but it is the lesser evil compared to the damage done by complete case analysis. If multiple imputation is used correctly and the data is MAR, the resulting estimates are consistent and asymptotically normal and efficient (Allison, 2002: 27). There is no known proper method to tackle the issue of data that is MNAR.

Whether to impute missing data within the dependent variable is a controversial issue. Von Hippel (2007) has shown that using the dependent variable for the imputation model and excluding all cases from the analyses with missing values within the dependent variable seems to be the best approach.

When to use random slopes versus fixed slopes

While specifying MLMs researchers have to decide whether to use random or fixed slopes. MLMs with fixed slopes (random intercept models; see Figure 6.1, left side) include a constant slope for all groups while the intercept varies by group following the logic of an analysis of variance (ANOVA). Random coefficient models (random intercept and random slope; see Figure 6.1, right side) allows the slope to vary by group.

Figure 6.1: MLMs with fixed slopes and random slopes



The decision of *which model* to use can be determined through both statistical and theoretical arguments.

Snijders and Bosker (2003: 43f.) suggest using *fixed slopes*, if:

- the groups can be understood as 'unique entities' for which evidence should be presented
- the number of groups is small (<10) – as a first rule of thumb

and *random effects*, if:

- the groups can be seen as a sample of a population for which conclusions should be drawn
- covariates on group level should be tested (as fixed effects already explain the whole variance)
- the random coefficients are normally distributed and
- the number of groups is large (>10), while the number of cases per group is small (<100) – as a first rule of thumb.

In educational research we usually work with large-scale surveys which include a high number of groups even at country level (>10), and research goals draw conclusions for the whole population. In this case, it seems appropriate to opt for the random effects approach.

Random coefficient models are getting quite complicated, with an increasing number of random slopes: with k random slopes (and one random intercept) one has to estimate (k+2)(k+1)/2+1 parameters in the random part (Rabe-Hesketh and Skrondal, 2008: 171). As the models in education research are often challenging due to large datasets with a nested data structure and multiple imputed data on each level, I suggest the more parsimonious solution recommended by Snijders (2005). It is a combination of these two approaches and suggests the use of random slopes only for the coefficients of main interest. Control variables or covariates of minor concern are modelled with fixed slopes.

How to apply regression diagnostics in MLMs

Model mis-specification involves two major fallacies: false conclusions about the relationships between covariates and outcome variable, and false hypothesis testing (falsely rejecting or confirming). It is therefore advisable to make an effort to test the model assumptions. Assumptions in MLMs include the linear dependence of the outcome variable on the covariates and random effects; constant variance of the residuals among all values of X (homoscedasticity); residuals being normally distributed, and the right specification of the covariates with random slopes. From these assumptions, Snijders and Bosker (2003: 120f.) create the following checklist:

- Do the fixed and the random parts include the right covariates?
- Are the residuals on Level 1 normally distributed?
- Are the random coefficients on Level 2 (and higher levels) normally distributed?
- Do the residuals on Level 1 have a constant variance?
- Do the random coefficients on Level 2 (and higher levels) have a constant covariance matrix?

Regarding the right specification of the fixed part, the question of the right covariates is often difficult, as we know from linear regression models. In addition, in MLMs 'one should be aware in any case of the possibility that supposed level-one effects are in reality, completely or partially, higher level effects of aggregated variables' (Snijders and Bosker, 2003: 124).

Luke (2004: 37f.) suggests examining two main model assumptions that are empirically testable. First, the Level 1 residuals should be independent and normally distributed with mean zero. Second, random effects should also follow a normal distribution with mean zero and should be independent across Level 2 units. Both assumptions are easily testable by considering the Level 1 and Level 2 residuals. For the examination of the Level 1 residuals, Luke (2004: 38) recommends boxplots of the Level 1 residuals for each Level 2 unit, as a diagnostic tool. This way the mean of zero and the constant variance over Level 2 units can be compared easily. In addition, scatter plots of standardised residuals against fitted values serve to detect heteroscedasticity.[10] For a sound test of the normal distribution of the Level 1 residuals QQ-plots can be used (quantile-quantile plots, Cleveland, 1993). QQ-plots and scatterplots are suitable for testing the second assumption concerning the attributes of the random effects (Luke, 2004: 39f.).

Adopting robust versus conventional standard errors

Whether to use robust or conventional standard errors seems to be the wrong question – or at least the second question one should ask. In the first place, the question should be 'Is there a great difference between robust and conventional standard errors in the model?' If the difference between them is small, the model assumption of homoscedasticity is met and actually it matters little which standard errors and significance values should be considered. Empirical results where the difference between robust and conventional standard errors is high should ring alarm bells (Angrist and Pischke, 2009: 307) as this is a sign of heteroscedasticity. Heteroscedasticity may stem from the outcome variable not being normally distributed, from outliers or a wrong specification of the model. With a great difference between robust and conventional standard errors, the first step should be to check the following issues:

- Is the outcome variable normally distributed? If not, does it make sense to transform it?
- Does the model contain outliers? Do the outliers have something in common? Can we 'explain' those outliers by including additional variables or can we exclude them with a theoretical reason?
- Is the model specification correct? Are all necessary variables included? Is there a linear association between covariates and outcome variable or do we have to include transformed variables

such as quadratic terms to model u-shaped or inverse u-shaped associations?

If heteroscedasticity cannot be accounted for by one of these strategies, the conventional standard errors are too small and the likelihood of falsely rejecting the null hypothesis is high (that is, assuming a significant effect in the population where there is none). Nevertheless, the estimators are still consistent and asymptotically unbiased (Hox, 2010: 260f.).

If this advice does not help to reduce the difference between robust and conventional standard errors, researchers should use a method to correct the standard errors and use the sandwich estimator by Huber (1967) and White (1982) as one possible solution to generate robust standard errors. Inference is thus less dependent on the normality assumption with the cost of losing statistical power (Hox, 2010: 261), but using robust standard errors per se is no panacea, as they are sometimes accidentally too small (see Angrist and Pischke, 2009: 293–325 for details).

In summary, using conventional standard errors is best in case of homoscedasticity. Robust standard errors should be used when heteroscedasticity cannot be accounted for by satisfying model assumptions otherwise.

How to interpret interaction effects and cross-level effects

The main question of 'how education systems shape educational inequalities' should be modelled as an interaction between attributes at system level (such as stratification, tracking and so on) and attributes at individual level (such as gender, social origin, migration background and so on). The interpretation of these cross-level effects is prone to failure. I will give some suggestions on how to interpret these effects correctly.

Apart from the complexity of multivariate models with numerous interaction terms, researchers should take care over the correct interpretation of interaction terms, which is far from trivial. With two independent variables there are three different scenarios, depending on the measurement scale of these variables, that may occur: (a) two dichotomous variables, (b) two continuous variables and (c) one dichotomous and one continuous variable:

(a) Dichotomous variables should be coded 0 or 1 for raw scores (or grand-mean or group-mean centred, see the subsection 'Why,

when and how to centre variables', pp 122-3). By multiplying two variables with the possible values of 0 and 1, only the combination of both variables being 1 equals 1 as a result. If we take the two variables gender (X_1 with 0 = boys and 1 = girls) and class (X_2 with 0 = working class and 1 = upper class) the coefficient β_{X1X2} of the interaction term X_1X_2 would measure the additional benefit of upper-class girls against all three remaining groups (working-class girls, upper-class boys and working-class boys). If the benefit of upper-class girls is not key, but the penalty of working-class boys is, one may change the coding for gender X_1 (with 0 = girls and 1 = boys) and class X_2 (with 0 = upper class and 1 = working class) to more easily interpret the interaction term. Please remember that the coefficient of the interaction term demonstrates the effect in addition to the main effects. To compute an average test score for upper-class girls, for example, both the coefficients of the main effects and the interaction effect have to be added to the constant α.

(b) In the case of two continuous variables, coding is not an issue for the definition of the interaction term, but for the interpretation of the direction and size of the coefficient. By multiplying two independent variables X_aX_b the result is the simplest functional form of an interaction between two continuous variables, which is called a bilinear interaction. It indicates that the effect of an independent variable X_a on a dependent variable Y changes with the size of the second independent variable X_b, or vice versa (Jaccard and Turrisi, 2003: 21; Mitchell, 2012: 127). For instance the effect of years of schooling on income may vary with age.

(c) An interaction between a dichotomous and a continuous variable describes a scenario where an additional effect of a continuous variable on an outcome variable concerns only one group, or one group more than the other. For example the job prestige of a student's mother as continuous variable only has an effect for girls on their future job prestige and does not affect the job prestige of boys.

Usually interaction terms are best illustrated by figures. Figure 6.2 gives an impression of how interaction terms may be interpreted in these three cases.

Cross-level effects can reveal whether effects on lower levels are mediated by social context; for instance if the gender effect on educational outcomes varies by characteristics of the education system. The interpretation of cross-level effects can also be illustrated using figures.

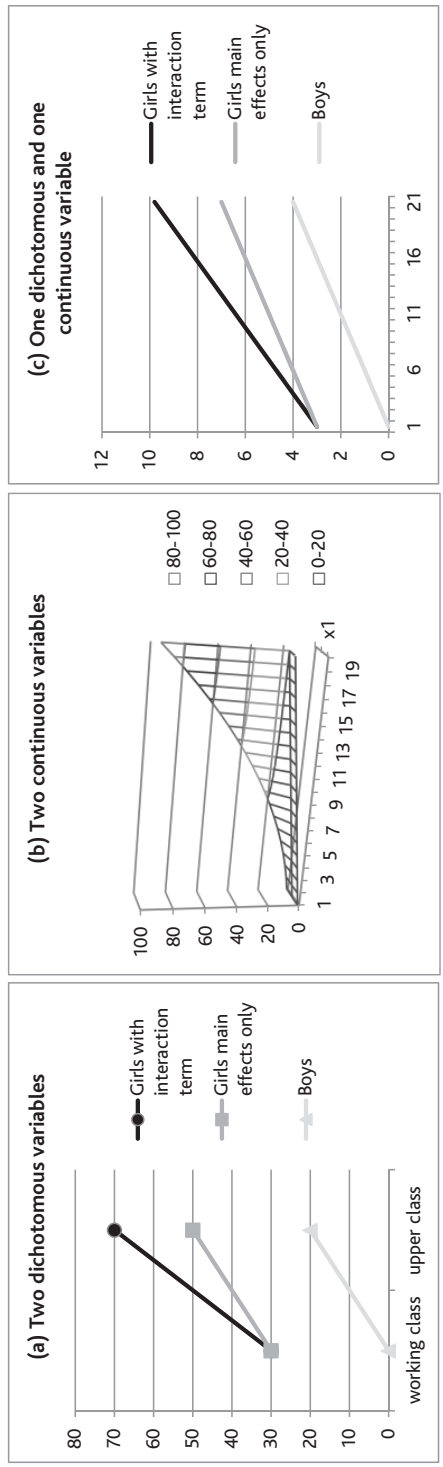


Figure 6.2: Interpretation of interaction effects depending on measurement scale

Conclusions

This contribution provides some methodological guidelines for the comparative analysis of the effects of education system characteristics on educational inequalities. Suggestions for the application of the comparative approach and the multi-level approach have been given, and should help researchers with some basic decisions.

Although the comparative approach and the multi-level approach have been presented as two distinctive research strategies, several hybrid forms are possible. For instance, an analysis can include multiple countries with a separate multi-level model for each country, including school and student data.

Nevertheless, as good data in this field is rare, and the detection of causal effects is difficult due to ethical restrictions (students cannot be randomly allocated to education systems) the need for a strong theoretical framework is obvious. In the end one has to decide between using deep case knowledge without the claim of external validity via inferential conclusions or using large-scale surveys with standardised variables regarding education systems (such as student age at first tracking) that may not meet the requirement to describe each education system properly. No matter which research strategy has been chosen, transparency regarding the applied methods is essential.

Notes

[1] I would like to thank Johann Carstensen, Hartmut Esser, Peter Kriwy, Concetta Mendolicchio and Andreas Hadjar for helpful comments on an earlier version of this contribution.

[2] Limited empirical diversity suggests that special configurations do not exist or are extremely rare for different reasons, such as logical impossibility (for example a pregnant man) or empirically unlikely (for instance a woman with a very low educational background working as a CEO).

[3] Equifinality means that different paths could lead to the same outcome: high educational inequality can, for example, be explained by the configuration of high standardisation AND low stratification OR by the configuration of low income inequality AND high school autonomy.

[4] Meaning that the Outcome (for instance high educational inequality) can be explained by configurations other than the Non-Outcome (low educational inequality).

[5] 'France' refers to a dummy variable that has the value 1 for the French sample and the value 0 for Austria and Germany.

[6] For cross-classified data, for instance, students attend different courses and not just one class, see Hill and Goldstein (1998).

[7] For statistical reasons it is not necessary to use MLMs as there are other options such as standard errors for clustered data.

[8] Multicollinearity leads to inflated and inexact standard errors (Gujarati and Porter, 2009; Chatterjee and Hadi, 2012).

[9] If the normality assumption is heavily violated, bootstrapping and matching routines can be used.

[10] Linear regressions and hierarchical linear models both have the assumption that the residuals are normally distributed at each section of the x-axes (homoscedasticity). A violation of this assumption is called heteroscedasticity.

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SEVEN

Education systems and inequality based on social origins: the impact of school expansion and design

Gabriele Ballarino, Fabrizio Bernardi and Nazareno Panichella

Introduction

The last generation of research on social stratification has given great importance to international comparison, studying how different contexts are related to the stratification of individual outcomes (Treiman and Ganzeboom, 2000). This chapter focuses on educational achievement, and in particular on differentials in achievement based on family background, often defined as the inequality of educational opportunities (hereafter, IEO). The aim is to discuss how family-based IEO relates to the institutional context where the process of schooling takes place. While the context might include both the features of the school system and those of the wider society of which it is a part, the chapter is limited to the former, due to lack of space. This chapter contributes to the literature by focusing on two institutional features of the educational system: its *expansion*, that is the extent to which individuals participate in it, and its *design*, that is the way the process of schooling is organised. Following a 'choice-within-constraints' perspective (Ingram and Clay, 2000), which defines institutions as the rules that constrain the choices of actors, the chapter looks at how individual choices concerning schooling are shaped by the context in which they take place.

The chapter includes six sections. The second section presents the theoretical model of 'choice-within-constraints' used by most researchers to explain IEO based on family background. The third section describes the main features of school design, and the fourth presents data, variables and methods. The fifth section exposes the main results and the sixth concludes the chapter.

Educational choice and its constraints

Many theoretical models have been proposed in order to explain the aggregate patterns of IEO by family background. This chapter concentrates on micro-level theoretical models that explain the macro-patterns as the aggregate outcome of a number of individual decisions, following the perspective on the micro-macro-transition proposed by Coleman (1990), as well as the 'choice-within-constraints' paradigm (Ingram and Clay, 2000). While a number of empirical papers have developed such a perspective with regard to educational choices (for example, Erikson and Jonsson, 1996; Breen and Goldthorpe, 1997; Becker, 2003; Breen and Yaish, 2006; Ballarino et al, 2009), little theoretical work has been done on the matter.

Indeed, this perspective is often seen by some of its major proponents in stratification research as closely related to the rational choice framework of human capital theory (Becker, 1962), where educational choice is seen as an investment choice consciously aimed at maximising the difference between the costs and expected benefits related to schooling. While there is no space for a full discussion of the topic, from the point of view of this chapter, such models of school decisions are mostly theoretical tools with which to analyse the factors involved in the process of schooling from the point of view of an abstract individual. As has been argued long since in economics (Manski, 1993), we do not think models of this kind describe the actual process of choice taking place at the individual level, but we find them useful in order to explain the causal mechanisms underlying the aggregate outcomes of the process, as proposed by Collins (2000a).

Ethnographic research proposes two major findings concerning the description of what actually happens. First, (at least) up to the college level, educational choice is not an individual process, but takes place within the family (Lareau, 2003; Lareau and Weininger, 2008). Educational choice models in stratification research acknowledge the key role of the family by using social class of origin (or parental education) as their key independent variable. Second, ethnographic research does not show any grand strategic decision, arising from a detailed cost–benefit analysis. On the contrary, many decisions related to children's activities and behaviour are taken without much reflection, as an implication of the way of life of the family, or, more precisely, of 'class-specific cultural orientations to child rearing' (Lareau and Weininger, 2008; see also Lareau, 2003).

Returning to the sociological models of educational choice, a great deal of literature follows the so-called 'educational transition model'

(ETM; Mare, 1981). The ETM sees educational attainment as the outcome of a sequence of transitions between school levels (or even between grades). At each transition (t), a decision is taken about whether to continue schooling, trying to make the transition to the next level or grade (t + 1) or to exit the educational system at the level (grade) already achieved, E_t. Four parameters drive such a decision. In general, we can write:

$$E = (B_{t+1} + C_{t+1} + SD_t)Pf_{t+1} \quad (1)$$

where E is the decision to be taken; B_{t+1} and C_{t+1} are the benefits and costs implied by the decision to make the transition to t + 1; SD is the risk of status decline implied by the decision of stopping at transition t; Pf_t is the probability of failing in the transition t + 1.

The benefits of t + 1 and the status decline implied by t make the motivation to pursue t + 1 higher, while on the other side the costs associated with t + 1 and the risk of failing in achieving it mean the motivation to continue is lower. The basic version of the model assumes that the material costs C and benefits B do not vary substantially over classes: tuition fees are the same for all students, and labour market rewards to a given educational degree do not change according to the family background. A more detailed version of the model could include interaction terms between family background and costs and/or benefits: costs are of course relative to family income and wealth, and it has also been shown that achievement in the labour market among those with a low level of education is higher for those who come from a socioeconomically advantaged family (Bernardi, 2012). This means that educational returns B differ by social class. However, even in the basic version of the model the amount of status decline SD and risk of failure P_f vary among social classes. In particular, the key parameter explaining the intergenerational correlation of education (inequality of educational opportunities) appears to be SD, as this term relates the educational choice for the new generation to the educational achievement of the previous one. The amount of status decline SD associated with a given t is relative to one's social position of origin, and in general it is lower for lower social classes.

One could say that the amount of status decline implied by achieving a given educational level or not is just the immaterial component of costs and benefits: if the choice taken implies the possibility of status decline, this is a cost, if it does not, it is a benefit. However, the sociological importance of this mechanism justifies the choice of considering it a separate term. The mechanism underlying this term has

been studied in detail in psychology (Keller and Zavalloni, 1964): from the sociological point of view, what seems more important is the fact that someone's educational level is a key marker of their social position in contemporary societies, where official and formalised status symbols existing in previous societies have disappeared due to the democratic-egalitarian ideology characterising modern societies (Lenski, 1966).

While the SD term thus relates educational choice to social structure and to the position of the family therein, on the other side it can be argued that the P_f term relates mostly to the school system. Indeed, the probability of successfully finishing E_{n+1} (and thus reaping the benefits of the investment) depends on previous educational achievement and performance, as well as how the school system is structured and on the level of selectivity it shows. Children with educated parents are advantaged in this respect, as they are more likely to receive from them those cognitive and social skills that are positively associated with learning and success in the educational system. The key research problem for the future is to ascertain how much such a transmission can take place via genes or via the environment, but existing datasets do not allow a robust answer to this question (see for instance Erikson and Goldthorpe, 2002; Marks, 2014). Whichever the transmission mechanism, for a given level of education E_{n+1} the risk of failure P_f can in any case be assumed to be higher for children with a lower family background.

The P_f term also involves a forecast which depends on available information (Erikson and Jonsson, 1996). The better the information concerning the school system, the more advantageous the choice to proceed to t + 1 will be with respect to the actual chances to make it. Children from more educated parents are at an advantage in this case, as their parents know directly how the school system works and its real level of selectivity. Typically, families where parents did not achieve higher education presume it to be more selective than it actually is, thus increasing P_f and decreasing the probability of enrolment.

The school system and inequality

The model presented above might be of use for a theoretical analysis of the relationship between the features of the school system and school inequality. Such an analysis is presented in this section: the first subsection looks at expansion of education, the second at school design. These are two crucial factors affecting IEO. Indeed, scholars agree that the expansion of the school system is associated with a decrease

of IEO and there is some consensus on the fact that in more stratified school systems IEO is higher, while standardisation decreases inequality.

The expansion of participation and inequality

The model presented above might be of use to explain both the mechanisms underlying expansion and the trend of IEO over time, because since the start of the contemporary mass education system, from the late 18th century on, the passing of time has been associated with increasing participation (Hadjar and Becker, 2009). In pre-modern education systems, research in historical sociology shows cycles of expanding and contracting school participation (Collins, 2000b), but it has to be kept in mind that no pre-modern school system was a mass school system.

Indeed, aversion to status decline gives us a simple explanation as to why in contemporary societies school participation does not decrease over time: if status decline has to be avoided, members of each new generation have to achieve at least the same educational level as their parents. From a comparative perspective, this may also be of help in explaining the strong path dependency shown by school participation across countries. This mechanism can explain the persistence of IEO over time: if the motivation to stay in school is associated with parental education, educational inequality will be transmitted over generations.

The lower the costs concerned, the less participation is constrained and the more it can expand. Indeed, progressive school policies oriented towards social equality via educational inclusion, which took place in all advanced countries, let the costs of t + 1 decline over time. Compulsory schooling is now free all over the world, and everywhere upper secondary and tertiary schooling are strongly subsidised by the state, even in those countries where private providers have a relevant role in educational supply. However, in the last decades in a number of rich countries, such as the US, the UK and Germany, tuition fees for higher education have been on the rise: it remains to be seen whether this will bring expansion at this level to a halt. It is easy to hypothesise that IEO would increase with increasing costs, as the lower classes face stronger liquidity constraints.

Correspondingly, education-related benefits should increase participation. However, an expansion of participation at a given educational level results in an increased number of holders of the degree, and this typically decreases its labour market value. Indeed, current research shows the occupational returns on education to have diminished over time in a number of countries (Bernardi and Ballarino,

2016), as forecast in the 1970s in the argument about the inflation of educational credentials (Collins, 1979). Cross-sectionally there is also a robust negative correlation between participation in higher education and the occupational returns it guarantees: countries where more individuals obtain a university degree are those where the same degree provides a lesser labour market advantage (Bernardi and Ballarino, 2014). In any case, the argument still holds if the decrease in costs is stronger than that of benefits, as might be the case.

Finally, in an expanding school system the probability of not successfully finishing a given school level (P_f), and thus not getting the final degree and the benefits it brings, is diminished by definition, thus reinforcing the expanding trend. Diminishing P_f should also contribute to diminish IEO, since we have seen how the mechanism it implies tends to reproduce school inequalities over time, as selection is stronger for those from a lower background and the information concerning the actual level of selectivity is also less precise for them, making it more likely that they will not make the right choice.

Generally speaking, most of the arguments reviewed above would lead to arguing that the association between expansion and inequality is a negative one. Evidence supporting this statement comes from many single-country papers, as well as from a number of comparative works (Breen et al, 2009; Ballarino and Schadee, 2011; Bernardi and Ballarino, 2014). However, other papers find the association between family background and educational achievement to be stable over cohorts, meaning that increasing participation does not change inequality (Arum et al, 2007; Pfeffer, 2008). In other geographical contexts, for example in China, educational expansion and the rapid marketisation in the 1990s did not bring more equal access to educational opportunities among different social strata (Wu, 2010).

School design and inequality

According to the sociological literature, the institutional structure of the educational system (school design) can be analysed according to three main dimensions: stratification, standardisation and vocational specificity (Allmendinger, 1989; Shavit and Müller, 1998). Stratification refers to the differentiation of students into separate tracks with different curricula, standardisation indicates whether pupils in the same position in the system get the same amount of resources invested in their learning, vocational specificity corresponds to the space vocational training has in a school system, that is to the amount of work-related

training with respect to academic training. How do they impact, theoretically, on the choice to prosecute school?

Stratification has a number of effects on educational choices. First, it increases the number of choices: the more tracks there are available, the more choices have to be made. Second, it lowers the age at which any choice has to be made: in a strongly stratified system, such as the German one, children are divided into three tracks at age 10, after the end of elementary school, whereas in less stratified systems, such as the Swedish one, the first choice has to be made at age 16. Third, stratification makes it harder to correct a wrong choice: those pupils who chose the non-academic path in upper secondary school cannot access university, even if they show great academic skills. Such mechanisms should somehow limit expansion, in particular of tertiary education, as there are few incentives for pupils from lower socioeconomic family background to choose to continue education. They should also increase IEO, as the contrary is the case for those from a higher socioeconomic family background. Indeed, the more complicated a school system, the more information is needed, and, given the family is the main provider of information, the more important it becomes with respect to educational choices. The earlier the choice takes place, the less information is available about the academic skills of the pupil (which are relevant for the P_f term), and the more the choice has to rely on other, family-related factors, in particular SD. So, the conclusion seems to be that stratification should enhance inequality, and this is what many comparative papers find (Brunello and Checchi, 2007; Bol and van de Werfhorst, 2013; Braga et al, 2013). Whether this general prediction holds true, however, depends on the actual mechanisms governing educational choice. For instance, a comparison between Italy and Germany shows that, despite its school system being much more stratified, the association between family background and the choice of upper secondary track, controlling for ability is weaker in Germany: this depends on the fact that track choice in Germany is to some extent made by teachers, based on skills, while in Italy it is entirely left to the family (Checchi and Flabbi, 2013).

Standardisation is the second dimension of educational systems. The more standardised a school system, the less variation can be found between the resources allocated to students, and this should of course compensate, to some extent, for inequality based on family background. In a standardised system, family-based choices will also matter less, as will family-related information relevant to the P_f term; however, while the theoretical definition of stratification and its empirical operationalisation is quite consistent over studies, in the case

of standardisation there is less consensus. This has probably to do with the difficulty of directly measuring it: how can the extent of resources allocated by the school system to each student be measured? In many cases what is measured is the centralisation of the school system (for example, Horn, 2009), under the assumption that the more centralised a school system, the less variation it will show in terms of resource allocation. Bol and van de Werfhorst (2013) appropriately call this dimension the 'standardisation of input'. However, the assumption might be questioned: central decision making might be associated with a systematic differentiation of the resources allocated. For instance, the school system in South Africa under apartheid was organisationally centralised, based on the European model, but it systematically allocated more resources to schools for white students compared to those for black students (Case and Deaton, 1999). This kind of problem has led a number of authors to try to measure standardisation of output rather than standardisation of input, or in addition to it, following a general trend begun by the economics of education. The presence of centrally organised examinations or tests is one of the indicators used to measure standardisation of output, but, from this point of view, theoretical and empirical problems might also arise, since often centrally administered tests are introduced in association with an increase in school autonomy, which might be thought of as the opposite of standardisation.

Finally, *vocational specificity* indicates the amount of space that training in work-related skills is given in a specific school system. Theoretically, this should be negatively related to the expansion of participation, as is stratification, since students on vocational tracks are often excluded from access to university. Concerning family-based inequality, however, the situation is less clear-cut (Müller and Shavit, 1998). On one side, it is well-known that the children of the working class are over-represented in vocational education, and their consequent exclusion from university fosters inequality. On the other hand, however, if IEO is measured with respect to the labour market value of education, and not on the nominal value of the qualifications (Triventi et al, 2015), a high level of vocational specificity enhances returns on this kind of education, and thus improves the labour market prospects of working-class holders of such degrees. Measurement is also not wholly consistent within research in this case. A number of studies use the existence of vocational tracks, or the number of students enrolled therein (for example, Brunello and Checchi, 2007), but in doing this, vocational specificity becomes a variant of stratification. A more theoretically sound measurement would refer to the involvement of firms in school activities, which is the actual mechanism making a difference where labour market access

is concerned, as shown by research on dual systems (Busemeyer and Trampusch, 2012), but this is of course very difficult to measure directly.

Data, variables and research strategy

Data from the European Social Survey (ESS; five waves 2002–10) and from the EU-SILC (European Union Statistics on Income and Living Conditions) module on intergenerational transmission of poverty (2005) is analysed. Both surveys have been harmonised and merged into a single dataset, including information on the social origin and educational attainment of a representative sample of 20 European countries.[1] After listwise deletion of missing values, the analytical sample includes 326,696 cases.

We measure educational achievement with two dummy variables: the first measures the probability of achieving at least an upper secondary diploma (International Standard Classification of Education [ISCED] 3), and is equal to 1 for those who did; the second refers to the probability of achieving at least some post-secondary degree, including of course a full university degree (ISCED 4–6). For parental education, we take the highest of the father's and mother's level of education and recode it into a three-level classification, distinguishing lower secondary education or less, upper secondary education and tertiary education. Estimations are controlled for gender and we analyse four birth cohorts: 1931–40, 1941–50, 1951–60 and 1961–70.

Following Bernardi and Ballarino (2014), a two-step model is estimated. Such a research strategy is particularly useful when a large number of observations at Level 1 are nested in a limited number of observations at Level 2. In this kind of circumstance, as is the case here, the more simple and flexible two-step approach performs as well as the more complex simultaneous hierarchical linear models (Lewis and Linzer, 2005). For each of the cohort-by-country clusters jk, individual educational attainment is a function of parental education and gender plus an error term u, where j refers to cohort and varies from 1 (oldest cohort) to 4 (youngest cohort), k identifies each country and varies from 1 to 20. The first-step regressions are:

$$UPSEC_{jk} = \alpha + \beta_{jk}PEDU + \gamma_{jk}GNR + \varepsilon \quad (2)$$

$$UNI_{jk} = \alpha + \beta_{jk}PEDU + \gamma_{jk}GNR + \varepsilon \quad (3)$$

$UPSEC_{jk}$ and UNI_{jk} are two dummy variables and express the probability of achieving upper secondary education and tertiary education in the cohort j and the country k. PEDU is a dummy variable which is equal to 1 if the highest parental education is secondary or tertiary education, and equal to 0 if the highest parental education is lower secondary or less. The equations also include a dummy variable for gender (GNR) and an error term (ε), which is assumed to be normally distributed and has been estimated with a linear probability model with robust standard errors for each cohort-by-country cluster.[2] Our focus is on the β_{jk} coefficient, which expresses the advantage of students whose parents had at least an upper secondary education, when compared to students from families with compulsory education only in the cohort j and country k. Since the analysis includes 20 countries and 4 cohorts, we have 80 estimates of β_{jk}. Each β_{jk} can be interpreted as a measure of IEO in a given country and cohort.

In the second step we analyse the association between β_{jk}, the educational expansion and the school design. Let $DUPSEC_{jk}$ and $DUNI_{jk}$ be the estimate of β_{jk} from the IEO equation 2 and 3 respectively. The second step equation formula reads:

$$DUPSEC_{jk} = \omega + EXP_{jk}\lambda_{jk} + Z_{jk}\psi_{jk} \quad (4)$$

$$DUNI_{jk} = \omega + EXP_{jk}\lambda_{jk} + Z_{jk}\psi_{jk} \quad (5)$$

where EXP is the percentage of individuals who have achieved upper secondary or tertiary education in the cohort j and the country k, while Z is a vector of institutional features of the educational system (described below). The estimation of equation 4 and 5 is based on weighted least squares, with weights proportional to the inverse of the squared standard errors for β_{jk} estimated in equations 2 and 3. The rationale is to give a greater weight to those observations more precisely estimated in equation 2 (King, 1997; 290). Finally, standard errors are clustered by country.

We consider four indicators of school design. Unfortunately, available data does not allow consideration of variation over time in school design, thus these indicators are time-constant: they vary among countries but not over time. The first refers to tracking. This variable was constructed by Bol and van de Werfhorst (2013) by means of a factor analysis of three country level variables: (a) age of first track, which is often used as the only indicator (for example, Hanushek and Wössmann, 2006); (b) the length of the tracked curriculum, which

indicates the tracked curriculum as a percentage of the total curriculum in secondary education; (c) the number of distinct school types that are available for 15-year-old students. Together these three variables give a comprehensive view of tracking and involve all theoretical aspects of the dimension. The second indicator refers to vocational specificity, and is an indirect measure of the involvement of firms in school activities, developed by Argentin and Ballarino (2014). The indicator takes the value of 2 for countries where a dual system exists (in the sense of Busemeyer and Trampusch, 2012), the value of 1 where there are technical-vocational schools at the upper secondary level, starting from age 14/15, and the value of 0 where upper secondary schools are comprehensive for most of their length.

The last two indicators involve standardisation in the two senses discussed above, and are also taken from Bol and van de Werfhorst (2013). Standardisation of input is based on the school questionnaire of PISA (Programme for International Student Assessment), and measures the autonomy of schools by means of a factor analysis of a set of questions regarding the extent to which schools can decide by themselves how and what is taught. Standardisation of output is a dummy variable taking the value of 1 when centralised exit exams exist.

Empirical results

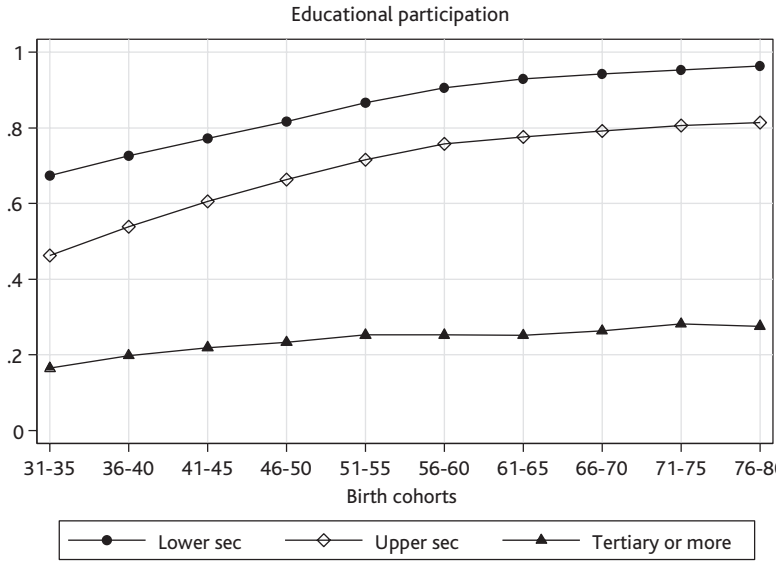
Descriptive evidence

Figure 7.1 reports the probabilities of achieving at least lower secondary, upper secondary and tertiary education for 10 five-year cohorts, controlling for gender, parental education and country.

The results indicate that a great expansion of lower and upper secondary education occurred over time. While the probability of achieving (at least) a lower secondary degree was 67% for the 1931–5 cohort, it increased to 96% for the last cohort considered (1976–80). The probability of achieving an upper secondary degree also considerably increased, from 46% for the earlier cohort to 81% for the last one. There has also been a long-term trend of expansion in tertiary degrees, but less marked: in the 1931–5 cohort, the probability was 16%, then it grew to 25% for those born between 1956 and 1960, to finally reach 28% in the last cohort.

Figure 7.2 shows how educational expansion was associated with a remarkable reduction of inequality in educational opportunities, adding to the model a cohort by parental education interaction. The figure thus shows the probabilities of achieving each educational level,

Figure 7.1: Probabilities of having at least lower secondary, upper secondary and tertiary education by cohorts

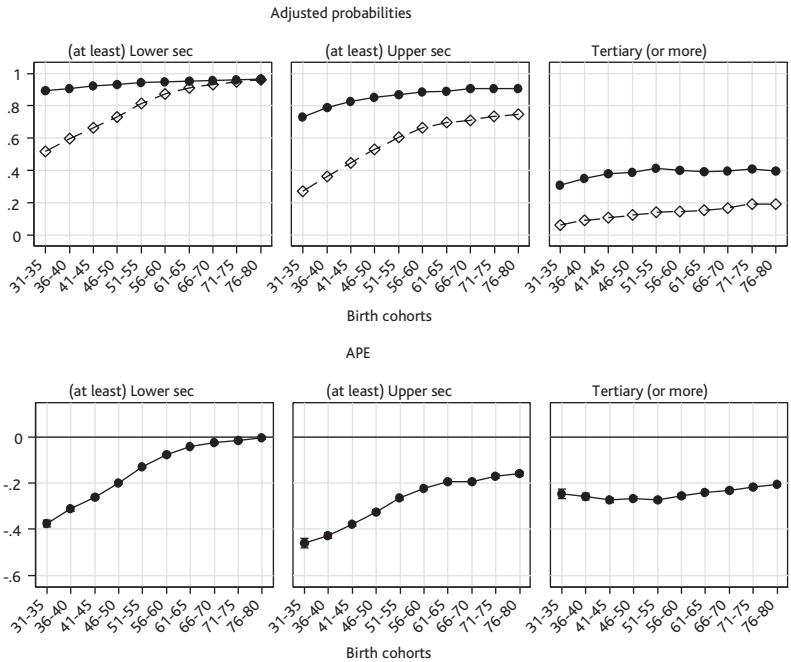


comparing individuals with higher social origin (reference category) with the others. The results are presented both in terms of predicted values and average partial effects.

As expected, the dramatic expansion of secondary education, both lower and upper secondary schooling that occurred in the second half of the 20th century diminished social inequality. The difference between those whose parents had compulsory education only and those with tertiary educated parents was -0.37 in the 1931–5 cohort, and in the last cohort it diminished to -0.01, losing statistical significance. The reduction of the IEO at upper secondary education was relevant, but in this case the difference between the two probabilities did not disappear: the average partial effect moved from -0.46 in the oldest cohort to -0.15 in the youngest. IEO also decreased where the probability of achieving tertiary education is concerned, but in this case the reduction was minimal: from 0.25 for the first cohort to -0.20 for the last one (Figure 7.2).

Such descriptive results confirm the results of other studies. In particular, we see that while it can certainly be said that a decline in social inequality in educational attainment occurred in the last century (Ballarino et al, 2009; Breen et al, 2009), such a decrease mostly occurred at the lower school levels, and much less in tertiary education (Shavit and Westerbeek, 1998; Checchi et al, 2008; Ballarino and Schadee, 2010).

Figure 7.2: Educational expansion by family education (solid circle: at least one parent with upper secondary; hollow diamond: both parents with less than lower secondary).



With Figures 7.3 and 7.4 we move to country results. In the left-hand panel, the beta coefficients are reported for parental education (lower secondary or less with respect to upper secondary or more) for the first and the last cohorts (1931–40 and 1961–70), by country.[3] In the right-hand panel, the figures show the difference between the coefficients for the two cohorts, which represent our indicator of change in IEO over time (ΔIEO).

Figure 7.3 refers to upper secondary education and confirms that IEO based on parental education has decreased in all countries considered: in all cases, indeed, ΔIEO between the two cohorts is positive. This reduction varies over countries: it is higher in Italy (0.41), Sweden (0.38), Portugal (0.34) and Finland (0.34), while it is relatively small in Germany (0.05). These differences among countries might be seen as produced by a 'ceiling effect': in Germany, for example, the expansion of the upper secondary occurred earlier, so that inequality was already relatively low in the oldest cohorts (right-hand panel). In Italy and Portugal, on the contrary, participation at this educational level expanded more recently, thus making the magnitude of the reduction higher.

Figure 7.3: Beta coefficient (cohorts 1931-40, 1961-70) and their difference. Upper secondary education

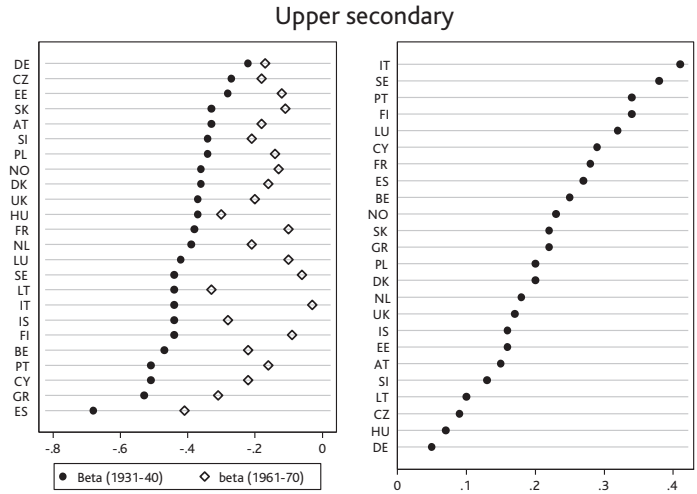


Figure 7.4: Beta coefficient (cohorts 1931-40, 1961-70) and their difference. Tertiary education

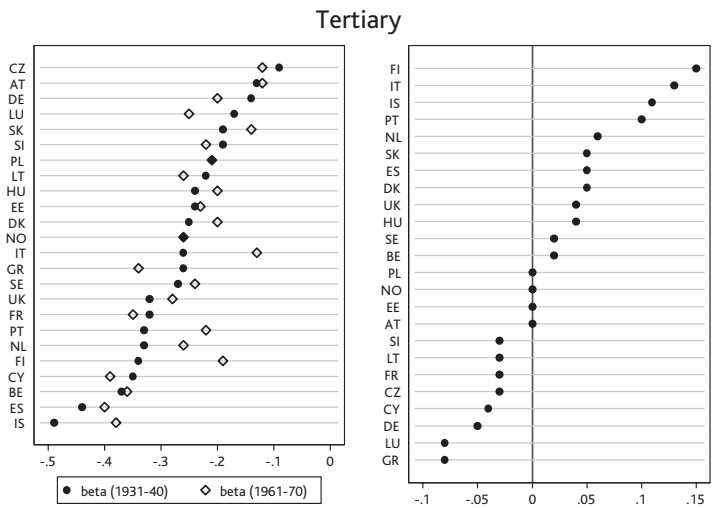


Figure 7.4 is similar to Figure 7.3 but concerns tertiary education. In this case, the results are less clear because the magnitude of the decline of IEO in tertiary education is smaller, as shown by the previous pooled analysis. Thus, in some countries, the difference between the cohorts is positive, as in Italy and Finland, while in Germany, Greece and Luxemburg such difference is negative, indicating an increase of IEO for access to university.

The next section studies whether the expansion of the educational system and the characteristics of school design had an effect on the IEO, both at the upper secondary and the tertiary level.

The effects of school expansion and school design

This section focuses on the effects of the features of the school system, that is, its expansion and design, on the magnitude of IEO based on parental education, both at the upper secondary (equation 4 above) and the tertiary level (equation 5 above). Six OLS (ordinary least squares) regression models have been estimated for upper secondary, as shown in Table 7.1. Models 1 to 5 estimate the effect of each feature of the school system separately, while Model 6 includes all indicators.

The findings of Model 1 confirm that educational expansion is associated with a reduction of IEO based on parental education (Bernardi and Ballarino, 2014). Using the 'clarify' procedure (King et al, 2000), we find that an increase of 10% in the participation from the first to the youngest cohort is associated with a reduction of -4.98 (CI = -6.43; -3.58) in IOE by parental education.[4]

As suggested above, the literature is consistent concerning the effect of tracking on inequality: the countries where the school system is tracked are those where educational inequality based on parental education is higher (Brunello and Checchi, 2007; Pfeffer, 2008; Horn, 2009). However, the result of our analysis is different: the coefficient for tracking is negative, despite not being of great magnitude (Model 2). Concerning vocational specificity (Model 3), our result supports the 'safety net' argument with respect to the 'diversion' one (Müller and Shavit, 1998). Indeed, on average, the country-by-cohort units where there is a strong vocational track or a dual system have about 16% less IEO than those where upper secondary school is comprehensive. Results concerning standardisation also do not support our expectations: standardisation of input has no relationship with IEO (Model 4), while standardisation of output shows a negative relationship (Model 5).

Table 7.1: School design, educational expansion and IEO at upper secondary level. Results from second step, 95% confidence intervals in brackets

	Upper secondary					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Educational expansion	-0.50***					-0.47***
	[-0.65 - -0.35]					[-0.59 - -0.35]
Tracking		-0.07***				0.03
		[-0.11 - -0.03]				[-0.03 - 0.09]
Vocational						
1			-0.16***			-0.15**
			[-0.24 - -0.08]			[-0.28 - -0.03]
2			-0.17***			-0.06
			[-0.24 - -0.09]			[-0.19 - 0.07]
Standardisation_ input				0.00		-0.00
				[-0.08 - 0.08]		[-0.04 - 0.03]
Standardisation_ output					-0.15***	-0.10***
					[-0.24 - -0.07]	[-0.15 - -0.04]
Constant	0.61	0.36	0.45	0.37	0.45	0.70
Observations	80	80	80	80	80	80
R-squared	0.45	0.16	0.25	0.00	0.22	0.63

Model 6 includes school expansion as well as all our indicators. While the coefficient for expansion does not change substantially (as shown by the CI) with respect to the bivariate regressions, the one for tracking becomes positive. The explanation for this might lie in some composition effect: the countries where participation is higher could be the same as those where a tracked system exists, so when tracking is related to IEO it takes part of the negative association depending on participation, and when this is controlled for the effect vanishes. Something similar might explain the changing coefficient for dual systems (vocational specificity = 2). The remaining coefficients, for intermediate vocational specificity (= 1) and for standardisation of

output, remain negative, significant but not very strong, as they were in the bivariate models.

In Table 7.2 we apply the same modelling strategy to tertiary education (defined as including all post-secondary degrees). Expansion also has a negative relationship with respect to IEO in this case, as found by Bernardi and Ballarino (2014), but the magnitude of the association is much smaller (Model 1).

Concerning the indicators, bivariate regressions (Models 2–5) provide results less different than those seen above for upper secondary, with the exception of standardisation of input, where in this case the coefficient is negative and significant, albeit with a very low value. It has to be remembered that, while expansion here is measured with

Table 7.2: School design, educational expansion and IEO at tertiary level. Results from second step, 95% confidence intervals in brackets

	Tertiary					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Educational expansion	-0.17**					-0.08
	[-0.30 - -0.04]					[-0.19 - 0.04]
Tracking		-0.07***				-0.01
		[-0.11 - -0.02]				[-0.05 - 0.03]
Vocational						
1			-0.13***			-0.07
			[-0.20 - -0.05]			[-0.17 - 0.03]
2			-0.12**			-0.05
			[-0.21 - -0.02]			[-0.12 - 0.03]
Standardisation_ input				-0.03		-0.02*
				[-0.08 - 0.01]		[-0.05 - 0.00]
Standardisation_ output					-0.08**	-0.05
					[-0.15 - -0.01]	[-0.12 - 0.02]
Constant	0.38	0.28	0.35	0.31	0.32	0.37
Observations	80	80	80	80	80	80
R-squared	0.14	0.33	0.36	0.08	0.18	0.44

respect to post-secondary education, the indicators of school design are the same as in the models referring to upper secondary: thus, we are looking at the association between the institutional structure of upper secondary and the class differential in the probability to achieve a tertiary degree. This might be why the values of the explained variances (R^2) of Models 2 and 3 (tracking and vocational specificity) are higher in the case of tertiary than in the case of upper secondary: indeed, stratification at the upper secondary level has a strong effect on tertiary choices, and appears also to shape student careers at this level. In particular, students from a working-class family background, who are more likely to choose a vocational track at the upper secondary level, can then be stimulated to continue after upper secondary graduation.

In Model 6, where all regressors are entered simultaneously in our equation, only standardisation of input has a significant value, albeit at the limit of the conventional definition of significance. All indicators in Model 6 show a negative relationship with respect to IEO.

In summary, at the upper secondary level the main factor associated with a decrease of IEO is the expansion of participation to the educational system. From this point of view, variation in school design appears to be much less important than participation. Moreover, their effects appear to be strongly dependent on model specification and do not appear to be really robust across different specifications.[5] The effect of educational participation, however, is a consequence of the fact that the educational level has reached saturation in many European countries, thus diminishing the IEO based on parental education. At the tertiary level, such a 'saturation point' has not yet been reached in most countries, thus at this level participation has a smaller effect on IEO. The effect of school design is also both tiny and unclear in this case.

Conclusions

This chapter has discussed how the characteristics of the educational system relate to inequality in educational achievement. A theoretical model has been presented, based on the 'choice-within-constraints' paradigm used in much of the current literature, and it has been shown how such a model can easily include both the level of participation in a given school system (or school level within a system) and its institutional features.

While such a theoretical perspective might be used for any kind of individual feature proceeding the entry in the school system, such as family background, gender, ethnicity, geographical mobility and so on, empirically the chapter was restricted to inequality related to family

background (as measured by parental education) in the achievement of an upper secondary and a post-secondary school certificate. The empirical results are quite clear about as far as participation is concerned, showing a clear negative association between the latter and IEO measured in this way; however, this relationship is much stronger at the upper secondary level, and becomes weaker where post-secondary is concerned.

Our results do not support most of the established findings concerning school design. A negative association was found at both levels between IEO and measures of tracking and vocational specificity, while results for standardisation change depend on the chosen indicator. The former result might be explained by the fact that a tracked system might enhance upper secondary achievement and the transition to university on the part of the offspring of the working class, an argument which is different from both the 'diversion' and the 'safety net' hypotheses found in the literature concerning vocational specificity. The latter results point at the inconsistencies, discussed in the theoretical section, concerning the definition and measurement of standardisation, which calls for further theoretical analysis.

It seems to us, however, that the key point is that macro-results concerning school design do not appear to be robust across different indicators and model specifications. Of course, more refined analytical strategies and model specification might be used, in particular looking at change over time, as shown by research in the economics of education (Braga et al, 2013), but in this case too, some empirical problems are difficult to solve, in particular the low number of cases with respect to variables and the number of unobserved and unobservable variables involved in any macro-cross-sectional comparison. A strategy based on an evaluation of the impact of reforms in changing school design in a single country, interpreted as a natural experiment, might give more robust results: this is an open area for research in the sociology of education.

Notes

[1] We also ran a parallel analysis, keeping EU-SILC and ESS separated (results available on request).

[2] We prefer this type of measure because it allows a less problematic comparison of coefficients among cohorts and countries (Mood, 2010). Moreover, we are interested in how educational expansion affects IEO, thus we specifically focus on the effect of marginals on inequality.

[3] In this and in the next section only upper secondary and tertiary educational levels are considered, because the proportion of individuals achieving lower secondary approaches 100% in the more recent cohorts.

[4] The 'clarify' procedure, available in Stata, draws simulations of the main and ancillary parameters of the model from their asymptotic sampling distribution and it converts the simulated parameters into substantively interesting quantities, such as predicted values, expected values or differences.

[5] A number of other specifications have been estimated, but were not reported for lack of space. They are available on request from the authors.

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EIGHT

Education systems and gender inequalities in educational attainment

Andreas Hadjar and Claudia Buchmann

Gender inequalities in educational attainment are of central concern today, in both public and scientific discourses. Prior to the rapid expansion of the educational systems of most industrialised societies in the 1960s, male educational attainment was higher than that of females nearly everywhere in the world. As the educational systems of industrialised nations expanded, both in the size and diversity of their populations, opportunities for women also grew, and girls benefited substantially. Today, throughout most industrialised regions of the world, girls attain better grades in school, take more challenging classes and achieve higher overall results. Due in part to their stronger academic performance, girls are now more likely than boys to enrol in upper secondary schools. Gender segregation in fields of study and vocations persists to the extent that men and women tend to specialise in very different areas.

This chapter presents an account of contemporary patterns of gender inequalities in educational attainment in industrialised societies. It then discusses theoretical explanations for the different types of gender inequalities in education and the reasons for changing gender inequalities in education over time. It considers micro-level explanations of gender differences in school performance and educational attainment, as well as the impacts of variations educational systems and societal-level characteristics on gender inequalities in education. The chapter concludes with a multi-level analysis investigating how variations in educational systems and societal-level characteristics impact gender inequalities.

Gender inequalities in education

Gender inequalities in education are differences between boys and girls or men and women in a broad variety of aspects of education at

different stages of the educational career. We define gender inequalities in education as *systematic variations in aspects related to education that are structured along gender as an axis of inequality*. Such aspects of education include access to educational institutions, placement in educational tracks or pathways, educational achievement as indicated by grades, test scores and credentials, as well as educational attainment. Other factors related to educational achievement and attainment outcomes, including student motivation, subjective well-being in school, interests and self-perceptions, can also be examined along gendered lines. Differences in aspects that can be hierarchically ordered such as grades, test scores and educational credentials are commonly referred to as *vertical inequalities*; aspects that do not directly relate to hierarchical ordering but to heterogeneity, such as field of study, are commonly referred to as *horizontal inequalities* (Charles, 2003; Watts, 2005). Horizontal inequalities, such as gender differences in fields of study, may be closely related to vertical inequalities, since fields of study are often related to gender segregation in occupations, which in turn is related to vertical inequalities in status and pay. For example, traditionally female-dominated occupations such as nursing or primary school teaching typically provide lower income and prestige than do traditionally male-dominated occupations.

Vertical gender inequalities in education have changed substantially in the course of the twentieth century, such that today women tend to go further in school and earn more educational degrees than men in most countries in the world (DiPrete and Buchmann, 2013). In the first half of the 20th century, men dominated upper secondary schooling and higher education, and women were under-represented in both of these levels, but towards the end of the 20th century, women first gained parity and then overtook men in their educational attainment. As awareness of this gender reversal grew, both scholarly and public attention shifted from the educational disadvantages of girls and women to the disadvantages of boys and men. Horizontal inequalities in education, most notably gender segregation in fields of study, declined substantially during the 1960s, 1970s and 1980s, but this trend has slowed in recent decades, and horizontal gender inequalities in education have thus changed less than have vertical gender inequalities over the 20th century.

Within these general patterns there is substantial country-level variation; as the following section shows, there are large differences between Western industrialised countries in terms of both change and stability in gender inequalities. What factors lie behind these country-level variations? The characteristics of national educational

systems likely impact gender inequalities, but it is not easy to separate the impact of educational systems from other societal-level variations such as cultural factors, the role of the welfare state, or other macro-level forces that may be related to the prevalence of social inequality in a country.

In this chapter, we summarise the conceptual and empirical state of research on gender inequalities, most of which focuses on vertical gender inequalities in education. The next section looks at gender inequalities in the course of the educational career, while the third section presents descriptive data on gender inequalities in education in Europe and the US from a temporal perspective. The fourth section considers theoretical explanations and empirical findings about gender inequalities, and trends in gender inequalities in education over time. It begins with a general theoretical framework and then examines individual-level factors and the macro-level characteristics of the educational and social system in determining gender inequalities in education. The chapter concludes with a brief consideration of methodological challenges and promising questions related to gender inequalities in education for future research.

A brief look at gender inequalities in the course of the educational career

A meta-analysis of empirical studies from Germany and Switzerland shows that gender differences in education vary by educational stage (Blossfeld et al, 2009; Hadjar et al, 2014). Boys and girls attend preschooling to the same extent but, even at this early age, they exhibit gender-typical behavioural and interest patterns in terms of expressions of gendered socialisation. Boys more often experience a delayed transition to primary schooling than girls. At the primary level of education, girls tend to score higher in reading and boys tend to score higher in mathematics and sciences. Vertical gender inequalities are comparably strong at the transition to secondary schooling. In highly stratified education systems with an early selection into different school tracks (such as Germany, Luxembourg and Switzerland), boys are at a higher risk of being placed in a lower secondary school track than are girls (Caro et al, 2009; Hadjar et al, 2014). Boys are also more likely to drop out of school. For example, a Swiss study based on a random school sample (Hadjar and Lupatsch, 2010; Hadjar et al, 2015) finds that girls outperform boys with regard to school grades in language subjects (German and foreign languages) and music, while boys do not score significantly better than girls in any subject. Moreover, when

measured by PISA (Programme for International Student Assessment) competency tests, the female advantage in languages is much higher than the advantage of boys in mathematics (for example, Jungbauer-Gans and Gross, 2011; Gottburgsen and Gross, 2012). Although in many countries women represent a larger share of tertiary students enrolled in OECD (Organisation for Economic Co-operation and Development) countries than men, the actual transition rates of women who are eligible to enter higher education are often still lower, women are more often diverted from tertiary education than men. With every step in the academic hierarchy, the overrepresentation of men increases, with only a small percentage of women attaining the rank of full professor (Leemann et al, 2010).

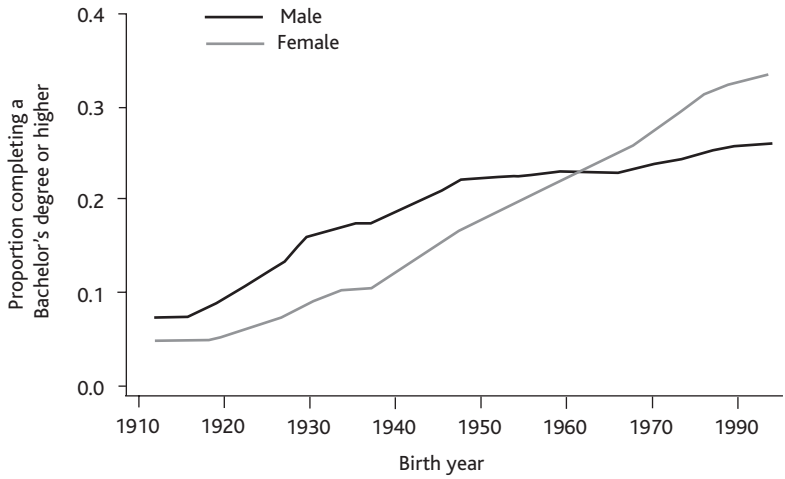
Changing patterns of gender inequalities

Trends in college completion for US men and women over the past 70 years indicate changing vertical gender inequalities in education (Figure 8.1). As DiPrete and Buchmann (2013) demonstrate, throughout much of the 20th century, more men earned more Bachelor's degrees than women, but among the 1960s birth cohorts (who were of college age during the 1980s) a greater proportion of women began completing college than men. In contrast, men's rate of college completion stagnated and remained essentially flat. As a result, between 1970 and 2010, men's college graduation rate had only climbed 7 percentage points, to 27 percent, while women's rates drastically increased from 14 percent in 1970 to 36 percent in 2010. This constitutes an enormous change in the relative position of men and women in a very short period of time.

The same trend is found in most European countries. Figure 8.2 compares males and females in cohorts born in the years 1919 to 1977 throughout Europe in terms of the proportion attaining university entrance certificates (equivalent to the British 'A'-level qualification). It shows a clear reversal in the gender gap for cohorts born in the 1960s onwards. Of course, this figure does not reveal the huge country differences within Europe, to be discussed below.

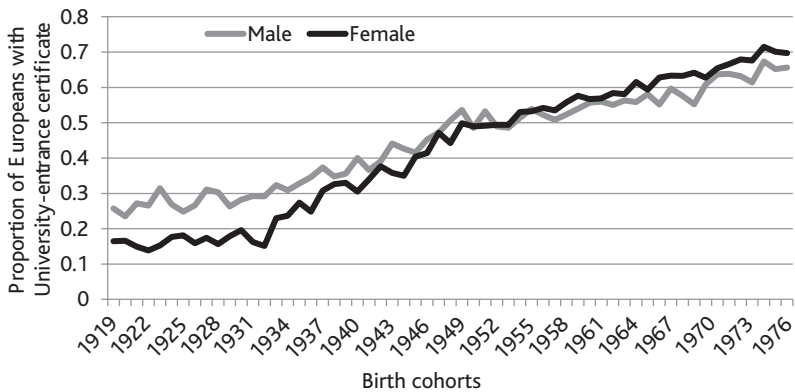
It is important to note that the reversal of the gender gap in higher education is a global phenomenon. It is striking that, according to UNESCO data (2012: 76), in most countries in the world today, more women are enrolled in higher education than men. Just a few decades ago the reverse was true, with more men than women enrolled in higher education. Growth in tertiary enrolment far exceeded population growth in all world regions. Moreover, everywhere in the

Figure 8.1: Proportion of 26- to 28-year-olds with Bachelor's degrees in the US



Source: DiPrete and Buchmann (2013: 3).

Figure 8.2: Proportion of Europeans with a university entrance certificate born between 1919 and 1977



Source: Own calculations, ESS data 2002–12, weighted, ESS countries (only people born in country).

world except for sub-Saharan Africa, the growth in female tertiary enrolments outpaced the growth in male tertiary enrolments, especially in East Asia and the Pacific (UNESCO, 2012: 76).

Within the general global trend of women's rising educational attainment, there are important variations. For example, large differences in gender inequalities in educational attainment are evident between European countries. Figure 8.3 shows the linear probability coefficients with regard to gender inequalities in receiving an upper secondary school degree for birth cohorts born between 1933 and

1977 in Austria (AT), East Germany (DE-E), West Germany (DE-W), Finland (FI), France (FR), Poland (PL) and the United Kingdom (UK). Scores above 0 indicate a female advantage. In Poland and Finland, women have long held an educational advantage; even among the oldest birth cohorts in these countries, women were more likely than men to receive at least a university entrance certificate. In France, the United Kingdom and East Germany, gender inequalities in the receipt of a university entrance certificate shifted from a male advantage to a female advantage. In West Germany and Austria the large gender gap favouring males has largely closed but among no cohort is there a female advantage.

Figure 8.3: Female advantage in A-level education, cohorts 1933–77

Note
Linear probability models, standardised coefficients, database: ESS waves 2002–12, design weight. Dependent variable: received at least a university entrance certificate/successful A-level education (ISCED 3a).

There is also much variation between and within different world regions. While in the mid 1990s the share of US women enrolled in college surpassed that in many other countries, Asian countries had a lower share of women in the tertiary education system. In China and India, for example, one third of college students were women. African countries have been characterised by the highest educational disadvantages for women in this regard (for example, Jacobs, 1996). As in most regions in the world, increasing educational opportunities and the expansion of the education systems led to a trend towards gender parity in educational attainment – first in primary and secondary education (cf. for Asia, for example, Tan and Mingat, 1992), and later

in college enrolment; however, country differences remain large, with the lowest gender equality rates in countries such as Pakistan, where gender inequality actually increased during the 1990s, as indicated by a decreasing Gender Equality in Education Index that refers to both female enrolment and achievement in education systems (Unterhalter, 2006). While in Pakistan and India, girls remain educationally disadvantaged, in other Asian countries such as Mongolia and Malaysia, women enjoy an advantage in college enrolment (UNESCO, 2012).

Gender inequalities in education: theoretical explanations and empirical findings

A general theoretical framework

While there are many empirical studies on gender inequalities in educational attainment, the theoretical underpinnings of these studies remain somewhat scarce. Most social science research is based on the constructionist assumption that gender differences in education relate to gendered socialisation experiences as opposed to biological or genetic sex differences. This social science notion has been made explicit in the classic work of Oakley (1972) on the distinction between 'sex' and 'gender'. Reference to 'sex' is accompanied by the underlying assumption that differences between men and women are biological, such as the differences in genitalia or child-bearing, while 'gender' refers to the social construction of males and females. Social scientists emphasise socialisation processes and cultural determinants, such as the internalisation of gender roles and norms, in explaining gender inequalities in education.

Although the distinction between sex and gender is common in social science research and provides a general framework for thinking about gender differences, it does not provide much insight into the specific mechanisms behind gender differences in education. Developing a general theoretical framework to explain gender inequalities is challenging, as it requires a theory that fits several sometimes conflicting aspects of gender inequalities in education. As noted above, gender inequalities are different at various stages of the educational career (for example, preschool versus tertiary education) and along different dimensions of inequality (for example, competencies, degrees and certificates, interests). For example, the sources of the male disadvantage in secondary school performance in many countries may be quite different from the sources of the female disadvantage in access to tertiary education during the first half of the 20th century. Similarly,

the sources of gender segregation in fields of study are also probably different from those explaining the high attrition rates of women at the very highest levels of academia (Leemann et al, 2010).

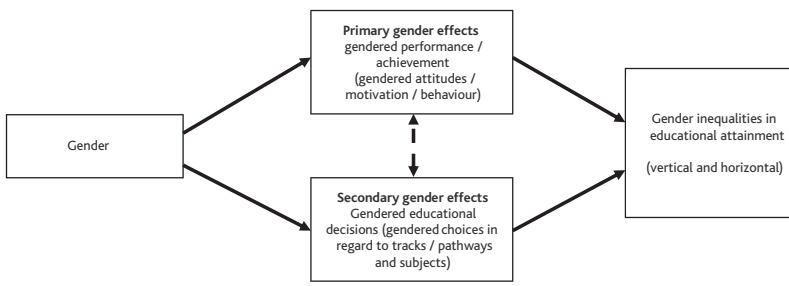
We seek to advance a more 'holistic theoretical framework' by applying Raymond Boudon's (1974) concept of the *primary and secondary effects of social origin* to gender inequalities in education. First, we briefly outline the original concept that sought to explain educational inequalities in relation to social origin. Primary effects of social origin describe differentials in educational attainment that are linked to differences in performance or achievement levels related to social origin. The main mechanisms behind these performance or achievement differences are social differences in parental support or learning environments. Poorer educational performance is thus ascribed to lower capital resources in the parental home and general social environment. Such capital deficits include a low level of parental education, a lack of books (cultural capital; Bourdieu, 1986), a lack of financial resources to purchase learning materials or private lessons (economic capital), and a lack of useful contacts who may provide learning activities or a motivating environment (social capital). Secondary effects of social origin refer to differences in educational decisions that are linked to group-specific cost–benefit calculations with regard to different educational pathways (programmes, tracks) and aspirations. Secondary effects can thus be conceptualised as rational educational decisions made by individuals (Breen and Goldthorpe, 1997; Esser, 1999; Becker, 2003) as a result of individual class-specific considerations of probabilities to succeed, as well as the costs and benefits of different educational alternatives. Individuals from the upper social strata expect greater returns and lower costs in terms of risks in obtaining higher education than do individuals from lower strata (for example, Becker and Hecken, 2009). Such secondary effects are particularly strong in highly differentiated (that is, highly stratified) educational systems with early selection and a variety of different educational tracks, since educational decisions by students and their parents and teachers must be made earlier and more often than in less differentiated educational systems.

While explicit applications of Boudon's (1974) concept to gender inequalities are rare (but see Hadjar and Berger, 2011, and Becker, 2014, for examples), implicit links may be found. For example, Breen and Goldthorpe (1997) related gendered educational choices to gendered perceptions of how an educational pathway contributes to the goals of status attainment and income acquisition among men and women. Others (DiPrete and Buchmann, 2006, 2013; Breen et al, 2010) argue that a major factor behind the reduction of educational

disadvantages for women during the last century were the increasing benefits of education for women and, thus, focus on secondary effects with regard to cost–benefit calculations to explain the rise of women's educational attainment.

Figure 8.4 provides a conceptual framework of the primary and secondary effects of gender as they relate to gender inequalities in education. The *primary effects of gender* on educational attainment are differences in performance and achievement between boys/men and girls/women. According to the constructionist perspective and much empirical evidence (Leaper, 2002; Hadjar et al, 2007), such differences do not originate from differences in biological ability but from the socialised motivational, attitudinal and behavioural patterns of males and females, and how these are supported and motivated with regard to educational activities. Hadjar and Berger (2011) conceptualise these factors as resources relevant for educational success. Such primary effects of gender might play a role, particularly in the lower educational success of boys; that is, the higher levels of school alienation in boys (Hadjar and Lupatsch, 2010) and their less conforming behaviour at school (Eagly and Chravala, 1986; Hadjar et al, 2015) may be seen as disadvantages. The same idea applies to girls' typically lower level of interest in STEM subjects (for example, mathematics, physics, engineering), or boys' typically lower interest in language subjects, that then relate to lower success in these school subjects (Hadjar and Lupatsch, 2011). Buchmann et al (2008: 322) summarise such primary effects as follows:

Figure 8.4: Primary and secondary effects of gender



Note
This conceptualisation follows that of Becker and Lauterbach (2010: 16) with regard to the primary and secondary effects of social origin.

> During adolescence, high school teachers consistently rate girls as putting forth more effort and as being less disruptive than boys. […] Adolescent girls also possess higher levels of other non-cognitive skills such as attentiveness and organizational skills, […] self-discipline […] leadership qualities, and interest in school, all of which facilitate academic success.

The *secondary effects of gender* involve the cost–benefit calculations of parents, teachers and students with differential evaluations of the benefits, costs and probabilities of educational success for males and females. With regard to gender, the main assumption is that perceptions of the likelihood of success, as well as the benefits of different educational pathways, differ for women and men. From the perspective of human capital theory (Becker, 1964) and other rationalist approaches related to this concept (for example, Breen et al, 2010), education becomes a meaningful investment for women if the investment pays off in terms of higher income and status in the labour market. As long as women's labour force opportunities remained severely constrained, they invested less in education and opted for lower educational pathways. This argument regarding cost–benefit analysis also applies to parent and teacher decisions about secondary school track placement for individual male and female students. As long as women were not perceived to be equal participants at the labour market, parents and teachers probably perceived lower educational pathways as sufficient for female students. Such secondary effects can also explain gender segregation, since gendered subject choice is strongly linked to perceptions of the differential competences and abilities of women and men, as well as gendered interests and life plans.

Gender and educational achievement and attainment

Individual-level explanations: primary and secondary effects of gender

At the individual level, one explanation for the rapid rise of women's educational attainment in recent decades focuses on the educational investments and motivations of individuals. Following human capital theory (Becker, 1964), investments in education only pay off when women are able to convert their education into higher income and status in the labour market. From this perspective, a main factor behind the lower educational participation of women historically had been their higher affiliation with household and child-rearing activities,

as well as their poorer labour market opportunities. The increasing educational participation of women is strongly linked to changing gender norms and women's rising labour force participation, which was caused, in part, by a rising demand for workers in the service sector. As a result of the decreasing importance of marriage and the increasing importance of labour force participation for women, their life prospects have changed substantially in recent decades. Institutional changes in both educational and social systems have also come to make education more attractive both to women and men (Breen et al, 2010). The increase in educational returns for women is a major mechanism behind the increasing motivation of women to pursue higher levels of schooling and, specifically, higher education (Buchmann and DiPrete, 2006; DiPrete and Buchmann, 2006; Buchmann et al, 2008). Girls have long earned higher grades on average, but they did not leverage their better academic performance into higher rates of educational attainment. Thanks to declining overt gender discrimination in most industrialised societies, and rising opportunities and incentives for women to earn a college degree, more women today take full advantage of their better average academic performance by completing more upper secondary and tertiary degrees than ever before.

Why do boys tend to achieve lower grades than girls in school? Within the scientific debate on boys who fail at school, several issues have been discussed, focusing on *student characteristics*, including their motivation, attitudes and behaviours. Compared to girls, boys tend to be less engaged in school and put forth less effort in their school work. Girls spend more time studying and doing homework. Girls are also more likely than boys to report that they fit in at school, that they like school and that grades are very important to them.

Boys also have lower social and behavioural skills than girls. These skills include orientations to learning, attentiveness, task persistence and self-control. DiPrete and Jennings (2012) examined differences in social and behavioural skills by gender, race and social class for a national sample of elementary school children in the United States. In the dataset they used, teachers rated student social and behavioural skills at several points from kindergarten through fifth grade, and these ratings were grouped into multiple behavioural dimensions. Using factor analysis, DiPrete and Jennings combined three scales measuring approaches to learning, self-control and interpersonal skills into a single factor that provided a more parsimonious description of gender differences. They found that girls lead boys in these skills by nearly .4 standard deviations at the start of kindergarten. From kindergarten to the end of fifth grade, boys fall further behind, and by the end of fifth grade

boys lag by .53 standard deviations. The skills gap between boys and girls is considerably larger than the gap between children from poor families and non-poor families or the gap between black and white children. Social and behavioural skills are directly related to teacher ratings of academic outcomes, such that girls get higher average ratings and hence higher grades than boys.

Another behavioural cause of boys' lower average educational success relates to the fact that boys more often engage in deviant behaviours in school; they are more likely to disrupt lessons and engage in violence, and less likely to conform to school norms and rules (Eagly and Chravala, 1986; Francis, 2000). Boys also respond more often to experiences of failure and frustration with aggressive and violent behaviour (Hannover, 2004). School deviance is associated with lower educational success, since school deviance diverts boys from successful learning and may be sanctioned by teachers (Salisbury and Jackson, 1996; Francis et al, 2010). Boys frequently put forth less effort and have a lesser sense of duty than girls. Leisure-time behaviours outside school are also of importance: one frequently cited cause of boys' relative lack of success at school is media consumption. Boys spend more of their leisure time than girls playing computer and video games and watching films that are often not appropriate for their age. This may draw some of their attention away from learning, as well as diverting some of the cognitive abilities that they need for school-related activities (see Hadjar et al, 2014).

School delinquency is rooted in two cognitive representations: school alienation and non-egalitarian gender role orientations. According to the findings of Hadjar et al (2015), boys tend to be more alienated from school and adhere to more traditional gender images than girls. Both a higher level of school alienation and a greater preference for non-egalitarian gender roles are predictive of higher levels of school delinquency that may subsequently lead to lower educational attainment. The gender difference in school alienation is due to several mechanisms: on the one hand, girls' needs seem to be better fulfilled by school; at the same time, girls tend to adapt better to the expectations of school (Hascher and Hagenauer, 2010). As early research by Willis (1976) found, school alienation is an expression of resistance to school. Willis was the first to report an opposition among working-class boys to school, its authoritative structures and its middle-class culture. These working-class boys tended to leave school to enter the labour market earlier than other boys. As a consequence of their school alienation, they failed to participate in learning activities and conform to school rules, which, in turn, often led to higher deviance, poor school success

and school dropout. With their increasing emotional and physical distance from school, they also lacked the resources to cope with experiences of failing in school (Hascher and Hagenauer, 2010).

The traditional image of male identity, which includes dominant, assertive or even deviant roles, is incompatible with contemporary schooling. For many boys, masculinity is incommensurate with approval from their peers at school and, rather than being good at schoolwork, they have to express a dislike of school to gain acceptance from their peer groups. Among some boys, traits such as conformity, cooperation and obedience, which might be important for educational success, are devalued as 'female' (Frosh et al, 2002). In the British discourse on failing boys, traditional gender role patterns are considered to be a 'laddish construction' (Francis et al, 2010). The laddish attitude is anti-academic, in that hard work and school achievement are devalued. The school culture and 'laddish culture' are in this sense antagonistic. Some scholars (Willis, 1976; Martino, 1999) emphasise that this 'laddish' construction of masculinity is associated with a devaluation of schoolwork, especially among working-class boys. For these reasons, school alienation is far more common among boys than girls.

Moving the focus from school students to *teachers*, female teachers have been at the centre of the debate regarding boys who fail at school from the beginning. Some scholars, such as Diefenbach and Klein (2002), maintain that female teachers interpret and respond to boys' behaviour at school differently than male teachers. The different socialisation experiences of female teachers and boys may result in a lack of understanding and subsequent conscious or unconscious discrimination on behalf of female teachers. From this point of view, the feminisation of the teaching profession has led to a 'feminised' school culture that some believe to be responsible for the lack of boys' school success; recent research, however, finds little support for this idea: on the individual level, teacher gender has not been found to have an influence on boys' educational success and the feminisation of schooling does not explain the gender gap in educational success (Francis et al, 2010; Neugebauer et al, 2010). On the other hand, it may be useful to consider stereotypes held by both male and female teachers regarding boys, which may serve as 'anchors' for their evaluation of student performance. The stereotypes that boys do not perform well in language subjects and that girls do not excel in mathematics may bias the grades teachers assign to students (Glock and Krolak-Schwerdt, 2013; cf. Hadjar et al, 2014). Research by Hadjar and Lupatsch (2011) also indicates that female teachers do not discriminate against boys, but they do find that the gender of the teacher appears to have a

(minor) impact on the interests of boys and girls. For example, boys instructed by a male German teacher are slightly more interested in this 'feminine' subject than boys with a female German language teacher. This speaks to the need for more heterogeneity among teachers, rather than matching the gender of teachers and their students.

Macro-level explanations: education systems and social systems, and how they shape gender inequalities

Countries differ greatly in how they organise their educational systems, and it is important to know whether some educational systems are more conducive than others for reducing inequalities among students. Quantitative research on educational systems and inequalities often focuses on three characteristics seen as particularly relevant to educational inequalities: external differentiation (stratification), standardisation and vocational specificity (Allmendinger, 1989; Müller and Shavit, 1998; Kerckhoff, 2001; Pfeffer, 2008; Van de Werfhorst and Mijs, 2010; Hadjar and Berger, 2011). In order to provide a summary of the main system characteristics (see chapter 1), *differentiation* or *stratification* refers to the number of different school types that exist in parallel and time of selection of students into differential pathways. Highly stratified (that is, highly differentiated) education systems are characterised by the early selection of children into different tracks or streams, few chances to switch between tracks, and a strong influence of social origin on prospects of access to the different, hierarchically ordered school types. *Standardisation* is related to variability between schools and regions with regard to quality of education, level of educational spending, governance structures and teacher education. *Vocational specificity* refers to the connection between educational institutions and the structure of professions. In a highly vocation-specific system, educational institutions impart skills and knowledge that are specific to particular occupations and therefore prepare students for specific occupational fields.

Research has examined how variations in educational systems are related to inequalities arising from social class, race and immigrant status in education. Very little research has considered how educational systems shape gender inequalities, while studies of gender inequalities in education have barely considered the role of educational systems. Research into these questions thus has great potential to make broad contributions to both literatures. Such research is also highly policy-relevant, in that it can provide clues to ways that educational systems

can ameliorate the growing gender inequalities in educational outcomes that exist today.

As outlined previously, the major driving force behind changing gender inequalities in education over the 20th century is the increased educational motivation of girls and women (for example, the secondary effects of gender) as opposed to the decreasing achievements of boys. Here we briefly focus on the macro-characteristics that may shape such secondary effects of gender. As the educational motivation of women increased due to increasing opportunities in the labour market (Breen and Goldthorpe, 1997) and parents became more willing to invest in their daughters' education, women probably made use of these new opportunities more than other groups in society (for example, working-class men) and thus benefited tremendously from educational expansion (Hannum and Buchmann, 2005; Hadjar and Becker, 2009). Increasing the size of the education system may benefit women and decrease the educational inequalities that favour men.

We know that highly differentiated and highly stratified systems (especially those with a strong vocational sector) help students transition from school to work, but there is growing evidence that countries with more highly differentiated educational systems also have higher levels of inequality in educational opportunity according to social class and race/ethnicity. Is this also the case for gender? The degree of stratification (external differentiation) of an education system presumably also has an impact on gender inequalities, as highly stratified education systems are characterised by the early selection of children into different tracks or streams, few chances to switch between tracks, and a strong influence of social origin on access to the different, hierarchically ordered school types. In highly differentiated education systems, the pathways of girls and boys are determined at an early age with an expected higher level of inequalities. In fact, Hadjar and Berger (2011) report, based on data from the ESS, that the reversal of gender inequalities in upper secondary education and the decrease in the disadvantages of women appeared to take place earlier and be much stronger in countries with less differentiated education systems, such as Sweden and Denmark, while gender inequalities appear to be more persistent in countries with highly differentiated educational systems. The currently debated disadvantages of boys, however, noting that they are placed in lower school tracks than girls, is also strongly prevalent in countries with highly differentiated educational systems such as Luxembourg, Switzerland and Germany (Hadjar et al, 2014). In the systems where girls and boys are not sorted equally into secondary schools, we might

see greater gender inequality in achievement outcomes and educational attainment.

Research has found that standardisation tends to reduce social class inequalities in achievement. This is because in standardised systems – where performance in several subjects is required to earn a diploma and advance to the next level of schooling – the individual orientations of students towards those subjects is less influential. This equalising effect of standardisation may also work for gender inequality. In fact, Ayalon and Livneh (2013) show that countries with standardised educational systems that have national examinations and a common curriculum that exposes all students to similar maths knowledge also have smaller gender gaps in mathematics test scores. So perhaps paradoxically, educational standardisation, which may be seen as a conservative practice that limits the freedom of students to choose courses that match their abilities and inclinations, seems to be linked to more egalitarian educational outcomes. It is an open question whether standardised systems also have less gender inequality in other outcomes, such as overall academic performance in terms of standardised test scores and grades or gender segregation in fields of study.

Vocational specificity is closely related to stratification (external differentiation), in that those educational systems that incorporate specific streams for vocational training tend to be more stratified, and there is a clear distinction between academic and vocational trajectories. How vocational specificity impacts gender inequalities is another open question, and, to the best of our knowledge, researchers have not yet investigated this relationship.

In addition to the institutional characteristics of education systems, other societal-level variations probably impact gender inequalities in education. Again focusing on the secondary effects of gender, gender role orientations prevalent in a society (stressed by Hadjar and Berger, 2011) and structural conditions that increase women's workforce participation (as outlined by Breen and Goldthorpe, 1997) may both have an impact. Women's education and workforce participation are facilitated in societies – or 'gender regimes' to use the terminology of Lewis and Ostner (1994) – where these issues are structurally supported by measures such as equal-pay policies, a strong childcare system and flexible working conditions for women and men with children. Such conditions are accompanied by modern and equal gender role orientations that appreciate women's workforce participation. According to the findings of Hadjar and Berger (2011), who considered how the structural conditions of different welfare regime types impact gender differences, the previously male advantage in education has

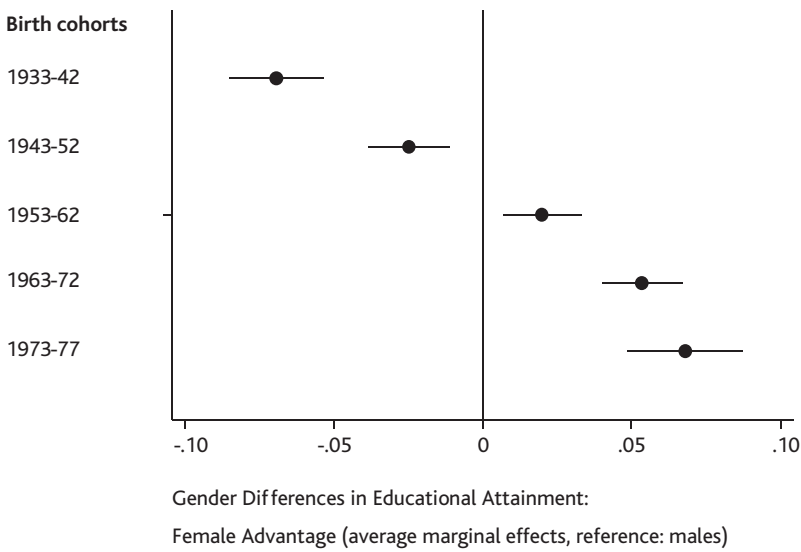
been reduced most profoundly in social democratic, post-socialist and, interestingly, in family-oriented welfare regime types.

Empirical results of complex multi-level analysis with data from the ESS

This section analyses how educational system characteristics and social system characteristics are linked to gender inequalities in education. The multi-level analysis of country level and individual level data uses a pooled dataset from the ESS waves of 2008–12, including data from 33 (mostly European) countries.[1] Since the number of country cases does not allow for highly complex analyses with regard to macro-level characteristics, not all characteristics of the education and social system can be considered at the same time. As figures are more accessible, the results are not presented in tables; instead figures illustrate certain issues based on the results of the multi-level multivariate analyses.[2]

Figure 8.5 shows how gender inequalities changed over time across consecutive birth cohorts. The coefficients plotted are the average marginal effects and indicate the gap in educational attainment between males and females who completed A-level education and above in percentage points. Values above 0 refer to a female advantage. The

Figure 8.5: Changing gender inequalities in educational attainment

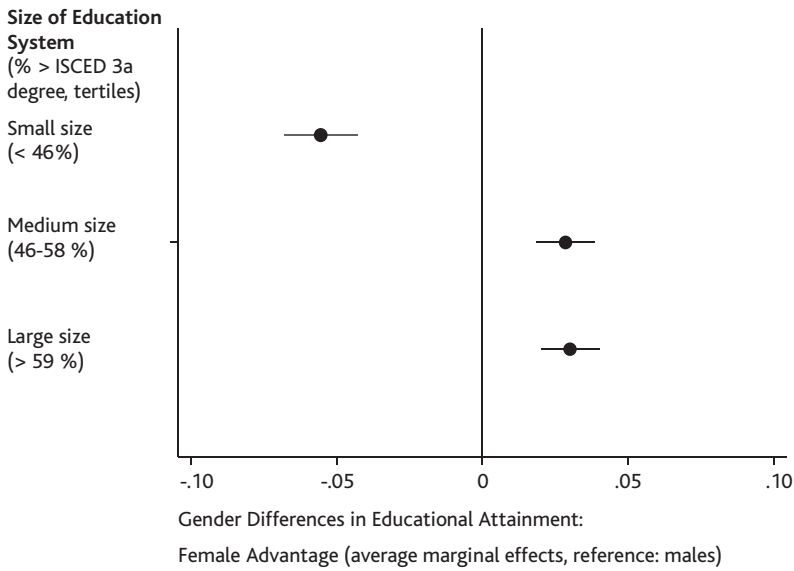


Note
Multi-level models (Level 1, *N* = 98,264 individuals; Level 2, *N* = 33 countries), controlled for social origin, citizenship, period
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, author calculations.

figure demonstrates the significant interaction effect of gender and birth cohort on educational attainment: the educational attainment of women has increased more strongly than male educational attainment over successive cohorts. For the 1933–42 cohort, women were about 4 percentage points less likely than men to attain an upper secondary education, but among the 1953–62 birth cohort, women were about 7 percentage points more likely than men to complete this level of education. This is a sign of the reversal of the gender inequalities in A-level education (upper secondary education).

Cross-level interaction effects related to the question of how macro-level characteristics impact gender differences indicate some influences of the education system and the social system: *size of the education system* (percentage of people with at least ISCED 3a-degree, that is, a general upper secondary school degree/university entrance certificate) moderates gender inequalities in education (see Figure 8.6). In education systems with a medium or high output of upper secondary graduates, women are more advantaged in comparison to men than in smaller education systems. Increasing the size of the education system

Figure 8.6: Size of education system and gender inequalities in educational attainment

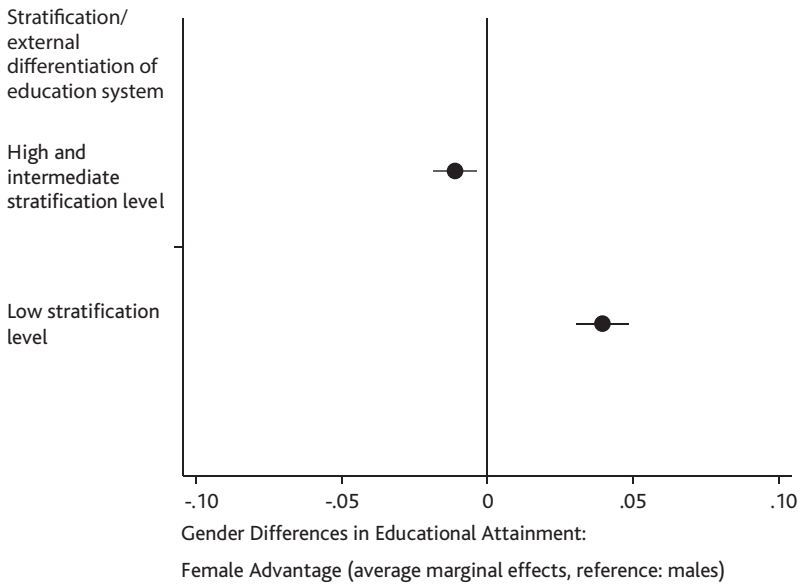


Note
Multi-level models (Level 1, *N* = 98,264 individuals; Level 2, *N* = 33 countries), controlled for social origin, citizenship, period, birth cohort on individual level; for stratification of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, author calculations.

by expanding the upper secondary school sector seems to decrease gender inequalities to the benefit of women.

Degree of stratification of the education system seems to impact on the gender gap in educational attainment, in that women are better off in education systems with a low level of external differentiation (Figure 8.7).

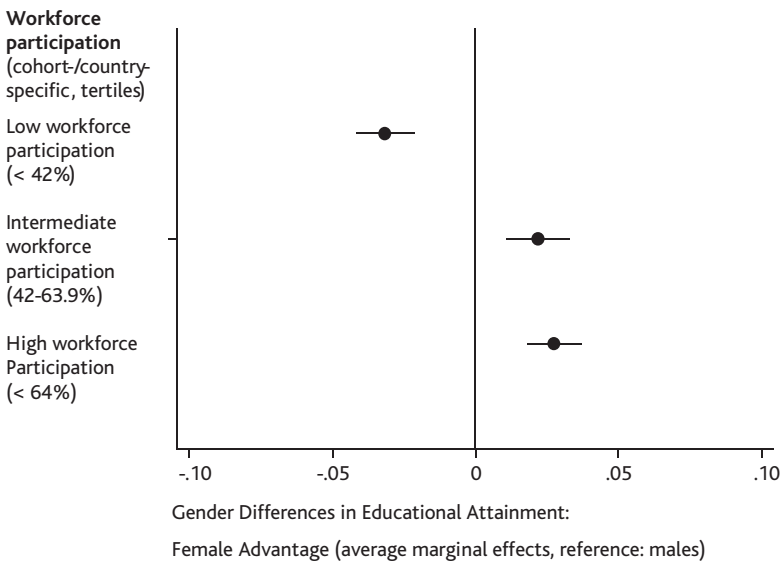
Figure 8.7: Stratification level and gender inequalities in educational attainment



Note
Multi-level models (Level 1, *N* = 98,264 individuals; Level 2, *N* = 33 countries), controlled for social origin, citizenship, period, birth cohort on individual level; for size of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, author calculations.

The *labour force participation of mothers* (operationalised in terms of the proportion of working mothers in a respective cohort in a respective country) has a weak positive effect on the female favourable gender gap (Figure 8.8), particularly if – in the simplified figure – the difference between a low level of workforce participation (the lowest tertile) and an intermediate and high level of participation is considered. This finding lends support to the notion put forth by Breen et al (2010: 33) that women's educational decisions depend on their perceived labour market chances, as the labour force participation of the mothers of the survey respondents (aggregated by cohort and country) is an indicator for the employment opportunities for the next generation.

Figure 8.8: Workforce participation of mothers and gender inequalities in educational attainment



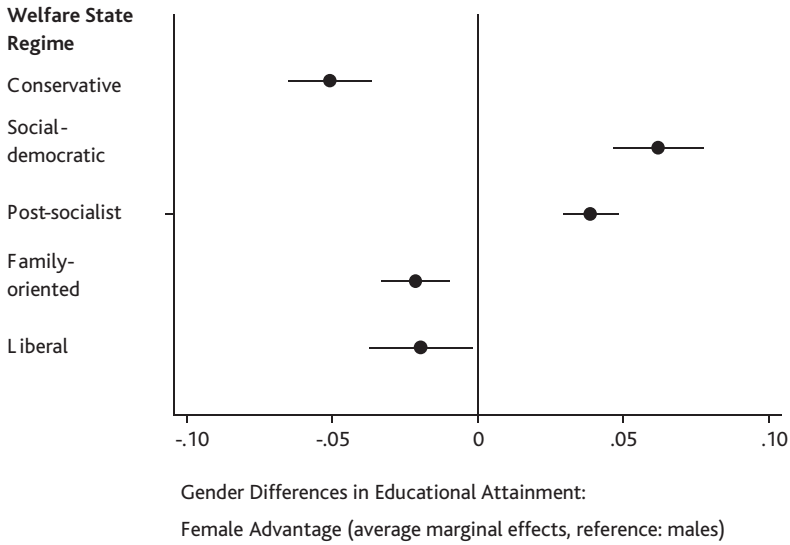
Note
Multi-level models (Level 1, *N* = 98,264 individuals; Level 2, *N* = 33 countries), controlled for social origin, citizenship, period, birth cohort on individual level; for size of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, author calculations.

With regard to *welfare state regimes* (Figure 8.9), women seem to fare best in social democratic welfare states (for example, Sweden, Finland) across all birth cohorts under consideration. While in conservative welfare state regimes (for example, Germany, Austria), men's chances of receiving at least an A-level degree is 5 percentage points higher than women's chances, women have better chances than men in social democratic welfare state regimes. The same holds true for post-socialist welfare state regimes. This implies to some degree that the welfare state regime and how it deals with inequalities also applies to gender inequalities.

Summary and outlook

Summarising the issue of gender inequalities in education is challenging, since the patterns of gender inequalities vary across contexts, for different educational outcomes, and across stages of the educational career. The 'failing boys' debate focuses primarily on the stage of secondary schooling. In relation to tertiary education and higher academic careers, the advantages for women that are perceived

Figure 8.9: Welfare state regime and gender inequalities in educational attainment



Note
Multi-level models (Level 1, *N* = 98,264 individuals; Level 2, *N* = 33 countries), controlled for social origin, citizenship, period, birth cohort on individual level; for size of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, author calculations.

to be 'new' are smaller than with regard to secondary education relative to men. When it comes to the question of high-level employment in the academic sector, women tend to continue to be at a profound disadvantage. The issue of labour market chances as it relates to women's educational attainment also requires further research. While there are certainly disadvantages for men in secondary education, in most contexts it appears that men continue to be better able than women to transfer their educational investments into income, status and prestige in the labour market.

The increased educational motivation of women, due in part to increased labour market opportunities, appears to be a major force behind the changing gender inequalities in (secondary) education – both in theoretical work and empirical studies. The poorer educational attainment of males in secondary school is partly based on the increased educational motivation of females (expressed in increasing participation in upper secondary education) rather than a decline in males' academic achievement over time; individual causes, however, seem to be linked to male behaviours and motivation rather than those of teachers.

How do education systems impact gender inequalities in education? The empirical results presented here show that as the size of the education system increases (with opportunities to attend upper secondary general and higher education as a major indicator) women's opportunities in the education system also grow. The stratification or differentiation of the education system also seems to be important. The findings also indicate that gender inequalities are smaller in countries that have less differentiated educational systems (in terms of later age of selection and comprehensive schooling). Such characteristics of education systems are also linked to social system characteristics. Social democratic and post-socialist welfare state regimes have been most successful in reducing previous gender inequalities in education that favoured men. Future research into the relationship of the role of institutional features of educational system and societal-level variations as they relate to gender inequalities in education should be informative. A holistic approach should consider factors on three levels: the macro-level characteristics of the education system (for example, mentoring programmes for women/men) and societal-level systems (for example, welfare state regimes, labour force participation rates, provision of childcare); meso-level characteristics (for example, school-specific selection procedures and support measures, teacher education, teaching practices) and student-level characteristics (for example, school alienation, learning behaviour, social behaviour). Such research will continue to advance our understanding of gender inequalities in education, as they continue to take shape and change over time.

Notes

[1] Countries included are Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Slovakia, Spain, Sweden, Switzerland, Turkey and Ukraine.

[2] Looking at the variance in educational attainment to be explained on the different levels, 63.7% of the variance is explained by individual-level factors, while 36.3% is explained by macro-level factors (for example, education system characteristics).

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NINE

Tracking, school entrance requirements and the educational performance of migrant students

Jaap Dronkers[1] and Roxanne A. Korthals

Introduction

The low educational achievement level of migrant students in most Western countries is a growing concern for policy makers.[2] High educational achievement is a prerequisite for successful integration into society and thus the best strategy to combat societal exclusion and discrimination of minority groups. Many studies (for example, Portes and Rumbaut, 2001; OECD, 2012) have shown that the low educational achievement of migrant students is partly explained by their lower socioeconomic status, but even controlling for this, research still suggests a wide gap between native and migrant students in educational achievement. What is interesting from a policy perspective is that there is substantial variation among migrant students themselves. This variation is linked to, for instance, individual characteristics such as the student's destination language, whether the student is a first- or second-generation migrant, age of migration, and having one or two non-native parents (Chiswick and Miller, 1996, 2002).

This study focuses on the effects of certain education system characteristics on migrant student performance. A study by the Organisation for Economic Co-operation and Development (OECD, 2007) showed that the more differentiated a country's education system, the more native students outperform migrant students, even after taking into account social background characteristics. Ammermüller (2005), who used a more restricted measurement of differentiation (number of school types available), reached another conclusion: the more types of school from which migrant students can choose in secondary education, the better they perform on average. Such a school system, however, with choices between different school types,

enhances the negative effect of speaking the language of the country of origin at home.

Although these studies examine the effects of education systems on migrants, this is not the main focus of their analysis. They also lack a suitable design to study the effects of a migrant's country of origin and destination, and these are related to their educational achievement. This chapter builds on the work of Levels et al (2008) and Dronkers et al (2014), who focused on the influence of both societal and education system characteristics of a migrant's country of origin and destination on their educational achievement. These studies use the cross-classified multi-level design first introduced by van Tubergen et al (2004). Instead of relying on observations of multiple-origin groups in a single destination, or a single-origin group in multiple destinations, the authors proposed a combined method that allows the comparison of multiple origins in multiple destinations.[3]

A major problem with the studies above (both for native-born and migrant students) is that they use a two-level model with a distinction between countries (origin and destination with societal and education system characteristics) and students (with individual and family characteristics). They thus ignore the fact that there are more levels that affect student achievement: students are nested in schools and within schools along different tracks, and all these levels produce sources of variation in achievement levels.

Dunne (2010) introduced a three-level model: countries, schools, and students. She showed that school characteristics such as socioeconomic composition and ethnic diversity have substantial effects on achievement levels, and also affect the relationship between parental background and achievement. These school characteristics seem to mediate some of the effects of education system characteristics found earlier. For instance, one of the reasons the relationship between parental background and achievement is stronger in stratified education systems, is that in these systems the particular school a student attends has a stronger effect.

Dronkers et al (2012) applied this three-level model to the children of migrants and their educational performance, confirming the results of Dunne (2010). The direct effect of parental background is strongest in comprehensive systems, and weakest in stratified education systems. This still holds true after inclusion of the track level within the schools, the origin countries of the migrant students, and the ethnic diversity of schools; however, the influence of parental background on the entrance selection of students (either based on prior performance or parental background) into different tracks and schools, is higher in stratified systems. It is possible that in these systems parents are more concerned

about school and track choice due to the long-term consequences of early choices. When schools and tracks do not select students, the influence of parental background is greater in comprehensive systems.

Korthals, and Dronkers (forthcoming) also explicitly take the school level into account to show that the relationship between tracking and student performance for native students is dependent on whether school principals use prior performance to select students. Their analyses showed that students in highly differentiated systems perform best when principals take into account prior performance in order to decide on student acceptance, leaving less room for parental influence. They also showed that in these schools and systems, students with high parental background gain less from their high parental background, whereas students with lower parental backgrounds are less harmed by it.

The main aim of this chapter is to investigate the relationship between tracking and student performance for migrant students, taking into account the school level and country of origin. This chapter contributes to a better understanding of differential effects of education system characteristics on native and migrant students. In our analyses we make use of the Programme for International Student Assessment (PISA) 2009 wave and compare two samples: a main estimation sample of 15 countries for which the country of origin of the migrant students is available (a sample similar to Dronkers et al, 2012), and a sample of 31 Western countries, as used by Korthals, and Dronkers (forthcoming).

Debates about migrants and education

The educational position of migrant children with different origins has been well documented. Research conducted in the United States has shown that major variation exists in the educational outcomes of different ethnic groups: Mexican Americans and black students obtain lower average grades than Asians and native Americans (for example, Bankston and Zhou, 2002), they are more likely to drop out of high school (White and Kaufman, 1997), and less likely to earn a college degree (Camburn, 1990; Mare, 1995). Similar gaps in educational success between different migrant groups have been observed in other Western countries such as the Netherlands (van Tubergen and van de Werfhorst, 2007), Belgium (Phalet et al, 2007), Germany (Worbs, 2003), and France (Brinbaum and Cebolla-Boado, 2007). In order to understand these migrant group differences, research has often relied on classic individual-level determinants (Kao and Thompson, 2003). Overall, these individual-level explanations have focused on the cultural position (for example, their motivation to perform) and the structural

characteristics (for example, parental social capital inside and outside their ethnic group and the time of arrival) of different migrant groups.

In addition to the study of the educational performance of different migrant groups in a single country, cross-national research has been conducted. Cross-national data collection such as that of TIMMS (Trends in International Mathematics and Science Study), PISA and PIRLS (Progress in International Reading Literacy Study), which focus on children's performances in various subjects, has allowed a comparison of the educational performance of migrant and non-migrant students in different destination countries. Individual- and school-level characteristics from PISA 2000 have been taken into account to explain differences in educational performance between first- and second-generation migrant students and native-born students (Marks, 2005; Schnepf, 2006). Interestingly, these effects vary substantially between countries. Although not tested, the differential effects seem to stem from differences in the education systems or immigration policies of the destination countries.

The study of educational system effects on the scholastic performance of migrant pupils is relatively recent. This study examines the influence of an important aspect of educational systems on the educational performance of migrant children. National education systems differ in the number of distinct educational programmes in secondary school, and the use of selection based on prior performance on entrance to secondary education (Shavit and Blossfeld, 1993; Shavit and Müller, 1998). Although it has been suggested that these different educational structures explain differences in the educational success of migrants across countries, there is little systematic evidence for this claim (Buchmann and Parrado, 2006; Heath and Brinbaum, 2007).

Since immigration is an intrinsically transnational phenomenon, it should be studied accordingly (Portes, 1999). Migrant parents and children from various countries of origin move to a variety of destination countries. In order to fully capture the complexity of the migration process, the use of a cross-classified multi-level design (or double comparative design) has been proposed (van Tubergen et al, 2004). Instead of relying on observations of multiple-origin groups in a single destination or a single-origin group in multiple destinations, the cross-classified design allows a simultaneous comparison of multiple origins in multiple destinations. Since this design disentangles the effects of characteristics of migrants' origin countries ('origin effects'), characteristics of the countries to which they migrate ('destination effects') and characteristics of their specific community (the origin–destination combination), it is extremely useful for gaining insight into

migrant outcomes such as educational performance. Analysing migrant integration in host societies without properly taking into account these origin effects will lead to flawed results: depending on the composition of the migrant population in a certain society, the results may be too optimistic or too pessimistic.

Data

We make use of PISA 2009 as organised by the OECD. PISA has been conducted every three years since 2000 and its main purpose is to facilitate international comparisons of student achievement. The PISA data involves a large array of students and school-level data and individual test scores on reading, science and mathematics. We supplement this data with country-level data on tracking.

PISA contains a representative sample from each participating country. It does so by selecting a sample of schools and including all 15-year-old students in that school.[4] Because of the two-tiered selection procedure and the need to obtain enough information on small subgroups, the samples might not be fully representative. For this reason the OECD provides individual sample weights which we use to ensure sample representation.

Extended sample

In 2009 75 OECD and partner countries participated in PISA. To ensure comparability with Korthals, and Dronkers (forthcoming) we employ only a selection of countries: the 31 countries which have a gross domestic product (GDP) per capita above the minimum of the OECD and available data on national tracking policies.[5] These limitations to the sample are imposed to exclude country heterogeneity as a driver of the results.

Table 9.1 shows the 31 countries and the sample sizes of both native students (both parents born in destination country) and students with a migration background. First-generation migrants are born outside the destination country, and have at least one parent born outside the destination country. Second-generation migrants are born inside the destination country, with at least one parent born outside destination country. This distinction between first- and second-generation migrants is derived from that of Portes and Rumbaut (2001), who classify migrant generation status based on age upon arrival in the destination country. We believe that the distinction used in this chapter

Table 9.1: Analysed countries, number of native and migrant students, and educational system characteristics per destination country

Destination country	Number of tracks	Proportion of students in schools that consider prior performance for student acceptance			Number of observations			
		Never	Sometimes	Always	Native-born	2nd gen.	1st gen.	All
Main estimation sample								
New Zealand	1	0.36	0.38	0.26	3,418	363	790	4,571
Norway	1	0.75	0.19	0.06	4,293	165	146	4,604
Finland	1	0.69	0.26	0.05	5,603	59	71	5,733
Denmark	1	0.49	0.47	0.05	4,474	931	358	5,763
Greece	2	0.55	0.38	0.07	4,499	141	242	4,882
Israel	2	0.12	0.35	0.53	4,459	679	391	5,529
Argentina	3	0.46	0.35	0.18	4,455	103	62	4,620
Portugal	3	0.71	0.27	0.02	5,858	151	182	6,191
Luxembourg	4	0.02	0.55	0.43	2,671	994	625	4,290
Germany	4	0.11	0.15	0.74	3,713	525	272	4,510
Netherlands	4	0.01	0.11	0.89	4,129	405	142	4,676
Austria	4	0.24	0.16	0.59	5,493	617	247	6,357
Belgium	4	0.38	0.43	0.19	7,059	585	638	8,282
Switzerland	4	0.29	0.17	0.54	8,850	1,708	991	11,549
Czech Rep.	5	0.19	0.26	0.55	5,830	95	64	5,989
Added countries in the extended sample								
Iceland	1	0.68	0.29	0.03	3,454	14	67	3,535
Sweden	1	0.78	0.19	0.03	3,976	339	163	4,478
Estonia	1	0.12	0.58	0.30	4,277	337	32	4,646
Poland	1	0.34	0.48	0.18	4,821	-	1	4,822
United States	1	0.47	0.27	0.26	4,116	658	325	5,099
Spain	1	0.76	0.20	0.04	23,179	310	1,915	25,404
Chile	2	0.17	0.42	0.40	5,424	5	23	5,452
Lithuania	3	0.38	0.49	0.12	4,142	68	7	4,217
Latvia	3	0.37	0.34	0.29	4,239	191	21	4,451
Hungary	3	0.03	0.05	0.92	4,416	44	51	4,511
Croatia	3	0.00	0.07	0.93	4,408	358	175	4,941
Russian Federation	3	0.33	0.43	0.24	4,545	349	249	5,143
Slovenia	3	0.32	0.47	0.21	5,454	391	92	5,937
Italy	3	0.30	0.29	0.41	28,954	365	1,178	30,497
Ireland	4	0.43	0.37	0.21	3,448	53	256	3,757
Slovak Rep.	5	0.18	0.19	0.63	4,482	15	10	4,507
Total	2.61 (mean)	0.36 (mean)	0.31 (mean)	0.33 (mean)	188,139	11,018	9,786	208,943

is clearer in cross-national usage and is less likely to underestimate the importance of pre-school socialisation.

The extended sample in this analysis consists of 188,138 native, 9,786 first-generation and 11,018 second-generation migrant students in (pre-)vocational or general education who were in schools where more than five students participated in PISA 2009. This amounts to 208,943 students in 7489 schools in 31 countries.

Main estimation sample

To determine the student's country of origin, which is necessary for our analyses, we need specific information on the country of birth of both the students and their parents, however, countries which allowed the country-of-birth questions in the PISA student surveys may have determined the set of allowed answers. This gave countries the option to include only their most important groups of migrants, limiting the options students could use. As a result, the origin countries of the different destination countries are partly dependent on the available categories. To account for this possible bias, we compared, as much as possible, the origin countries in PISA with national statistics. In most cases the largest immigrant groups identified by the statistical offices are also represented in our PISA data. There are no indications that selectivity in the possible answers (only the largest migrant categories of destination countries are included) has produced a bias, because small migrant groups in destination countries barely influence the results (see Dronkers and Kornder, 2014, for the distribution of migrants in all countries and areas of origin). Students with a country of birth other than the country-of-birth options given, are classified as having an unknown country of birth. To simplify the presentation of the analysis, we combined the countries of origin into 14 regions of origin based upon a slightly adjusted version of the United Nations Statistics Division's composition of macro-geographical regions.

We omit destination countries that did not allow for enough country-of-birth options in the main sample. Among some destination countries that did provide enough country-of-birth options, the question was not consistently asked, and therefore data from only 15 of the 31 countries of the full sample was useful for the analysis where country of birth is included. The main estimation sample consists of 74,588 native, 7,609 first-generation and 5,180 second-generation migrant students.

Tracking and school selection policies

The defining characteristics of tracking in this chapter are the number of tracks a country has available for 15-year-old students, as obtained from OECD (2007). School principals can influence tracking by the manner in which they allocate students across tracks. School directors can decide based on prior performance (an imperfect proxy of ability), parental background or a number of other criteria, while in some countries parents have the last word. As in Korthals and Dronkers (forthcoming), school policies on the track placement of students are obtained from the school survey in PISA 2009. School principals were asked how often consideration was given to a student's record of academic performance (including placements tests) and to feeder school recommendations in admitting the student to the school. There are schools where neither of the two factors is considered, schools where at least one of these factors is sometimes used to decide acceptance, and schools where at least one of the two factors is always considered. 9.1 provides some descriptive statistics for school selection policies at the country level. It shows that there is large country variation in the percentage of schools that never, sometimes or always consider prior performance. In countries with four or five tracks over 50% of schools answer that they always consider prior performance, while in comprehensive systems still 45% of schools indicate they always or sometimes consider prior performance in accepting the student to the school. We control for the track level of the students to limit the possibility that school principals only consider prior performance so as to accept the better students to the school. More attention is paid to this possible bias in Korthals and Dronkers (forthcoming).

Control variables

In addition to the 2008 GDP per capita from the World Bank (2012), all control variables were obtained from the PISA student and school surveys. The control variables at the student level are gender, age, parental background, whether the student is in (pre-)vocational education as opposed to general education, and whether the student is in upper secondary school as opposed to lower secondary school. Parental background is measured by an index that describes the student's economic, social and cultural status. An internationally comparable version of education levels (lower versus upper secondary education) is based on the International Standard Classification of Education (ISCED) level and provided by the OECD.

The control variables at the school level are school composition, a number of school input variables and a range of other school characteristics. The school average and variation in parental background and the percentage of students in a school who speak a language other than the test language at home measure different school aspects of composition. School input is the student–teacher ratio, teacher shortages, shortage in instruction material, and whether the school is responsible for the curriculum and assessment. Other school characteristics are the school type (public, private government-dependent or private government-independent school), whether school achievement is tracked by an education authority, school competition in the area, school location, school size and the use of ability grouping.

Estimation method

We use random effect models, which are estimated using maximum likelihood, to take into account error terms for countries, schools and individuals. These are necessary, since students are nested within schools within countries. Ignoring the nested data structure led to a downwards bias of the standard errors, since we would implicitly assume that all observations are independent from each other.

Missing values in the sample are replaced by group averages. To control for possible bias introduced by the method for replacing missing values, imputation dummies and imputation interactions are used in all models.

We reweighted the subsamples (native-born, first generation, second generation) in such a way that each country within a subsample was the same size, in order to avoid countries with many migrant students dominating the results.

Results

In this section, we first look at the relationship between tracking and migrant student performance, taking into account whether school principals consider prior performance in accepting students, and we compare the results across native-born, first- and second-generation migrants. We run all models for the three indicators of student performance (reading, maths and science), and separately for native-born, first- and second- generation migrant students. The first model in Tables 9.2, 9.3 and 9.4 contains, next to all control variables, information about whether principals consider prior performance

(the reference category is when principals never consider prior performance) and the number of tracks in the destination countries.[6] In the second model, we add the interaction terms between number of tracks and whether school principals consider prior performance.

Second, we ask whether the effect of parental background is different when there are more tracks to which students can be allocated. In the third model, we therefore include the interaction between parental background and number of tracks in order to look at this question.

Third, we are interested in the extent of the bias when omitting the region of origin for migrant students from the analyses. We estimate models with and without origin dummies. To determine whether the choice to include only those countries which provide information on the region of origin biases the results, we also estimate the models without region of origin with the extended sample of 31 countries as used by Korthals and Dronkers (forthcoming).

Without controls for origin – main estimation sample

Table 9.2 shows our results for first generation, second generation and native students in the 15 destination countries for which we know the origin countries of the migrants. As in Korthals and Dronkers (forthcoming), and as can be seen in the lower panel for our main sample, the direct effect of tracking on student performance is insignificant for native students. 9.2 shows that this is the same for first-generation migrant students, but that for second-generation migrant students there is a negative relationship between the number of tracks and reading performance (compare Model 1 for the three panels).

If we look first at first-generation migrant students and add the interactions between number of tracks and whether school principals consider prior performance in Model 2, we find no significant effect of tracking, nor are there significant effects of whether principals consider prior performance, which we do find for native students; however, we find that in countries with more tracks, students perform better in schools that consider prior performance (interactions *Sometimes* and the number of tracks, and *Always* and the number of tracks). For the 15 destination countries, we find that first-generation migrant students have higher educational performance in highly stratified education systems if schools consider prior performance when accepting students. The educational performance of first-generation migrant students in these 15 countries is thus not solely driven by individual and school characteristics, but also influenced by the combination of schools and stratification of the education system.

Table 9.2: The relationship between number of tracks, whether school principals consider prior performance, and test scores (main sample: 15 countries)

	Model (1)			Model (2)			Model (3)		
Dependent variable	read	maths	science	read	maths	science	read	math	science
Sample: first-generation migrant students									
School considers prior performance:									
Sometimes	7.83	6.24	10.05	-7.12	2.58	-11.96	7.04	5.47	9.20
Always	11.49	12.28	9.68	-18.35	-18.53	-27.77	10.53	11.33	8.67
Number of tracks	1.15	4.54	4.25	-5.75	0.98	-5.35	-0.08	3.34	2.92
*Sometimes**Number of tracks				9.95**	2.81	14.54**			
*Always**Number of tracks				13.89**	12.64**	17.87**			
Parental background*Number of tracks							-6.67**	-6.44**	-7.15**
Sample: second-generation migrant students									
School considers prior performance:									
Sometimes	16.88**	9.48	17.77**	9.65	7.73	7.46	16.83**	9.47	17.77**
Always	23.34**	24.33**	30.44**	-3.09	1.50	-10.53	23.47**	24.48**	30.25**
Number of tracks	-4.615*	0.62	-0.91	-9.820**	-2.64	-9.168**	-4.97*	0.28	-0.40
*Sometimes**Number of tracks				5.156*	1.21	7.59**			
*Always**Number of tracks				12.30**	10.18**	19.16**			
Parental background*Number of tracks							-1.47	-1.41	1.92
Sample: native-born students									
School considers prior performance:									
Sometimes	-3.89	-2.12	-3.13	-7.834*	-5.71	-8.156*	-4.11	-2.31	-3.33
Always	3.94	6.26	6.04	-19.78*	-17.30*	-20.93*	4.55	6.81	6.73
Number of tracks	-0.96	4.63	3.41	-4.68	1.02	-0.98	-0.68	4.91	3.74
*Sometimes**Number of tracks				2.87	2.62	3.64*			
*Always**Number of tracks				11.05**	11.03**	12.76**			
Parental background*Number of tracks							-5.24**	-4.91**	-5.58**

Notes
Coefficients with standard errors in parenthesis. The superscripts *, and ** indicate significance at the 5%, and 1% levels, respectively. Included but not shown are constant student background variables, school composition variables, school input variables, school characteristics, and the 2008 GDP per capita. All models include imputation dummies and imputation variable interaction terms. Poland has no second-generation migrants. Full information available from first author.

In the third model, we turn to our second question, where we ask whether the relationship between tracking and performance influences the effect of parental background, and we find that parental influence is lower when countries have more tracks available to students (negative interaction for parental background and number of tracks). This result is similar to that for the native students.

For second-generation migrant students, we find a significant effect from the number of tracks on reading and science in Model 2, and similar interaction effects as for the first-generation migrants. We thus find that for second-generation migrants, educational performance is also not driven solely by individual and school characteristics, but also influenced by tracking and school selection policies.

In the third model we find that the relationship between parental background and student performance does not differ between countries with more or less tracks available to students (insignificant interaction of parental background and number of tracks).

Differences in results for the main and extended sample

Table 9.3 shows our results for first generation, second generation and native students of the extended sample, the 31 destination countries without the origin of the migrant students. The results are only shown for reading. Where the results deviated for mathematics and/or science, this is mentioned in the text.

The differences between the samples are quite large (compare panels vertically). For first-generation migrants, we find no effect from the number of tracks and whether school principals consider prior performance, nor in combination with parental background. The educational performance of first-generation migrant students seems solely driven by individual and school characteristics, and not by the education system of their destination countries.

For second-generation migrant students, the results in Table 9.3 (containing students from 15 countries) are less significant than in Table 9.2 (31 countries), except for Model 3. The results from Model 3 show that in countries with more tracks the relationship of parental background and student performance is lower (negative interaction between number of tracks and parental background), and that in 9.2 the relationship was not lower in countries with more tracks available to students. In the main sample (Table 9.2), Models 1 and 2 showed significant results, but this is no longer the case in Table 9.3 (extended sample). The results for the mathematics and science scores are even less significant than for the reading scores. In summary, we find that

Table 9.3: The relationship between the number of tracks, whether school principals consider prior performance, and test scores (extended sample: 31 countries)

	Model (1)	Model (2)	Model (3)
Dependent variable	Reading score	Reading score	Reading score
Sample: first-generation migrant students			
School considers prior performance:			
Sometimes	3.12	2.58	3.12
Always	9.82	-1.57	9.68
Number of tracks	-1.4	-2.9	-1.06
Sometimes *Number of tracks		0.26	
Always *Number of tracks		5.49	
Parental background *Number of tracks			1.65
Sample: second-generation migrant students			
School considers prior performance:			
Sometimes	14.59*	12.35	14.07*
Always	16.55**	-2.84	17.39**
Number of tracks	2.79	-0.26	1.14
Sometimes *Number of tracks		1.57	
Always *Number of tracks		9.333*	
Parental background *Number of tracks			-10.84**
Sample: native-born students			
School considers prior performance:			
Sometimes	-2.19	-6.00*	-2.08
Always	6.623*	-9.08*	7.00*
Number of tracks	-2.63	-5.68*	-2.39
Sometimes*Number of tracks		2.72*	
Always*Number of tracks		8.26**	
Parental background*Number of tracks			-3.46**

Notes
Coefficients with standard errors in parenthesis. The superscripts *, and ** indicate significance at the 5%, and 1% levels, respectively. Included but not shown are constant student background variables, school composition variables, school input variables, school characteristics, and the 2008 GDP per capita. All models include imputation dummies and imputation variable interaction terms. Poland has no second-generation migrants. Full information available from first author.

the relationship of second-generation migrant students and the number of tracks, whether school principals consider prior performance, and student performance in the main sample of 15 countries, is stronger than the relationships in the extended sample of 31 destination countries.

Controlling for region of origin

Table 9.4 shows our results for first- and second-generation migrant students from the main sample of 15 destination countries for which we know the origin countries of the migrants. Again only the results for reading are shown. The sample and the models are the same as in Table 9.2, except that now we add region-of-origin dummies for the migrant students. This allows us to see whether the results without and with origin dummies are different, and to estimate the importance of the inclusion of origin dummies to obtain a less biased effect of education systems on the performance of migrant students.

The results for the first-generation migrant students when controlling for region of origin are almost identical to the results when region of

Table 9.4: The relationship between tracking, entrance requirements based on earlier performances and test scores, including region-of-origin dummies (main sample: 15 countries)

	Model (1)	Model (2)	Model (3)
Dependent variable	reading score	reading score	reading score
Sample: first-generation migrant students			
School considers prior performance:			
Sometimes	6.58	-4.99	5.75
Always	13.53	-11.48	12.49
Number of tracks	-2.99	-8.45	-4.42
Sometimes *Number of tracks		7.741*	
Always *Number of tracks		11.50**	
Parental background *Number of tracks			-6.76**
Sample: second-generation migrant students			
School considers prior performance:			
Sometimes	16.70*	10.75	16.67*
Always	25.20**	2.25	25.38**
Number of tracks	-5.05*	-9.55**	-5.36*
Sometimes *Number of tracks		4.26	
Always *Number of tracks		10.68**	
Parental background *Number of tracks			-1.28

Notes
Coefficients with standard errors in parenthesis. The superscripts *, and ** indicate significance at the 5%, and 1% levels, respectively. Included but not shown are constant student background variables, school composition variables, school input variables, school characteristics, and the 2008 GDP per capita. All models include imputation dummies and imputation variable interaction terms. Poland has no second-generation migrants. Full information available from first author.

origin is not controlled for, although somewhat smaller in size. There is no evidence for a significant relationship between student performance and the number of tracks, or between student performance and whether school principals consider prior performance (Model 1). If we add the interactions between number of tracks and whether schools consider prior performance in Model 2, we still find no significant main effect of tracking, nor are there significant main effects of whether schools consider prior performance. Again this is in accordance with the results without origin dummies; however, as before, we find that in countries with more tracks, the relationship with student performance is positive if school principals consider prior performance on accepting students (positive interaction terms of *Sometimes* and number of tracks, and *Always* and number of tracks). If we test whether the relationship between student performance and parental background differs between countries with more or fewer tracks, we see that it does not (Model 3). This is similar to the results in Table 9.2, which looked at the same 15 countries, but without including origin dummies. In summary, including the origin dummies does not change the effects of whether school principals consider prior performance or number of tracks for first-generation migrant students.

The bottom panel of Table 9.4 shows the results for the second-generation migrant students, and these results are also very similar to Table 9.2, where we did not control for region of origin. In the first model we only found a significant effect from the number of tracks for reading, and we found positive significant effects from whether schools consider prior performance. Again, these results are the same as for the second-generation migrant students in 15 countries without origin dummies (Table 9.2). In the second model, we find that the relationship between student performance and the number of tracks is more positive when school principals always consider prior performance (positive interaction term of *Always* and number of tracks), but this is not the case for mathematics. Again, this is similar to the results for the second-generation migrant students in 15 countries without origin dummies (Table 9.2). We find no evidence that the relationship between parental background and student performance differs between countries with more and fewer tracks available to students (Model 3).

The origin effects on educational performance themselves are substantial and significant (results not shown),[7] so the omission of the origin of migrants as a source of variance in educational performance might have led to flawed conclusions; however, in this particular circumstance, the inclusion of origin of the migrant student did not change the relationship between the number of tracks, whether the

schools of destination countries considered prior performance on accepting the student, or student performance (compare Tables 9.2 and 9.4). In other words, the general direction of the effects of education systems for migrants when not controlling for origin are in this case not biased by the omission.

Conclusions

The aim of this chapter was to investigate the relationship between tracking and migrant student performance (and parental background). We thus combined two insights from the literature on education systems and the literature on migrant outcomes: the need to take into account intervening school-level variables, as suggested by Korthals and Dronkers (forthcoming), and the need to include country of origin in order to correctly estimate models for migrant students, as suggested by Dronkers et al (2012).

We use a three-level model including students, schools and countries. The school level will absorb between-school segregation. In systems that track students, this between-school segregation is related to how schools place students into tracks, based on a varying combination of ability and parental background, and in comprehensive systems this between-school segregation is based on parental background (mostly related to spatial segregation). Between-school segregation in tracked systems which select based on prior performance, controls for part of the primary effect of parental background, since children from more privileged background *ceteris paribus* display higher achievement levels in primary schools and thus are more likely to be selected into higher tracks, as when selection is based on prior achievement.

When we simply extend the earlier analyses by separating native and first- and second-generation migrant students, we find results similar to those of Korthals and Dronkers (forthcoming). We find that migrant students in education systems with many tracks, who are in schools in which the principal always considers prior performance in accepting students to the school, have scores equal to or higher than students in systems with only one track, irrespective of whether or not the school principal considers prior performance. We also find that migrant students in education systems with many tracks, who are in schools in which the principal never considers prior performance in accepting students to the school, have lower scores than students in systems with only one track, and also lower than students in systems with many tracks if entrance selection is always based on prior performance. In the extended sample, however, the influence of education systems for

first-generation migrant students is absent, while the performance of second-generation migrant students is also influenced by tracks or prior performance, but the significance of the combination of tracks and entrance selection is greatest for native students. In the model using only natives we find the highest number of significant parameters of tracks and of entrance selection, as compared to the models using only first- or second-generation migrants.

For first-generation migrants in the 15 destination countries we find that many tracks decreases the effect of parental background, if the achievement of entrance requirements of schools is included, a result which is similar to the results for native students. The effect of the parental background of the second-generation migrant students in the 15 destination countries does not differ significantly in systems with many or few tracks; however, this deviates from the results for the 31 countries.

In summary: educational systems can make a difference to migrant pupils, but in a different way than often assumed. Selection on prior performance in a system with many tracks can be beneficial for migrant students. A possible explanation for this is that many tracks and selection according to prior achievements gives migrant parents and pupils more clear indications of the required performance and procedures than do systems without selection based on prior performances and fewer tracks. Migrant parents and pupils may have more problems navigating their way through the latter systems.

Limitations

Unfortunately, we only have the region of origin for migrant students in 15 of the original 31 countries; however, using 15 or 31 countries did not change the results for the native students. This consistency in the results suggests that the 15 countries are not deviant cases compared to the 31 countries, but using 15 or 31 countries does change the results for the migrant students. A possible explanation for these differences between the samples might be the different origins of migrants in the 31 countries compared to those in the 15 countries; however, the addition of origin dummies does not affect the system's parameters and the implication of this finding is that the difference between the 15 and 31 destination countries cannot be explained by the different origins of migrants in these countries. Another possible explanation for the differences between the samples is that the general policies and attitudes towards migrants in the 15 countries deviate from those in the 31 countries, and thus that the functioning of education differs

between these countries, not so much due to systematic education differences but to more general country characteristics, such as labour market opportunities, social welfare, ethnic niches and so on.

Notes

[1] Shortly before the finalisation of this book, my co-author Jaap Dronkers suddenly passed away. I would like to dedicate this chapter to Jaap, who was an excellent mentor and friend. *Roxanne Korthals*

[2] This chapter is based on Dronkers and Korthals (2015).

[3] It is important to distinguish both countries of destination and countries of origin. Omitting the latter from the analysis would give misleading results: Swedish and Russian migrants in Finland (with a comprehensive system) and Turkish and Yugoslav migrants in Germany (with a strongly differentiated system) cannot be treated as similar migrants, even when controlled for background characteristics.

[4] PISA officially samples students between the ages of 15 years and 3 months to 16 years and 2 months (OECD, 2010).

[5] Australia, Canada, France, and the United Kingdom are excluded due to missing data for the available number of tracks or school-level data. Mexico is excluded since Mexican students and schools are very different from other included countries in a large number of characteristics.

[6] See Dronkers and Korthals (2015) for the full models.

[7] Some region-of-origin dummies are significant and substantial, both positive (Northern Europe; Western Europe; North Africa; South East Asia) and negative (West Asia; Oceania), which underlines the importance of the inclusion of origin in cross-national analysis of migrant performances. See Dronkers and Korthals (2015) for more information about these results.

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TEN

From exclusion and segregation to inclusion? Dis/ability-based inequalities in the education systems of Germany and Nigeria

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Global context: from exclusion and segregation to inclusion in education systems

While many groups have historically been marginalised in education systems, few groups have faced the same extent of exclusion and discrimination within formal education systems as the diverse group of pupils with disabilities, learning difficulties or disadvantages. These children and youth have been largely excluded from, segregated or separated within formal education systems, resulting in persistent inequalities in learning opportunities and in (lifelong) disablement and reduced life chances (Powell, 2011). A range of special education settings has been institutionalised, providing additional or specialised support to help these groups of learners to address their 'special needs'. Most often, such support and services were and continue to be provided in segregated or separated formal settings, such as special schools or classrooms. Special education has provided learning opportunities to groups of children and youth previously excluded outright from schooling, but globally the goal has shifted from special to inclusive education, due to the benefits it brings in fostering individual learning and democracy (for example, Allan, 2008). For all countries, whether in Africa, the Americas, Asia, Australia or Europe, this remains a challenge. Even the most egalitarian education systems, which have done the most to overcome outright exclusion from schooling have yet to succeed fully in schooling all children in diverse classrooms (see Richardson and Powell, 2011 for a global analysis; see also Biermann and Powell, 2014, comparing Germany, Iceland and Norway).

Definitions of inclusive education vary, and the necessary conditions and benefits of such programmes remain contested, as educators, researchers and policy makers struggle to apply and adapt pedagogical concepts and legal principles that insist on transformative change (for example, D'Alessio and Watkins, 2009). We thus examine here two *contrasting* cases: very different countries that strive to become more 'inclusive' but exhibit considerable barriers to inclusion. Nigeria, with a huge out-of-school population, endeavours to reduce prevalent exclusion from schooling, while Germany attempts to reduce persistent segregation in its special school system. As different as these countries are, policy makers and educators in both countries increasingly acknowledge that their systems require transformative reform to better meet the needs of *all* children and youth, whether through the United Nations (UN) Education for All framework or inclusive education. Indeed, both countries must do so to realise the legal and moral commitments that they made when they ratified the United Nations Convention on the Rights of Persons with Disabilities (UN-CRPD).

The global agenda for more inclusive schooling has gained momentum since adoption of the UN-CRPD in 2006 (UN, 2006), which emphasises inclusive education as a human right.[2] A UN study of the rights of people with disabilities to education specifies that realising this requires education systems to: (1) achieve education for all (and thus reduce remaining outright exclusion) and (2) to combat discriminatory practices while providing needed supports and services to help individual learners to reach their potential (UN, 2013). The scope of inclusive education systems has been increasingly discussed, both during the convention's drafting process as well as during its truly globe-spanning ratification (in 159 countries thus far; UN, 2015), with the UN-CRPD aiming to reduce exclusion and segregation and ensure that inclusive classrooms are available for all pupils (Degener, 2009). The adaptation of the principles, standards and regulations required at different levels of education systems to implement such reforms requires significant effort, especially because education systems vary considerably in their institutionalisation, with considerable inertia and, when institutional change occurs, path dependence in school structures and cultures (see, for example, Powell, 2011; Blanck et al, 2013). Nevertheless, this international legal obligation demands that ratifying states guarantee non-discriminatory access to the general education system for people with disabilities, although the group of those considered to have special educational needs is both large and diverse.

The systematic exclusion or segregation of students on the basis of disability from, or within, the public formal school system is a violation of the principles and guidelines embedded, but underspecified, in the UN-CRPD (DIM, 2011; UN, 2013; UNICEF, 2013). Most countries have only begun to take the first steps to meet the obligations deriving from Article 24 of the UN-CRPD, which demand changes in terms of regulations, organisational structures and educational paradigms of almost all school systems worldwide. If the ideal of inclusive education remains elusive, there are countries, such as the Nordic countries, that not only guarantee access to the education system but also provide the necessary support for the majority of pupils with additional learning needs in inclusive classrooms (see Biermann and Powell, 2014). While global social movements and international organisations alter concepts, expectations and debates for national reforms (Dierkes and Zorn, 2005: 318), the achievement of the global disabled people's movement and organisations in developing the UN-CRPD must now be followed up by research into processes of institutional change after ratification (Blanck et al, 2013; Powell et al, 2015). From this perspective, we analyse and evaluate educational inequalities along the axis of dis/ability in a major African country and a core European country, both of which are gradually committing to reform their education systems so as to foster more equality in learning opportunities for student groups often excluded or segregated on the basis of disability or disadvantage.

This contribution examines the (re)production of educational inequality and dis/ability in the process of appropriating the right to inclusive education in diverse contexts. Utilising a comparative approach, we examine the challenges of institutionalising inclusive education that requires, to some extent, a *de-institutionalisation* of established organisational forms that exclude, segregate or separate, and thus determine the educational opportunities of students with disabilities and the inequalities they face. Inclusive education policies aim to guarantee equal opportunity, equity and equal access to education for all, and thus confront prevalent exclusion and segregation (Agunloye, 2012). There are thus two overarching questions. What is currently *understood* as inclusive education at the policy level? In what ways do inclusive education reforms affect the historically evolved formal (special) school systems, changing educational opportunities for this group of students? We trace and compare the way *educational disability* has been institutionalised in two very different systems of schooling and how this determines contemporary efforts to implement obligations deriving from the ratification of the UN-CRPD.

We will introduce the study's scope, theoretical framework, case selection and methods applied, which partly derive from the first author's dissertation project. We then present two concise case studies that describe current school structures, categories of special educational needs, and attendance rates, as well as UN-CRPD-related policy reforms. We compare cases by briefly summarising the historical development of (special) school systems that determine the pathway(s) to inclusive education and thus influence the learning opportunities provided to students with disabilities, learning difficulties or disadvantages. In conclusion, we emphasise similarities and differences in terms of inequalities of learning opportunities for those perceived as having as special (educational) needs.

Analysing educational inequalities and student dis/ability

The analytical framework of this comparative case study comprises educational inequalities faced by children and youth with disabilities, learning difficulties or disadvantages, in two contrasting education systems. In the fields of special and inclusive education, a range of studies – from descriptive country studies to more ambitious historical and geographical comparisons – has examined the effects of internationalisation, delineated the rise of special and inclusive education worldwide and compared developments in different countries (for example, Peters, 1993; Mazurek and Winzer, 1994; Booth and Ainscow, 1998; Barton and Armstrong, 2001; Powell, 2011; Richardson and Powell, 2011; Tomlinson, 2013). We discuss educational inequalities in terms of institutionalised learning opportunity structures (Powell, 2011). With the focus on the *availability* of and *access* to formal schooling, we refer to the first two of four dimensions of the right to (inclusive) education,[3] which also encompass *acceptability* and *adaptability* and that focus on the *form* and *content* of learning (UN CESCR 1999; see also Poscher et al, 2009; Platte, 2015). This operationalisation derives from the macro-sociological comparison focusing on special and inclusive education as institutionalised organisational forms, less as pedagogical approaches and teaching or learning practices. Children and youth excluded or in segregated special education face constraints on learning opportunities because exclusion from schooling or segregated learning environments emphasise particular differences between children as they classify, sort and often limit educational attainment. These differences often produce prejudice, negative stereotypes and discrimination against children and student groups, and determine life chances; however, these processes are characterised by a

paradox: while the expansion of education counters outright exclusion, it simultaneously increases the stigmatisation of less educated youth (Solga, 2002) and the contemporary global growth of special education belies the increased emphasis on the global norm of inclusive education (Richardson and Powell, 2011). While teachers in special education often provide needed support, as a low-status educational track special education routinely increases stigmatisation and discrimination, even beyond schooling, as youth transition to labour markets (Pfahl, 2011; Tomlinson, 2013). For decades, special education classification and tracking systems have systematically excluded many children and youth from the learning opportunities, high expectations and rich curricula that would do most to prepare them for their futures (Powell, 2011).

We apply a broad conceptualisation of the group of children with disabilities, learning difficulties or disadvantages (OECD, 2007) to analytically grasp the diverse categories of special needs that not only refer to physical impairments but also include socioeconomic status and ethnicity. In many countries, we find persistent educational and social disadvantages suffered by children and youth with disabilities and learning difficulties, and the increased probability of socially and economically disadvantaged individuals becoming 'disabled' in school and later life. We therefore apply the term *student disability* to encompass the scope of special needs classifications and categories at the intersection of impairment, disadvantage, and social inequality in the field of education. Which students 'become disabled' in schooling depends significantly on special needs categories and the institutionalisation of the education system and its organisational forms.

Case selection

In this study, we discuss and compare educational provisions for children perceived as having special needs resulting from disabilities, disadvantages or difficulties in Nigeria and Germany. This raises the question of whether Nigeria, in directly implementing inclusive education reforms, could bypass the institutionalisation of segregated special schools as developed in Germany over the 20th century. We emphasise the complex relationship and complementarities between special and inclusive education in the respective school systems as these alter availability and access to formal education for this group of students. Both nation states have ratified the UN-CRPD and are legally committed to granting the right to education and implementing inclusive education systems, despite the inevitable loose coupling between national and local contexts and school levels. The country-

specific contexts are integral parts of the process in which inclusive education is negotiated and appropriated (Mitchell, 2005).

By selecting Germany and Nigeria, we apply a 'most different' case design in relation to the historical development of formalised schooling, the establishment of special schools as an independent school form, enrolment rates, and socioeconomic and demographic characteristics. Historically, Germany was a pioneer in institutionalising formal (special) education and schooling, yet today Germany lags behind many of its neighbours, with the vast majority of children with special needs and disabilities still educated in special schools, despite ratification of the UN-CRPD in 2009 (Powell, 2011). In Nigeria, the rise of a special education system is tied to the institutionalisation of formal education and schools, yet what began as a missionary and colonial project has morphed into a development project in the context of the UN framework of 'Education for All' (Biermann, 2015). The countries and their education systems differ widely in scope and space, as do poverty and income levels. Nigeria's population of roughly 174 million people is double Germany's 80 million (World Bank, 2014). Whereas Germany counts as a high-income country, almost 85% of the Nigerian population live on less than $2 per day. Nevertheless, in relative terms, poverty in Germany affects almost one-fifth of children under 18 years (19.4%) (Statistisches Bundesamt, 2014). In Germany, only 5% of children under 15 years of age did not attend school in 2010/11 (Statistisches Bundesamt, 2012), while Nigeria recorded 10.5 million out-of-school children – the highest number worldwide (UNICEF West and Central Africa Regional Office, 2014). Children and youth with disadvantages and disabilities thus face high probabilities of *exclusion* from schooling in Nigeria and *segregation* in Germany.

Theoretical framework

Explicit theorising is crucial for comparative case study research; when analysed in the light of specific theoretical concepts, the cases gain 'comparative merit' (Muno, 2009: 117). To analyse educational inequalities in relation to disability, we focus on the *availability* of and *access* to learning opportunities for children with disadvantages and disabilities in formal school systems. Sociological institutionalism offers a theoretical framework and analytical perspective that facilitates differentiation between three pillars of institutions: cultural-cognitive (beliefs and ideas), normative (standards, organisational forms, professions) and regulative (rules, regulations) (Scott, 2008; Powell, 2011). This facilitates an analysis of the principles of schooling, how

school systems provide different settings and services to children with special needs (based on concepts of special or inclusive education and student dis/ability), and the respective education policies and legislation.

As discussed above, the rise of international discourse and supranational policy making has led to isomorphic pressures. These become evident at many levels of education, from early childhood to higher education and lifelong learning, with educational reforms an expression of global movements and trends (Meyer and Ramirez, 2005). Developments in the countries studied emphasise the interplay of these international pressures and the institutionalisation pathways of formal school systems in countries that have accepted the UN-CRPD's obligation to become (more) inclusive. Despite such international pressures to reform structures and reach specific standards, national and local models and institutional arrangements in (special) education persist as incremental change occurs path dependently (Powell et al, 2015).

If the diffusion of international models is crucial in explaining institutional change across time and space, the concept of path dependence – increasing returns to existing institutional settings – helps to explain why, once established, institutions and organisational forms persist despite international isomorphic pressures. Once a path has been chosen, shifts or even departures from the established to an alternative institutional arrangement are difficult, because positive feedback processes consolidate the once chosen path. The range of options for subsequent policy making or institutional redesign are limited as formerly available institutional alternatives become increasingly inaccessible because of cumulative commitments and investments (see Ebbinghaus, 2009; Blanck et al, 2013 for application to special and inclusive education in Germany). We thus compare the institutional dimensions of the two formal school systems in relation to special and inclusive education, and then analyse processes of institutional persistence and change (in the penultimate section).

Methods

The methods used include content analysis of documents and official statistics paired with extensive fieldwork in both countries – interviews and participant observation in schools – by the authors. We analyse arguments, normative guidelines and organisational structures enshrined in policy documents, which alter the implementation of the UN-CRPD's tenets. The text corpus comprises official documents, policies and laws issued by the federal governments and

education ministries with reference to special and inclusive education in schools. Accordingly, we focus mainly on content (not on the processes and circumstances in which these documents were produced, are consumed or exchanged; see Prior, 2003). These sources show how special and inclusive education have been conceptualised and distinguished (cultural-cognitive pillar), how standards have been defined, professional responsibilities delineated and organisational forms developed (normative pillar), and the policies and regulations enacted (regulative pillar).

Case studies: from exclusion to segregation to inclusion?

This section establishes the basis for the following macro-level comparison, outlining overarching trends in policies and delineating contemporary organisational forms. In particular, we focus on categories of special needs, related participation rates and contemporary education reforms, especially the impact of the UN-CRPD. We cannot here examine differences in education system institutionalisation across all states of both federal countries; however, large disparities by region, often along a north/south divide, do exist.

Germany: a segregated special education system (with regional disparities)

The German school system is highly stratified in organisational structure: four- or six-year common primary schooling is followed by vertically differentiated secondary schooling (*Gymnasium*, *Realschule*, *Hauptschule*, comprehensive schools, special schools). The most important distinction is that between general and special schools, which establishes a binary structure concentrating support services in special schools, although increasingly ambulatory services exist in some *Bundesländer* (see Blanck, 2014).

In such a stratified school system, pupils are sorted early according to biological, cognitive and social standards,with teacher evaluations and tests determining whether they deviate from average expected abilities. This is based on the *Leitidee* of 'homogenous learning groups' as the preferred type of instruction (see Preuss-Lausitz, 2014). Since 1994, the classification of 'special educational needs' (SEN; *sonderpädagogischer Förderbedarf*) includes several areas of support (and the respective categories or *Förderschwerpunkte*: learning, language, emotional-social development, mental disabilities, physical impairment, hearing, seeing, disease) (KMK, 1994). These areas of support define

student disabilities and correspond to the differentiated school types in the special school system.

Since ratification of the UN-CRPD in 2009, the proportion of children with SEN attending regular schools has risen from 18.4% to 25% nationwide, but there is divergence among western German states, with Schleswig-Holstein an inclusion pioneer (less than 1% special schooling at primary level) and Bavaria at up to 5% since ratification of the UN-CRPD (Blanck et al, 2013). The proportion of pupils in special schools has remained stable (4.6% to 4.8%), however, because ever more pupils are classified as having SEN (an increase from 6.0% to 6.4%; see Autorengruppe, 2014). The learning disability category accounts for the highest share among categories, at 40%, although the dominance of this category has recently declined (Autorengruppe, 2014: 163). For decades, special school-leavers have constituted a large proportion of those with the lowest educational attainment, as three-quarters leave school without any qualification, with negative consequences for their future vocational careers and society (Pfahl, 2011).

In response, 12 of the 16 *Bundesländer* (and the federal government, *Bundesregierung*) have released action plans and debated far-reaching legal changes in education systems (DIM, 2015); recent research reveals, however, that while some state education laws have been adapted to the provisions enshrined in the UN-CRPD, none of the *Länder* meet all legal criteria constituting the right to inclusive education (Blanck, 2014). Germany as a whole has thus only partially developed school integration or educational inclusion, despite many local and regional successes (for example, Dorrance and Dannenbeck, 2013; Powell et al, 2015). The German parliament is preparing a Federal Participation Law (*Bundesteilhabegesetz*) to foster a more inclusive society.

In the context of inclusive education, the focus is on children with disabilities. Germany's core policy document 'Inclusive Education of Children and Youth with Disabilities in Schools', released by the Standing Conference of Education Ministers (KMK 2011), defines the expansion of inclusive education as a focus for *special* educators and refers broadly to the right to access the school system and the different types of schools, however:

> Inclusive educational opportunities enable children and youth with disabilities or with a special educational need to have equal access to all opportunities for instruction, to the offerings of various educational programmes and to school life. […] The need for education, counselling

> and the support of children and youth with disabilities differs individually. This also applies to the expectations and demands of parents with regard to the joint education of children and youth with and without disabilities or for specific educational programmes in special educational facilities. (KMK, 2011: 8, 13; authors' translation)

The National Action Plan, issued by the federal government in 2011 (BMAS, 2011), envisages continuous increases in inclusive schooling as the preferred option in many states; an explicit commitment to reduce school segregation is lacking in both documents, however. These efforts have been debated since 2011 in the Committee on the Rights of Persons with Disabilities, which officially examined the first state and shadow reports in March 2015. The segregated school system in particular evoked critical questions from committee experts before and during the meeting. In her concluding remarks, Diane Kingston, the committee expert acting as Country Rapporteur, urged Germany 'to do more to ensure that education was truly inclusive for all children with disabilities' (CRPD Committee, 2015).

Overall, the UN-CRPD and Article 24 have become a priority on the political agenda and in public debate, with considerable implications for the core conflict of education policy making – the stratified secondary school structures; however, path-dependent institutionalisation processes reflect both more inclusion and more segregation, with considerable divergence between the *Länder* (Blanck et al, 2013; Powell et al, 2015). We now turn from one of the largest countries in Europe to the most populous African country – similarly challenged by the global norm of inclusive education.

Nigeria: special education as a response to exclusion and inclusion in the context of Education for All

The Nigerian school system is divided into two broad sectors: basic education, which covers the first nine years of schooling (six years primary and three years junior secondary education), and three years of senior secondary. We refer here mainly to basic education and the distinction between children in school and not in school, and less to socioeconomic segregation in the context of access to public or private schools, which is also considerable, but for which limited data exists.

Today, the education system faces serious challenges in terms of providing and maintaining meaningful access to any formal education (see Obanya, 2011). In total, 10.5 million children do not attend

school at all (UNESCO, 2012), the highest number worldwide for any single country; however, enormous disparities exist within this group in relation to gender, residence, region, economic status and dis/ability. The highest rate of attendance is recorded for urban males with a high socioeconomic status, and children doing Qu'ranic schooling ('*almajiris*') count as one of the largest groups among out-of-school children (Hoechner, 2013; Taiwo, 2013). More than 70% of women in the north have never attended school compared to less than 20% in the south (NPC/RTI International, 2011). The rural–urban inequality in terms of access to schooling worsened between 2003 and 2013, as the primary attainment rate among the poorest households fell from 35% in 2003 to 22% in 2013 (UNESCO, 2015: 81, 83). Half of those with disabilities do not benefit from any form of formal education (Federal Republic of Nigeria, 2011: 99); a few public and some private schools, founded and maintained by churches, philanthropic organisations or parents, cater to students with disabilities, mainly with sensory impairments (Agunloye, 2012: 18).[4]

The National Policy on Education refers to three groups targeted by special education: the disabled, the disadvantaged, and the gifted and talented (Federal Republic of Nigeria, 2004: 47).[5] The category of 'the disabled' includes people who have an impairment of their vision, hearing, speech, or have a physical or health impairment, who are 'learning disabled', multiply handicapped – or those who face mental or emotional challenges. While these categories are enshrined at the policy level, there are no officially regulated diagnostic procedures that lead to an official statement of a special (educational) need, which could generate additional or specialised resources or have an impact on school placements. The compulsory school law, the Universal Basic Education (UBE) Act from 2004, lists nomads and migrants, 'girlchildren' and women, *almajiri*, street children and 'disabled groups' as 'special groups'. These groups are vulnerable to exclusion from, and marginalisation within, formal school systems.

This broad approach to special groups and special needs is reflected in Nigerian conceptualisations of 'inclusive education'. The federal government and some states have started to develop inclusive education policies; however, it is the Disability Bill that overshadows the UN-CRPD as a key reference and is a call to action (Biermann, 2015). The Disability Bill, not yet passed,[6] mandates: 'All public schools […] shall be run to be inclusive of and accessible to persons with disabilities, accordingly every school shall have […] (b) special facilities for the effective education of persons with disabilities' (The Senate, Federal Republic of Nigeria, 2013: 23). In the same vein, the National Policy

on Education mandates that: 'All necessary facilities that would ensure easy access to education shall be provided, e.g. inclusive education or integration of special classes and units into ordinary/public schools under UBE scheme' (Federal Republic of Nigeria, 2004: 49). Inclusive education is thus viewed as encompassing the growth of special education and complementing the path to universal basic education (nine years of schooling), thus serving as an instrument to institutionalise Education for All (EFA) (see also Anaduaka and Okafor, 2013), but Nigeria received a dismal assessment in the final report evaluating global EFA achievements since 2000, because 'Nigeria has lacked progress in nearly all education indicators' (UNESCO, 2015: 81).[7]

In summary, categories of special needs in both countries relate to socioeconomic disadvantage and disability as perceived bodily impairments or cognitive challenges. In Germany, the vast majority of children identified as having SEN are segregated in special schools within highly stratified state education systems. Nigeria's education system, by contrast, is characterised by the exclusion of a vast of number of children, whatever their dis/ability status. The global norm of inclusive education is a major challenge for both countries, regardless of their economic, social and political development. In confronting this problem, understanding the institutional dimensions of schooling is crucial in gauging change.

Comparing countries: pathways away from or towards inclusive education?

Here we explicitly compare the two countries and, in particular, their school systems in relation to special and inclusive education, as this reveals the principles and policies that structure educational opportunities in terms of their availability, and access to them for children with SEN. We summarise the institutional dimensions, highlighting the sometimes contradictory and sometimes complementary relationship between special and inclusive education. Reform processes to implement the right to inclusive education are embedded in these contexts, which exhibit both institutional persistence and change as Germany and Nigeria react to the commitments UN-CRPD ratification brought.

Institutional dimensions of school systems in relation to special and inclusive education

The cases demonstrate considerable variation in the three institutional dimensions: the ideas and concepts embedded in special and inclusive education, organisational forms and classification systems relating to (student) disability, and special and inclusive education policy making. Here, we briefly discuss each institutional dimension based on our analysis of official documents and scientific literature (see Table 10.1). This

Table 10.1: Institutional dimensions of special and inclusive education in Germany and Nigeria

	Germany	Nigeria
Formal public schooling is	stratified, segregated	exclusionary
Beliefs and ideas (concepts of special and inclusive education)		
Inclusion	'contemporary' concept requiring debate in social, political and scientific arenas	
Inclusive education	a challenging school reform (widespread maintenance of special schools)	an instrument to institutionalise 'Education for All' through expanding special education
Special education	serves those pupils with recognised special educational needs (KMK, 2013)	formal education provided to those children and adults with recognised special needs (Federal Republic of Nigeria, 2004)
Norms (organisational forms and classification systems)		
Key barrier to equal learning opportunities for all students	large, differentiated system of special schools	deficient public school system
Historically, special schools	grew into a distinct type of school in most cities from 1900	were single schools first introduced by missionaries in the 1850s
Recently, special schools	host the majority of students with SEN	only available for a very few students
Classification of special (educational) needs	eight official support categories, including 'learning disability'	three groups: disabled, disadvantaged, highly gifted
Regulations (policies and legislation)		
Relevant international policies	UN-CPRD	EFA, Millennium Development Goals
Legislation	state school laws and action plans, 'participation law' Bundesteilhabegesetz (not yet passed)	Universal Basic Education Act, Disability Bill (not yet passed)

Sources: Powell (2011), Biermann and Powell (2014), Biermann (2015).

compilation is non-exhaustive; statements should thus be considered as ideal-types that help to emphasise certain commonalities and differences but that vary within these culturally and politically decentralised countries.

Germany maintains one of Europe's highest levels of school *segregation*, where children with student disabilities are mostly educated in special schools (Blanck et al, 2013). Inclusive education policy making, thus, basically involves school reforms targeting structures, and a shift in special education expertise to regular schools, which further maintains 'student disability', since some pupils are still considered in need of specialised teachers, materials and programmes based on their classification in relation to expectations of 'normal' abilities, even as these expectations differ considerably across schools. The Nigerian system, in contrast, can be described as *exclusionary*. Especially for children with disabilities, schools remain largely unavailable or inaccessible. Calls for inclusive education paradoxically imply the institutionalisation of special education services, since these are, if at all, available in (segregated) special education settings. This response to international pressure to become more inclusive results in a perverse expansion of organisational forms that are not compatible with – and in fact, contradict – the spirit of the UN-CRPD.

Institutionalised school systems in both countries (re)produce and maintain inequalities in learning opportunities, especially of those with student disabilities. The groups targeted, however, are not identical. In Germany, inclusive education is discussed in relation to the eight types of student disability analogous to special education's support areas. By contrast, the focus in Nigeria is on children with disabilities when it comes to special education, and on socially disadvantaged and marginalised groups when it comes to the general failings of the public school system (and regular schools). The concept of inclusion is far broader in Nigeria than in Germany, as a result of the widespread poverty and disadvantage faced by so much of the school-aged population, with emphasis on reducing widespread exclusion (inclusion in the education system). In Germany, the challenge is to reduce school segregation in favour of inclusive classrooms serving all children and youth, whatever their dis/ability.

The comparison of these contrasting cases emphasises the interdependence of special and inclusive education, but from different angles. In Germany, the debate mainly focuses on school structures and settles on a (gradual) shift of special education expertise from special to regular schools. In Nigeria, by contrast, inclusive education is a development project in the context of EFA in Nigeria, whose overall target is to institutionalise a functioning, formalised 'Western-model'

education system (see also Kendall, 2009; Harber, 2014). In both countries, becoming more 'inclusive' paradoxically results in attempts to maintain, or even expand, special education expertise and settings, which ultimately leads to inclusive education being *subverted* and a renewal of special education ('*Sonderpädagogisierung der Inklusion'*).

To summarise, special education and special schools retain legitimacy in both cases, even though this contradicts the principles of the human right to inclusive education codified in international charters, from Salamanca (1994) to the UN-CRPD (2006); however, whether special schools are barriers to inclusive education or, alternatively, necessary for the development of inclusive education, remains a contentious matter (see Degener, 2009; Powell, 2011; Richardson and Powell 2011), and affects implementation of the right to inclusive schooling as anchored in the UN-CRPD's Article 24. Although the hope of decreasing educational inequality by developing inclusive school systems is openly debated in terms of organisational forms and professional standards (norms), as well as in terms of policy making (regulations), the reforms disregard beliefs, underlying cultural meanings ascribed to schooling and dis/ability paradigms in general (ideas).

Institutional persistence and change

To analyse these current trends, debates and reform initiatives, we chart their shifting historical contexts, showing institutional persistence and change in relation to the commitments made upon ratifying the UN-CRPD. This requires an understanding of the different developmental paths upon which school systems have evolved. Such an analysis must embrace discussion of the complex relationship – contradictions and complementarities – between special and inclusive education.

The concept of path dependence facilitates investigation of gradual educational change in Germany's 16 states (*Länder*), while at the same time elucidating why segregated structures may persist despite ratification of the UN-CRPD. Special schooling, in particular, has shown considerable inertia due to ideational, normative and regulative barriers to inclusive education. From around 1900, special schools were developed as a separate school form as part of highly stratified education systems that emphasised 'homogenous learning groups' (Powell, 2011). With the universalisation of compulsory schooling and special education's expansion during the post-Second World War period, the German system was organisationally differentiated, including a wide array of special school types. Despite successful pilot projects in inclusion since the 1970s (Schnell, 2003; Preuss-Lausitz,

2014), professional, parental and political interests continue to conform to the institutional logic of special schooling. Conflicts between the persistence of legitimated selection for special schools (with many resources, but low status) and change towards inclusion continue. Here, the steady and continuing expansion of special education in West Germany since the 1960s confronts the transformation of education in the new *Länder*, paradoxically leading to dramatic increases in special schooling rates after reunification (Autorengruppe, 2014). The influence of the special education profession, oriented towards differentiated, segregated special school types, remains a key factor in the thwarted development of inclusive education (Pfahl and Powell, 2011). Schooling in Germany can therefore be characterised by the paradox of gradually increasing inclusive education, simultaneously with maintained school segregation for three-quarters of all pupils with SEN, accompanied by increased rates of classification and provision of special education services.

By contrast, analysing institutional persistence and change towards inclusive education in Nigeria is not about overcoming a far-reaching special school system. What could be seen as a 'late-adopter' advantage, however, is limited by the international model of schooling itself. For that reason, we can find an over-representation of children from ethnic minorities and low-income households in Germany's special schools, which parallels their over-representation in Nigeria's public schools and especially within the out-of-school population. The overwhelming majority of children in public schools are (extremely) poor – and not officially considered 'disabled', but are in multiple senses disadvantaged. The attempt to institutionalise formal public schooling was and still is a process that has contributed neither to individual aspirations nor societal welfare. In the 1840s, missionaries founded formal and (later) special schools; from the 1880s, the colonial administration introduced the first educational policies in the territory that became Nigeria in 1912. Following independence from colonial rule (1960), attempts were directed to unifying the public school system through nationwide legislation and universal primary education programmes. An economic downturn coupled with an oil crisis in the late 1980s rendered the school system close to collapse. A revitalisation of basic education under the umbrella of international development frameworks started in the 1990s, with diverse education sector support programmes and a host of international organisations (see Federal Ministry of Education, 2005; Ayeni and Dada, 2011).

Today, the public school system is under the 'guidance' of diverse international organisations and development frameworks (Agunloye, 2012, 19); a similar influence can be seen within the disability rights regime (Biegon, 2011). Schooling, once used as a 'civilising' force in colonial

times that meant 'literacy for a few', has become 'schooling for some' and does not provide meaningful (inclusive) education for all. This is especially the case because a narrow approach to education prevails that equates EFA with formal schooling and thus ignores informal or indigenous forms of learning (see Brock-Utne, 2000). Accordingly, the influence of Western and then global concepts, models and pressures in the process of institutionalising a formal school system, has been present since inception, and thus incorporates (the rhetoric of) inclusive education in the processes of providing EFA to meet the goals of universal basic education.

The comparison of Germany and Nigeria highlights the importance of legacies as education and school systems gradually expand: in the former, as a pioneer in special education, the continued reliance on special schools as an early innovation to counter exclusion; and in the latter the establishment of special and regular schools during colonial times as a limited solution for a selected few. The general phases of development seen around the world, from exclusion to inclusion, have not been compressed in these two countries. In fact, the relationship between special and inclusive education in both cases is complex, because inclusion is viewed by many as requiring the interventions of special education as a profession, within established settings, so that special schools and classrooms become the 'solution' to not only counter exclusion from schooling, but also to accomplish what they cannot: to enable inclusion (see, for example, Tomlinson, 2013). We have argued that Germany subverts inclusion in favour of strengthening existing special schools. Vitriolic debate on school structures and the hollow pledge to increasingly open general schools for children with SEN reflect this pattern. Overall, conditions for inclusive education are not being met, and the shift in special education expertise into general schools has been limited. In Nigeria, the goal to achieve Education for All now encompasses the expansion of special education and the establishment of special schools, special classes or classes for all; however, the limited resources provided for schooling and widespread poverty result in a tremendous gap between national policy rhetoric and reality in communities, especially in the north.

Conclusions

We now return to our initial expectation that international pressure to promote inclusive education would alter established educational structures. Focusing on educational inequalities and (student) disability and disadvantage, we find that inclusive education is rising up the political agenda. It gives rise to controversy in the selected, contrasting, African and European cases. Rhetorically, inclusive education and the right to equal learning opportunities of children with student

disabilities have become increasingly significant in contemporary education policy making and schooling. Path-dependent developments within each country also result in different principles and approaches to inclusive education. These are tied to the institutionalisation of general formal and special education, with the continued maintenance or indeed the paradoxical expansion of special schools and classrooms in both countries. While special education programmes that segregate or separate contradict the globally accepted principle of inclusion, these institutionalised organisational forms cannot be ignored when discussing the theory and practice of inclusive schooling in these currently exclusionary (Nigeria) and segregated (Germany) contexts.

The analysis of institutionalised inequalities in learning opportunities provided for students disabled in and by schooling offers broader insights into the dynamics of change in education systems. For that reason, the question of whether Nigeria could circumvent segregation in special schools that developed in Germany, demands an understanding that the outright exclusion and the provision of segregated special schooling reflect institutional discrimination embedded in the arrangements of formal schooling that follows powerful Western models of selective, stratified and stigmatising school forms. Nigeria's huge out-of-school population and Germany's stratified and segregated (special) school systems result in the inaccessibility of regular schools and classrooms for the majority of children with disabilities and thus reduce the learning opportunities provided.

These institutionalised exclusionary and segregating processes favour a norm-group deemed able to cope with regular provision and simultaneously (re)produce educational inequalities. Whereas the most disadvantaged in Germany are over-represented in stigmatising special schools, in Nigeria this group remains largely excluded from formal schooling altogether. The Nigerian context therefore exhibits institutionalised discrimination in one of its most extreme forms, where primarily one select group benefits from schooling and all others are accordingly distinguished as 'special' groups; they suffer various inequalities in accessing the curriculum. Even when the outright exclusion of pupils with disabilities has been overcome through the development of special education programmes, these frequently have an over-representation of boys, ethnic minorities (and children from migrant families), and children living in families with low socioeconomic status (a pattern found in many parts of the world; see Richardson and Powell, 2011).

Special education's segregated settings testify to the continuous construction of educational differences, disadvantages and disabilities.

Educational stratification reproduces and exacerbates inequalities in education and society. In Germany, the impact of socioeconomic status in schooling is hard to overestimate as family background and education determine educational access, achievement and attainment, but inclusive schooling also depends to a large extent on the *Bundesland* in which one lives. In Nigeria, family income determines access to formal education and educational opportunities, as does region, with large north/south disparities.

Paradoxically, the context-specific construction of inclusive education programmes after ratification of the UN-CRPD has led to the expansion and further development of segregated special education forms instead of more inclusive arrangements. The stigmatisation of this group of students continues, even when the policy rhetoric emphasises the benefits of inclusion. Accordingly, there is a huge gap between inclusion principles in discourse and policy making internationally, and the further expansion and elaboration of special education found in Germany and Nigeria at national and local levels. These developments contradict the goal of making education systems more inclusive, and are thus barriers to attaining the global norm of inclusive education as a human right.

Notes

[1] We thank Christian Brüggemann and Jennifer Dusdal and the reviewers for helpful comments on earlier drafts of this chapter. Julia Biermann's doctoral work was funded by the Friedrich Naumann Foundation.

[2] At the international level, the Salamanca Statement of 1994 first stated that the 'fundamental principle of the inclusive school is that all children should learn together, wherever possible, regardless of any difficulties or differences they may have' (UNESCO, 1994: 11).

[3] The accuracy of this fit can be traced to the Global Survey on Government Action on Implementation of the UN Standard Rules on the Equalisation of Opportunities for Persons with Disabilities (2006), which found that the 'real gap in the area of education lies between availability and accessibility' (UN ECOSOC, 2007.

[4] We lack data on the number of children with disabilities in (special) schools and different structures in Nigeria. Nevertheless it is noteworthy that half of all people with disabilities in schools reported awareness of discrimination against them (Federal Republic of Nigeria, 2011, 144). Of course, this is a highly selective group and furthermore their (tenuous) participation may hinder them from acknowledging active discrimination.

[5] The first version of the National Policy on Education from 1977 mentioned integration as 'the most realistic form of special education' (Abang, 1992: 14f.; Garuba, 2003: 179).

[6] The new president-elect, General Muhammadu Buhari, has promised in an open letter to the Nigerian public ('My Covenant with Nigerians') to work with the National Assembly to finally pass the National Disability Act.

[7] But, as Brock-Utne (2000) explains, the declining enrolment rates and increasing dropout rates may relate to the inappropriateness of education offered in schools.

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ELEVEN

Education systems and meritocracy: social origin, educational and status attainment

Andreas Hadjar and Rolf Becker

Meritocracy, educational and status attainment

In modern societies, education is one of the main mechanisms in the reproduction of inequalities in terms of an existing link between social origin and destination class across the life course (see, for example, DiPrete and Eirich, 2006; Müller and Jacob, 2008; Müller and Kogan, 2010). Education is strongly linked to life chances – income, political participation, health, subjective well-being and even life expectancy (see Hadjar and Becker, 2009) – and educational inequalities are reflected in inequalities in life chances throughout the life course (Mayer, 2005). There is a long-lasting tradition of educational policies and reforms which have attempted to weaken the influence of social origin and thus develop more meritocratic educational and status attainment (see Breen et al, 2009). Two key mechanisms have to be analysed with regard to the impact of the institutional settings of the education system on the degree of meritocracy in educational and status attainment: first, to what extent does social origin determine educational attainment; and, second, to what extent does education – rather than social origin – shape status attainment (for example, class position, income, occupational career)? A general assumption regarding why education system characteristics should influence inequalities in educational and status attainment, is that such institutional characteristics have special consequences for the primary and secondary effects of social origin on educational attainment (Boudon, 1974), for example, to what extent do education systems try to compensate for class-specific achievement deficits, and to what extent do education systems include selection points and foster or reduce class-specific differences in cost-benefit calculations (for example, Becker and Hecken, 2009a). The institutional conditions of the transition from school (across general education or

vocational training) to work and the general links between education system and labour markets need to be considered in the light of inequalities in status attainment (see Müller and Shavit, 1998; Becker and Hecken, 2009b).

First, theoretical accounts of meritocracy and, in particular, of inequalities in educational and status attainment, and how these are shaped by institutional characteristics, are considered. The empirical section consists of both a summary of major studies and our own empirical multi-level analyses.

Theorising meritocracy and inequalities

According to meritocratic principles illustrated by Young (1958), goods, positions and power should be allocated based on merit, (intellectual) achievement, efforts and skills, and the classic social hereditary (class) and other ascriptive characteristics such as gender, ethnicity or race, should not play any role. While at first sight, meritocracy means greater equality, since ascriptive factors should not play a role in the distribution of goods, it is still related to inequality: (dis)ability appears as a legitimate inequality principle (see Roemer, 1998). The idea of meritocracy is far from the ideal of egalitarianism as expressed in the concept of 'luck egalitarianism' (Dworkin, 2000; see Swift, 2004) with the demand that societies should fulfil the needs of all people whatever their natural ability or talent (Roemer, 1998). Another major criticism of the concept of meritocracy is rooted in Collins (1979), who focused on the functionalist core of meritocracy. He doubts the importance that is given to intelligence and effort and refers to 'credentialism' in terms of the hunt for educational certificates; educational success in this regard is not necessarily based on IQ and effort.

In contrast to Young (1958), *sociological accounts* focus on educational qualifications, cognitive skills and effort (for example, Shavit and Blossfeld, 1993; Goldthorpe, 1996; Müller and Shavit, 1998; Jackson, 2007). Education is seen as a major indicator of merit; employers reward formal educational qualifications on the labour market with material and symbolic benefits, income and positions, among other things, which are perceived as 'genuinely earned, deserved rewards' (Bell, 1973: 455). Hoffer's (2002: 255) definition, centring on the mechanism that 'individuals are selected for educational opportunities and jobs on the basis of demonstrated performance', as well as Kingston's (2006: 112f) concept also broaden the definition of merit to include cognitive skills (IQ, knowledge, competencies), educational attainment in terms of certificates and assignments/grades, and general

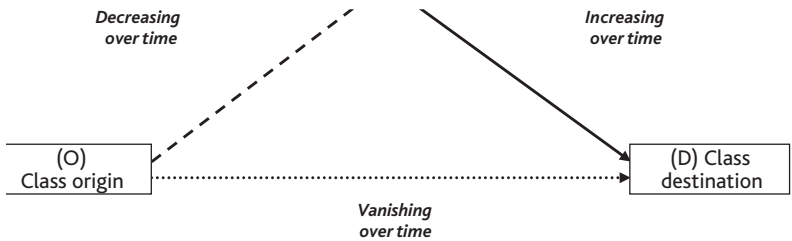
personality characteristics such as diligence and a sense of duty. The idea of meritocracy is not only an ideal in Western industrialised countries. In Japan, the idea of 'educational credentialism' is a core feature of the education system, with the implication that entrance to prestigious education institutions is highly competitive and strongly based on achievement, and assuming educational credentials to be the major determinant of socioeconomic success (Ishida, 1993).

The concept of the 'meritocratic triad', with education as a proxy variable for 'merit' at its centre, has its roots in the 'status attainment model' (Blau and Duncan, 1967; Mayer and Blossfeld, 1990). This 'OED triangle' conceptualises the links between (social) origin (O), education (E) and destination class (D). Assessing whether or not the meritocratic principle in terms of contest mobility (that is, equal opportunity in access to high-status groups) dominating over sponsored mobility (that is, access to high-status groups through sponsorship by elites) is existent requires the study of two key associations (see Fitz et al, 2005: 69): (a) To what extent do ascriptive characteristics (for example, social origin) determine educational attainment? and (b) To what extent does educational attainment explain occupational status and income? Meritocracy would require that there were no associations between ascriptive characteristics and education, or ascriptive characteristics, status and income, but strong links between education, status and income. Theorising the changing inequality principles in society and the evolution of meritocracy, many studies (for example, Fitz et al, 2005; Jackson, 2007) focus on the 'increased merit selection hypothesis (IMS)' (Jonsson, 1992). At the core of this concept is the assumption of a shift from ascription (social position, family connections) as the inequality principle to achievement (education, ability); achievement becomes the only determinant with regard to access to educational institutions, educational qualifications, labour market chances and occupational career in modern societies. The driving forces behind these assumed changes are industrialisation, technological progress and economic prosperity (Treiman, 1970; Bell, 1973; Goldthorpe, 1996), the higher demand for highly skilled people accompanied by an increasing importance of the meritocratic principle when filling managerial and professional positions (Whelan and Layte, 2002), processes of educational expansion, and cultural and normative changes (Dörfler and van de Werfhorst, 2009). The political sphere implements educational reforms with the aim of initialising an educational expansion (Hadjar and Becker, 2009) and to guarantee continuous growth by increasing educational potential. This accompanies a higher intergenerational upward social mobility that differs between countries

(see Breen, 2004). The changes assumed with the increasing importance of meritocratic inequality mechanisms in society are symbolised in the frequently used figure of the meritocratic triad (Breen and Goldthorpe, 2001; Goldthorpe, 2003; Jackson et al, 2005).

In the process of increased merit selection, education becomes the main selection criteria or 'merit'. As the association between social origin and educational attainment (O-E) decreases, the association between educational attainment and class of destination (E-D), and status and income increases. The direct link between class of origin and class of destination (O-D) should decrease or even vanish in this scenario, since class reproduction should only function as mediated by education (Figure 11.1).

Figure 11.1: Prognosis with *regard to increased merit selection* hypothesis (OED triangle)



There are two influential theses with regard to the question of changing inequality patterns. The maximally maintained inequality hypothesis (MMI) by Raftery and Hout (1993) assumes that middle classes will first benefit from educational expansion and increased educational opportunities. Only after the desire of the middle classes for education has been sated, will the working classes also benefit from the new educational opportunities (see Breen and Jonsson, 2005). Analysing inequalities often neglects horizontal inequalities with regard to education institutions, apparently horizontal tracks in secondary education, and differential curricula. The main assumption is that while vertical inequalities decrease, privileged groups maintain their advantages through educational decisions that at first sight relate to horizontal inequalities, but result in vertical inequalities in the labour market and in life chances. This argument is reflected in Lucas's (2001) effectively maintained inequality thesis (EMI), with the core assumption that when higher educational institutions such as upper secondary

schools or universities become universal, 'the socioeconomically advantaged seek out whatever qualitative differences there are at that level and use their advantages to secure quantitatively similar but qualitatively better education' (Lucas, 2001: 1652).

The empirical reality of 'meritocracy'

The results of studies are highly ambivalent with regard to the assumption of a shift from ascription to achievement as outlined in the 'increased merit selection thesis' (for example, Jonsson, 1992). Studies focusing on the original concept of meritocracy and the factor of 'cognitive ability' show that intelligence is strongly linked to educational attainment (Sewell and Shah, 1967) and that testing becomes more important at different stages of the educational system (see, for example, Alon and Tienda, 2007 with regard to college enrolment). Ability in terms of job skills demonstrates an impact on income and status in most studies (for example, Saunders, 1997, for the UK).

A meta-study on status attainment by Kingston (2006) leads to the conclusion that Young's (1958) vision of a perfect meritocracy cannot be backed by empirical evidence, although 'meritocratic factors have so much more impact on careers than ascriptive factors. As a distributional principle, merit is relatively significant; to the extent that the allocation process is rule-governed, meritocratic rules predominate and their impact is consequential' (Kingston, 2006: 126). It is thus meaningful to take a closer look at empirical evidence of inequalities in educational attainment and inequalities in status attainment.

Empirical evidence of *educational inequalities* suggests that they have decreased during the 20th century, but not been abolished: educational opportunities are still distributed unequally among different social strata. Many scholars have concluded from their empirical studies of Western industrialised countries that social inequalities appear to be persistent (Shavit and Blossfeld, 1993). The same pattern of stability, with no decreasing link between social origin and educational attainment, was also found for Japan (Ishida et al, 1991, 1995; Ishida and Miwa, 2008), with its rather low level of differentiation (compulsory schooling to the age of 15) and the – for Asian countries typical – high importance of private extracurricular evening and weekend courses ('shadow education'; Bray and Lykins, 2012). For China, with its comparably high level of standardisation with regard to the achievement-based entrance into higher education, Tam and Jiang (2014) demonstrate increasing inequalities in this regard and show that one of the major causes lies beyond the education system: changing labour market

incentives. New evidence by Breen et al (2009) suggests that educational reforms seem to have led to a decrease in social inequality in many countries, but not to the expected and desired extent. The decrease in educational inequalities by social origin at earlier educational transitions (for example, primary to secondary schooling) accompanies strong inequalities in tertiary education (Shavit et al, 2007).

Looking at inequalities in *status attainment* or considering the *entire meritocratic triad*, with the assumptions of a decreasing direct link between social origin and destination class and an increasing impact of education on destination class, there is also no clear support for a process of meritocratisation. Many studies show that the effect of social origin on education did not vanish at all in such systems, instead service-class offspring even enjoyed improved relative chances with regard to educational attainment (for example, Whelan and Layte, 2002 for Ireland). The statistical relationship between class of origin and class of destination remained substantial, even while controlled for education (see Breen, 2003, 2004). This is supported by results from other regions in the world. Studies (for example, Ishida et al, 1991; Ishida and Miwa, 2008) have found relatively stable links between social origin and destination class in Japan for the time period of strong industrialisation in the second half of the 20th century; however, there has also been a strong debate about how to interpret findings and about the methodological shortcomings of studies that support the idea of a meritocratisation process (see the debate of Saunders [2002] versus Breen and Goldthorpe [2002]). This critique is backed by empirical evidence (Jackson et al, 2005; Dörfler and van de Werfhorst, 2009). Educational certificates also potentially signal class origin and lifestyles – and not just ability – to employers. From a conflict theoretical perspective (Collins, 1979), an increasing orientation towards educational certificates is not an expression of the 'rise of meritocracy', but an increasing 'credentialism' with the goal of social exclusion of specific classes, namely unskilled and skilled manual workers, from desirable positions in the labour market. All in all, since differences related to social origin do not vanish, societies are far from perfect meritocracies.

How do the institutional characteristics of the education system shape inequalities in educational and status attainment?

The links between education system characteristics and inequalities in educational and status attainment processes are now considered, emphasising the state of empirical research, while some theoretical

mechanisms will be only briefly characterised (for detailed theoretical elaboration, see Chapter 2). Again, following the structural-individualist framework of Coleman (1990), a general thesis is that education systems and their institutional characteristics (macro-context) frame individual situations, and thus individual preferences, opportunities and limitations with regard to educational and status attainment. With regard to social class as an axis of inequality, the following education system characteristics seem to be of particular importance (Allmendinger, 1989; Müller and Shavit, 1998): the stratification/external differentiation of education systems (number of different school types that exist in parallel, age of selection and permeability between tracks), the degree of standardisation (variability in the quality of education between schools and regions) and vocational specificity or orientation (connection between educational institutions and the professional sphere).

Theorising the impact of education systems on inequalities in educational and status attainment

An assumption about *educational inequalities*, shared by most state-of-the-art research, is that they are higher in stratified education systems (van de Werfhorst and Mijs, 2010). Since high stratification and institutional differentiation is characterised by early selection of students to several educational pathways in secondary schooling, educational inequalities are more likely in those systems, as there are several points of differentiation that do not exist in comprehensive schooling systems. Early selection – common in highly stratified systems – fosters class-specific educational decisions and thus educational inequalities. The main reasoning behind this assumption is that the impact of social origin on educational attainment is stronger at a younger age, because time in school is too short to fully compensate for disadvantages in achievement based on resource deficits in the parental home (primary effects of social origin), and early educational decisions are mainly parental decisions (secondary effects). Selection points are prone to social selectivity and a lower probability of children from lower social backgrounds attending upper secondary schooling (Müller et al, 1997; von Below, 2009).

As indicated previously, a major driving force for educational inequalities involves the group-specific educational decisions of parents. The earlier the selection to different educational tracks, the less precisely parents or teachers can predict the development of the cognitive skills of the students. The lower the certainty with regard to skill development – an issue linked to the probability of success in the rational model of educational decisions (Becker, 2003) – the

more actors have to rely on points of reference or stereotypes that are prevalent in their direct environment (Esser, 2000: 217–19). Selection at an early age thus accompanies greater uncertainty about the child's development and a higher orientation towards group-specific (for example, class-specific) accounts of the appropriate educational path for a particular group. A similar argument related to educational decisions, although with a different focus on parents' strategic knowledge of the education system, is outlined by Pfeffer (2008). Since parents derive their knowledge of the education system mainly from their own educational attainment, in stratified systems – with very different educational pathways – there is a higher likelihood that children will reproduce their parents' educational status, since they follow the paths of their parents. One of the core arguments of Pfeffer (2008: 546) is: 'The advantage of highly educated parents in guiding their children through the educational labyrinth should be notably larger in nations in which the educational labyrinth contains many bifurcations and pathways that inescapably lead to dead ends.'

Another mechanism supporting educational inequalities in stratified systems is linked to the learning environment (school, classroom) in terms of it being a socialisation environment or differential developmental milieu (Baumert et al, 2006). School facilities differ between different school types – students on higher educational tracks often experience an environment that facilitates educational success (Bol and van de Werfhorst, 2013).

A crucial issue is the differential composition of the school student environment, with lower school tracks often characterised by a homogeneous school student population of poorly motivated and poorly skilled school students. As they are internally influenced, this homogeneous student population reinforces these features in itself (Hadjar and Berger, 2010). Differences in educational attainment – in particular the lower performance of working-class or migrant students – can be reduced and the achievement of disadvantaged students increased in heterogeneous environments as long as the disadvantaged group is not the majority in a classroom (Coleman et al, 1966). Such distinct learning environments in stratified school systems are characterised by certain motivation and support levels and also by specific aspiration levels. Teachers may apply a lower aspiration level and accept the status quo – which also increases performance differences between school tracks. Group-specific (for example, class-specific) performance differences and the disadvantages of low-performing students cannot be reduced, and inequalities may even be reinforced (Baumert et al, 2006; Schubert and Becker, 2010). Particularly in school tracks with a

low aspiration level such as the German *Hauptschule* (lower secondary school) or the Swiss *Realklasse*, the less motivated and less highly performing students from disadvantaged origins tend to congregate.

Focusing on inequalities in *status attainment* and the question of how characteristics of education systems impact the general link between education and the labour market – which is related to the link between educational inequalities and inequalities in life chances in later life – the way that institutional arrangements regulate the transition from school to work has to be considered (Kerckhoff, 1995, 2001; see Shavit and Müller, 1998). Such arrangements developed over decades and centuries and are thus to be understood as historical objects. According to the theory of historical effects (Maurice et al, 1982), a major determinant of the link between education and employment is whether training is occupationally specific (qualification space, for example, in Germany, Switzerland, Austria, the Netherlands) or whether secondary school curricula are general in content (organisation space, for example, in the US, Australia, the UK), referring to the characteristics of vocational specificity or vocational orientation of an education system. In qualification-oriented vocational-specific systems, vocational education is of great importance and is a main element of the education system, while in organisation-oriented systems the education system is strongly directed towards general education, with vocational education being mainly provided within companies ('on-the-job training'). In the first system, educational qualifications strongly determine labour market entry and employment careers, in the second system the link between education and employment is much weaker. The assumption behind these theoretical reflections is that inequality reproduction via status attainment processes is stronger in qualification-oriented systems with strongly vocational-specific education systems (Shavit and Müller, 1998). Accordingly, Dörfler and van de Werfhorst (2009: 700) argue that vocationally specific education systems accompany occupational labour markets: 'where access to numerous occupations is regulated through formal educational qualifications, often through apprenticeships of vocational education. In such systems it may be more likely that vocational education and educational fields of study are relevant in the selection process, and that their effects have persisted or increased across time.'

As vocational-specific education systems, with their division between vocational and general secondary education, are more highly stratified by definition, stratification is assumed to be another important predictor of strong school–work links and inequality reproduction. In highly stratified education systems, restricted access to higher education

institutions and the stronger signalling of educational qualifications (since they show a high degree of differentiation due to the manifold educational pathways) leads to a strong association between educational attainment and labour market outcomes (see Shavit and Müller, 1998).

The degree of an education system's standardisation is also linked to inequality reproduction via status attainment. In less standardised education systems with a rather loose coupling between skills and educational qualifications, the reliability of educational certificates as signals for an applicants' skills is low for employers (Allmendinger, 1989; Shavit and Müller, 1998). With a lower standardisation level the link between educational qualifications and employment decreases, since in less standardised countries employers cannot base their employment decisions on educational qualifications. Taking these theoretical arguments into account, inequality reproduction should be lower in less standardised countries – although, on the other hand, educational inequalities tend to be higher in these countries. Shavit and Müller (1998) introduce another characteristic of education systems with a presumed impact on school-to-work transitions: the percentage of tertiary-educated people or size of the education system. The main assumption is that in education systems with a large output of highly skilled people, competition is higher and – if the labour market is not as big as the 'queue of highly skilled people' – educational inflation leads to a weaker link between education and employment.

The links of the meritocratic triad, in particular with regard to status attainment, depend on two major societal processes. As explained, first the stage of the inflation of educational credentials (Collins, 1979, 2000) within the expansion of the education system influences the education–status link. The main assumption in this regard is that the more people graduate from higher education institutions, the lower the occupational returns on education. Second, as derived from the theory of skill-biased technological change (Acemoglu, 2002; Goldin and Katz, 2008), it will be suggested that the occupational advantage for the highly educated is increasing with respect to the poorly educated (see Ballarino et al, 2014).

Empirical evidence for the impact of education systems

Empirical evidence with regard to *educational inequalities* shows that the degree of stratification of an educational system has an impact on inequalities. Whereas highly stratified countries such as Germany, Austria and Switzerland are characterised by a strong impact of social origin on educational attainment, Nordic countries – with

less stratified educational systems – show relatively fewer educational inequalities (Müller et al, 1997). Stratification in terms of external differentiation is negatively linked to equality of opportunity – in highly stratified countries, the disadvantages of risk groups are higher than in less stratified countries (see meta-analysis of van de Werfhorst and Mijs, 2010). Results by Pfeffer (2008), based on the mobility tables of 20 countries, show a strong and, over the course of the 20th century, rather persistent link between social origin (parental educational level) and the educational attainment of the children. While from a theoretical perspective one would expect a low level of standardisation to correspond with greater inequality (for example, Allmendinger, 1989), empirical results are ambivalent. As noted above, Pfeffer (2008) did not find a significant influence of standardisation on educational inequalities, however, van de Werfhorst and Mijs (2010) concluded from their literature review that standardisation reduces inequality in educational achievement. Standardisation promotes equality of opportunity, efficient selection and facilitates school-to-work transitions. Further support for this conclusion can be derived from Asian evidence: Park (2013) – who looked at Japan and Korea with their highly centralised and standardised education systems – concluded from his comparison that recent reforms aimed at reducing the high standardisation level and giving individual students and their needs more attention led to higher inequalities and greater disparities between the school students of different social strata. Vocational specificity also demonstrates an impact on educational inequalities, since vocational-specific countries (for example, dual education systems in Germany, Switzerland, Austria) are highly stratified at the same time (Müller and Shavit, 1998). Evidence also suggests that in choice-driven systems, where parents decide which type of school their child attends, educational inequalities related to social origin are greater than in systems where teachers alone decide (Stadelmann-Steffen, 2012).

Empirical evidence with regard to *status attainment* supports most of the arguments mentioned above (see Shavit and Müller, 1998; Breen, 2004; van de Werfhorst and Mijs, 2010). Shavit and Müller (1998) indicate a strong impact of stratification, vocational specificity and size of education system (percentage of people with tertiary degrees) on the link between education and employment. Inequality reproduction via status attainment is higher in highly stratified and highly vocational-specific education systems. A higher output of tertiary-educated people seems to weaken inequality reproduction, presumably because some of the more highly skilled people have to work in inadequate employment. Shavit and Müller (1998) are less clear about standardisation. Based

on their empirical findings, van de Werfhorst and Mijs (2010: 411) identify an important trade-off between labour market preparation and equality of opportunity in stratified education systems, since on the one hand a 'stratified educational system (in particular, one with a strong vocational sector) clearly helps youngsters in the transition process from the educational system to work', but on the other hand 'students enrolled in vocational tracks have fewer opportunities to access tertiary education' and thus 'strongly vocationally oriented systems may enlarge social class differences in the attainment of a tertiary-level degree'. Evidence suggests that in highly stratified countries, the type of school largely determines educational aspirations and occupational plans and thus inequality is much more strongly perpetuated in those stratified education systems (Buchmann and Dalton, 2002; Buchmann and Park, 2009).

An empirical inquiry into the meritocratic triad with the European Social Survey

Before summarising this brief review with regard to theoretical frameworks and empirical evidence with regard to the concept of meritocracy, some multi-level analyses of the link between education system characteristics and educational inequalities and status reproduction are presented in terms of the meritocratic triad. The analyses are based on European Social Survey (ESS) data (2008–12) from 33 countries, within the birth cohorts 1933–77. [1] The 33 European countries provide heterogeneity with regard to education systems. A special focus is given to the education system characteristic of stratification – countries were classified into three categories according to number of tracks at secondary school level and age of selection in the 1980s (employing data of Müller and Shavit, 1998; Brunello and Checchi, 2007; Eurydice, 2014: high stratification level (for example, Austria, Germany, The Netherlands), intermediate stratification level (for example, France, Greece, Portugal) and low stratification level (for example, Estonia, Finland, Sweden). Due to limited space, we will only give brief information with regard to the construction of variables and methods of data analysis.

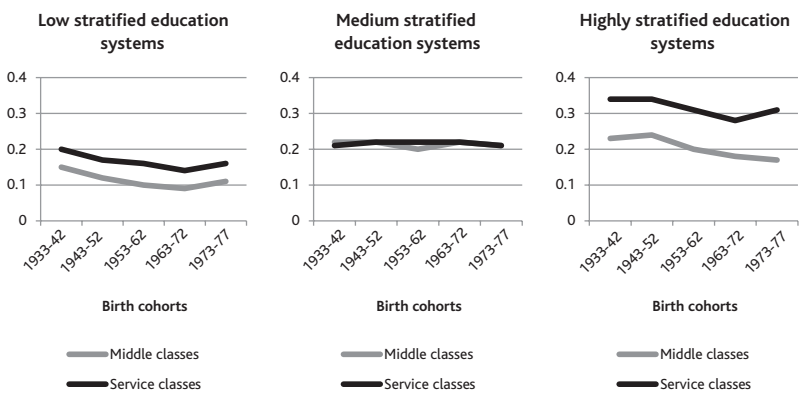
We have chosen upper secondary general education as the point of demarcation, since a general upper secondary qualification is the main prerequisite for (prestigious) higher education institutions, although there are also alternative access opportunities in some countries (see Griga and Hadjar, 2014). ESS data includes the highest educational level achieved at the time of data gathering. Our conceptualisation

of social origin (class of origin) relates to the highest class position of either the mother or father of the respondent (class scheme by Erikson and Goldthorpe, 1992): service classes (upper and lower service class), middle classes (for example, clergy workers, self-employed, manual supervisors) and working classes (skilled workers, unskilled and semi-skilled workers). Class of destination is operationalised via the status variable ISEI (International Socio-Economic Index of Occupational Status). To reduce complexity, we only focus on status as a main outcome of the meritocratic variable and neglect unemployment, income or inadequacy of jobs.

Visual inspections of the cohort change in the link between social origin and educational attainment

Visual inspections of the advantages of receiving a general upper secondary educational degree (International Standard Classification of Education [ISCED] 3a) for middle-class and service-class offspring compared to the working class (reference) in Figure 11.2 give a first impression of the changing association between class of origin and educational attainment (O-E) in low stratified, intermediate stratified and high stratified education systems. All in all, educational inequalities have been decreasing. The lowest levels of educational inequality are

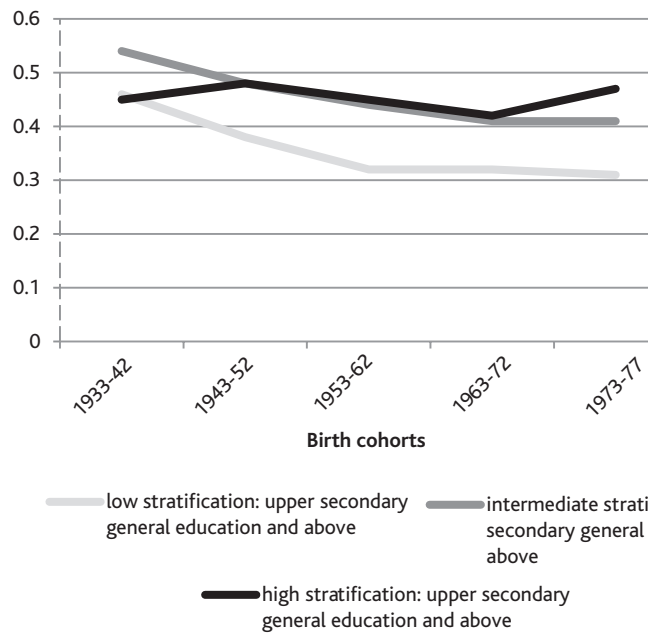
Figure 11.2: Educational inequalities by stratification level: class differences in the probability to attain at least a general upper secondary educational degree (ISCED 3a)



Note
Standardised linear probability coefficients (b), reference category independent variable: working classes in the respective subsample
Data source: ESS 2008, 2010, 2012, cohorts 1933–77 (only people born in country), weighted results. Controlled for period, gender, citizenship.

noted for the lowest stratified countries, with the smallest gaps between the working class and the other classes. In countries with a medium stratification level, the gap in educational opportunities between the working classes and the other classes is larger, and there seem to be no differences between middle classes and service classes. In highly stratified countries, huge gaps between working classes, middle classes and the service class (with the notably highest advantage) are visible. The impression from the following figures is that the other paths of the meritocratic triad, namely the associations between class of origin and class of destination (O-D) and between educational level and destination class (E-D), do not seem to follow the 'increased merit select thesis'. Although in Figure 11.3, education turns out to have a very strong impact on status (class of destination) – and comparing the coefficients with the impacts of the class-of-origin dummy variables education even shows the strongest effect – the impact of the education criteria on status slightly declined over time in low- and

Figure 11.3: The link between educational attainment and status (class of destination) by stratification level

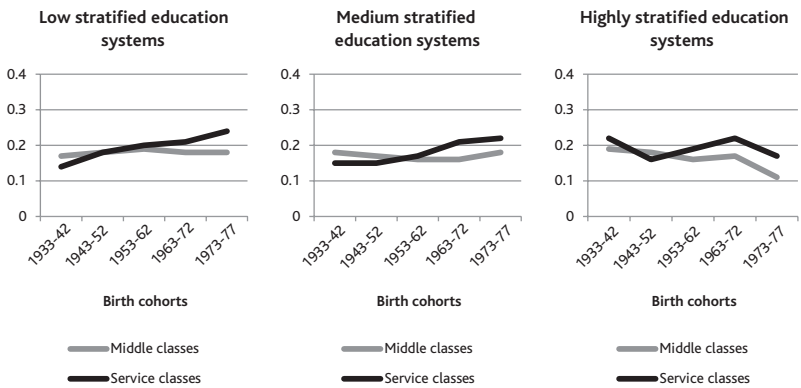


Note
Dependent variable: ISEI
Standardised OLS (ordinary least squares) regression coefficients (b), reference category independent variable: below upper secondary general education (< ISCED 3a) in the respective subsample.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77 (only people born in country), weighted results. Controlled for period, gender, citizenship, social origin (service classes, middle classes, reference: working classes).

medium-stratified settings (with no clear pattern in highly-stratified school systems). Comparing the three country groups distinguished by stratification level, the effect of education is lowest in countries with less stratification.

The direct links between class of origin and class of destination (Figure 11.4), controlled for educational attainment (that is, net of the education effect) did not vanish, but appear to be similar in the three different stratification levels. In all settings, the working class is profoundly disadvantaged in status attainment. There is a tendency to slightly increasing advantages of service-class origin with regard to status attainment over cohort succession, while the advantages of middle-class origin are quite stable or decrease slightly; however, nothing points to a vanishing direct link between class of origin and class of destination.

Figure 11.4: Class reproduction by stratification level: the direct link between social origin (class of origin) and status (class of destination), net of educational attainment



Notes
Dependent variable: ISEI
Standardised linear probability coefficients (b), reference category independent variable: working classes in the respective subsample.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77 (only people born in country), weighted results.
Controlled for period, gender, citizenship, educational attainment.

Multi-level analyses of the meritocratic triad

The main aim of the multi-level models presented below is to determine the individual effects of social origin on educational level with respect to social origin and educational level on status attainment. Again, instead of presenting tables of results, the most important effects

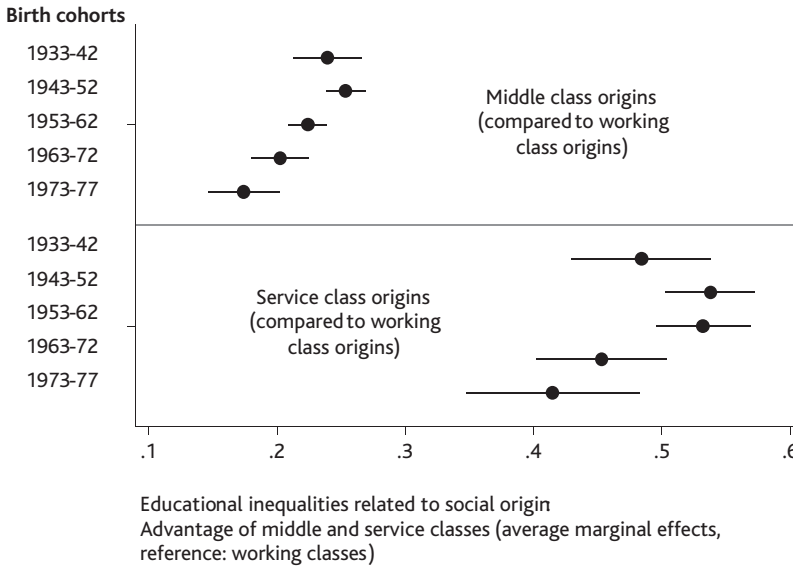
(cohort changes and cross-level interaction effects of macro-factors on inequalities) will be shown in graphs.

Social inequalities in educational attainment

The results of a binary logit regression analysis of the social origin-education link (O-E) are presented, with the dependent variable of educational level (high educational level, that is, at least a general university entrance certificate, reference: low educational level). The graphs refer to average marginal effects (AME) that are to be interpreted in terms of percentage points of a higher (positive AME) or a lower probability (negative AME) of having received a higher educational level of a group in comparison of a reference group.

People of service-class origin and people of middle-class origin have significantly better chances of reaching a high educational level (for example, to receive at least a general upper secondary degree) than do the working class. The gaps between both service class and working class, and between middle class and working class decrease during educational expansion (with increasing year of birth) (Figure 11.5).

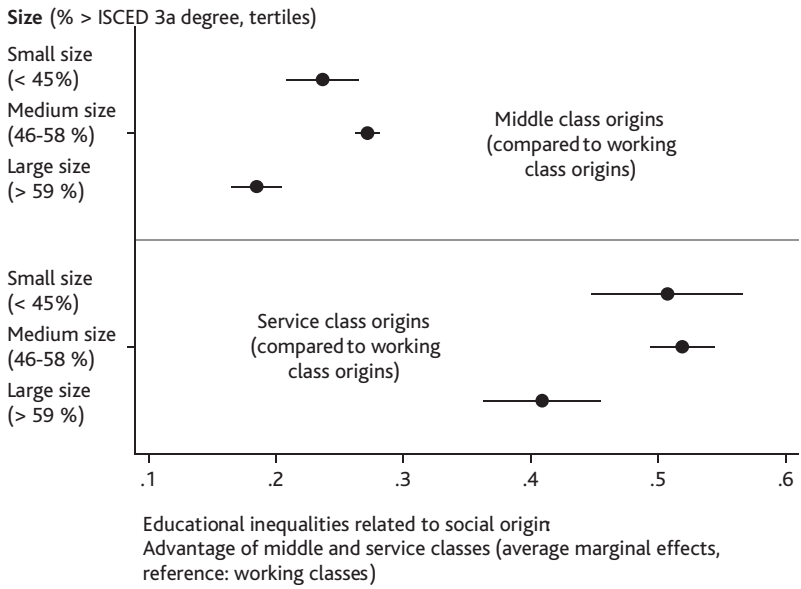
Figure 11.5: Changing social inequalities in educational attainment



Note
Multi-level models (Level 1, individuals, N = 98,264; Level 2, countries, N = 33), controlled for gender, citizenship, period.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, own calculations.

In the complex models – modelling two macro-factors (size, stratification/external differentiation) simultaneously – cross-level interactions indicate some education system influences. We will not report the models in their entirety, but show the interaction effects. *Size of the education system* (percentage of people with an upper secondary school degree/at least ISCED 3a in a country, ESS) moderates educational inequalities, while the cross-level interaction effects indicate that in larger education systems the advantages in educational attainment of the middle class (and to a smaller extent also the advantages of the service classes) in comparison to the working classes are lower; grouping the countries by size of education system (three groups) does not show a linear link between size of education system and inequalities. There is, however, a tendency for the group of the largest education systems to show the smallest differences between the different class positions (Figure 11.6). Increasing the size of the education system, expanding the upper secondary school sector, seems to reduce educational inequalities related to social origin slightly.

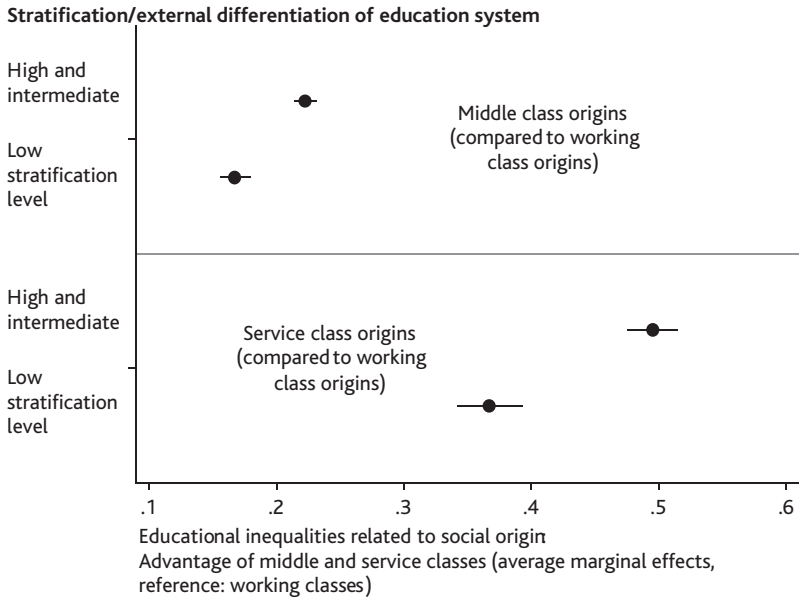
Figure 11.6: Size of education system and educational inequalities related to social origin



Note
Multi-level models (Level 1, individuals, *N* = 98,264; Level 2, countries, *N* = 33), controlled for gender, citizenship, period, birth cohort on individual level; for stratification of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, own calculations.

The lower the *stratification of the education system* (for example, late age of selection, no or only few differential school tracks at secondary school level), the smaller the gap between service classes and the working classes in educational attainment. Overall, educational inequalities are lower in less stratified education systems (Figure 11.7).

Figure 11.7: Stratification level and educational inequalities related to social origin



Note
Multi-level models (Level 1, individuals, *N* = 98,264; Level 2, countries, *N* = 33), controlled for gender, citizenship, period, birth cohort on individual level; for size of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, own calculations.

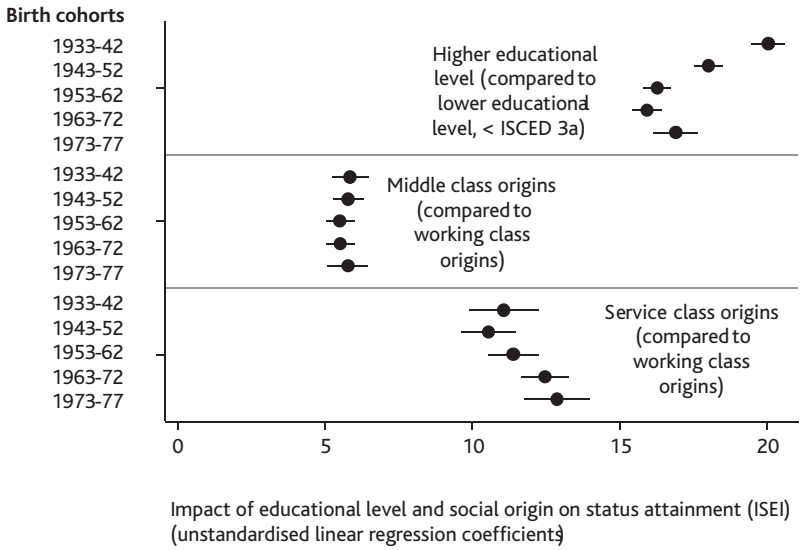
Educational attainment and status attainment

Similar models have been estimated with regard to the macro-impact of the education system on the links between educational attainment and class of destination (E-D), and between class of origin and class of destination (O-D). We estimated multi-level linear regression models with the dependent metric variable of status (ISEI). The direction of the unstandardised linear regression coefficients reveals the direction of the effects: if the coefficient is negative, there is a negative effect and vice versa. Since the number of estimated macro-level parameters

is high in relation to the 33 country cases, we estimate a full model including all macro-factors and reduced models in order to validate the findings. Again, we present graphics of the most important effects.

The unstandardised linear regression coefficients (x-axis) refer to the difference in status points that a certain group can gather compared to a reference group (Figure 11.8). Overall, there are strong positive effects of class of origin, as well as of education, on the class of destination (status). People with at least an upper secondary educational qualification can attain a professional status that is 16 to 20 points higher than the status less educated people can attain. The differences in status points between those with middle-class origins and those with service-class origins, and the reference group with the working-class origins, are smaller. The impact of educational attainment on class of destination (status), and thus the role of education for status attainment decreases (negative interaction effect) over successive birth cohorts. At the same time, direct class reproduction, the link between class of origin and class of destination, seems to increase slightly. In particular, the offspring of service classes show an increasing advantage in status attainment over successive cohorts (positive interaction effect) compared to the working

Figure 11.8: Changing links between class of origin, education and class of education (status attainment)

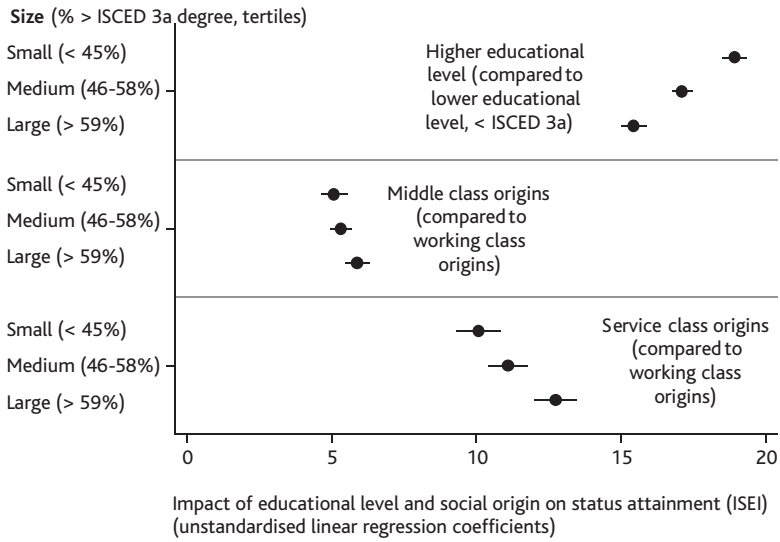


Note
Multi-level models (Level 1, individuals, *N* = 98,264; Level 2, countries, *N* = 33), controlled for gender, citizenship, period, birth cohort on individual level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, own calculations.

classes. The difference in status attainment between middle-class origins and working-class origins remains generally stable.

Education is less associated with class of destination (status) in countries with a large (general upper secondary) education system (*size*). Direct class reproduction is stronger in large education systems (Figure 11.9).

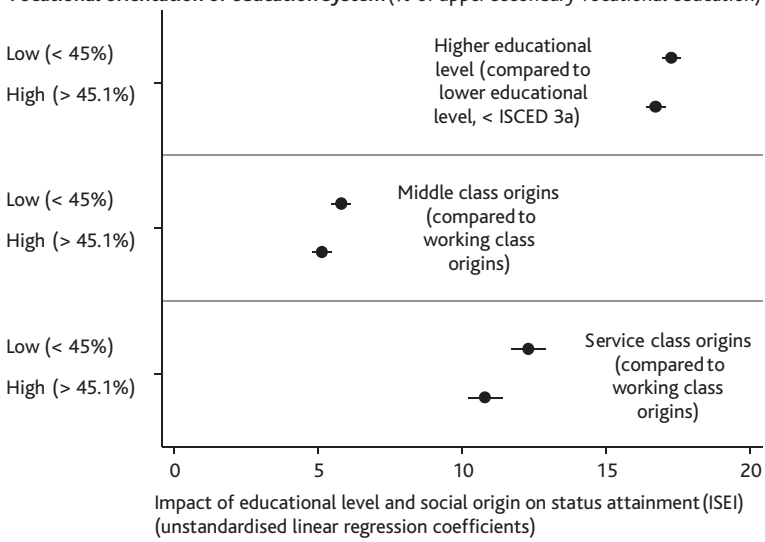
Figure 11.9: Size of education system and status attainment



Note
Multi-level models (Level 1, individuals, *N* = 98,264; Level 2, countries, *N* = 33), controlled for gender, citizenship, period, birth cohort on individual level; stratification and vocational orientation of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933-1977, own calculations.

Vocational orientation plays only a very minor role. The importance of education – and of social origin – for status attainment is slightly lower in countries with a strong vocationally oriented section of secondary education (Figure 11.10). The stratification level of the education system does not seem to play an important role with regard to the effects of education and social origin on status (Figure 11.11).

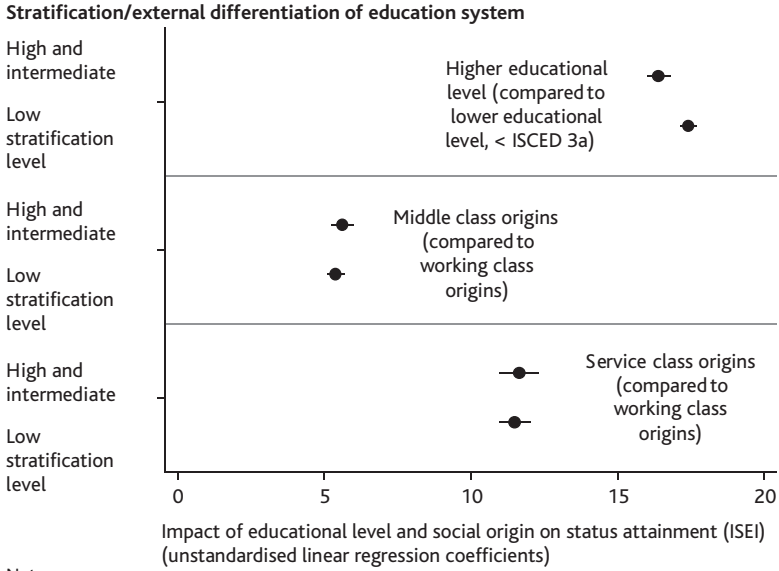
Figure 11.10: Vocational orientation of education system and status attainment



Note

Multi-level models (Level 1, individuals, N = 98,264; Level 2, countries, N = 33), controlled for gender, citizenship, period, birth cohort on individual level; size and stratification of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, own calculations.

Figure 11.11: Stratification level of education system and status attainment



Note

Multi-level models (Level 1, individuals, *N* = 98,264; Level 2, countries, *N* = 33), controlled for gender, citizenship, period, birth cohort on individual level; size and vocational orientation of education system on macro-level.
Data source: ESS 2008, 2010, 2012, cohorts 1933–77, own calculations.

Conclusions

With regard to the rise of meritocracy, both hopes – an extra increase in economic prosperity due to a meritocratic allocation of positions – and fears – disintegration, precarisation and non-integration of individuals with low skills – have been realised to a certain extent (Goldthorpe, 1996: 280). Inequality of educational opportunities and intergenerational status attainment is still strongly linked to class. Social origin is still an important factor in educational attainment and there is still a direct link between class of origin and class of destination alongside a meritocratic indirect effect via education. The empirical picture describes parallel ascriptive and meritocratic factors in educational and status attainment.

In summary, the changes with regard to the meritocratic triad can be described as follows. The link between class of origin and educational attainment (O-E) decreased, as assumed in the 'increased merit selection thesis' (Jackson et al, 2005: 5). In contrast, the link between educational attainment and class of destination (E-D) decreased, while the (direct) link between class of origin and destination class (O-D) slightly increased – also in contrast to the 'increased merit selection thesis'.

How can characteristics of education systems contribute to a decrease in inequalities related to social origin? Theoretical reflection and empirical results hint at stratification/external differentiation and size of education systems as important issues. The larger the upper secondary general education sector, and the lower the stratification of the education system (low stratification suggests a comprehensive schooling system and a late age of selection), the lower the educational inequalities related to social origin. Interestingly, these influences only apply to inequalities in educational attainment. With regard to inequalities in status attainment, or the effect of social origin on destination status, the characteristics of education systems had smaller and different effects. A larger upper secondary general sector and a stronger vocational orientation accompany the lower importance of education in the status attainment process, and the size of the upper secondary general sector even increases the direct link between class of origin and class of destination. This hints at unintended consequences of political policies (educational expansion) in the sense of Boudon (1974); however, with regard to the limitations of such multi-level analyses, there are surely many other macro-factors related to the education system (for example, classroom measures to decrease inequalities such as team teaching) and the social system (for example, welfare state regime, career counselling programmes) that were not

taken into account, and may be behind some of the findings. Another – content-related – issue is that sociological analyses, with their need to reduce the issues of analyses to some extent to make them comparable across countries, often neglect the horizontal dimension of inequality of opportunity. While vertical inequalities seem to diminish when moderated by the institutional settings of education systems, horizontal inequalities, which relate to certain choices of educational institutions or studies with specific curricula, may move in a different direction.

Note

[1] East and West Germany have been separated, since they were two distinct systems during the crucial educational phases of the cohorts under consideration.

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TWELVE

Education systems and gender inequalities in educational returns

Concetta Mendolicchio

Introduction

Although investment in human capital cannot be reduced only to investment in education, formal education does play a central role, and it is particularly interesting due to the crucial role of public intervention, which includes, among other things, the choice of the education system implemented in the country. The level of education has been identified as one of the most important engines of economic growth and has been seen as an important factor affecting many dimensions of social life, including the structure and dynamics of the family, and fertility patterns. Changes in the skill premium also affect income distribution and inequality in a country. From the viewpoint of policy, it is worth remembering the role attributed by the 2000 meeting of the European Council in Lisbon of the contribution of education and training towards the stated goal of making 'Europe the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion' (European Commission, 2001: 3). The subsequent Report of the Education Council to the European Council, *The Concrete Future Objective of Education and Training Systems* (2001), states three main objectives: increasing the quality and effectiveness of education and training systems in the European Union (EU); facilitating the access of all to the education and training systems; and opening up education and training systems to the wider world. These are only some of the issues behind the active discussion of the levels and dynamics of investments in education, and their returns. The obvious motivation for the interest in a disaggregate analysis by gender is related to the disparities in earning profiles for men and women, confirmed in most of the countries. The wage profiles differ for many reasons. For instance, education attainments, length of active life, unemployment rates and

unemployment benefits vary by gender. Public policies can affect differently the incentives to invest in education and to participation in the labour market of men and women. All these policies, in particular the initiatives promoting the reconciliation of working and family life, differ greatly across countries, even within the EU, and emerge as a core concern of governments.

While theoretical analysis has been progressing, together with an increasing amount of empirical research, there are still many open questions. How does gender affect returns on education? How do public policies affect educational achievements and labour market participation? We believe that a comparative perspective, taking into account countries with different systems of education and policy interventions, is particularly useful in dealing with gender-related disparities in returns on education and labour market performance. According to the data, female dominance in higher education is a phenomenon of recent decades and differences across countries could be driven by the structure of the education systems. In particular, the effect of early versus late tracking could differently affect males and females. In comprehensive systems (late track), students attend the same schools throughout lower secondary school, until age 16. In selective systems (early track), students enter academic or vocational tracks prior to lower secondary school, at age 10. The different effects of late tracks by gender on educational attainment and choices about future studies create a gender difference around the time of puberty. In a late track system, females are more likely to choose academic tracks and to enter tertiary education. The positive impact on educational attainment is stronger for females, and the negative impact on males is higher in families with non-academic educational background (Pekkarinen, 2008). It would be expected that in countries with late track systems, males and females would have more similar education attainments than in countries with early track system; however, early tracking actually increases educational inequality (Hanushek and Wößmann, 2006). This was confirmed for the sample of countries we consider in this chapter: the higher the age when placed in tracks, the lower the gender gap in education. Given that individual education consists of a series of choices, the tracking decision can have long-term effects, influencing future income and labour market outcomes. The link between educational systems and educational achievements is discussed in other chapters. Here, we focus mostly on the consequences of different educational attainment, for males and females, on the returns on education. Cross-country gender differences do not depend only on educational systems; a multitude of factors are at play which may,

in the long run, adjust or change the initial impact. In this chapter, we contribute to the discussion by providing additional evidence. First, we present a model of individual choice to compute the rates of return on education. This approach allows us to take into account, and to assess the significance of, relevant variables: the wage premium, the structure of the income tax and of some public transfers and benefits, in particular maternity benefits, and the costs of investments in education, which also can vary by educational system. Second, we present estimations of the wage premium obtained using the EU Survey on Income and Living Conditions (EU-SILC), which improves the quality of the data previously available for comparative analysis. Finally, we consider 12 different countries spanning quite different situations in terms of labour market conditions, public policies and educational systems.

The core of the chapter is in the third and fourth sections. In the third section, extending the model according to de la Fuente (2003), we compute the rates of return on education by gender for 12 European countries. The de la Fuente model has become the theoretical reference for several studies. The main contribution here is to develop a new version of this theoretical model, aiming to capture gender-related features of the work experience and, on the basis of this model, to provide specific rates of return for men and women. The fourth section makes two main contributions. First, we discuss the data and present the estimates of the Mincerian coefficients, which measure the educational premium on wages and salaries. Calibrating the theoretical model, we then obtain the rates of return on education by gender and discuss the main results. Finally, in the fifth section, we analyse the impact of public policies on the returns. The sixth section presents conclusions.

Theoretical background

The growth in per capita incomes of many countries during the 19th and 20th centuries are usually explained by stressing the role of the rapid increase of scientific and technical knowledge that raised the productivity of labour, and of the other inputs to production. It is clear that the exploitation of the benefits of technological improvements requires a parallel improvement in the skills of workers. Given that formal education is one of the most important factors affecting individual human capital and the ability to increase human capital,[1] educational attainment plays an important role in affecting the growth outcomes of modern economies.

Two important distinctions must be made here. The theoretical literature on the role of schooling has developed along two different

lines of analysis: the human capital theory and the signalling approach. The *theory of human capital*, initiated by Becker (1964), considers how the allocation of time and resources to education affects the future productivity of workers. This approach assumes that schooling increases worker productivity and, consequently, their wages and salaries. It follows that the choice of schooling attainment is, at least partly, a factor affecting the productivity differences across workers. According to this approach, the monetary and non-monetary investment in education is, at least potentially, productive from both the individual and the social viewpoints, due to the increases in individual salaries and productivities that it prompts.

A second approach, built on Spence's (1973) seminal contribution, emphasises the *signalling role* of education. Consider an environment where some privately, but not publicly, observable characteristic, such as 'innate ability', affects the probability of success in education, its cost and the productivity of the individuals on the job. The productivity, however, depends only upon the 'innate ability' and is not affected by education. In such a situation, education attainment can be used to screen individuals with high ability from those with low ability. Employers will then be able to use school credentials as an index of the productivity of individuals on the job. A wage premium for highly educated individuals is required to compensate them for the resources spent on education, and therefore, according to this approach, there is a private premium for education due to the higher wages of educated workers (exactly as in the human capital approach). The social gain from education is not due to an actual increase in the productivity of the educated individuals (as in the human capital model), however, but to the benefits related to the possibility of screening individuals of different abilities. These two approaches have quite different theoretical, empirical and policy implications. In the following, we will refer to the human capital approach.

In both approaches, an essential distinction is between private and social rates of return. Generally speaking, the *private rate of return* is the rate of discount equalising the expected private marginal costs and benefits of the investment in education.[2] This rate is one of the main determinants of individual choice in educational attainment. It is affected by many public policies, including direct and indirect subsidies to education and income taxes. Instead, the *social rate of return* is the rate of discount equalising the expected marginal social costs and benefits of the investment in education. The difference between social and private returns is potentially large. For instance, the cost of public education systems enters the calculation of the social rate of return in

its entirety, while only the costs, monetary and non-monetary, paid by the individual student affect the private rate of return. Similarly, while after-tax incomes are the relevant variable with which to compute private returns, what matters in the computation of social returns are before-tax incomes. Finally, social rates of return should also take into account the effects of positive externalities of education,[3] if any. In this chapter, we will only consider private returns; however, it is important to bear in mind the role of both private and social returns. For instance, the economic rationale for the large, generalised subsidies to education characterising most economically advanced countries rests on the presumed size of the social returns over the private ones. Note that in the following we are abstracting from the possible non-economic benefits of education that will be discussed in next chapter. We look at education attainments as the optimal outcomes of individual decisions. This approach does not explicitly consider the effects of education on consumption. This is because, in the model we present, it is possible to separate the individual choice about education from choices related to consumption. Once we limit the analysis of the education decision to its productive investment feature, the standard approach is to define the discounted sum of the future stream of income, net of private education costs as an objective function of the individual.

As usual, making the optimal choice requires that the marginal benefit (here measured by the expected discounted value of the increase in future income caused by a marginal increase in education attainment) equals marginal costs (here measured by the net, monetary and opportunity, costs of the increase in education).[4] Benefits are usually computed to the age of retirement.[5] Bear in mind that when we are looking at the choice of the length of schooling, S, as the optimal choice of an individual, the discount rate is, from the individual viewpoint, an exogenous parameter: individuals will invest in education as long as $r > i$,[6] where r is the rate of returns on education and i denotes the interest rate prevailing in the economy.[7] Evidently, to proceed to an empirical test of the theory, more structure needs to be imposed. As already mentioned, the human capital approach postulates that schooling increases wages by increasing the workers' productivity and, therefore, that the choice of schooling causes at least part of the productivity differences among workers. The most common empirical approximation of the human capital framework is the earnings equation derived by Mincer (1974). In this chapter, we will follow this approach. A recent critical discussion of the Mincerian approach is provided by Heckman et al (2003; see also Harmon et al, 2003). Here, we will only present the intuition behind the approach.

The reduced, and empirically testable, Mincerian equation postulates that the logarithm (log) of the observable earnings at time t are (approximately) given by the sum of four components: a constant term, α, which is a linear function of the amount of formal schooling S and a quadratic function of the work experience x. This translates into the canonical Mincer specification used in most empirical studies: given a sample of individuals, denoted by the subscript i, observed at time t, we usually proceed to estimate the econometric model:

$$\log w_i = \alpha + \theta S_i + \beta_1 x_i + \beta_2 x_i^2 + u_i \qquad (1)$$

where w_i is an earning measure for individual i with schooling S_i and work experience x_i, while u_i is a disturbance term representing other relevant factors not explicitly measured.[8] In equation (1), as in most applications in the literature, all the parameters are identical across individuals, so that they do not depend on any individual specific feature (such as innate ability): the effect of these sort of individual features is 'hidden' in the error term u_i. Notwithstanding its limitations, the Mincerian model is the key reference in most empirical studies on education. We present the empirical strategy, a discussion of some of the econometric issues involved in its actual estimation late in the fourth section. Here, it suffices to say that there is a large body of literature estimating the Mincerian equation and variations. The estimated values of θ vary significantly across the different studies depending upon the data and sample used, and the econometric techniques adopted. For instance, the exact *specification* of the model varies somewhat across studies (introducing demographic or other control variables assumed to affect the wage premium, and so on). The *methodologies* adopted to estimate the model also vary. In this chapter, we present estimates of the Mincerian equation obtained using the Heckman's selection model to control for potential selection bias into employment.[9] More generally, in addition to the basic ordinary least squares method, techniques based on instrumental variables and proxy variables are also widely adopted in the literature (for an overview of the literature see Mendolicchio and Rhein, 2014).

While the formal derivation of equation (1) is in line with the standard applications of the Mincerian approach, the interpretation of the results is slightly different: the estimated Mincerian coefficient θ is treated as a measure of the education premium embedded in observable earnings; however, this coefficient is then used as an input for the computation of the internal rate of return of investments in

education, by gender, together with several other parameters which also affect the returns (that is, for calibrating the theoretical model).[10]

The approach of the analysis

As already discussed, many studies analyse the rate of returns on education, embedding the wage premia. Most of them provide gender-free estimates. Conversely, we compute separately the returns on education of men and women entering the job market at the end of their formal education and exiting the job market at the age of retirement. To describe the decision on schooling, we present an extension of the model proposed by de la Fuente (2003). The structure of the model has the advantage of considering the costs of the investment in education, taxes, probabilities of employment during school and after school, and unemployment benefits, and therefore it allows us to compare the way these variables affect individuals in several countries (covered in the sample). To study all the possible factors driving the gender gap in returns, however, we take the de la Fuente model one step further by also considering parameters related to maternity issues. Since the actual female work experience may be affected by maternity episodes, we introduce maternity leave benefits and maternity related monetary benefits and the interaction between fertility rates and education. Looking at international data, it turns out that there is a negative correlation between education and fertility: the higher the level of education, the lower the fertility rate. To disentangle the impact of the fertility path on education, we must account for the position of the individual woman in the labour market. In all the European countries, in order to reconcile women's family life and work, the law establishes for a working woman the right to leave her job for a period of time for maternity and childcare. A fraction of this period is paid by the firms or by the public insurance system. For all women having a child, independent of their position in the labour market, the government usually pays a cash benefit. The child benefit programmes differ dramatically across countries, and thus it is natural to ask how (if) these policies affect the investment in education. The first question is how to define and measure the returns of the investment in education by gender? To answer these questions, we first study an individual decision model accounting for these public policies and, calibrating the model, we obtain the private rate of returns on education, which depends upon the marginal costs and benefits of the investment, where the costs are the sum of direct and opportunity costs, and the benefits are the sum of the change in the wage profile, the

probability of employment and differences in unemployment benefits due to higher levels of education. For women, they will also depend on the change in the profile of benefits related to maternity. Finally, we discuss the elasticities of the returns on education with respect to the policy parameters and evaluate them numerically[11] (see fifth section). In the following, we present the theoretical approach behind the model. The numerical values are presented in the next sections of the chapter.

The model

The model that we present in this chapter can best be seen as an extension of the one by de la Fuente. We consider the after-tax earnings of an individual in full-time employment as an increasing function of schooling. To capture differences in the progressivity of the tax system across countries, we include both the average and the marginal rate of income tax. We take into account that, if unemployed, individuals obtain unemployment benefits that may or may not be related to their previous earnings and to their average earnings.[12] We also consider the possible changes in the probability of being employed. This probability depends upon the unemployment rate, which is per se a function of the education level. It can be seen from the data that for all countries in the sample, independent of gender, the higher the education level, the lower the unemployment rate, and the higher the probability of being employed. We also consider that, while in school, individuals devote a fraction of their time to studying and attending school, and therefore the potential labour supply of students and their probability of being employed are lower than that of a full-time worker.[13] We explicitly introduce maternity and parental leave and child benefits for women as follows: we compute the fraction of her working life that the representative woman can spend on maternity leave. This will depend upon the number of children, if any, and upon the length of maternity leave allowed by law. During this fraction of her active life, a female member of the labour force can, legally, be on maternity leave.[14] Finally, schooling also implies direct private costs. Using these variables, we can redefine and compute the present value of expected net lifetime earnings, following the approach previously discussed. Denote with g the rate of productivity growth, then, the private rate of return on education (RRE) is the value $r = R+g$, such that the average level of education is the optimal solution to the problem of maximisng the present value of the expected net lifetime earnings, for the representative agent, man or woman, who studies for S years and retires at time U. A straightforward computation based on the

solution to the optimisation problem shows that R is obtained solving the following equation:

$$\frac{R}{1-e^{-RH}} = \frac{Benefits}{Costs} = \frac{\Delta W + \Delta E(+\Delta F)}{\Delta OC + \Delta DC} \qquad (2)$$

Equation (2) may be easily interpreted: the denominator can be seen as the sum of the marginal opportunity, ΔOC, and direct costs of education, ΔDC. Similarly, the numerator gives the marginal effect of education on earnings. For men, this effect can be decomposed into two components: one related to the wage profile, ΔW , which is driven by the Mincerian parameter, θ, and a second one related to the effect of education on the probability of employment and unemployment benefits on income, ΔE. The tax system is extremely important in this kind of analysis, because of its effect on ΔW: the more progressive the tax system, the lower the impact of the wage premia on the rates of return. In the case of women, there is a third component, ΔF, due to the effect of education on fertility and the benefits that a woman obtains if she is out of work because she is on maternity leave.

The last component ΔF can be interpreted as the marginal (percentage) increase of income due to the change of the fertility rate caused by an increase in the level of education. ΔE measures the marginal (percentage) effect of the increase in education on income due to the change in the probability of employment. Similarly, ΔW measures the effect on after-tax incomes due to the effects that an increase in education has on the earning function. Since the left-hand side of equation (2) is strictly increasing in RRE, the larger the value of the right-hand side, the larger the value of the private returns on education.[15]

Estimations, calibrations and main results

One of the key building blocks of the analysis presented in this chapter is the estimate of the wage premia θ. In a multi-country analysis, the main difficulty is in comparability of the data. The EU-SILC dataset gives us the opportunity to use recent and comparable micro-data. Since 2004, the EU-SILC data have been collected annually by the national statistical offices for the purpose of providing comparable information on income and the poverty situation in EU member countries. The EU-SILC data have replaced the European Community Household Panel (ECHP) previously used in many studies. The dataset contains cross-sectional information about household financial behaviour and fundamental individual socio-demographic characteristics such as age, gender, highest completed degree, parent backgrounds, family

composition, working status and so on. On the basis of the availability and comparability of the data, we selected 12 countries with different welfare regimes, institutions and educational systems.[16] We restricted the sample to the working age population (men and women aged 25–64). A methodological problem arises when estimating the schooling coefficients due to the possibility of non-random selection of the sample from the workforce (Heckman, 1979, 1980). A priori, the relevance of this problem might vary across genders. Given the aim of this study, it is particularly important to take this possible bias into account, and thus we estimate the wage equation, the Mincerian equation, using the selection model by Heckman to control for potential selection bias into employment.[17] The Heckman *selection equation* is:

$$z_i(\cdot) = \alpha_0 + \alpha_1 S_i + \alpha_2 x_i + \alpha_3 x_i^2 + \alpha_4 DForeign_i + \alpha_5 DMarried_i + \alpha_6 YCh_i + \alpha_7 OCh_i + \alpha_8 FInc_i + e_i \quad (3)$$

where YCh_i is the number of young children, aged 0–5, while OCh_i is the number of older children, aged 6–17, in the household. $FInc_i$ is a measure of the income of the other members of the family.[18] Finally, e_i is a zero mean error term. Then, given a sample of individuals, denoted by the subscript *i*, observed at time *t*, we proceed to estimate the corrected *wage equation*:

$$\log wage_i(\cdot) = \beta_0 + \theta Schooling + \beta_1 Experience_i + \beta_2 Experience_i^2 + \beta_3 Married_i + \beta_4 PublSector_i + \beta_5 Foreign_i + \beta_6 PartTime_i + \beta_7 ParentEducation_i + \beta_7 \hat{\lambda}_i + u_i \quad (4)$$

where we control for schooling, defined as the number of years of education, work experience[19] measured as the real experience of the individual[20] and, including several dummy variables, for marital status, public vs. private sectors, native-born vs. foreign-born individuals, part-time vs. full-time jobs, and parent's educational background.[21] As usual, $\hat{\lambda}_i$ is the inverse of the Mills ratio,[22] estimated from the first stage, and u_i is a disturbance term representing other explanatory variables.

The estimated coefficient of schooling in a Mincer wage equation, θ, can be conveniently interpreted as the wage premium. It gives the average percentage increase in wage due to an increase in schooling, in our case an additional year of school. We then embed the estimated

values of θ as parameters affecting the individual decision problem, together with several other parameters that try to capture the relevant characteristics of the labour markets and public policies, as explained in the previous section. Finally, to obtain the returns on education by gender, we calibrate – separately for men and women and by country – the theoretical model presented in the previous section.[23] We present the estimates of the Mincerian coefficients[24, 25] and the rates of returns, by country and by gender in Table 12.1.

Table 12.1: Mincerian coefficients and RRE by country, by gender

Country	Heckit		RRE (%)	
	θ_M	θ_W	r_M	r_W
Austria	0.0495*** (0.0028)	0.0614*** (0.0037)	5.00	5.81
Belgium	0.0443*** (0.0024)	0.0531*** (0.0034)	4.64	5.47
Denmark	0.0446*** (0.0026)	0.0508*** (0.0025)	6.10	6.88
France	0.0462*** (0.0022)	0.0484*** (0.0024)	5.75	6.36
Germany	0.0461*** (0.0018)	0.0449*** (0.0023)	5.32	4.82
Ireland	0.0569*** (0.0036)	0.0859*** (0.0043)	6.81	9.92
Italy	0.0363*** (0.0010)	0.0406*** (0.0016)	3.88	4.48
Luxembourg	0.0827*** (0.0023)	0.0842*** (0.0037)	8.63	8.68
Netherlands	0.0404*** (0.0022)	0.0286*** (0.0028)	4.57	2.72
Portugal	0.0727*** (0.0034)	0.0940*** (0.0034)	7.90	9.67
Spain	0.0577*** (0.0023)	0.0705*** (0.0039)	6.41	7.97
Sweden	0.0543*** (0.0038)	0.0342*** (0.0042)	5.23	2.76

Notes

θ_M and θ_W own estimations using the EU-SILC data (2007). Standard error in parenthesis: significant at ***1%, **5%, *10% level. r_M and r_W own calculations based on the calibration of the model.

To interpret the results, remember that θ_M and θ_W measure the average percentage increase in future earnings due to an increase in schooling, while r_M and r_W measure the internal rate of returns from the investment.[26] Let us first focus on men. In most countries, private returns for men range between 4% and 6%, with an average of 5.7%. The minimum value, 3.9%, is in Italy, and the maximum is 8.6% in Luxembourg.

The private returns of women vary greatly across countries, with an average of 6%. They are much lower than the average in Sweden (2.8%) and in the Netherlands (2.7%). For Ireland, Luxembourg and Portugal, the rates are much higher than average: 9.9%. 9.7% and 8.7%, respectively.

Our results show that private returns on education for females are higher than those for males in most of the countries in the sample. The only exceptions are Sweden, the Netherlands and Germany. For example, in Germany, returns on education are equal to 5.32% for males and 4.82% for females; more important, the difference is not statistically significant. This can be explained taking into consideration some peculiar features of their labour markets.

In Sweden, the public sector is a relevant component of gross domestic product (GDP) and there is a higher percentage of skilled women, compared to skilled men, working in this sector. Our results show that the wage level is typically lower in the public sector. Differences by gender in the skill composition of workers in public employment can therefore explain the gender gap in the returns on education.

In the Netherlands, the female job market is characterised by a high proportion of women in the labour force who work part-time. This proportion is even higher among low-skilled women and working mothers. In a separate analysis, not reported in the chapter, we combine educational levels and part-time experience. The wage premium decreases with education levels: this suggests that the high incidence of part-time jobs plays a role in explaining the lower rates of return for females.

For Germany, the values are in line with the results of previous studies. Occupational segregation by gender, in particular in the low-wage sectors, is a well-known and widely discussed phenomenon in Germany. Segregation makes it difficult for highly skilled women to obtain jobs in the upper part of the occupational hierarchy. There is also evidence that, if they do obtain such jobs, they no longer suffer wage discrimination. Clearly, this phenomenon has an impact on the returns on education for females.

Quantitatively, the returns on education depend crucially on the wage profile (wage premium and labour income taxes). Looking at the composition of the numerator of equation (2), we see that the main component of the benefits depends on the coefficient of the Mincerian equation, while the effects of education on the probability of employment and the fertility effect vary greatly across countries and are of a smaller order of magnitude.[27] We can conclude that the gender gap in returns on education can be explained mainly by the Mincerian coefficients which more than compensate for the negative effects on female returns triggered by higher unemployment rates and maternity related benefits. Finally, looking at the denominator of equation (2), we have found that the key components of costs are opportunity costs. In only three countries (Austria, Portugal and Spain), do direct costs exceed 5% of earnings. On the other hand, opportunity costs are (at the margin) always above 75% of earnings.

Elasticities and public policies

Relevant public policies vary substantially across countries, and therefore questions arise. What is the effect of changes in the policy parameters on rates of returns by gender? Do policies affect gender-specific returns differently? What is the effect of maternity on women's investments in education? For instance, increases in maternity leave and childcare benefits have a *direct effect* on the RRE because they decrease the opportunity cost of maternity. There is also an *indirect effect* because the changes in these policies also affect the fertility rate and may influence the values of the probability of being employed. By direct computation,[28] we find that, for the sample of countries considered here, both elasticities have a negative sign. As one would expect, increases in childcare benefits increase the opportunity cost of schooling and the return decreases. It turns out that the effect of an increase in maternity leaves is also always negative. This is somewhat counterintuitive because an increase in the value of maternity leave increases the expected future income, however, it also increases the opportunity costs of schooling. The impact of a change in opportunity costs dominates all the others. Both results are in line with the empirical evidence. Following the same approach, we estimate the elasticities of returns on education with respect to unemployment benefits, marginal and average tax rates. The numerical values are presented in Table 12.2.

The first two columns of Table 12.2 report the elasticities of the returns on education for men and women with respect to the replacement rates. An increase in unemployment benefits has a negative

Table 12.2: Elasticities of RRE by country, by gender

Country	Unempl. benefits		Marginal tax rate		Average tax rate		Mat. leave	Child-care
	Male	Female	Male	Female	Male	Female	Female	Female
Austria	-0.68	-0.61	-5.93	-6.34	1.96	-5.54	-0.01	-0.09
Belgium	-1.07	-1.24	-7.33	-7.91	2.68	3.34	-0.03	-0.03
Denmark	-0.31	-0.51	-5.42	-5.88	5.08	10.01	-0.12	-0.05
France	-0.64	-0.62	-3.07	-3.15	1.99	0.19	-0.24	-0.13
Germany	-1.91	-2.13	-5.33	-5.22	2.30	-3.80	-0.05	-0.20
Ireland	-0.63	-0.92	-2.78	-5.98	0.00	0.93	-0.07	-0.16
Italy	-0.35	-0.33	-3.96	-3.95	0.92	-0.22	-0.10	-
Luxembourg	-0.28	-0.28	-6.20	-6.16	2.66	2.01	-0.09	-0.18
Netherlands	-0.21	-0.31	-5.01	-5.01	3.65	-3.70	-0.07	-0.01
Portugal	-0.23	-0.18	-5.54	-9.18	1.64	-1.95	-0.09	-
Spain	-0.33	-0.28	-3.68	-4.80	0.68	-1.08	-0.07	-
Sweden	-0.32	-0.11	-6.98	-6.65	2.72	9.84	-0.32	-0.11

Note
The elasticities with regard to maternity leave and childcare benefits are computed for the female population.

impact on the returns on education for both genders. The magnitude of these effects is, however, fairly small except for Germany, where an increase of 1% in unemployment benefits causes a decrease of 1.9% in returns on education for men. The negative impact is even higher for women, 2.1%. What is much more relevant is the impact of a change in the tax system. The sign of the elasticity with respect to the marginal tax rate is negative for both genders, for all the countries. To give an example, an increase of 1% in the marginal tax rate decreases by about 5% the returns on education in Germany, for both genders. On the other hand, the impact of an increase in the average tax rate can vary according to the position of the individual in the wage distribution. For men, the impact is always negative. For women, the sign changes considerably across countries. It may be positive or negative. It is positive and significant in countries such as Denmark and Sweden, where the tax system is more progressive and the relative earnings distribution of females is fairly close to that for men. In Germany, for example, an increase of 1% in the average tax rate implies a decrease of about 3% in female returns on education. While an increase of 1% in childcare benefits decreases the returns of women of 0.2%, the elasticity with respect to maternity leaves is even smaller with a value

equal to -0.05. The impact of both policies on the returns is, usually, small. To interpret the results properly, bear in mind that the focus of the analysis is on only one of the possible channels for the effectiveness of public policies. In particular, they could possibly have a quantitative impact on the choice of whether to participate in the labour force. The empirical approach (see previous section) allows us to correct only partially for this endogenous decision.

Conclusions

In this chapter, we discussed gender inequalities in returns on education in countries implementing different policies and educational systems, and we analysed the role and the impact of institutional variables in the decision of the individual to invest in education. Towards this aim, we embedded the Mincerian coefficients in an individual decision problem, together with several parameters capturing the characteristics of the labour market and tax system, the costs of the investment in education and public policies which may affect the incentive to invest. To compute the gender-specific returns on education, we have also explicitly considered policy variables related to maternity episodes. The results show that the returns on education of females are higher than those of males in all countries in the sample except Germany, the Netherlands and Sweden. The gender gap in the returns on education can be explained mainly by the Mincerian coefficients, typically larger for women, which more than compensate for the negative effects of women's returns triggered by higher unemployment rates and maternity related benefits. Finally, the effects of the returns on education of the policy parameters can be evaluated in two ways: computing the elasticities of the returns and, as a robustness check, using several counterfactual experiments.

Evaluating the elasticities, we can conclude that an increase in unemployment benefits, by increasing the opportunity cost to be employed, always has a negative, but weak, impact on the returns on education, for both men and women. Women seem to be, on average, more sensitive to this policy.

An increase in marginal tax rates always has a strong and negative impact for men. For women, the elasticities are, in absolute value, even larger. This is due to the relative position of females in the earnings distribution. An increase in the average tax rates always has a positive impact on men's returns, while it can have a negative or positive impact on the returns on education of women, depending upon the progressivity of the tax system and their relative position in

the earnings distribution. The more progressive the tax system, the greater the negative impact on the rates of return.

Finally, in each country, the elasticities with respect to maternity and childcare benefits are negative and not high, that is, an increase in maternity and childcare benefits always implies a weak decrease in women's returns on education.

To interpret these results properly, note that the analysis considers one dimension of maternity related policies: the effect on the rates of return on education and on their differences across gender. These policies may have aims which are beyond the scope of this study, for instance to promote an increase in fertility. From this viewpoint, the small values of the elasticities presented are reassuring, in that they suggest that they can be implemented at a fairly small cost in terms of returns on education, and hence of investment in human capital.

As a robustness check, to assess the impact of public policies, it is also possible to run several counterfactual experiments simulating the theoretical model assuming different, hypothetical, policy scenarios. Since all the results of the counterfactual experiments confirm the impact of the various policies implicit in the elasticities, we preferred to report the values of the elasticities in the chapter, which are somewhat more intuitive. Nevertheless, we would like to present an interesting result from one simulation where we evaluated the impact of public financing of education, by comparing the actual returns – presented in the fourth section – with those that would prevail in a scenario where individuals had to bear the total cost of education. The provision of education services has a very high impact on the rates of return. If individuals had to directly bear the full cost of their education, the rates of return would substantially decrease for both genders and, in particular: returns on education would decrease, on average, by 1.7% for men and 2.8% for women. As a final exercise, we have computed the rates of return as if there were no public intervention at all. We call this simulation the 'basic scenario'. Comparing the returns of the basic scenario with the actual ones, we note that the latter are, in most countries, higher, suggesting that the positive effects of education spending are more important than the negative effects of taxes and unemployment benefits.

Notes

[1] Via, for instance, learning-by-doing or other informal processes.

[2] As with any other investment, investment in education entails a comparison between the current outlay and the expectation of a future return. The individual is therefore comparing values at different points in time: the costs they have to pay today to obtain,

for example, a higher degree, and the future higher wage on the labour market. The procedure used to compare gains and losses at different points in time is discounting: for instance, X euros obtained t years from today are equivalent to $X/(1+r)^t$ euro today, where r is the appropriate discount rate. The *internal private RRE* is the discount rate such that the cost of a small increase in education will be fully compensated by the increase in the discounted value of the gains it induces (where both costs and benefits are computed at the level of schooling optimally chosen by the individual).

[3] An example of externalities are *peer effects*. To the extent that schooling and learning on the job are group activities, the level of other people's activity may have a direct effect on the learning level of an individual. This is also related to the educational system implemented in the country.

[4] In this way we can convert a risky future cash flow into today's monetary equivalent. In our specific case, one additional year in education will (with some probability) increase the future (yearly) income. This expected flow of income is discounted today to measure the total marginal benefit of the investment in education. The same approach is used for the total marginal costs. More details are given on p. 268.

[5] This implicitly assumes that the amount of post-retirement benefits are the capitalised values of individual contributions to pension funds (an assumption which, strictly speaking, is warranted only for fully funded contributive pension systems).

[6] Under the standard assumption of perfect capital markets.

[7] As we will see, in the empirical implementation of the model, *r* is computed ex-post, as the value which 'rationalises' the observed average level of education attainment as the optimal choice of a representative individual.

[8] These error terms are assumed to be independent of the other explanatory variables.

[9] There are few estimations which adopt this approach. Usually, they focus on single-country analysis.

[10] This approach also gives us the opportunity to analyse the role and the impact of Mincerian coefficients in the decision of the individual to invest in education.

[11] Elasticity measures the percentage change of an economic variable, in our case the RRE, to a percentage change in another variable; in this case we will consider, one by one, several policy variables. For each policy, the elasticities, at country level, are computed and evaluated separately for men and women. A full computation of all elasticities is available upon request.

[12] To compare the different unemployment systems implemented in the countries, the unemployment benefits are computed as the sum of two components. One captures the benefits related to the previous net earnings, while the second captures benefits that are related to the average net earnings. Whether one of the components is different to zero will depend on the unemployment system of the country.

[13] Taxes are corrected accordingly.

[14] During this period, she can be either employed or unemployed, with some probability. If employed, she will receive a fraction of her previous earnings, plus other benefits related to childcare and typically independent of the personal income and depending instead on the average income of the country. If unemployed, her income will be determined by the unemployment benefits plus the maternity related benefits which are, however, independent of employment.

[15] For the full discussion and derivation of the model, and all formal definitions of the components see Mendolicchio and Rhein (2014), Appendix 1.

[16] The European countries we include in the sample can be divided according to educational system into three groups: early tracking countries (Austria – age 10, Germany – age 10), medium tracking countries (Belgium – age 12, France – age13, Italy – age 14, Luxembourg – age 12, the Netherlands – age 12, Portugal – age 15), late tracking countries (Denmark – age 16, Spain – age 16, Sweden – age16).

[17] Not for all observations is a positive outcome reported. In our case, we can observe the wage only for individuals who work. Since people who work are selected non-randomly from the population, estimating the determinants of wages from this subpopulation may introduce bias. The Heckman model is a two-step statistical approach which allows us to correct for selection bias. In the first stage, it estimates the probability of working using a probit model, see equation (3). In the second stage, it corrects for self-selection by incorporating a transformation of these predicted individual probabilities as an additional explanatory variable, $\hat{\lambda}$, see equation (4).

[18] In our case it is the total household income minus own labour income.

[19] Experience is included as a quadratic term to capture the concavity of the earning profile.

[20] If this information is not available, potential experience or age might be used.

[21] The parent's educational background is measured by the higher number of years of schooling of mother or father.

[22] The inverse of the Mills ratio is the ratio of the probability density function to the cumulative distribution function.

[23] More details are available upon request.

[24] When convenient, we will use the subscripts W and M to denote the values of the parameters for women and men, respectively.

[25] In a multi-country analysis the main question is: are these measures comparable across countries? Here, given that the model is fully specified, the effects are comparable across countries and across genders.

[26] As already explained, it is the discount rate such that the cost of a small increase in education will be compensated by the increase in the discounted value of the gains it induces.

[27] Data for the decomposition is available upon request.

[28] For the computation of the elasticities by gender, see Mendolicchio and Rhein (2014), Appendix 2.

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THIRTEEN

Education systems and migrant-specific labour market returns

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Introduction

Industrialised countries have increasingly competed for the best and the brightest immigrants in recent decades (Iredale, 1999; Mahroum, 2001; Quaked, 2002; Hugo 2005; Asis and Piper, 2008). By adjusting admission policies in order to attract highly skilled immigrants, immigrant-receiving countries try to balance their country's economic needs and humanitarian obligations; they also go to considerable efforts to ensure that newcomers assimilate smoothly into the labour market. Despite these efforts, concerns are often heard about the waste of newcomer potential in reference to their failure to adequately integrate into host-country labour markets. Across many European Union (EU) countries, there is a glaring gap in employment rates between third-country nationals and EU nationals or native-born populations (van Tubergen et al, 2004; Kogan, 2006, 2007; Fleischmann and Dronkers, 2010). When employed, immigrants – especially those originating from outside the EU – are more likely to be overqualified and to occupy jobs at the lower end of the socioeconomic ladder. One of the obvious reasons for immigrant integration problems in general, and for the underutilisation of their skills in particular, is related to the difficulties in transferring immigrant human capital from their origin to destination countries.

Migration scholars have long recognised this problem, relating immigrant (initial) difficulties to the loss of value associated with their foreign credentials or skill devaluation (Chiswick, 1978; Borjas, 1994; Friedberg, 2000). As credentials are normally used to screen candidates for job openings (Spence, 1973), individuals with foreign qualifications are likely to be disadvantaged during this process. Cain (1986) characterises the problem as 'informational discrimination',

since immigrants are penalised for the uncertainty of employers about their educational credentials.

One way to overcome employer uncertainties is to increase the amount of information that can be relied on in recruitment decision making, for example by providing employers with credible ways to assess foreign diplomas. This procedure is appropriate because it provides immigrants with guidance about the value of their qualifications in the new setting, and matches their diplomas to the needs of the host country's economy. It also helps them decide whether additional training or retraining might be worthwhile.

This process of assessment and recognition involves multiple actors, including educational authorities, professional bodies, specialised recognition bodies and employer associations (OECD, 2014). Formal recognition by educational and professional bodies includes certifying the authenticity of the foreign qualification as well as determining its correspondence to equivalent host-country qualifications. For some so-called regulated professions, formal recognition is the only way to practise the occupation. The most obvious examples of regulated professions are medicine and law, although several countries with a strong vocational tradition have a much longer list of regulated occupations, extending to those in crafts and services (Kogan, 2012).

After undertaking this assessment and recognition procedure, immigrants often receive a recommendation about whether to obtain additional host-country qualifications. They are often recommended to do so if their education is only partially recognised (Kogan, 2012). Third-country immigrants applying for tertiary education in host countries are at any rate required to prove that their secondary education meets host-country standards.

Despite the importance of recognising past training and education, relatively few applications to assess qualifications are made in most EU countries (OECD, 2014). Procedural hurdles – including strict bureaucratic requirements, translation difficulties and costs, high fees and long waiting times – and the ambiguity of the whole procedure prevent many potential aspirants from applying. In addition, the responsible authorities might not even be able to determine the adequacy of foreign educational degrees, particularly when immigrants come from countries affected by war and unrest. The relatively low numbers of applicants and processed applications might also be due to the fact that assessment and recognition practices have not yet become a standard offering within host-country integration policy packages, and thus immigrants may not know they are available.

The aim of the current study is to conduct an empirical assessment of the role that host-country acquisition and recognition of education plays in immigrant labour market success. I argue that job seekers who can prove the value of their credentials with official certificates of recognition, or who have received host-country education or training, have higher chances of attaining more favourable employment. The study examines country-level differences in the effects of recognised or host-country-specific education on immigrant occupational levels. I expect the labour market value of education – acquired in both countries of origin and destination – to differ across immigrant-accepting countries, depending on the strength of the link between education and the labour market in the country. Returns on recognised and host-country education among immigrants should be greater in countries with more vocationally/occupationally oriented education systems than in those with more general education systems.

Theoretical arguments regarding both micro-level mechanisms and the related micro–macro links are discussed in the subsequent theoretical part of the chapter. Empirical tests of the research hypotheses follow, using data from the EU Labour Force Survey ad hoc module on the labour market situation of migrants from the year 2008. This data is used to estimate the effects of recognition of education and acquisition of host-country qualifications on immigrant labour market performance; these effects are then compared across countries with various levels of education-labour market links.

Theoretical approaches to labour market returns on immigrant education

The body of research dealing with immigrant economic integration is guided by the *human capital theory*, which predicts better labour market integration for immigrants with higher levels of human capital (that is, higher levels of education) (Chiswick, 1978). It should be noted, however, that some elements of human capital can be devalued in the process of migration due to the loss of their country-specific aspects, such as occupational licences that are valid in one country and not another, or country-specific knowledge (Friedberg, 2000). Most obviously, language-related aspects of human capital are likely to be lost in the process of migration across language borders (Esser, 2006). Following this argument, levels of human capital must not only be high – education must also be relevant for (and valid in) the host country in order to facilitate successful immigrant integration. Even then, there is no guarantee that employers would value signals

about education – an indicator of individual productivity and the most frequently used proxy for human capital – at the same level for immigrants and native-born applicants.

The *signalling theory* explains why this might be the case (Spence, 1973; Stiglitz, 1975). In order to overcome uncertainty regarding imperfect information about worker performance, employers rely on credentials when screening candidates during the recruitment process. Immigrants or individuals with foreign qualifications are thus more likely to be disadvantaged, as employers might not be as familiar with the value of their qualifications. Whereas the *error discrimination approach* assumes that, due to incomplete information, false beliefs are imputed about workers' 'true' productivity (for example, England, 1992), proponents of the *statistical discrimination approach* argue that employers lack full information about the productivity of potential workers and thus impute group information instead (Arrow, 1972; Phelps, 1972; Aigner and Cain, 1977). If job seekers can provide reliable information about the value of their credentials in the form of recommendations or official certificates of recognition, their prospects for more favourable employment should increase (Hypothesis 1). This hypothesis assumes that employers indeed rely on official assessments when recruiting, and that they value recognised foreign diplomas more highly than educational certificates without official approval.

The explanation that post-migration education and training should be beneficial for immigrant labour market integration requires no particular elaboration. From the human capital perspective, host-country human capital should increase immigrant productivity, particularly with regard to skills that are considered valuable in the receiving country's economy, and make newcomers more attractive to prospective employers (Becker, 1964). From the signalling perspective, immigrant host-country education would demonstrate an individual's perseverance and trainability to employers, and subsequently reduce uncertainty costs during the recruitment process. Education acquired in the host country should thus be associated with higher status employment (Hypothesis 2).

Whereas empirical evidence of the positive association between recognised education or host-country education/training and labour market outcomes among immigrants is commonly reported in various single-country studies[1] (Schoeni, 1997; Bratsberg and Ragan, 2002; Constant and Massey, 2003; Chiswick and Miller, 2008; Cohen and Eckstein, 2008; Ferrer and Riddell, 2008; Kanas and van Tubergen, 2009; Cohen-Goldner and Eckstein, 2010; Kogan, 2012), the exact mechanisms behind this association are not always easily understood.

Similarities in the theoretical arguments about human capital and signalling explanations, particularly difficulties in disentangling each of the mechanisms empirically, cause researchers to presume that either mechanism can be at work. This is particularly evident in studies that analyse the effects of host-country education and training, whereas research focusing on the recognition of foreign education – albeit scarce to date – seems to come closer to theoretically understanding the phenomenon (see Kogan, 2012). The issue of causality also often remains unresolved, not least due to the limitations of cross-sectional data. This means that it is often unclear whether vocational training leads to higher wages or whether people with higher wage potential are self-selected into training. Similarly, it is often impossible to determine whether recognition of education is beneficial for higher status employment or whether individuals who would otherwise acquire more favourable employment are also successful in getting their education recognised.

The role of national educational approaches

The structure of opportunities for immigrants to get adequate returns on their education is likely to depend on the institutional approach of the host-country education system and the education–job links in the host country. One approach, which is commonly used to explain varying country patterns of school-to-work transitions, is to compare countries close to the occupational labour market (OLM) tradition with those in which internal labour markets (ILM) prevail (Marsden, 1999; Gangl, 2003). Germany is considered a typical example of an OLM country, and the USA is commonly named when referring to ILM cases. OLMs tend to have stronger vocational training at the secondary education level, and thus have close links between education and the labour market, and qualifications are used to match jobs with the appropriate skill levels. ILMs are characterised by a more haphazard matching process, as recruitment occurs at entry-level positions, and training and advancement are provided in the workplace. As a result, labour market entry is less contingent on educational credentials (Gangl, 2003; Matković and Kogan, 2012). Matković and Kogan (2012) argue that OLM and ILM both apply to tertiary education graduates as well.

Similar ideas are found in the skill production regime literature (Estevez-Abe et al, 2001; Hall and Soskice 2001), which addresses skill formation processes in various countries and juxtaposes liberal market economies (LMEs) with coordinated market economies (CMEs). Educational systems in LMEs usually teach general skills

and subjects, with little vocational training – which occurs on the job and is decoupled from the education system. A distinctive feature of LMEs is enhanced skill portability and transferability. By contrast, dual vocational training systems in CMEs provide highly specialised skills through a combination of workplace-based training in firms and vocational school education, which are closely coordinated. CMEs tend to feature a predominance of specific, occupation-tailored skills with limited transferability.

The skill production regime approach and the literature on education–job links tend to sidestep the issue of immigrants. There is no reason to believe that patterns of country differences in the signalling value of educational credentials should be different for immigrants than for native-born populations. If employers rely strongly on educational credentials in the recruitment process, they should apply similar heuristics irrespective of the applicant's origin. This would mean that informational discrimination is likely to be higher in OLM/CME countries, as foreign education can never provide the same signals to employers as host-country education. Following this logic, in countries where educational systems send particularly strong signals to employers, as in OLMs or CMEs, immigrants with educational qualifications recognised in the host country should enjoy higher returns on their education compared to their fellow migrants without recognised qualifications. In ILMs or LMEs, in which education is seen as less crucial for labour market entry and skills are considered more portable, recognition of foreign education should be less important for labour market success, and the differences between immigrants with and without recognised education should be less pronounced. By the same token, immigrants who acquired their education and training in the host country, which provides more occupationally specific skills, should also fare more favourably than those who acquired skills abroad (and failed to get them recognised). At the same time, the difference in labour market returns on skills acquired within a more generally oriented educational system and those brought from abroad, should be smaller.

The third hypothesis thus relates to a larger gap between recognised and unrecognised education in OLMs or CMEs, particularly for educational credentials at the (upper) secondary and tertiary levels, where occupational skills are more relevant. In the same vein, Hypothesis 4 postulates that labour market success is more dependent on possessing host-country education in OLM/CME countries than in ILM/LME countries.

Data and methodology

Our empirical analyses are conducted with the help of the micro-level data of the European Union Labour Force Survey (EULFS) ad hoc module on the labour market situation of migrants, which was collected in 2008 in EU member states. The main advantage of this dataset is its broad coverage and the inclusion of a range of variables pertaining to immigrant integration policy dimensions at the individual level. This module is in addition to the regular EULFS questionnaire, which includes a large set of variables related to the socio-demographic and labour market situation of the EU population. The ad hoc module data captured information on immigrant populations since the end of the Second World War, but this study focuses on immigrants who arrived in the 10 years preceding the survey because information on participation in integration measures, such as labour market training courses, was collected only for these most recent immigrants. The analyses are further restricted to immigrants aged 20–64 in five countries: Austria, Germany and the Netherlands (as typical representatives of OLM/CME regimes), Ireland and the UK (as ideal cases of ILM/ LME regimes).

A focal variable of interest is whether efforts are made to determine the host-country equivalent of qualifications obtained in the country of origin. The variable is coded 1 if education was obtained in the host country, 2 if the adequacy of the qualification was established, 3 if the adequacy of the qualification was not established (or the procedure was not completed), 4 if there was no need to establish the adequacy of the qualification, 5 if facilities for establishing the adequacy of the qualification were not used for any other reason and 6 if there was no information provided on whether such facilities were used.[2] For our analyses, I created a set of dummy-coded variables differentiating between (1) host-country education (category 1 of the above-mentioned variable), (2) recognised education or education certificates with no need for recognition (categories 2 and 4) and (3) the rest of the categories. By combining categories 2 and 4, I assumed that respondents who mentioned no need to recognise their education were generally those whose education was automatically recognised in the host country.[3] The effects of these dummy-coded variables are also estimated separately for (upper) secondary and tertiary levels of education to verify whether there are differences across levels of education in the degree of skill transferability.

For the sake of brevity, the focus is on a single labour market outcome – occupational status of current employment – measured against the International Socio-Economic Index of Occupational Status (ISEI)

(Ganzeboom et al, 1992) scale. ISEI's score ranges between 18 and 90. The occupations assigned to the lowest ISEI values are truck driver's helpers and small farmers, whereas the highest ISEI occupations encompass judges and medical doctors. To estimate the effect of host-country education and recognised foreign qualifications on the occupational status of current employment, a linear (Ordinary Least Squares, abbreviated as OLS) regression model is estimated. Since the association between recognised/host-country-specific education and the labour market outcome is likely to be mediated by other individual characteristics, these are taken into account by means of a multivariate regression. Alongside the levels of education – low (International Standard Classification of Education, ISCED categories 1–2 capturing a compulsory level of education), medium (ISCED categories 3–4 referring to upper secondary and post-secondary non-tertiary levels of education) and high (ISCED categories 5–6, tertiary education), other covariates include socio-demographic variables such as gender and marital status, and immigration characteristics such as age at migration, years since migration, immigrant participation in language courses and labour market training programmes. I further account for immigrant ethnic origin,[4] differentiating between immigrants coming from new EU member states, non-EU Europe, countries of the Middle East and Northern Africa (MENA), other African countries, Asian countries and the rest of the world. Immigrants from EU-15 and European Free Trade Association (EFTA) countries serve as a reference category. Native-born populations are excluded from the analyses. In addition, I take into account reasons for migration, differentiating between immigrants arriving with employment intentions (reference category), in the framework of international protection, family reunification/formation and other reasons, including study-related. Further control variables are the nature of residence permit, differentiating between temporary residence versus permanent residence permit or citizenship of the host country. OLS regressions are run separately for OLM/CME and ILM/LME countries, and the results are compared across these groups of countries.

Descriptive findings

Before assessing returns on recognised or host-country education, it is necessary to discuss the distribution of the respective categories across the two groups of countries and educational levels. From Table 13.1 it is apparent that selected ILM/LME and OLM/CME countries are not particularly different in this regard, apart from evidence that

Table 13.1: Transferability of educational qualifications by level of education and country type

	Host-country education	Education recognised, no need for recognition	Other: not recognised, did not apply, info missing	N
ILM/LME (Ireland, UK)				
Total	11.87	55.69	32.44	5,890
ISCED 1-2 (compulsory education)	4.30	35.22	60.48	582
ISCED 3-4 (upper secondary education)	9.83	61.82	28.36	2,687
ISCED 5-6 (tertiary education)	15.64	53.95	30.41	2,621
OLM/CME (Austria, Germany, Netherlands)				
Total	18.62	51.32	30.05	1,890
ISCED 1-2 (compulsory education)	32.34	35.32	32.34	538
ISCED 3-4 (upper secondary education)	14.23	54.96	30.81	766
ISCED 5-6 (tertiary education)	11.77	61.26	26.96	586

Source: EULFS ad hoc module 2008, author's calculations.
Note: ISCED = International Standard Classification of Education (Schneider and Kogan, 2008).

slightly more immigrants acquire host-country education in Austria, Germany and the Netherlands. Many more differences are noticeable in education-specific patterns. In Ireland and the UK, immigrants with higher levels of education are more likely to have acquired it in the host country. An opposite pattern can be seen in Austria, Germany and the Netherlands, where the majority of immigrants with host-country education are the least educated. The distribution across educational levels of those whose education is recognised in the host country or who see no need for recognition of education, is similar in both groups of countries. The only difference is that in OLM/CME countries, a higher proportion of highly educated immigrants claim that their education is transferable to the host country than in ILM/LME countries, whereas in the latter group of countries it is immigrants with upper secondary education who tend to say so. There is a relatively even spread in the distribution of immigrants in the third category by levels of education in Austria, Germany and the Netherlands. In the UK and Ireland, the least educated are among those who are most likely to be found in the 'other' category. This is largely explained by the high proportion of those who did not answer the question about recognition of their education, particularly in the UK.

Table 13.2 reports mean ISEI scores (as well as standard deviations)[5] in the two groups of countries by the level of education and the category of transferability of education. It comes as no surprise that immigrants with higher levels of education occupy jobs with higher ISEI scores. The table also shows that the gap between the least and the most educated in OLM/CME countries is considerably larger than in ILM/LME countries, which confirms the anticipated stronger link between education and occupation in the former group of countries. Whereas the average ISEI score among the least educated constitutes only 27.4 in Austria, Germany and the Netherlands, it is 30.5 points in Ireland and the UK. Similarly, the gap in mean ISEI scores at the medium level is about 2 scale points in favour of ILM/LME countries. Among the tertiary educated, the mean ISEI gap between the two groups of countries is even larger (about 7 ISEI points) and is in favour of ILM/LME countries.

Table 13.2: Mean ISEI scores (standard deviation in brackets) by level of education, transferability of education and country type

	ILM/LME (Ireland, UK)	OLM/CME (Austria, Germany, Netherlands)
Level of education		
ISCED 1-2 (compulsory education)	30.52 (12.75)	27.38 (9.95)
ISCED 3-4 (upper secondary education)	37.07 (16.01)	34.64 (13.28)
ISCED 5–6 (tertiary education)	47.12 (18.74)	53.68 (18.12)
Transferability of education		
Host-country education	48.30 (19.18)	36.86 (16.74)
Education recognised, no need for recognition	41.33 (18.03)	40.65 (18.27)
Other: not recognised, did not apply, information missing	37.44 (16.53)	35.76 (16.87)

Source: EULFS ad hoc module 2008, author's calculations.

The lower panel of Table 13.2 reports mean ISEI scores by the categories related to the transferability of education. In ILM/LME countries, an expected relationship is detected: immigrants with host-country education occupy higher status jobs, whereas those who have never applied for recognition of education are channelled to less prestigious employment. Those who were successful in having their education recognised (and those who report no need for recognition of education) lie in between with regard to the mean ISEI of their

occupations. In OLM/CME countries, on the other hand, immigrants with host-country education are employed in occupations with a status no higher than the occupations of those who did not have their education recognised (or who never applied). A most obvious explanation for this intriguing finding is that in these countries, the least educated are more likely to possess host-country education and, by virtue of labour market stratification, they also tend to occupy jobs of comparatively low occupational status. Otherwise, the correspondence of the categories of transferability of education and ISEI scores of current employment is similar across the two groups of countries.

Results of the multivariate analyses

In the next step, I turn to the multivariate assessment of the relationship between level of education, educational transferability and occupational standing among immigrants in the two groups of countries. In the first model presented in Table 13.3, a main effect of these two variables on the ISEI scores of current employment is estimated, while controlling for a large set of potentially relevant control variables. In the second model, an interaction term between the level of education and indicators of transferability is estimated with the aim of evaluating whether transferability of education is more relevant at some educational levels than others.

The results of the first model regarding the effect of levels of education, echo the descriptive findings: the higher the level of education, the higher the occupational status of employment that immigrants attain. As already noted above, the link between education and occupation is much stronger in OLM/CME countries than in ILM/LME countries, and the difference in the coefficients is statistically significant. With regard to the categories of transferability of education, the results accord with the first and second hypotheses. *Ceteris paribus*, I note a significant net advantage among immigrants with host-country education and those with recognised education in terms of the ISEI score of their current employment. As possibly expected, the benefits of host-country education tend to be greater than those associated with recognised education. There are no significant cross-national differences in the strength of the association between the degree of skill transferability and the occupational status of current employment, which clearly contradicts the theoretical expectations. The distribution of immigrants with host-country education (or who claim to have had their foreign education recognised) varies by the level of education in both sets of countries, however, so possible cross-national differences

Table 13.3: Selected coefficients from the OLS regression predicting occupational status (ISEI) of current employment, by country type

	ILM/LME (Ireland, UK)						OLM/CME (Austria, Germany, Netherlands)					
Educational level (ISCED 5–6 – ref.)	Model 1			Model 2			Model 1			Model 2		
ISCED 1–2	-16.92	(0.75)	**	-16.45	(1.02)	**	-23.79	(0.86)	**	-19.24	(1.48)	**
ISCED 3–4	-11.27	(0.47)	**	-10.21	(0.82)	**	-17.93	(0.76)	**	-15.11	(1.39)	**
ISCED missing	-11.11	(0.77)	**	-10.61	(0.78)	**						
Recognition of education (other – ref.)												
Host-country education	3.27	(0.72)	**	6.34	(0.97)	**	2.36	(0.98)	*	7.48	(1.96)	**
Education recognised or no need	2.39	(0.48)	**	2.23	(0.69)	**	1.55	(0.76)	*	4.70	(1.29)	**
Education x recognition												
ISCED 1–2: host-country educ.				-2.75	(3.39)					-8.33	(2.45)	**
ISCED 1–2: educ. recognised/no need				0.26	(1.52)					-6.02	(1.92)	**
ISCED 3–4: host-country educ.				-7.59	(1.44)	**				-5.11	(2.49)	*
ISCED 3–4: educ. recognised/no need				0.01	(0.95)					-3.64	(1.67)	*
Ethnic origin (EU-15 – ref.)												
New EU-12	-13.04	(0.64)	**	-13.24	(0.64)	**	-4.63	(1.01)	**	-4.66	(1.01)	**
Other Europe	-11.64	(1.21)	**	-11.55	(1.21)	**	-7.32	(0.92)	**	-7.18	(0.92)	**
MENA countries	6.18	(2.03)	**	6.12	(2.02)	**	-2.38	(1.26)	+	-2.26	(1.26)	+
Other Africa	1.33	(1.36)		1.31	(1.35)		-1.58	(1.57)		-1.39	(1.57)	
Asia	1.01	(1.29)		0.89	(1.29)		-0.20	(1.25)		-0.13	(1.31)	
Northern America	10.76	(1.48)	**	10.72	(1.47)	**	8.82	(2.12)	**	9.09	(2.11)	**

	ILM/LME (Ireland, UK)						OLM/CME (Austria, Germany, Netherlands)					
Educational level (ISCED 5–6 – ref.)	Model 1			Model 2			Model 1			Model 2		
Other	-8.63	(1.32)	**	-8.60	(1.31)	**	-4.58	(1.09)	**	-4.58	(1.09)	**
Immigration characteristics												
Age at migration	-0.05	(0.03)	+	-0.05	(0.03)	+	-0.14	(0.04)	**	-0.13	(0.04)	**
Years since migration	0.32	(0.09)	**	0.31	(0.09)	**	-0.05	(0.13)		-0.08	(0.13)	
Employment	0			0			0			0		
Asylum seekers	-5.18	(1.70)	**	-4.81	(1.70)	**	-4.29	(1.49)	**	-4.00	(1.49)	**
Family	-1.98	(0.62)	**	-1.99	(0.62)	**	-2.51	(0.82)	*	-1.94	(0.88)	*
Other	0.07	(0.54)		-0.15	(0.54)		0.06	(0.94)		-0.05	(0.94)	
Residence status												
Permanent/citizen	-0.26	(0.58)		-0.16	(0.58)		2.51	(0.82)	*	2.60	(0.82)	*
Integration indicators												
Language course attendance	-2.68	(0.63)	**	-2.55	(0.63)	**	-1.72	(0.72)	*	-1.69	(0.72)	*
LM training course attendance	1.05	(0.66)		1.13	(0.66)	+	-0.06	(1.10)		-0.01	(1.10)	
Intercept	57.17	(1.27)	**	56.74	(1.27)	**	63.33	(1.07)	**	60.50	(2.29)	**
R squared	0.29			0.30			0.44			0.45		
N	5,890			5,890			1,890			1,890		

Source: EULFS ad hoc module 2008, author's calculations.
Note: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Variables of the study's main interest are in bold. Other control variables include gender, marital status and countries' fixed effects

might be concealed. That is why a more fine-grained inquiry into possible cross-country differences in this regard is used in the second model; it introduces interaction terms between levels of education and categories related to the transferability of skills. In this model, the main effect of educational transferability no longer captures an average effect across all levels of education, but refers to the effect at the tertiary level of education (a reference category in the variable level of education). Interaction effects pertain to the gap between the respective categories of educational transferability at a particular educational level. The results show that at the tertiary level, possessing host-country education is associated with the highest occupational returns, and this is true for both groups of countries to a similar degree (the differences in the respective coefficients are not statistically different across both groups of countries). Recognition of foreign educational qualifications also yields significant advantages, yet they are far below those associated with possessing host-country education.

The benefits are significantly higher in the OLM/CME group of countries than in ILM/LME countries, which is in line with the theoretical expectations. The advantages of host-country education for the least educated (with ISCED 1–2 level) are much lower in ILM/LME countries than they are for tertiary educated immigrants, and they are almost null in OLM/CME countries. The cross-national differences in this regard are not statistically meaningful. They are statistically meaningful, however, if differences in the effects of recognised education at the compulsory (ISCED 1–2) level are considered. In ILM/LME countries, having the lowest level of education recognised brings more occupational returns than it does in OLM/CME countries (the respective statistical tests are not shown but are available upon request). The differences in the patterns of returns on upper secondary level education – either recognised or acquired in the host country – are also worth noting. Upper secondary education acquired in the host country is rewarded significantly more in OLM/CME countries than in ILM/LME countries, which accords with the expectations about a stronger signal provided by upper secondary education with a more pronounced vocational orientation acquired in the host country. Recognised education at the upper secondary level apparently does not provide employers with similarly clear-cut signals as host-country education in OLM/CME countries. This situation is not much different in ILM/LME countries.

In addition to the above-described findings, there are other results worth reporting. With regard to immigrant ethnic origin, there are some common patterns across both groups of countries. Immigrants

from North America have the highest ISEI scores, outperforming immigrants from EU-15 and EFTA countries (the reference group) in both groups of countries. Immigrants from African countries (apart from North Africa) and Asia are on par with immigrants from the old EU-15 countries. Immigrants from the new EU countries (EU-12) and other European non-EU countries occupy significantly less prestigious jobs in both groups of countries, and are particularly disadvantaged in Ireland and the UK. Similar patterns are found for immigrants from the rest of the world. Diverging patterns are noticeable for immigrants from MENA countries: whereas in Ireland and the UK they occupy significantly higher status jobs than immigrants from the EU-15, in OLM/CME countries there is evidence that they are disadvantaged. Immigrants arriving in host countries as asylum seekers or refugees, as well as those entering these countries on the basis of family reunification/formation, are not able to catch up with immigrants arriving with employment intentions (as well as student migrants) with regard to their occupational status. The latter do significantly better in both ILM/LME and OLM/CME settings. Although there are no differences between immigrants with temporary, permanent residence permit and citizenship status in ILM/LME countries, a more secure status in the host country is associated with higher status employment in OLM/CME settings. Age at migration matters, and the effect operates in a similar direction across the board: immigrants arriving at younger ages are able to secure higher status employment. Tenure in the host country seems to significantly improve occupational status only in Ireland and the UK. A similar effect is not found in OLM/CME countries. With regard to immigrant attendance of language courses, in both groups of countries it is associated with lower status employment. This might indicate the negative (self-)selection of the participants of language courses for labour market success, that is, individuals with low language proficiency who are unable to gain an advantageous labour market position tend to participate in language courses. There is some indication of the beneficial role of labour market training courses (the effect is significant at the 10% level), but only in Ireland and the UK.

Summary and discussion

Within the large body of research on immigrant labour market integration into Western countries, little is known about how immigrants manage to transfer their skills and credentials into the new setting (for research on Canada, see Trovato and Grindstaff,

1986; Li, 2001). This study is one of the few attempts to assess the rate of return on recognised education from abroad and host-country education and training in a number of EU countries. Austria, Germany and the Netherlands are examined as countries that provide strong occupationally specific skills at the (upper) secondary educational level, while Ireland and the UK have more general education systems. Until now, the role of the institutional features of national educational systems and the links between education and the labour market, which are extensively discussed in the literature about school-to-work transitions (Shavit and Müller, 1998; Müller and Gangl, 2003; Kogan et al, 2011) and varieties of capitalism (Estevez-Abe et al, 2001; Hall and Soskice, 2001), have not been examined in connection with immigrant skill utilisation. This study is an attempt to marry these strands of research and to explore whether the returns on education among immigrants differ, depending on the set-up of the host country's educational systems.

The effort proved to be worthwhile, even though there were more commonalities in cross-national patterns than hypothesised. One important finding is that the acquisition of host-country education and recognition of foreign educational credentials both pay off in both groups of countries. In a more differentiated manner, in both country settings, tertiary education acquired in the host country has a similarly strong effect on occupational allocation. Recognised education at the tertiary level is also associated with higher status jobs across the board, but this effect is more pronounced in OLM/CME countries than in ILM/LME countries. At the upper secondary education level, credentials acquired in the host country matter only in the OLM/CME setting, whereas recognition of education is not adequately rewarded in either group of countries. Finally, the least educated with recognised credentials profit from recognition of their education in terms of ISEI scores in ILM/LME settings more substantially than in OLM/CME countries. Host-country education at the lower secondary level, on the other hand, is not associated with any particular advantage in either group of countries. Albeit in a more nuanced form, the results in general accord with the expectations about the higher returns on host-country-specific and recognised education at the upper secondary and tertiary levels of education in OLM/CME as opposed to ILM/LME countries. For immigrants, acquisition of host-country education at the upper secondary level and recognition of foreign tertiary credentials are thus associated with greater occupational returns in OLM/CME countries. Where vocationally specific skills are more strongly instilled at the upper secondary level, and where employers seek clear-cut

signals regarding skills, immigrants with transferable skills are likely to benefit more.

The results must be approached with a degree of caution, as a small-*N* study at the country level such as this one cannot provide strong causal claims about the role of institutions in micro-level processes. Larger-*N* multi-level studies (which were not possible with the EULFS 2008 ad hoc module), or studies exploring within-country institutional change within a natural experiment design, will be necessary to validate my findings.

This study, similar to the bulk of the earlier research, is not able to identify any causal effects of host-country education or recognised education due to the cross-sectional nature of the data. To be able to claim causality, analyses of panel data containing the relevant constructs of skill transferability should be conducted in future research. Future research should also try to invest more in exploring employer perceptions of immigrant qualifications, their assessment of signals associated with officially recognised diplomas and credentials acquired in the host country as opposed to foreign qualifications.

Despite its limitations, the study delivers a clear-cut message to the policy makers involved in drafting legislation related to the recognition of foreign credentials, and organising training and retraining courses for immigrants. According to the findings, both the provision of host-country education and recognition of foreign-source credentials are worthwhile tools governing skilled immigrant access to host-country labour markets. Countries with educational systems that tend to emphasise vocational skills should also be prepared to invest in easier immigrant access to vocational training, and recognise immigrant qualifications, in order to promote their smooth labour market integration and ultimately profit from the better utilisation of immigrant human capital.

Notes

[1] In fact, the topic of recognition of education in Europe is rather underexplored.

[2] The categories provided in the data are far from perfect, since I cannot differentiate between categories that capture whether recognition was denied or if the process of recognition is ongoing. Further, the reasons for not applying for recognition are not specified.

[3] The analyses indeed show that immigrants from EU-15 and EU-12 countries state there is no need for recognition of their education significantly more often than the rest of immigrants, which would support my assumption.

[4] In all countries but Germany, I relied on the variable about immigrant's country of birth. The German data provides information on the nationality of immigrants. Focusing on immigrants without German nationality with a maximum of 10 years of

residence in Germany should not be a big problem, as the majority of such immigrants are not yet eligible to apply for German citizenship. My analyses tend, however, to ignore ethnic German immigrants who are eligible for German citizenship immediately upon arrival.

[5] A standard deviation close to zero indicates that the data points tend to be very close to the mean value in the respective sample, while larger standard deviations indicate that the data points are spread out over a wider range of values.

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FOURTEEN

Health returns on education and educational systems

Johann Carstensen and Monika Jungbauer-Gans

Introduction

During the last decade intensive discussion about the inequality of health chances has taken place in the sociology of health. Broad empirical evidence about the correlation between several dimensions of social inequality and health exists, as we will show below. Among these dimensions, education is of substantial interest in itself, but also for its relevance to occupational positions and income. We will thus discuss theories that explain which social mechanisms may be responsible for the health-determining effects of education. As research in the sociology of health has so far ignored the macro-context of educational systems, we will expand the discussion by applying these approaches. We will refer to existing branches of research that have not yet been connected. The research about educational systems analyses the way that educational systems reproduce inequalities of education. What does this mean for the social inequality of health? We examine, which mechanisms might be responsible for the correlation of education and health or well-being. An important group of social mechanisms are competencies, abilities and cognitions, or the 'health literacy'. Does health literacy help people to determine the appropriate health-related behaviour and lifestyle? Are personality traits related to education and health? Numerous studies provide evidence that education is the most important prerequisite for successful labour market integration in modern societies. Exclusion from the labour market, precarious employment or low pay may result in harmful living conditions or mental stress that may be the cause of poor health. The resources that are provided by work and employment are thus another mechanism that is relevant to health. This chapter summarises the research about the correlation between education and health and the mechanisms that might explain this correlation. The concluding section includes

thoughts about how educational achievements and conditions in the educational system may influence the educational inequality of health. The chapter will finish by identifying open research questions and providing a basis for future comparative research on this topic.

Education and the health of individuals

There is a well-established correlation between educational achievements and health outcomes (such as various measures of morbidity and mortality); however, it is still unclear which social mechanisms are behind this relationship. The following section provides an overview of different theoretical approaches to explain those findings.

Many authors have confirmed the existence of an education gradient in health (for a detailed review of empirical findings see Grossman, 2006). Positive effects of schooling have been found for mortality (for example, Mackenbach and Bakker, 2002) and general health (for example, Grossman, 1972). Health behaviour also is heavily influenced by education. There is evidence for an effect of education on smoking (for example, Bergen and Caporaso, 1999), being overweight (for example, Chou et al, 2010), regular exercise (for example, He and Baker, 2005) and healthy eating (for example, Kristal et al, 2001). In the following we will describe different mechanisms through which education may affect health, at first dealing with knowledge and competencies that are acquired in education.

Human capital and health literacy

According to Grossman (1972), education improves the efficiency of health production, mainly because of better knowledge about the relationships between certain behaviour and health and a higher demand for health, since health determines productivity on the labour market. In economics health is seen as closely related to human capital since health enables participation in the labour market, and therefore investment in health can also be interpreted as investment in human capital (Becker, 1993: 54). At the same time health determines the amount of time for which returns can be gained (Becker, 1993). Grossman (1972) further developed this thought using the term 'health capital'. He believes that human capital can be seen as consisting of two different sources: knowledge capital and health capital (Grossman, 2006). In this perception, health is a form of human capital just like education, and these two elements 'interact in their levels and in the

ways they affect the cost and usefulness of the other' (Grossman, 2006: 578). Health is both a consumption and an investment commodity. As a consumption commodity it is a direct source of utility, while as an investment commodity it determines the amount of time in a period that can be allocated to productivity in the market and non-market sector (Grossman, 2006). More educated people are more efficient producers of health due to their better knowledge about health promoting behaviour and the use of institutions within the health system (Grossman, 1972). They also have higher utility from health because their productivity time is more valuable (Grossman, 1972); however, this view is challenged by Selden (1993), who acknowledges that a loss of earnings weighs more heavily on poorer people.

The emerging concept of *health literacy*, which has gained more and more popularity, is closely related to the idea of a productivity effect from education. Health literacy is defined as 'the degree to which individuals have the *capacity to obtain, process and understand* basic health information and services needed to make appropriate health decisions' (Ratzan and Parker, 2000: vi). While those competencies are closely related to more general cognitive domains, especially reading skills or numeracy, the concept of health literacy describes the mechanisms by which individuals benefit from competencies in health contexts. Nutbeam (2009: 304) describes health literacy as 'the ability to perform *knowledge-based literacy tasks* and the *possession of literacy skills* that are required in different *health contexts*'. Education can thus not only work through the promotion of a healthier lifestyle by fostering comprehension of medical mechanisms and imparting knowledge, but also by increasing the efficiency of treatments through the improvement of communication and compliance.

There is a great deal of empirical evidence on the impact of health literacy on different health outcomes. Effects can be found on mortality (for example, Wolf et al, 2010), retinopathy and blood sugar control in diabetics (Schillinger et al, 2002) and hospitalisation (Baker et al, 2002). There is also well-established evidence about the effect of health literacy on health behaviour such as physical exercise (Park and Kang, 2008), breastfeeding (Kaufman et al, 2001) and utilisation of health checks (Webbink et al, 2010); however, especially in older populations, effects could not be found on the consumption of tobacco, alcohol and drugs after controlling for relevant covariates (Wolf et al, 2007; Park and Kang, 2008). In the group of global health measures, positive effects were detected for self-rated health (Baker et al, 1997; Gazmararian, 1999), and physical and psychological well-being (Tokuda et al, 2009), but not for health-related quality of life (Sullivan et al, 1995). Furthermore,

personality seems to contribute to the education-health gradient nearly as much as cognition.

Personality traits

A noteworthy amount of literature recognises the fact that the health gradient may be due to unobserved causes, leading to higher education and better health behaviour in equal measure (Fuchs, 1982). Here, personality traits are especially of interest. If confounders are responsible for the education–health gradient, attempts to raise the general health of a population by interventions in the educational system would have an effect only insofar, as these traits are susceptible to schooling and learning environments.

One personality trait often mentioned is time preference (Grossman, 2006). People with a low time preference favour current outcomes over future outcomes. In terms of education this means that a person has a lower affinity for higher educational certificates as they take more time to acquire. In health behaviour this implies that the current gratification of, for example, smoking or alcohol consumption is rated more highly than the prospect of better health in older age. If time preference is a constant personality trait, it could be a cause of both health and educational achievement. Other personality measures discussed in this context are self-esteem and self-efficacy. Risk aversion is also frequently mentioned, since investment in health and education both are uncertain (van der Pol, 2011). Causality is unclear: contrary to Fuchs (1982), who believes that differences in time preference account for differences in health behaviour, Becker and Mulligan (1997) hypothesise that better health increases the value of the future by reducing mortality and raising future utility levels. Lastly, personality traits such as self-control can influence one's ability to translate intentions into action (Salovey et al, 1998), which might be crucial for both academic achievement and health behaviour.

Some authors argue that personality traits are prone to education themselves (Fuchs, 1982; Feinstein et al, 2006). Becker and Mulligan (1997) describe the relationship between schooling and time preference as endogenous, as schooling increases wealth and this, in turn, has an effect on time preference: the poorer a person the more important is immediate reward for them. Time preference may also be a reason for people to continue schooling. At the same time, personality traits can be affected by cognitive abilities. As Borghans and colleagues (2008) argue, numeracy influences the processing of a situation in which a future value has to be evaluated against a present value. Framing effects

appear to be greater for less numerate people. There is mixed evidence about the influence of education on risk aversion (Borghans et al, 2008).

Income, social class and life chances

Sociology has long concentrated on the more general socioeconomic gradient in health, meaning that not only education but one's position in the social structure measured by income, occupational status and education, is responsible for a large amount of variation in morbidity and mortality.

Vertical models of social segregation are used to describe different life chances resulting from social position, leading to deprivation and thus to worse health behaviour, higher morbidity and mortality. Specific health-related consequences of differing life chances are housing and environmental factors, working conditions, leisure activities, mobility chances, educational chances, possibilities for further education, and the possibilities of generating and maintaining social contacts – in sum, living a healthier life.

Lahelma and colleagues (2004) proposed a model of the interdependence of socioeconomic influences on health. They account for the direct effect of education on health, but they also postulate an indirect effect, which is mediated by occupational status and income. They find that for women 50–75%, and for men 40–80%, of educational inequalities in health were mediated through occupational social class and household income; however, their analysis cannot really shed light on the question of causality since it deals with cross-sectional data and has no experimental design.

It can be argued that resources are important for individual health; however, on the aggregate level of societies, scholars could not confirm a correlation between the average living standard and life expectancy in countries (Marmot and Wilkinson, 2001; Preston, 2007). Instead Preston (2007) suggested that income inequality influences health status in countries. Different mechanisms explaining this hypothesis are suggested in the literature. Psychosocial interpretations suggest that income inequality fosters certain patterns of social comparison, which can cause 'status anxiety' and competition, producing chronic stress and poor health (Wilkinson and Pickett, 2010). The empirical evidence around this question is mixed. Many studies find an effect of income inequality on health, but only at the national level (Wilkinson and Pickett, 2007) and the findings seem to rely on the operationalisation of inequality and of health outcomes (De Maio, 2008). It is still highly

debatable whether status anxiety is responsible for this relationship (see review in Lynch et al, 2000).

Causality of education and health

Summarising the different arguments made so far, we see that the idea of a causal effect of education on health can be explained by two different pathways: a direct and an indirect one. The direct effect accounts for the possibility that education provides abilities that generate health in some way. The indirect effect hypothesis accounts for the fact that education leads to a better occupational position with higher income. Higher income allows a person to live a healthier lifestyle due to increased spending on goods that contribute to health such as food and housing, or health-related activities and medical services (Marmot, 2010). At the same time, low income may hinder people from participating in social life (Marmot, 2010). There is still debate, however, about whether those findings really reflect a causal effect or whether there are different explanations, such as confounders and reverse causality. We have already noted personality traits as a confounder which may influence health as well as educational achievements, leading to a spurious correlation. Other authors discuss parental background (Currie, 2009) and genetic resources (Behrman and Rosenzweig, 2004). There is also the potential for reverse causality, meaning that children with worse health have fewer chances to participate in education. The mechanisms could be absenteeism (Grossman and Kaestner, 1997), impaired learning abilities in school (Currie, 2009) or mental health conditions (Currie and Stabile, 2009). These concerns are addressed by recent empirical studies which aim to identify the causal effect of education on health by ruling out reverse causality and confounders.

Parental background is relevant to the education–health gradient as a confounding variable if it affects the health of children and their educational achievements similarly. Poor health and health behaviour on the side of the parents, which is again related to the education of the children, can affect children's health and cognitive development. Social and educational immobility appears to be an important factor by which to explain health inequalities (for example, Marmot, 2010). Currie (2009) argues that parental background is a strong determinant of children's health, which itself determines educational success. This is confirmed by Lahelma and colleagues (2008), who used data from the Helsinki Health Study to test a multidimensional model of the effects of the socioeconomic position on self-rated health. Nevertheless,

individual education remains an important explaining factor in their findings, even when controlling for occupational class.

In trying to determine the magnitude of the true causal effect of education on health, most studies are based upon instrumental variable approaches, others use natural experiments. One of the commonly cited studies using a natural experiment was conducted by Lleras-Muney (2005). She looks at the effect of changes in the US compulsory schooling law on mortality. Using an instrumental variable estimation she concludes that the probability of dying within the next 10 years is lowered by 3.6 percentage points with each additional year of education. In a replication of the study that additionally accounts for state-specific time trends, Mazumder (2008) detects an effect of education level on general health, but not for specific health conditions. Other studies using natural experiments find mixed evidence for mortality (for example, Spasojević [2010] for a positive effect and Albouy and Lequien [2009] for no significant effect) and no effects for general health and health behaviour (Clark and Royer, 2013).

Conti et al (2010) examined the effect of early life environments, including family background characteristics, cognitive and non-cognitive abilities, and health on selection in education and on post-schooling outcomes. Using a latent variable structural model accounting for unobserved factors by the use of proxies (abilities for early life cognition, personality and health endowments) and accounting for their error, they find little to no evidence for the effects of early health endowment on education, but a significant effect on later outcomes. Education has a strong effect on most outcomes, which is interpreted as causal; however, they also find that controlling for selection on factors of early life endowments in health, cognitive and non-cognitive abilities, and family background explains half of the difference in health by education. Van der Pol (2011) examined the magnitude of the influence of time preference and risk aversion on the education–health gradient. She finds a clear effect of education on health for different health outcomes and smoking, which remains significant – although slightly reduced – after controlling for time preference and risk aversion. Using different datasets from the USA and the UK, Cutler and Lleras-Muney (2010) show that resources such as family background or income account for a large share of the education gradient. In turn, they do not find evidence for the influence of tastes and personality traits, such as discounting rates, risk aversion, value of the future, self-efficacy and locus of control; this result is challenged by Conti and Hansman (2013), however, who argue that the choice

of personality measures is important and criticise the choice made by Cutler and Lleras-Muney.

Effects of the school context

Since young people spend a great deal of time in school, the school environment is one of the most influential contexts (Konu et al, 2002) and thus a central institution where socialisation takes place. Learning environments in schools also provide the opportunity to influence non-cognitive traits important to health. On the other hand, school and classroom properties may be damaging for health, such as when school is a cause of stress for pupils. Schools may also have different physical characteristics (for example, mould, poor air-conditioning), provide different health services and different health-related cultures (Macintyre et al, 1993).

Schools and school classes may differ in various aspects. The *composition* or diversity of schools regarding socioeconomic and other factors, such as age, gender and migration background, has been shown to be a determinant of educational achievement (see reviews in Ditton, 2009; Maaz et al, 2010), but some studies have also found effects of class composition on BMI (body mass index; Bernell et al, 2009), substance use (Araos et al, 2014), well-being (Östberg, 2003) and depression in adolescence (Goodman et al, 2003). There is also considerable evidence that the average academic achievement level in schools has an effect on risky health behaviour such as smoking, alcohol and marijuana consumption (Markham et al, 2008; Tobler et al, 2011). Lastly, school characteristics can also moderate the effects of students' individual characteristics on health, so that students from disadvantaged neighbourhoods are even more disadvantaged in schools with more crowded classrooms (Saab and Klinger, 2010). Regarding the psychosocial working conditions of Swedish ninth grade students, Modin and colleagues (2011) found, as well as an individual effect of strained working conditions, a positive effect of school-related sense of coherence on health at the individual and contextual level.

Another context factor is *peer effects*. Social inclusion or being bullied can seriously affect mental health (Asher and Paquette, 2003), whereas social support from peers acts beneficially (Bilz and Melzer, 2008). Östberg and Modin (2008) found a significant effect of the peer status in school class on self-rated health and long-standing illness in adulthood; however, the impact of peer relations as a stressor seems to be greater for boys than for girls (Murberg and Bru, 2004).

In the classroom context, teachers have a strong effect on individual development. According to Jennings and DiPrete (2010), teachers influence social and behavioural skills even more than academic achievements. There is evidence for a positive effect of teacher support on self-esteem (Reddy et al, 2003), low adolescent health-risk behaviours (McNeely and Falci, 2004) and sound mental health over time (Bilz and Melzer, 2008). It is independent of socioeconomic status, peer or family relations, low self-esteem or poor sense of coherence (Dür and Griebler, 2004).

The actual learning environment and *teaching methods* applied in school can depend both on the school and the teachers. Methods aiming to foster participation and empowerment are usually discussed, associated with student perception of stress and school-related social support (Natvig et al, 2003) and the development of important personality traits such as self-worth and a sense of belonging (Krause, 2011). Lindström and Eriksson (2011) introduce the term 'healthy learning'. This is defined as:

> a lifelong process where people and systems increase the control over, and improve health, wellbeing, and quality of life through the creation of learning environments characterised by clear structures and meaningful empowering conditions, where one becomes an actively participating subject in reciprocal interaction with others. (Lindström and Eriksson, 2011: 90)

To achieve this, schools should not focus on 'school intelligence', but help to develop understanding and meaningful learning (Nilsson and Lindström, 1998), and foster participation as a powerful method to provide meaningful learning, increasing social engagement and well-being (McLaughlin and Clarke, 2010).

Educational systems and health

The research into social inequality in health and the effects of education on health so far has ignored the macro-context of educational systems. Comparative studies note that educational systems in different countries have different characteristics that explain educational inequality (see Gross et al, chapter one in this volume). Such studies analyse whether the dispersion of performance and the effect of the socioeconomic status on school performance are influenced by the characteristics of the educational systems.

'Standardisation is the degree to which the quality of education meets the same standards nationwide' (Allmendinger, 1989: 233). The curriculum, examinations or human and financial resources (teacher education, facilities) of schools can be standardised. The opposite of standardisation is school autonomy. Standardised systems with national curricula reduce competition between schools. Low competition may cause lower achievement in students. Standardisation leads to higher transparency of criteria and decisions. Both low competition and high transparency may promote health among students. Together with central examinations, school autonomy raises performance. Through central examinations schools face standardised expectations regarding their performance level and the content taught, but as schools are autonomous they can decide independently about the way in which they try to reach their performance goals. We therefore expect that the health and well-being of students suffer from central examinations but, if schools are autonomous, they can adjust their pedagogical strategies to the needs of their student population, which may reduce negative effects on their health and well-being.

Stratification is the degree of differentiation within given levels of education (tracking or ability grouping) in combination with the proportion of a cohort that reaches the maximum number of school years. Differentiation may be designed in the shape of school types for different ability levels or as tracking within organisations. The age of students at which ability grouping begins is important, and the potential for transitions between tracks. Differentiation may reduce the efficiency of education because it is connected to entry barriers to higher education. If substantial groups do not have the required school certificates for continuing to tertiary education, people have to invest much more effort and time to catch up on their certificate, which may cause stress for them. Another social mechanism that may influence the health of students is the experience of social deprivation. Social inequality in school performance is high if the structure of the educational system differentiates early, tracking exists, selection is strong and family has an important weight in school decisions (Duru-Bellat and Suchaut, 2005). School composition matters more in differentiated educational systems (Dunne, 2010), therefore the effects of school context on health may be more distinctive in stratified school systems.

Research about types of educational systems has also argued that the structure correlates with the coupling of education and the labour market. In stratified educational systems occupational status is closely related to education (Allmendinger, 1989). The effect of education on labour market outcomes is stronger in stratified systems because of

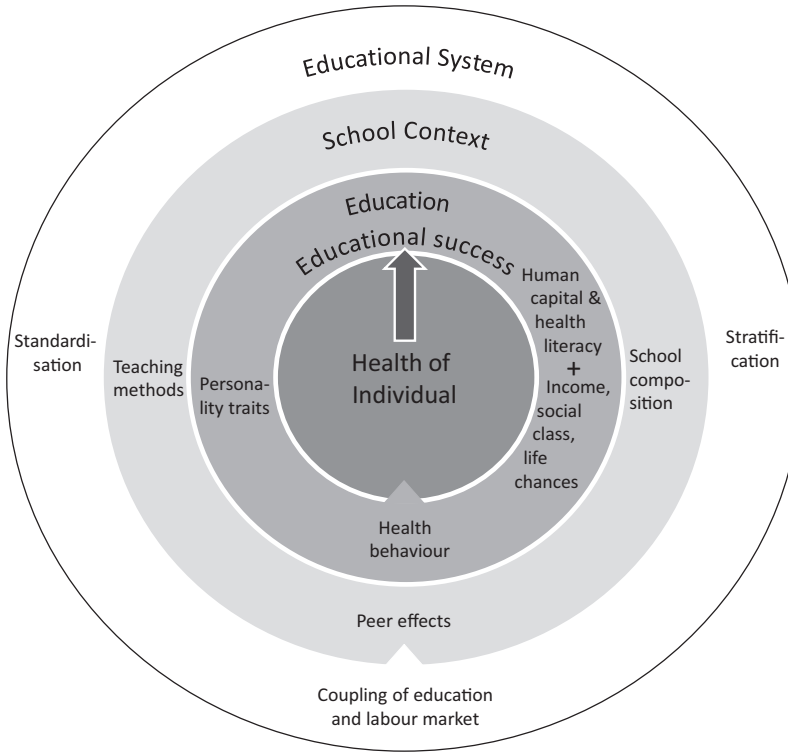
more restricted access to tertiary education. In standardised educational systems job changes occur less frequently since employers can match employees more effectively to jobs according to their educational certificates. Within standardised educational systems, qualifications represent the same skill level for all schools and regions, and certificates provide stronger signals for the labour market. Students (or their parents) anticipate the importance of their success at school for their life chances, and therefore students face more or less stress depending on the structural characteristics of the educational system.

In addition to providing learning environments to acquire competencies, schools also have the task of supporting the development of abilities that enable social integration. This may promote the students' self-efficacy and self-consciousness; if students are not very successful at school, however, this will put pressure on them. Burdens and stress from failure may even be higher when there is low achievement in stratified educational systems, and determines the track to which students are assigned. High selectivity could therefore be related to negative effects on student mental health. The risk accompanying decisions in the educational system differs according to its openness. In comprehensive educational systems transitions are smoother and may be revised, whereas in stratified systems the risk of failure has serious consequences. The danger of facing stigmatisation from failure is higher in stratified systems. Additionally, the long-term consequences of educational achievement may be anticipated by students and their parents. In standardised and stratified educational systems, where the coupling with the labour market is strong, the consequences of school failure are more far-reaching. If a decision causes high costs and offers insecure returns, then students from lower socioeconomic positions will be disadvantaged since their parents are not able to afford a failure. Pfeffer and Hällsten (2012) noted that parental wealth has a securing function, in buffering negative consequences from failures in educational careers. Students with wealthy parents can choose more competitive options that may have higher returns in the labour market because the risk of failure has less serious consequences for them. Summarising these arguments, we hypothesise that stress and psychological burden from school is higher in differentiated educational systems (see Figure 14.1 for an overview).

Conclusions

Health can interfere with education in many ways. Better educated people are more efficient in producing health and have better health

Figure 14.1: Educational systems and health



literacy. They achieve higher occupational positions and earnings in the labour market. Both these arguments point to the fact that educational inequality is transferred, at least to a certain degree, to inequality of health. There is still much debate, however, about the importance of their relative socioeconomic positions. Educational inequality is not converted one-to-one to income inequality, but narrowing the gap between educational achievements may nevertheless be profitable for the less educated groups. Research has shown that personality traits play a substantial role in the connection between education and health; an overview of empirical findings, however, showed that when controlling for personality, the education–health gradient still exists. We also provided evidence that schooling and educational environments can cause an increase in beneficial personality traits. Schools and educational policies should not only aim at providing the best education and thus life chances for everyone, but also at creating environments that foster participation and action competency to maintain the health of their students in later life as well. Schools and educational politics can also prevent damaging peer effects by increasing diversity in schools and

classrooms. Not concentrating students from certain social backgrounds in one place could be fruitful in the prevention of an accumulation of negative influences on health.

So far, no research is known to have considered the health effects of the structural characteristics of educational systems. We argued above that the standardisation and stratification of educational systems influence the way teachers and students interact with each other, and may have effects on health. If early selection takes place within stratified educational systems and is difficult to revise, this may impose considerable burdens on students and discourage them in cases of failure. As schools in stratified educational systems reproduce social inequality of labour market positions, they also contribute to a reproduction of inequality of health in society. Educational systems are also embedded within a societal context of the more general welfare regime.

Clearly more research is needed in this field, but some advice can be given. The need for political action to diminish health inequalities is evident. The Marmot review estimates the cost of health inequalities as 2.5 million years lost to premature deaths each year, and only in England, if no action is taken (Marmot, 2010). As a consequence the review includes some advice directed towards educational policy. In order to diminish health inequalities, policy must give every child the best start in life, among other things by providing good quality early years education and childcare. It should enable all children, young people and adults to maximise their abilities and have control over their lives. Major tasks in order to do so are to reduce the social gradient in educational outcomes, reduce the social gradient in life skills, and foster ongoing skills development through lifelong learning (Marmot, 2010). How much inequality is produced and perpetuated by education depends on institutional characteristics. A comparison of educational systems may help to identify reasonable measures.

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FIFTEEN

Good and bad education systems: is there an ideal?

Jutta Allmendinger

Is there such a thing as an ideal education system? My answer to that question is a resounding yes. Findings from empirical education research and lessons from educational practice converge on a set of systemic key features. These key features are identified and promoted in the programmes of most political parties and associations in many European countries. If education systems continue to fall short of that ideal in some respects, it is not because we do not know what an ideal education system might look like but rather because we fail to make the necessary changes to the existing systems.

What are the undisputed goals and features of an ideal education system? How can they be implemented? The authors in this volume have done an outstanding job in finding answers, which is why this chapter can largely be limited to a few additional comments. It starts with a brief summary of the goals an education system must achieve, followed by a discussion of the structures and cultures that shape these goals and support the path towards achieving them. The third section addresses the question of whether the concepts of standardisation and stratification are systematically related to good and bad education systems.

Goals of good education policy

The goals of good education policy are largely uncontested and are specified in many seminal contributions to the sociology of education. In this chapter I primarily rely on Allmendinger (2012) and Allmendinger et al (2014), two pieces that have recently summarised existing knowledge.

Inclusion. A good education system is one that is open at no charge to all individuals, helping them to fully realise their unique potential. In other words, children's socioeconomic background, their place of residence, their parents' countries of origin and whether or not

they have physical or mental disabilities, should be irrelevant. The goal is to provide equal access to education and to achieve the best possible educational outcome for each learner. The dual nature of this imperative is important: equal access *and* optimal support. Promoting equal access to education alone is far from sufficient. It is perfectly possible to provide opportunities and then simply sit back and wait to see who takes advantage of them and how, but it is also possible to encourage people to embrace these opportunities and to actively support them in making the most of their potential. The goal of this approach is to endow people with skills (Sen and Nussbaum, 1993). This certainly does not result in equality of outcomes, but it is more than equality of opportunity in the traditional sense. Considering the far-reaching consequences of education on people's entire life courses, we urgently need approaches that go beyond only equal access to education (see Atkinson, 2015).

Broad curricula. A good education system prepares learners for life in all of its diversity and breadth. Of course, education is also about enabling individuals to enter the workforce, about creating the preconditions for a financially independent and thus materially autonomous life, however, education is not a servant of the labour market (Dahrendorf, 1965). Education empowers people to take control of their lives and to be active participants in society and its political processes.

Adaptability. A good education system is able to change and evolve, integrating new societal developments and making active contributions to those developments. Examples of such societal changes include the continuous workforce participation of both parents, dramatically increasing life expectancy in good health, immigration and globalisation, rapid changes in skills requirements in the labour market, and the growing impact of technology on all aspects of life. Each of these trends presents a specific challenge to the education system, requiring changes in the duration and timing, as well as the forms and content, of teaching.

Interconnectedness. Education is not limited to schools and vocational training sites. Family, friends, sports clubs, youth groups and the media also provide important learning environments. Good education systems go against the sharp division of labour derived from the dated idea that schools are in charge of cognitive skills, and that non-school learning environments take care of everything else.

Transparency and systematic quality assurance. A good education system is also marked by transparent structures and a valid method of measuring and documenting educational outcomes. This is the only way to ensure

that certificates retain their meaning and continue to serve as indicators for placing individuals into social positions.

Characteristics of good education systems

The goals of good education policy – the inclusion of all children, broad curricula, adaptability, interconnections with other areas of society, transparency and quality assurance – can now be translated into the structural characteristics of education systems.

Creating equal opportunities

The only way of ensuring equal access to education and the best possible educational outcomes is by creating the required structures and by providing learners with individualised support within these educational structures.

To do so, we have to start as early as possible. High-quality early childhood education opportunities create essential preconditions for the learning development of all children. Early childhood education and caretaking services therefore have to be expanded in a way that means all families – including those from socially disadvantaged groups or with a migration background – can take advantage of them. To assure a high level of quality at all institutions, uniform standards must apply. Most importantly, these include a child/teacher ratio appropriate for children of that age, professionally trained staff, an age composition of groups that facilitates supporting each child, the appropriate timing of activities, last but not least, effective language learning.

A good education system needs structures that enable children to learn together, at least up to the age of 14 but preferably up to the age of 16 – structures that have been successfully established in many countries. This will enable us to unleash dormant potential. In many countries, however, even after hundreds of years, the pedagogy of diversity continues to face fierce opposition. 'Being able to interact and act successfully in socially heterogeneous groups' is one of the three key competencies emphasised by the Organisation for Economic Co-operation and Development (OECD). Learning by doing is a key principle of teaching. In a segregated school system, students cannot actively learn how to meet people from different social and cultural groups in an appreciative and respectful way. Children from marginalised groups are unable to find points of entry to mainstream society if they are separated from other children at an early age.

People with disabilities, too, need to have access to high-quality education in general education institutions. As a matter of principle, nobody should be excluded because of a disability. This is the essence of the United Nations (UN) Convention on the Rights of Persons with Disabilities. To ensure those rights, we need suitable structures, institutions and measures, as well as qualified staff. We need educational programmes that do justice to the diversity of learners. Classrooms, schedules and the make-up of the teaching staff have to be adapted to this diversity. We need clearly defined collaborations between institutions of special needs education, early education, social education and vocational training, some of which are subject to different kinds of legislation (social law or education law).

Learning at all-day schools provides children with crucial resources: more time, a wider range of extracurricular learning opportunities and a higher level of social interaction. All of these resources have the potential to offer children and young people more effective individual guidance and support. As a shared learning environment, all-day schools create superior conditions for social and democratic learning, and they also make an important contribution to helping parents balance work and family responsibilities. This is why they must become a standard component of the general school system. Schools should preferably be institutionalised as all-day schools, requiring all learners to participate in all-day activities and offering mandatory programmes on all weekdays. Again, this requires clearly defined, uniform teaching concepts and standards to ensure that the potential for rescheduling and redesigning learning hours is fully exploited. Finally, collaboration between teachers and other education staff has to be intensified and professionalised.

Learning for life

A good education system offers a curriculum that prepares learners for life in all of its diversity and breadth. In addition to knowledge in the core subjects of mathematics, science, history, geography, literature and languages, equal weight must be given to learners' musical, cultural and athletic education, as well as their personal growth, by promoting empathy, involvement and tolerance. Education for democracy is a key responsibility of the education system, as the Council of Europe has emphatically pointed out, but a democratic organisational culture is far from being the norm in the education system. For democracy to really come alive at educational institutions, we need to come up with and implement concepts and standards for learning democracy and for an organisational development based on democratic education.

These standards need to guide participatory processes, forms and rights, especially with regard to how learning processes, learners' everyday environments, and institutional structures are designed. It is only through their own actions and personal experiences that children and young people can develop social and democratic attitudes and skills. Learning democracy is so much more than taking political science classes and serving on the student council.

The principle of learning for life also applies to the teaching staff. The professional development and continuing education of teaching professionals is an essential field of action when it comes to improving the quality of teaching-learning processes, creating equal opportunities and fighting educational deprivation while simultaneously supporting gifted learners. Whether or not changes in educational policy can unfold at individual institutions depends to a large degree on the skills and collaboration of local teachers; however, some of today's key skills for the teaching profession are not yet taught, or not taught systematically enough, at teacher training institutions. Teachers are faced with major professional challenges when organising and designing skills-oriented learning activities, when providing individual support to children, young people and adults with different needs and learning histories, when dealing with social, ethnic, cultural and academic diversity, and when working in a classroom shared by students with and without disabilities. Professional development and continuing education opportunities for teaching professionals also have to take account of structural changes in the education system.

Reacting to societal challenges in a proactive manner

Working parents often find that the school system still largely consists of half-day schools. In many countries, this type of school was a good fit for the way families lived in the past: when school finished around noon, children went home and received a warm meal from their mothers, who were also there, to a lesser or greater extent, to help them with their homework. Today, people's houses and flats are mostly empty when school is over. Too many children are left to their own devices at an early age, or looked after by people other than family. Good school systems must respond to that situation by offering all-day schools and by integrating the education that children once learned from their families in the regular curriculum. Unless this happens, social inequality in educational outcomes will increase even further.

Rising healthy life expectancy has implications for the education system as well. Life expectancy has evolved over the course of a single

century. My grandmother was born in 1900, my mother in 1930 and my sister in 1960. Life expectancy in my grandmother's generation was 53 years, compared to 72 years in my mother's generation and 81 years in my sister's. With life expectancy and good health on the rise in this way, the proportion of our lives we devote to education becomes smaller and smaller. Measured by life expectancy, the time devoted to education has decreased steadily over the years, from 25% to 18% and finally 16%. If my grand-daughter was born in 2020, the education-related portion of her life would be much smaller still, based on today's situation. Nurseries, kindergartens and all-day schools do not make up for this loss in education time.

It is wrong to assume, however, that the education we receive in our early years will last a lifetime. A good education system will offer a range of interconnected lifelong learning opportunities. Such education chains begin in early childhood and extend to continuing education programmes in advanced adulthood. Interconnecting the various building blocks also means that it is possible to switch directions at any time, for instance between academic and vocational training. In such a scenario, employers would enable their employees to actually take advantage of continuing education opportunities, for instance by giving them leave to complete a second or third vocational training. Education insurance schemes are needed to help people pay for such training periods. Once these new lifelong education, training and professional development opportunities have become the norm, the labour market transformations caused by globalisation and digitalisation will lose much of their menace. Currently, it is only in some of the professions that members are required to engage in professional development on a regular basis, and it is mostly people with a high level of prior education, who take part in adult learning and continuing education, whereas people with a lower level of prior education generally don't. This requires a sweeping continuing education initiative, which should include both informal and non-formal learning formats within and beyond the workplace. It should also enhance the professional status of people in continuing education, make higher education institutions part of the continuing education system, and help improve the governance of the continuing education sector, which is highly fragmented in most countries.

Globalisation calls for further adaptation. Schools must redesign their curricula in a way that helps students learn at an early age how to *deal with new situations*, and how to embrace tolerance and acceptance. The best way to do this is by creating culturally diverse classrooms and having children grow up in this diversity.

Connecting all relevant actors

The many actors and institutions involved in a child's education must be connected to give them the time and the resources to help and support children in a sustained manner. This requires the collaboration of very different institutions and professions. As a result, they will be able to provide better education to more children than currently. In doing so, more time can be spent together, whether it is in the nurseries, in kindergarten or at school. To achieve that goal, various political departments have to cooperate more intensively than they have in the past. A good education system can only emerge if education policy, family policy, labour market policy and social policy are interconnected. Urban planning schemes and transport policies also have an impact on schools. Education is a cross-sectoral task involving the entire political system.

Defining curricula

We need to reach a consensus about the knowledge and skills that today's pupils should acquire. In all areas of education, it is essential to identify, expand and assure the quality of provision. Standards are one important instrument in doing so, providing clearly defined expectations regarding the quality of educational provision, educational processes and educational outcomes for all links in the education chain. Procedures also need to be in place to monitor the extent to which these standards are being met. Internal and external evaluations in the general school system (for example, school inspections) are one example of this; professional standards for training and good practice in the field of early childhood education are another. Without systematic quality assurance, it is impossible to use funds and resources effectively. A responsible education policy has to firmly integrate quality development, evaluation and quality assurance into the design and implementation of every reform.

Once these shared standards have been established, schools need the freedom to choose their own teachers, teaching materials and formats. Depending on their location, schools require various amounts of money. Schools in socially deprived areas, for example, need to engage with their students much more strongly and intensively than schools in neighbourhoods where parents are more able to be involved in their children's education. Autonomy is a major challenge. Headteachers have to be well trained for this task. Each school works according to its own plan, which is customised to match the social and regional

situation of its students. This plan also includes guidelines on choosing the right teachers, social workers, mentors and volunteers. It determines the teaching materials to be used, the timing of lessons, the amount of time students spend in class, holiday activities, parent involvement and school architecture.

We need transparency when improving the quality of our schools; it is indispensable. What we do not need is competition based on school rankings. Finland, for example, unlike other countries, including its Scandinavian neighbours, has never ranked its schools, and thus could provide guidance. Financial rewards or negative sanctions for over- and underperforming schools are entirely out of the question. 'Weighing the pig doesn't make it any fatter', as Domisch and Klein (2012) have quipped. Evaluations depend on the trust and acceptance of everybody involved. The goal of evaluations is to determine the learning processes of each student and the ways in which they can be supported further. Well-being is a crucial element, which is why students' perceived 'happiness' is among the items that are measured. Such a 'social standard' tells us much more than subject-related tests. When referring to the fact that Finland has one of the world's strongest school systems, even though it doesn't reward or penalise performance and doesn't make special efforts to prepare students for standardised tests, Diane Ravitch (2012), one of the United States' most influential education experts, said that it had 'schools we can envy'.

Documenting educational outcomes in a reliable way

Another characteristic of a good education system is that educational outcomes are measured and documented in a valid manner. This is the only way to ensure that certificates retain their meaning and offer reliable guidance to employers at home and abroad. This leads us to the fundamental question of how to measure education in the first place.

When studying educational credentials in international comparisons, we necessarily assume that they are in fact comparable, but are they really? The truth is, we don't know very much about a country's education system if we only know the exact percentages of students earning this or that degree. After all, such differences may simply result from a country's general economic circumstances, the proportion of migrants in the population or the structure of the education system itself. This is why we need a great deal of additional information about each country. What about a country's wealth? What is the make-up of the population? What is the percentage of students whose native language isn't their country's national language? What is the level

of social inequality? Do many people live in poverty? We also need information about the education systems. How well are they funded? How are they structured? How are people trained to become teachers? How many hours do they have to teach? Are they paid well?

None of this information, however, tells us anything about the skills and abilities behind the degrees. To learn more about those, we need information from achievement tests. PISA (the Programme for International Student Assessment), for instance, measures the skills and knowledge of 15-year-olds in many OECD countries. Initially, skills assessments provide us with data for an international comparison of achievement in different school systems. Based on the level and distribution of achievement, it is then possible to identify various 'skill production regimes' in the OECD countries (Allmendinger and Leibfried, 2003). However, skills and degrees do not measure the same thing. There are countries that award degrees to a large number of people and still have a skill level far below the OECD average. Similarly, there are countries that boast extraordinary skill scores but award comparatively few degrees. What is true of individual human beings is equally true of whole countries: some have a high level of formal education but comparatively few skills. For others, it's the exact opposite.

So what do we take away from this? First, skills testing provides us with many new insights. In fact, this is one reason why education research has made substantial progress since the mid 1990s. Second, we should be very careful when dealing with benchmarks that refer to educational degrees and credentials. If the European Commission and the OECD define international standards regarding a desirable rate of tertiary attainment, for example, such benchmarks can take us completely in the wrong direction. Awarding degrees simply for the sake of degrees and targets doesn't make sense. Third, degrees and skills do not measure the same thing. We must be careful not to jump to conclusions here. Fourth, degrees and skills do not measure everything. We have to keep looking at human beings in their entirety, including their emotional and social skills.

Ensuring smooth transitions into vocational training

Making the transition from general education school to vocational training continues to be a major problem for many adolescents. This is especially true of adolescents who fail to obtain a secondary school degree. If these young people come from a migrant family, the obstacles they face are particularly great, and so the transition into vocational

training has to be redesigned. General education schools have to expand their career counselling and career preparation services, and policy makers must make it easier for young people to enter a workplace-based training scheme or a full-time school-based vocational training programme. General education schools and the various measures of employment agencies, youth career support services, employers and other institutions have to be integrated more effectively. This requires cross-institutional concepts, collaboration and resource coordination.

Ensuring education funding

Money alone does not build a good education system; nor does it produce good educational outcomes. This is evident from simple comparisons: on average, OECD countries spend US$9,900 per student per year from primary through tertiary education. Finland spends an average of US$9,500; Germany spends US$9,100 (Allmendinger, 2012): in other words, both countries spend less than others. The difference between the two amounts is small and surely does not explain the differences in educational outcomes. When taking a closer look at the figures, however, we see that Germany's expenditures are particularly low in pre-primary and primary education, that is, when children's needs for compensatory learning are highest. Once the children are distributed across the various school types, the German school system starts investing more per student. In concrete terms, Germany spends *less* per student than Finland in Primary and Secondary Level I education: the difference is about US$1,200 and US$3,500, respectively, in favour of the Finnish students. At Secondary Level II, Germany spends substantially *more* per student than Finland: the difference is about US$3,100 in favour of the German students. To be sure, these expenditures also include teacher salaries in each country, but that is an expression of a kind of education policy that has its roots in history but is no longer in line with the findings of contemporary research.

Standardisation and stratification as key features of good and bad education systems?

Two key features of an education system have not been mentioned so far: the extent of its stratification and its standardisation. Based on the typologies of Turner (1960) and Hopper (1968), these were first formulated by Allmendinger (1989). 'Standardisation is the degree to which the quality of education meets the same standards nationwide'

(Allmendinger, 1989: 233). Nationally standardised features of education systems can be found in the curriculum, examination requirements, marks, education regulations, teacher salaries, and the budgets of public schools and vocational training institutions. Accordingly, non-uniform features of an education system are defined as 'unstandardised'. Training contents that vary depending on the specific firm where apprentices complete their training are one good example. This is traditionally the case in on-the-job training schemes. In the original definition, unstandardised systems and autonomy were not treated as one and the same thing (but see Carstensen and Jungbauer-Gans, chapter fourteen in this volume); neither did it assume a link between standardisation and (in-)equality (but see Hadjar and Becker, chapter eleven in this volume). Operationally, autonomous schools may very well pursue nationally uniform objectives while using substantially different methods to reach these objectives.

Stratification refers to the extent to which a school system is hierarchically structured. At what age are students separated from each other to be tracked into different types of schools? What percentage of a student cohort is given the opportunity to spend the maximum number of years at school or in vocational training, as prescribed by the education system? Again, the original focus was on the transition from education to employment. A low level of stratification was not considered to be the same as equality of access or equality of outcomes. For instance, schools awarding the highest certificates to all their students may still use strong differentiation via marks or skills assessments. In other words, non-stratified systems, in which all children of a birth cohort go to school together without being tracked, are not 'just' systems per se, or systems with a high level of equality of outcomes. If empirical studies still find 'that tracking increases the inequality of opportunity' (Bol and van de Werfhorst, chapter four in this volume), this is probably because, in other education systems, other systemic features covariate systematically with the degree of stratification (see also Esser, chapter five in this volume). It doesn't seem to be a systematically derived conclusion.

The original intention of the typology was a modest one. Allmendinger's work addressed the transition from the education system to the employment system. Accordingly, she claimed (and found empirical evidence to show) that standardised systems facilitate these transitions, because they provide employers with reliable information about what prospective employees have learned in their education and/or training. Such systems also tend to increase the freedom of employees to switch employers, because what they have learned is

easily transferable. The effects of standardised systems thus also involve the entire life course. Many contributions in this volume confirm that connection. Bol and van de Werfhorst (chapter four in this volume), for example, find that standardised training in the form of a dual apprenticeship facilitates student integration into the labour market.

Stratified systems also facilitate the transition from education to employment, because a hierarchically structured education system meets a hierarchically structured employment system, meaning that social and occupational placement decisions are already made in the education system. This is why the finding of Carstensen and Jungbauer-Gans (chapter fourteen in this volume) is very plausible. The authors show that 'high selectivity could be related to negative effects on student mental health', since permanent selection at school, combined with early career tracking, can produce a high level of stress. The results of Bol and van de Werfhorst (chapter four in this volume) point in a similar direction, showing that stratified systems tend to produce passive citizens disinclined to engage in civic volunteering.

Applying the typology to the issues of an ideal education system thus generates an uneven empirical picture simply because the two key dimensions underspecify what happens at schools. As my comments have shown, we need significantly more systemic features to understand the complex interactions in schools (see also Esser, chapter five; Hadjar and Buchmann , chapter eight; and Hadjar and Becker, chapter eleven – all in this volume). It seems appropriate, therefore, to limit the dimensions of standardisation and stratification to the transition between education and employment, and to use more specific indicators for defining the goals of good education systems, including the inclusion of all children, broad curricula, systematic adaptability, interconnections with other areas of society, transparency and quality assurance.

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Conclusions and summary

Christiane Gross and Andreas Hadjar

The most challenging work for editors is to summarise the main findings of the contributions. We start with the lessons learnt from each chapter in the main sections of the volume: theory and methods, education systems and educational inequalities, and education systems and inequalities in status attainment and life chances. From this we derive our main conclusion and end with an overview of what is needed for further comparative education research.

Lessons learnt from each chapter

Theory and methods

The first chapter of the *theory and methods* section (chapters one to six), written by Christiane Gross, Heinz-Dieter Meyer and Andreas Hadjar, provides evidence for path dependencies regarding the development of education systems, exemplified by the education systems in the United States and Germany. They illustrate the strong link between the processes of nation-building and the development of education systems. In a second step, they present a macro-meso-micro-model developed following the concept of Coleman (1990). Within this model, previous research into the question of how education systems shape the production of educational inequalities at the micro-level is summed-up.

Susan L. Robertson and Roger Dale dedicate their chapter to a critical review of comparative research, criticising the fact that comparative research often assumes, but never problematises and reflects on, the empirical comparability of different education systems, and that comparative studies – here the PISA (Programme for International Student Assessment) studies function as an example – tend to evaluate education systems, but do not attempt to understand and explain their nature. This critical look back may widen the perspective on the subject and allow a broader view, not focusing on finding the right answers for our research questions, but on asking the right questions.

The chapter by Christiane Gross, Anja Gottburgsen and Ann Phoenix shows how the intersectionality paradigm could be applied to the analysis of education systems and inequalities. They argue that

within qualitative research, there are several opportunities to bring in an intersectional perspective, by: (a) including intersections in the research question, (b) examining emergent intersectional complexities, or (c) examining intersections 'as a by-product of secondary analysis'. The authors show how the paradigm's main assumptions can be implemented in the quantitative framework: multidimensionality by including multivariate analyses, contextuality by performing multi-level analyses with a focus on covariates on higher level and cross-level effects, and intersectionality by including interaction terms. In addition, the authors provide arguments about why qualitative comparative analysis (QCA) may fit well with the intersectionality approach.

Thijs Bol and Herman G. van de Werfhorst conceptualise three main characteristics of educational systems and provide five institutional indicators with which to measure education system characteristics for a wide range of countries, which could be used in future research. The five indicators include tracking, vocational enrolment, vocational specificity, standardisation of input and standardisation of output. In a second step, they examine how these measures are associated with four functions of education, including labour market allocation (measured by youth unemployment ratio and length of school-to-work transition) at the macro-level, development of skills (measured by average PISA competencies in mathematics), equality of opportunity (measured by the class gap in PISA scores in mathematics) and socialisation (share of people participating in a voluntary organisation). Among other interesting results, the authors reproduce the previous finding that a low share of youth unemployment is associated with the dual system (rather than with any kind of vocational specificity). External differentiation – tracking or streaming – is negatively associated with equal opportunities by class. The citizens of countries with highly stratified education systems show less civic engagement than those who are less stratified.

In his methodological chapter, Hartmut Esser explains the different results of two- and three-level models, examining the effect of ability sorting after elementary school on educational achievement in secondary school. He argues that the inclusion of the school/classroom level (in three-level models) is necessary in order to properly consider and analyse system effects of differentiation/stratification on educational inequality. He demonstrates how ignoring pre-sorting abilities in inequality studies leads to an overestimation of the effect of social origin and an underestimation of the effect of abilities. Accounting for abilities before sorting drastically decreases the effect of social origin on achievement.

Christiane Gross demonstrates how to model the effect of education systems on educational inequalities properly by exploring the comparative approach and multi-level techniques. Applying multi-level models, she recommends the theory-driven choice of using centring methods (grand-mean versus group-mean centring), the use of multiple imputation to tackle missing data issues, adequate regression diagnostics suited for multi-level models, and suggests which figures to use for a straightforward interpretation of interaction and cross-level effects.

Education systems and educational inequalities

The next part of the book (chapters seven to ten) focuses on the effect education systems have on different axes of inequality, including social origin, gender, ethnicity and dis/ability. Investigating education system effects on inequality of educational opportunity (IEO) as related to social origin, Gabriele Ballarino, Fabrizio Bernardi and Nazareno Panichella focused on the system characteristics of levels of educational expansion, tracking, standardisation input and output, and vocational specificity. They first theoretically enhance the choice-within-constraints-model and, in a second step, analyse the effects of educational systems on IEO – with social origin measured through parental education, and educational attainment measured through upper secondary and post-secondary school qualifications. They demonstrate a strong negative association of IEO with educational expansion, output standardisation and tracking at upper secondary level, and a weaker association with post-secondary credentials.

Andreas Hadjar and Claudia Buchmann examine gender inequalities in education, which is challenging in that they vary over time and between career stages. They find empirical evidence that, with the increasing size of education systems, women's opportunities increase. Gender inequalities also tend to be smaller in countries with less differentiated educational systems, although there is no significant effect of stratification level on gender inequalities. Using the welfare state regime function as a proxy, social democratic and post-socialist countries were found to do especially well in reducing gender inequalities in education, which for a long time favoured men.

Jaap Dronkers and Roxanne Korthals analyse achievement inequalities related to migration background based on PISA data, focusing on stratification/tracking as an education system characteristic. They demonstrate equal or higher scores for first- and second-generation migrant students in educational systems with many tracks compared to systems with only one track. They also discuss methodological issues,

emphasising the usefulness of taking into account intervening school-level variables, and of the inclusion of country of origin to correctly estimate models for migrant students.

The second section concludes with a chapter by Justin Powell and Julia Biermann, who study how international pressures to promote inclusive education alter established educational structures, focusing on Germany and Nigeria as country cases. Inclusive education is rising in the political agenda, and was discussed in both country settings. While there are path-dependent developments in each country, both country settings maintain or even expand special schools and separate classrooms. As the authors note, these developments contradict international attempts to provide Education for All and to promote inclusion.

Education systems and inequalities in status attainment and life chances

The chapter by Andreas Hadjar and Rolf Becker on the meritocratic triad – the links between social origin and education, and the connections of class of origin and education with class of destination (status) – investigates the influence of educational systems on educational and status attainment. They demonstrate that lower educational inequalities related to social origin come with a larger sector of upper secondary general education and lower stratification of the education system (meaning quite a comprehensive schooling system and selection at a higher age). The impact of specific characteristics of the education systems on inequalities in status attainment (that is, the effect of social origin on destination status) is smaller and slightly different: with the increasing size of the upper secondary general sector and stronger vocational orientation, the importance of education in the status attainment process decreases, while the increased size of the upper secondary general sector even strengthens the association between class of origin and destination.

Concetta Mendolicchio examines gender inequalities in the labour market. From an economic perspective, she investigates gender differences in (labour) market returns on education, focusing on the level and distribution of wages in 12 European countries. Her evidence shows higher returns on education for females than for males in all the countries considered except for Germany, the Netherlands and Sweden. The gender gap in educational returns can be explained mainly by the Mincerian coefficients, which overcompensate the negative effects on women's educational returns caused by higher unemployment rates and maternity-related benefits.

Irena Kogan examines whether educational returns among immigrants vary depending on the institutional characteristics of the host country's education system. Examining data from Ireland, the UK, Austria, Germany and the Netherlands, she finds empirical evidence supporting her hypothesis: in countries with a strong vocational orientation at the upper secondary level, and where employers search for straightforward skills signals, immigrants with transferable skills benefit more than in other settings.

Johann Carstensen and Monika Jungbauer-Gans deal with the question of how education systems shape health as the most important non-monetary return on education. Based on their literature review, they show the strong links between social inequality and low education and (poor) health. As no research investigating the effects of education systems on health inequalities has been conducted so far, they derive hypotheses from the theoretical background that could be tested in future research. They conclude with the assumption that in stratified education systems with a low permeability, higher burdens exist for students, and may lead to poor health outcomes and higher health inequalities.

Finally, Jutta Allmendinger poses the difficult question of whether there is an ideal education system and what this would look like. Her normative discussion about educational justice focuses on certain goals of education. As the 'right' goals at which to aim, Jutta Allmendinger suggests inclusion (available to all individuals at no charge), broad curricula (that should prepare people for more than just the labour market), adaptability (being able to react to societal challenges of different kinds), interconnectedness (the interconnection of formal and informal learning environments), and transparency and systematic quality assurance (describing transparent structures and valid indicators of educational outcomes). In a second step, Allmendinger translates these aims into characteristics of education systems. Creating equal opportunities is only one of the many attributes she examines.

Main conclusions

The diverse chapters in this volume clearly indicate that producing equal opportunities – independent of class, race, ethnicity, gender, dis/ability and other characteristics – is one of the many functions that any education system should fulfil. What we learn from this volume is that, at the same time, there is no easy way to explain the (re)production of (in-)equality and how the characteristics of education systems shape various inequalities. First, the usual suspects – stratification,

standardisation and vocational specificity – that subsume a wide range of institutional conditions have to be specified in greater detail. Second, we must decide which axes of inequality should be considered (class, race, ethnicity, gender, dis/ability and so forth) and their intersections. Third, the dimensions of education should be specified. What is meant by educational achievement? Should we focus more on competencies and skills (as is increasingly done) or rather on educational attainment or credentials (classic approaches in the sociology of education)? Fourth, when we speak about inequality in terms of educational returns: do we evaluate in monetary or non-monetary returns, such as health and well-being alongside income? 'Inequality in educational returns' must be understood in several respects: different returns structured by *differences in* educational level (educational returns) or different returns to the *same* educational level (inequality in educational returns). As so often in the social sciences, this volume raises more questions than it can provide final answers; however, the contributions clarify the steps we must take to further improve our knowledge about the interaction of the multitude of influences that education systems have on inequalities – and the reasons for them.

Overall, there are few ultimate answers to the questions of which education system characteristics are *most* useful in providing education for all, in reducing educational inequalities and in maintaining best labour market and living conditions. While most of the research presented indicates strongly that a high level of stratification and/or differentiation goes hand in hand with a higher level of educational inequalities, some chapters cast doubt on these conclusions; we can expect further debate on this central issue. One has to ask whether in less stratified countries low levels of educational inequalities also translate to low inequalities with regard to labour market outcomes, status attainment and life chances. For example, Finland, with its comprehensive schooling system and additional pedagogical and inclusive measures, such as team teaching and multi-professional services for disadvantaged children and youth, often serves as a best practice case. As the PISA studies indicate, the Finnish education system unifies low educational inequalities and high competency levels. Although many scientists and politicians stress that the Finnish case is not comparable with other settings, it is worth noting that Finland also has groups of immigrants and even different languages represented within the education system. Why not study this and related cases in more detail, instead of rejecting out of hand the manifest benefits of comparative studies? Indeed, many of the traditionally most stratified European education systems, such as the Austrian, German or the

Swiss systems, are gradually moving in the direction of the Nordic countries, as they combine school tracks with different skill levels in comprehensive schools, and implement far-reaching inclusive education reforms. As the variety of contributions in this book demonstrate, there is merit in these attempts – although focusing only on one feature of an education system may not be sufficient to induce transformative change.

Outlook for future research: if we had a magic lamp with three wishes ...

What would you choose if you had a magic lamp with three wishes to improve comparative education research? We would choose adequate theoretical models, the correct data and a bridge that mends the gap between qualitative and quantitative education research.

Although there is empirical evidence that shows which characteristics of education systems accompany more or less social inequality, *theoretical models* that explain these social mechanisms causally are rare. In a second step, the question of which characteristics of education systems actually foster or contain which dimensions of social inequalities, is still theoretically unsolved. A general theoretical model should enable the derivation of such hypotheses.

From a quantitative point of view, the need for *proper data* is urgent. What we need is international data on different levels – including country, school, and eventually classroom and individual level (meaning information about students and their parents), such as the PISA data, not only in cross-sectional design, but also as panel data. This data should contain comparable indicators at the macro-level of education systems across countries or states (depending on the institutional unit that governs the education system). Information about the schools and the students' private situations is needed. Repeated measures, that is, panel data, are necessary to control for the prior knowledge and competencies of students, and to enable the separation of selection and causal effects of educational institutions and their characteristics (as also suggested by Esser, chapter five this volume). That is, we need, for instance, information about student competencies before and after their allocation to different tracks in order to estimate the effect of tracking on the inequality of competencies in a proper way. Currently, the available data is either international but cross-sectional (such as the international PISA data), or is panel data, but only linked to the national level (such as the data provided by the German National Educational Panel Study, NEPS). Neither design allows a proper analysis of the

effects of education systems on educational inequalities. From a qualitative point of view, the challenge of international comparison may be rooted in the significance of language in qualitative empirical work, and thus in the need for strong linguistic proficiency researchers may face.

Although from a quantitative background, we both wish to *bridge the gap between qualitative and quantitative education research*. What we currently often observe is blind criticism on both sides that does not foster scientific progress. As many mixed-methods studies show, qualitative and quantitative designs can complement one another in a very fruitful manner, by compensating for each other's weak spots. The chapter by Gross, Gottburgsen and Phoenix (chapter three) provides an overview of the strengths and shortcomings of the three methodological branches (including QCA) and one could easily derive mixed-methods designs using the strengths of more than one (or all three).

Ultimately, future research will demonstrate whether the obstacles of comparative educational research in general can be overcome. With this volume, we have brought together some important pieces of the current state-of-the-art research and given some examples of how future research could enrich the debate.

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"A standout volume for critical discussion of education systems and inequalities that helps move the debate decisively from outlining a general problem to refined analysis, highlighting what needs to be done where."

Elaine Unterhalter, UCL Institute of Education

How do education systems shape educational inequalities and differences in educational outcomes? And how do advantages and disadvantages in educational attainment translate into privileges and shortcomings in labour market and general life chances? *Education systems and inequalities* is unique in comparing different education systems and their impact on creating and sustaining social inequalities.

The book considers key questions such as how education systems impact educational inequalities along such variables as social origin, gender, ethnicity, migration background or ability and what social mechanisms are behind the links between education system and educational inequalities and provides vital evidence to inform debates in policy and reform.

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