# The intergenerational social mobility of children from working-class backgrounds in Germany and Britain

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## ABSTRACT

Research in social stratification has shown that children from working-class backgrounds have substantially lower levels of education and tend to obtain lower labour market positions than children from higher social class backgrounds. However, we still know little about the macro- and micro-level dynamics that underlie this empirical regularity. This dissertation investigates the role of different macro-level institutions and micro-level processes in accounting for the educational and labour market inequality between individuals from working-class backgrounds and individuals from higher social class backgrounds in Germany and Britain. Moreover, we investigate the extent to which there are intra-class differences in the educational and labour market prospects of individuals from unskilled and skilled working-class backgrounds.

The first paper, titled *Left behind? Over-time change in the social mobility of individuals from unskilled working-class backgrounds in Germany*, examines the labour market chances of people from unskilled working-class backgrounds, relative to individuals from skilled working-class and more advantaged backgrounds, and how they have changed across four cohorts born between 1940 and 1979 in Germany. Having established the over-time pattern in the inequality in labour market chances between these groups, the paper examines whether and to what extent this inequality can be attributed to cross-class differences in educational attainment.

The second and third paper seek to contribute to the debate in social stratification scholarship on the effect of institutional change on the intergenerational transmission of inequality. The second paper, titled *Educational inequality after state socialism: The effect of German unification revisited*, draws on the natural experiment of

German unification to examine, first, whether state socialism in the GDR succeeded in realising its ideological commitment to increasing the educational attainment of children from working-class backgrounds, relative to children from more advantaged backgrounds. Second, it assesses whether the restructuring of the East-German educational system and economy in the wake of German unification led to a convergence in the level of educational inequality in East Germany towards that of West Germany. To address these two research aims, we compare changes in the class gradient in educational attainment in East and West Germany across six birth cohorts, including three cohorts of individuals who completed their schooling after unification.

The third paper, titled *Fostering equality of opportunity? Compulsory schooling reform and social mobility in Germany*, analyses the effect of one specific policy reform, the extension of compulsory schooling in Germany, which has been argued to have led to a decrease in educational inequality and an increase in social mobility. Using a difference-in-difference design, the paper exploits the variation in the timing of the reform across German states to estimate the reform effect on the educational attainment and labour market chances of individuals from different social class backgrounds.

While the first three papers focus on over-time change in the educational and labour market chances of children from working-class backgrounds and the role of macro-level institutional reforms therein, the fourth paper, titled *Understanding the mobility chances of children from working-class backgrounds in Britain: How important are cognitive ability and locus of control?*, seeks to contribute to our understanding of the micro-level processes that account for the tendency of individuals from working-class backgrounds to obtain lower levels of educational attainment and lower labour market positions than children from higher social class backgrounds. To this end, we take a

path-analytical approach to shed light on the role of two individual-level characteristics, cognitive ability and locus of control — i.e. people's sense of control over their own lives — in mediating the effect of individuals' parental class background on their educational attainment and social class position in Britain.

# DECLARATION

I hereby declare that the thesis I have presented in partial fulfilment of the requirements for the Doctor of Philosophy at the Department of Social Policy and Intervention, University of Oxford, is solely my own work, with the exception of Paper 4, which was co-authored with Mollie Bourne (Mollie Bourne did 30 percent and I did 70 percent of the work). Despite the use of the 'authorial we' throughout the dissertation, the remainder of this dissertation is solely my own work. The copyright of this thesis rests with the author. Quotation from it is permitted, provided that full acknowledgement is made. This thesis or parts thereof may not be reproduced without the author's prior written consent. Paper 1 of the dissertation is currently in the 'Revise and Resubmit' phase at *Acta Sociologica*. Paper 2 is currently under review at the *European Sociological Review*. Paper 3 has been published 'open access' in the *European Sociological Review* under the CC-BY Creative Commons Attribution Licence. Paper 4 is currently under review at the *British Journal of Sociology*.

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*Alles ist schwer und alles ist Leicht.*
*Wo beide sich scheiden ein Lächeln des Anderen.*
*So bleibt in Herzens Tiefe Dank allein.*

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# INTRODUCTION

Research in social stratification has shown that children from working-class backgrounds tend to obtain substantially lower levels of educational attainment and lower labour market positions than children from higher social class backgrounds (Shavit and Blossfeld, 1993; Breen, 2004; Erikson and Goldthorpe, 1992). This inequality of opportunity can be seen as one of the core problems of industrial and post-industrial societies, both from a normative as well as from an efficiency perspective. Normatively, it can be argued that in a fair society all people should have the same life chances, irrespective of their parental class backgrounds. It follows that the labour market chances of children who are born into families at the low end of the social class spectrum are of particular concern, as they are most disadvantaged by the circumstances of their birth (Rawls, 1971). From an efficiency perspective, it is desirable that individuals' labour market position should be solely determined by their talent and true ability, and not depend on their parents' financial resources, networks or social capital (Heckman and Masterov, 2007; Gray and Moshinsky, 1935). Investigating the processes that lead to the inequality of opportunity between individuals from working-class backgrounds and people from higher class backgrounds thus constitutes a fundamental challenge for scholars of social stratification. Understanding these processes also constitutes a precondition for policy makers to effectively increase the educational and labour market prospects of working-class youth, relative to young people from more advantaged backgrounds.

While research in social stratification has provided strong evidence demonstrating the existence of inequalities in educational and labour market outcomes between individuals from working-class backgrounds and people from higher class

backgrounds, we still know relatively little about the macro-level determinants and micro-level processes that underpin these inequalities. As discussed in more detail in our review of the existing literature below, we identify three key limitations of the existing body of research on intergenerational social mobility. First, since research on over-time change in social mobility has focused on examining changes in the overall social fluidity in society, we still know little about over-time changes in the mobility chances of specific groups in society, particularly individuals from unskilled and skilled working-class backgrounds. Second, since existing studies have mostly focused on long-term, societal-level trends in social mobility, there is little evidence on the effects of specific macro-level institutional changes and policy reforms on intergenerational social mobility, and on the educational and labour market chances of individuals from working-class backgrounds in particular. Third, we still know little about the role and relative importance of different micro-level processes that channel the intergenerational transmission of inequality. More specifically, there continues to be much debate and uncertainty over the importance of cross-class differences in children's cognitive and socio-emotional development in accounting for educational and labour market inequalities in later life.

The four papers that comprise this dissertation seek to contribute to addressing these limitations in the existing literature. The first paper seeks to address the first gap in the literature by examining the labour market chances of people from unskilled working-class backgrounds, relative to individuals from skilled working-class and more advantaged backgrounds, and how they have changed across four cohorts of people born between 1940 and 1979 in Germany. After establishing the over-time pattern in the labour market inequality between these groups, the paper goes on to examine

whether and to what extent this inequality can be attributed to cross-class differences in educational attainment.

The second and third papers of the dissertation seek to address the second gap in the literature, i.e. the limited evidence on the effects of macro-level institutional changes on intergenerational social mobility. In the second paper, we draw on the natural experiment of German unification to examine, first, whether state socialism in the GDR succeeded in realising its ideological commitment to increasing the educational attainment of children from working-class backgrounds, relative to children from more advantaged backgrounds. Second, we assess whether the restructuring of the East-German educational system and economy in the wake of German unification led to an increase and convergence in the level of educational inequality in East Germany towards that of West Germany.

The third paper analyses the effects of one specific policy reform – the extension of compulsory schooling – on educational inequality and intergenerational social mobility in Germany. Using a difference-in-difference design, the paper exploits the variation in the timing of the reform across German states to estimate the reform effect on the educational attainment and labour market chances of individuals from working-class backgrounds, relative to individuals from higher social class backgrounds.

While the first three papers focus on over-time changes in social mobility and the role of macro-level institutional reforms therein, the fourth paper seeks to address the third gap in the literature, noted above, by contributing to our understanding of the micro-level processes that underpin the intergenerational transmission of disadvantage. More specifically, we take a path-analytical approach to shed light on the role of two individual-level characteristics, cognitive ability and locus of control – i.e.

people's sense of control over their own lives – in accounting for the tendency of individuals from working-class backgrounds to obtain lower levels of educational attainment and lower labour market positions than children from higher social class backgrounds. As discussed in further detail below, the primary reason for focusing the fourth paper on the British case is the availability of adequate data for our analysis, which does not (yet) exist for the German case.

The next section discusses why this dissertation uses social class as a measure of social position in society, and how it is conceptualised and operationalised. The third section provides an overview of the existing literature on intergenerational social mobility and discusses the key gaps in this body of research in more detail. The fourth and last section then elaborates on how the four papers that comprise this dissertation contribute to addressing each of these gaps, and discusses the methods and data sources used to this end.

**Social class as a measure of social position**

This dissertation measures individuals' position in society – their social origin, social destination, and social mobility – in terms of social class. When conceptualised in terms of employment relations, social class has been shown to be a parsimonious, yet powerful indicator of individuals' economic security (Goldthorpe and McKnight, 2006; Chan and Goldthorpe, 2007; Bihagen and Nermo, 2010). As such, it is widely recognised as an important marker of social position in industrial and post-industrial societies (Breen and Rottman, 1995; Marshall, 1997; Goldthorpe and Marshall, 1992; Wright, 2008; Crompton, 2008; Scott, 1996).

In comparison to other measures of social position, using social class has both theoretical and practical advantages. Contrasting with measures of individuals' income at the time they were interviewed, individuals' social class position indicates not only individuals' current level of income, but also the short-term stability of their income and their long-term income prospects (Goldthorpe and McKnight, 2006). Social class is also preferable over composite measures of social position and socio-economic indices (SEIs), which combine different individual-level characteristics, such as individuals' occupation and education (see, e.g. Oesch, 2006; Ganzeboom et al., 1992; Duncan, 1961). Combining these different characteristics into one indicator makes these indices inherently unfit for investigating the associations between them. For example, working with a composite measure that combines measures of individuals' educational attainment and income into one socio-economic index would not allow one to investigate the relationship between these two characteristics. Composite indicators also tend to obscure which component of a given index drives its associations with other variables of interest. For instance, when working with a socio-economic index that combines measures of individuals' educational attainment and income, a researcher would be unable to ascertain which of these characteristics drives the association between the index and a given outcome or explanatory variable of interest, say individuals' social background. Given that this dissertation seeks to examine the determinants of individuals' social positions and decompose the observed associations into the proportions mediated by different individual-level characteristics, working with social class as a theoretically 'pure' measure of social position is thus preferred over the use of socio-economic indices.

For practical reasons, social class is a useful measure for the study of intergenerational social mobility dynamics, since data on social class is generally

available and of sufficient quality for both parent and offspring generations. This is not the case for data on income, which is often not collected, imprecise or missing for the parental generation. Information on parental income thus frequently needs to be imputed, with negative implications for the quality of the data and the reliability of the results. This difference in the quality of information on parents' social class and parents' income in social survey data is often due to the fact that respondents are generally able to readily recall their parents' occupation during the respondents' childhood, while it is much harder for them to reconstruct their parents' earnings at this time.

We conceptualise social class in terms of people's employment relations in the labour market. More specifically, we follow the approach developed by Erikson and Goldthorpe (1992) which distinguishes between three broad groups of individuals: employers, the self-employed or 'own-account workers', and employees. This approach generally further distinguishes between employers who delegate some managerial tasks and employers who perform these tasks themselves, as well as between the professional and non-professional self-employed. The group of employees is further sub-divided according to the explicit or implicit employment contract that governs the relationship between them and their employers. Goldthorpe (2007) distinguishes between two types of employment contracts: the labour contract and the service relationship (also see Rose and Harrison, 2010). The type of contract an employee holds generally reflects (i) how easily her work can be monitored and (ii) the asset specificity of her skills and expertese. The labour contract is common for occupations where work is easily monitored and the asset specificity of employees is low. From the perspective of the employer such labour is best purchased on a piece- or time-rate basis. The most typical example of such work would be 'unskilled' manual

work, such as work on an assembly line. By contrast, in occupations where work is less easily monitored and asset specificity is high, the service relationship is generally seen as the more appropriate contractual relationship by employers. Service relationships are characterised by long-term contracts, which comprise a fixed salary and prospective elements, such as salary increments, promotions and occupational pensions. Such contracts are designed to incentivise employees to maximise their performance in a context when this cannot be easily monitored, and to increase their likelihood of continuing to work for a given employer, who requires the employee's specific skillset and knowledge.

It is important to note that the labour contract and the service relationship constitute *ideal-types* of employment relationships. In practice, employment relationships tend to combine different elements of each of them. In the German 'dual labour market', an important difference exists between skilled and unskilled workers with respect to their terms of employment and their economic security. While individuals in both these groups tend to work under conditions typical of the labour contract, skilled workers generally have a higher level of economic security, as they benefit from labour market institutions such as collective wage bargaining, employment protection legislation and high unemployment insurance benefits. By contrast, individuals in the unskilled working class generally receive substantially less institutional support (Leibfried and Tennstedt, 1985; Lindbeck and Snower, 1988; Emmenegger et al., 2012; Palier and Thelen, 2010). Due to the absence of strong collective bargaining institutions, laxer employment protection legislation and less stratified unemployment protection policy, this difference in the economic security between skilled and unskilled workers is likely to be less pronounced in Britain (see Hall and Soskice, 2001; Esping-Andersen, 1990).

For the German case, this dissertation operationalises social class using the European Socio-Economic Classification (ESeC). This classification allocates individuals to different social classes based on the employment relations typical for their occupation, as well as individuals' employment status, supervisory role and number of employees (where applicable) (Rose and Harrison, 2010). To our knowledge, ESeC is the most up-to-date classification based on the conceptualization of social class outlined above. It is a refined version of the widely-used EGP social class schema (Erikson and Goldthorpe, 1992), and it has been extensively validated including for the German case (see Wirth et al., 2010; Rose and Harrison, 2010). For the British case, the National Statistics Socio-Economic Classification (NS-SEC) is preferred over ESeC, since it has been specifically developed to reflect the structure of employment relations in the British labour market (see Rose and Pevalin, 2005). As is the case for ESeC, NS-SEC allocates individuals to different social classes based on their occupation, employment status, supervisory role and number of employees (where applicable) (ibid.).

Table 1 and Table 2 provide an overview of the ESeC and NS-SEC schemata, as well as the collapsed versions thereof, which are used in this dissertation. Given the abovementioned divide between individuals in unskilled and skilled working-class positions in terms of their level of economic security in Germany, for our analyses in the first, second and third paper, we work with a four-fold collapse of the ESeC schema that differentiates between individuals from salariat, intermediate-class, unskilled and skilled working-class backgrounds (see Table 1). Considering the substantive concern of paper four with children from working-class backgrounds *at large*, and given that the difference in the level of economic security between unskilled

**Table 1**. Overview of the European Socio-economic Classification (ESeC)

| *ESeC categories* | *Collapsed version* |
|---|---|
| 1. Large employers, higher grade professional, administrative and managerial occupations | Salariat |
| 2. Lower grade professional, administrative and managerial occupations | |
| 3. Intermediate occupations | Intermediate class |
| 4. Small employer and self-employed occupations (excl. agriculture, etc.) | |
| 5. Small employer and self-employed occupations (incl. agriculture, etc.) | |
| 6. Lower supervisory and lower technician occupations | |
| 7. Lower services, sales and clerical occupations | Skilled working class |
| 8. Lower-technical occupations | |
| 9. Routine occupations | Unskilled working class |

*Source*: Rose and Harrison (2010)

**Table 2**. Overview of the National Statistics Socio-economic Classification (NS-SEC)

| *NS-SEC categories* | *Collapsed version* |
|---|---|
| 1. Managerial and professional occupations | Salariat |
| 2. Lower professional occupations | |
| 3. Intermediate occupations | Intermediate class |
| 4. Small employers and own-account workers | |
| 5. Lower supervisory and technical occupations | |
| 6. Semi-routine occupations | Working class |
| 7. Routine occupations | |

*Source*: Rose and Pevalin (2005)

and skilled workers is likely to be less pronounced in Britain than is the case in Germany, we do not differentiate between these two groups in the fourth paper. For Britain we thus work with a three-fold collapse of the NS-SEC schema that differentiates between individuals from salariat, intermediate class, and working-class backgrounds (see Table 2).

**The existing literature on intergenerational social mobility**

Intergenerational social mobility is a vibrant area of research in the social sciences, particularly in sociology and economics. The field traces its origins to the first general treatise on social mobility by Sorokin (1927) who examined mobility into social elites, such as political leaders, industrialists, millionaires and 'men of genius'. Since then, the field has advanced substantially with respect to the quality and sophistication of the data and analytical methods used, as well as the concepts and theories developed to describe and explain observed patterns of social mobility.[1]

To date, research in this field has generated a wealth of empirical findings on the extent of intergenerational social mobility in economically developed democracies and how it has changed over time (see, e.g. Erikson and Goldthorpe, 1992; Breen, 2004). An important conceptual distinction is generally drawn between absolute social mobility and relative social mobility (Goldthorpe, 2007). Absolute social mobility simply refers to the extent to which individuals obtain a position in a different social class than their parents. Changes in absolute mobility are therefore affected by changes in the social class structure in society. For example, an expansion in the share of 'top-end' jobs in the labour market will have a positive effect on the level of absolute social

[1] See Goldthorpe (2005) for a discussion of the development of the field of research on intergenerational social mobility.

mobility. By contrast, relative social mobility refers to the association between individuals' social class position and that of their parents, *net of changes in the social class distribution*. Relative social mobility is also referred to as 'social fluidity', and it is often seen as an indicator of societal openness and equality of opportunity in society.[2] Not least for this reason, most research focuses on measuring relative social mobility in society.

Past research on over-time change in social fluidity in Germany finds a trend of increasing social fluidity over the course of the 20th century, i.e. a weakening of the association between individuals' social class position and that of their parents (Müller and Pollak, 2015, 2004; Breen and Luijk, 2007; Breen, 2010). However, there is some evidence that this trend of increasing social fluidity may have started to level out for people born in the late 1960s (Mayer and Aisenbrey, 2007).

For Britain, there is little evidence of any systematic change in relative social mobility during the past decades (Bukodi et al., 2015; Goldthorpe, 2004). While some scholars claim to have found a decline in relative social mobility (e.g. Blanden et al., 2004), it has been argued that the empirical grounds for this claim are rather weak (see Gorard, 2008; Erikson and Goldthorpe, 2010; and, for a response, see Blanden et al., 2013).

One common characteristic of most research on over-time change in intergenerational social mobility is that it tends to focus on examining changes in the level of overall social fluidity in society at large. Consequently, we still know relatively little about how the social mobility of specific groups has changed over time. This is

[2] See Breen (2004) for a detailed discussion of the concepts of absolute and relative mobility and the methodological approaches commonly used to measure them.

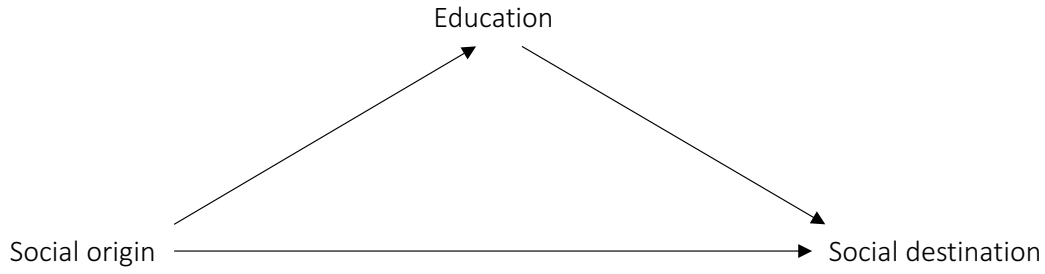
problematic, since over-time changes in social mobility may well differ across different social origin groups.

Aside from providing descriptive accounts of changes in social fluidity, the existing literature has also made advances in developing and testing theories of the micro- and macro-level processes and mechanisms that underpin the observed empirical patterns of intergenerational social mobility. However, a number of important gaps remain within this literature. The remainder of this section reviews the existing body of research on the micro- and macro-level determinants of intergenerational social mobility and discusses what we see as the main gaps in this literature.[3]

*Micro-level determinants of intergenerational social mobility*

The association between a person's social origin and her social destination is commonly conceptualised through what is known as the 'OED triangle' (Erikson and Goldthorpe, 1992), depicted in Figure 1. The figure highlights the role of education as

**Figure 1**. The OED Triangle




[3] The discussion of this literature builds on the author's review of the existing research on intergenerational social mobility and on recent discussions of this body of research by Goldthorpe (2005, 2007, 2013); Breen and Jonsson (2005), Jackson (2013), Bernardi (2012), and Treiman and Ganzeboom (2000).

a mediator of the effect of social origin on social destination, but also depicts an association between social origin and social destination that is not mediated by education. This section discusses existing research on each of the three links depicted in the OED triangle in turn. It considers, first, the link between social origin and educational attainment (OE), second, the link between educational attainment and social destination (ED), and third, the 'direct' link between social origin and social destination (OD), which is not mediated by educational attainment.

*Social origin and educational attainment (OE)*

It is widely recognised that there is a strong association between social origin and educational attainment, and that the extent of this association varies across countries (see, e.g., Shavit and Blossfeld, 1993). While in their seminal volume *Persistent inequality: Changing Educational Attainment in Thirteen Countries*, Shavit and Blossfeld (1993) find this association to be stable during much of the 20th century, more recent research finds a weakening of the association in some European countries, including Germany and Britain (Breen et al., 2009, 2010; Breen and Jonsson 2005; Vallet, 2004; Jonsson et al., 1996). But importantly, while the association between social origin and educational attainment may be weakening, it has been shown to remain relatively strong. This becomes clear when one compares the relatively moderate changes in this association with the much more dramatic decline of gender inequalities in educational attainment over the past few decades (Jackson, 2013, p.2).

The existing literature has advanced different explanations for the effect of social origin on educational attainment. One strand of literature posits that inequalities in educational attainment between children from different social class backgrounds

primarily reflect differences in cognitive ability between them (see, e.g., Saunders, 1996, 1997; Marks, 2014). This argument has faced extensive criticism, mainly on empirical grounds. Refuting the claim that cognitive ability is the most important mechanism through which the effect of social background on educational attainment is channelled, recent research has shown that cognitive ability mediates at most half of this this association. More specifically, the proportion of the association between individuals' social background and their educational attainment that is mediated by cognitive ability has been estimated at around 50 percent in the US (Hsin and Xie, 2016), about 30 percent in Sweden (see Erikson, 2016; Mood et al., 2012) and about 40 percent in Britain (Bourne et al., 2017).[4]

Recognizing the fact that a substantial part of the social origin effect is not mediated by cognitive ability, other researchers have proposed alternative mechanisms which might account for this association. Within this literature, the effect of social origin on educational attainment is commonly broken down into what Boudon (1974) has referred to as primary effects and secondary effects. Primary effects refer to the effects of a person's social origin on her school performance. Secondary effects refer to the effects of a person's social origin on the choices she makes between the different educational options available to her, *net of her school performance*. Existing research has found that both primary and secondary effects contribute to the link between social origin and educational attainment (Jackson and Jonsson, 2013). However, it has also been shown that the strength and relative importance of primary and secondary effects differs across countries and over-time (ibid.).

[4] To our knowledge, no estimates of the percentage of the social origin effect on educational attainment that is mediated by cognitive ability exist for Germany.

Aside from the above-mentioned mediating role of cognitive ability, it has been argued that primary effects – i.e. the effect of social origin on children's school performance – also reflect the extent and nature of the support that children receive from parents and the circumstances they grow up in. More specifically, the higher school performance of children born into wealthier families is thought to result from the fact that their parents invest considerably more economic resources in promoting their children's cognitive development and school performance, for instance through the provision of books, newspapers, tutoring and summer schools (see, e.g., Kaushal, et al., 2011; Duncan and Brooks-Gunn, 1999). It has also been argued that children from more advantaged backgrounds receive more parental support in building certain types of cultural capital – specifically language skills and a taste for 'high culture' (De Graaf et al., 2001; Kloosterman et al., 2011). Proponents of the so-called social reproduction theory of educational inequality (Bourdieu and Passeron, 1977) argue that the higher classes in society use their power and influence to shape educational institutions in such a way that they reward children who display outward markers of cultural capital (also see Bowles and Gintis, 1976; Collins, 1979; Parkin, 1979). Children from lower class backgrounds, unable to demonstrate this familiarity with 'high culture', are thus mistakenly regarded as possessing a lower level of ability, relative to their more advantaged peers, and this is reflected in their formal academic attainment.

Scholars have also advanced different theories that seek to explain secondary effects – i.e. the effects of social origin on the choices individuals make between different educational pathways, net of their educational performance. A common starting point for this literature is to model individuals' education as a set of multiple transitions, at each of which they face the choice between different educational options

(Mare, 1981). This approach generally distinguishes between two or three main educational transitions, depending on the national context. In some countries, the first transition is as early as after the completion of primary education, around age ten, when pupils have to decide between different school tracks in which to pursue their secondary education (as is the case in Germany, for instance). In other countries, the first transition lies after compulsory education, which typically ends at the lower secondary level (as is the case in Britain or Sweden). At this transition point, students who have the necessary grades can generally decide between continuing in general education, enrolling in vocational education and training, or entering the labour market. A further transition lies after the completion of upper secondary education, when students who have progressed to this level and have gained the necessary qualifications, decide between enrolling in university, attending vocational training or entering the labour market.

Theories that seek to explain how social origins affect educational choices at each of these transitions can broadly be divided into those who understand educational choice as a process of rational action and those who see it as a less deliberate result of a person's socialization into different subcultures and value systems. Scholars who take the former theoretical approach generally posit that individuals (together with their parents) base educational choices on an assessment of the expected benefits, costs and risks of the different options available to them (see, e.g., Becker, 1964; Schultz, 1962; Mincer, 1958; Breen and Goldthorpe, 1997; Erikson and Jonsson, 1996; Esser, 1999; Boudon, 1974). However, different strands of rational action theory vary with respect to the factors they expect individuals to consider in making their educational choices and the complexity of information on which they expect individuals to base their decisions.

One prominent theory that takes a rational action approach to educational choice is human capital theory, which has had a particularly strong influence in the discipline of economics. It posits that individuals assess the costs of different career options in terms of the direct cost of pursuing further education as well as the earnings they forego by not entering the labour market (see, e.g., Becker, 1964; Schultz, 1962; Mincer, 1958). Individuals are thought to weight these costs against the benefits of continuing in education, which are assessed in terms of the expected lifetime returns to a given educational investment. Furthermore, educational choices are seen to also be based on the likelihood of receiving (or the risk of not receiving) these future returns to educational investments. It is assumed that individuals have all the relevant information and are able to accurately forecast their foregone earnings and the likely lifetime returns to education. With respect to explaining social class differences in educational choices, human capital theory suggests that these result mainly from differences in the financial resources that children from different class background can invest in their education (see, e.g., Blanden et al., 2011). Paying for a university education, for instance, is seen to generally be much less costly, in relative terms, for an individual from a wealthy background, as compared to an individual who has fewer resources at her disposal.

In response to the arguably unrealistically strong view of rationality implied by human capital theory, alternative theoretical models of educational choice have been developed mainly from within the discipline of sociology. These theories seek to advance a more realistic view of people's capacity to weigh up the costs and benefits of different educational choices. The model of educational choice developed by Breen and Goldthorpe (1997), for instance, posits that rather than focusing on an estimate of expected lifetime earnings, individuals perceive the benefits of different educational

options in terms of whether or not these will allow them to achieve at least the social class position of their parents and thus avoid downward mobility (Ibid., p. 283; see also Keller and Zavalloni, 1964). In other words, the goal of *status maintenance* is seen as the primary concern for young people. Since individuals from higher class backgrounds need a high level of educational attainment in order to achieve a class position equal to that of their parents, they are thought to be willing to take more risks in their educational choices and to choose more demanding educational pathways, which contributes to cross-class differences in individuals' educational choices.

Similar to human capital theory, sociological models of educational choice also highlight that the relative cost of a given educational option differs for people from different class backgrounds as they have different funds at their disposal to meet the costs of their education (Erikson and Jonsson, 1996; Breen and Goldthorpe, 1997). With respect to people's assessment of the riskiness of different educational investments, individuals are seen to focus not primarily on the certainty of their future earnings, but on their chances of completing different educational pathways. It is assumed that individuals base their expected likelihood of success in a given educational pathway on their previous educational performance (Breen and Goldthorpe, 1997), and on the extent to which they can expect help from their parents in supporting them in navigating a specific educational pathway (Erikson and Jonsson, 1996; Pfeffer, 2008). According to sociological approaches to educational choice, class differences in educational attainment thus also result from differences in mean school performance – which is seen to itself result from cross-class inequalities in economic resources, as discussed above.

Rational action theories contrast with culturalist theories of educational inequality, which see the educational choices of young people as mainly reflecting the

specific value system and sub-culture of the social environment that young people were socialised into during their childhood and adolescence. The so-called 'value theory' developed by Hyman (1954) posits that the value of education is mostly subjective, and that it differs across different value systems of different social classes. Children who were socialised in the milieu of lower social classes are seen to attach less value to education, relative to children from higher classes (see also Richardson, 1977; Willis, 1977). This idea of cross-class differences in the valuation of education is also reflected in the theories of the *famille educogène* which contend that parents in higher social class positions attach more value to education than those in lower class positions and that they therefore provide more support to their children in striving for high educational goals (Banks, 1971; Halsey et al., 1963).

While there are clear differences in culturalist approaches and rational action approaches to educational choice, the two can be seen as compatible. This is shown in the work by Akerlof (1997) who integrates the two approaches to educational choice and contents that in addition to weighing up the costs, benefits, and risks highlighted by rational action theory, individuals also consider the attitudes to education by 'significant others' in their socio-cultural environment when making educational choices.

*Educational attainment and social destination (ED)*

With respect to the second link in the OED triangle, existing research shows that there is a strong association between a person's educational attainment and her social destination, the latter generally being measured in terms of social class or income (see, e.g., Shavit and Müller, 1998; Becker, 1964). It has been shown that for most European

societies there has been little change, or if anything some decline, in this association (see, e.g., Whelan and Layte, 2002; Goldthorpe and Jackson, 2008; Goldthorpe, 1996; Breen, 2004).

Prominent theories which aim to provide an explanation of how individuals' educational attainment affects their labour market position are human capital theory, screening and signalling theory, job competition theory, and incentive-enhancing preferences theory. This section outlines each of these theories and, following Goldthorpe (2013), suggests that they can be seen as complementary – each providing insight into a different aspect of the link between individuals' educational attainment and their labour market position – and that they differ in the extent to which they apply to specific forms of education and labour market segments.

While human capital theory has already been discussed above with respect to its theoretical contributions for understanding educational choice, it also speaks to the link between educational attainment and social destination. Put simply, it suggests that the more an individual invests in her or his education and skill development, the more life time earnings that individual can expect (Mincer, 1958; Schultz, 1962; Becker, 1964). Human capital theory has been critiqued for conceptualizing labour as a continuous commodity, and for overlooking that labour is in fact constituted by the 'inconvenient lumps' called workers (Granovetter, 1981). Because of this simplistic conceptualization of labour, human capital theory fails to sufficiently address the dynamics by which workers and jobs are matched. Moreover, human capital theory has been criticised for its focus on the supply side of labour markets and for failing to consider the preconditions and processes by which demand for labour from employers is generated.

In response to the weaknesses of human capital theory, various alternatives have been developed which seek to theorise more explicitly how workers are matched to existing jobs. Arguably the most influential of these is screening and signalling theory (see, e.g. Arrow, 1973; Stiglitz, 1975; Spence 1973, 2002).[5] Proponents of screening and signalling theory focus on how employers solve the problem of hiring employees without having extensive information on them. They posit that employers rely mostly on information on applicants' educational attainment to make their choices of whom to hire. However, the value of this information is seen not to primarily lie in verifying whether or not applicants have specific skills, but in signalling more basic attributes of applicants' personality, such as their readiness to work hard or to acquire new skills and knowledge. Screening and signalling theory thus contrast with human capital theory in that the main function of education is not seen as equipping people with the specific skills and qualifications they will need in a given job, but as allowing employers to screen potential employees for more basic attributes related to their personality and work attitudes, and as enabling applicants to signal these attributes. Proponents of screening and signalling theory suggest that the skills people use in their jobs are generally acquired 'on-the-job', not in their formal education.

Another theory that seeks to explain the link between a person's education attainment and her labour market position is the so-called 'job competition theory' devised by Thurow (1975, 1983).[6] This theory understands the labour market as being comprised of two queues. One is the 'job queue' which consists of all jobs ordered according to the complexity of the work required and the payment offered by employers. The other is the 'labour queue' which consists of all workers ordered by

[5] For a detailed review of signalling and screening theory see Connelly et al. (2011) and Checci (2006).
[6] For a detailed review of the job competition theory see Quintini (2011), McGuinness (2006) and Goldthorpe (2013).

the cost of training them for employment. The latter is approximated by employers based on what are seen to be relevant personal characteristics, such as their attitude to work and their ability to learn new skills and acquire new knowledge. Mirroring the screening and signalling theory, the job competition theory sees employers as relying mostly on people's educational attainment in order to gauge these personal characteristics, but it is also expected that employers take into account people's age and way of life. A key theoretical contribution of the job competition theory is that it understands the value of a person's educational attainment to be relative to that of other people in the labour market (as opposed to absolute), since it functions as a means for employers to rank applicants (Goldthorpe, 2013, p. 21).[7]

A further theory on the link between individuals' educational attainment and their labour market position is the 'theory of incentive-enhancing preferences' which was developed by Bowles, Gintis and Osborne (2001a) and which focuses on the principle-agent problem faced by employers when seeking to enforce employment contracts. It highlights that employers often cannot directly enforce parts of the employment contract, such as the effort an employee puts into her work, because they lack the necessary information and power over the employee. The theory of incentive-enhancing preferences argues that employers seek to mitigate this problem by hiring people that have preferences which lead them to maximise their efforts out of their own accord. These desired applicant preferences include an orientation towards future rather than current rewards, a sense of personal efficacy, and self-discipline. Similar to screening and signalling theory, the theory of incentive-enhancing preferences sees the main role of education as allowing employers to screen applicants with respect to how

[7] On the relative nature of educational attainment also see Hirsch (1977).

likely they are to have these preferences and characteristics. In addition to the level of educational attainment, incentive-enhancing preference theory also expects employers to screen applicants by the type of educational institution (e.g. private vs. public) they have attended. This follows from the contention that different educational institutions instil different values, preferences and work attitudes in people.

As has been argued by Goldthorpe (2013), the different theories of educational attainment and social destination are not mutually exclusive, but can be seen as highlighting different roles of education. Education can function as equipping people with human capital, instil certain values and preferences in people, serve as the screening and signalling of relevant characteristics, and allow employers to rank applicants according to their likely aptitude for employment. Furthermore, the above theories might apply to different extents to different types of education and to different labour market segments. For instance, vocational education and training is more likely to equip individuals with specific skills that can be used on-the-job than is the case for general education. Human capital theory might thus apply more to the school-to-work transition of people in vocational education and training, while screening and signalling theory might more accurately describe the experience of people in general education. Similarly, the function of different personal preferences might differ across types of work and labour market segments. For example, respect for authority and the readiness to follow guidelines might be more sought after by employers hiring applicants for routine work, while creativity and self-reliability may be seen as more valuable by employers hiring for non-routine and managerial types of work.

*Social origin and social destination (OD)*

Aside from the part of the association between social origin and social destination that is mediated by educational attainment, which has been discussed in the foregoing two sections, there is also evidence of a 'direct' association between social origin and social destination that is not mediated by education (see Bernardi and Ballarino, 2016; Erikson and Goldthorpe, 1992). This direct link has been shown to exist in Germany (Müller et al., 1998; Grätz, 2011), Britain (Gugushvili et al., 2017), Sweden (Erikson and Jonsson, 1998), Norway (Hansen, 2001; Mastekaasa, 2011), France (Vallet, 2004), Italy (Bernardi, 2003; Zella, 2010) and Spain (Bernardi, 2012), and no strong evidence has been found of any sustained change in this association over time (Bernardi, 2012; Goldthorpe, 2013).

The role of cross-class differences in the parental support that young people receive in their job search has been proposed as a potential mechanism that may account for this 'direct' social origin effect. It is argued that parents in higher class positions provide their children with more financial support, which the latter can use to spend more time searching for jobs, doing unpaid or low-paid internships, taking more risks in their job search strategy, or for starting their own business (Bernardi, 2012; Pfeffer and Hällsten, 2012). Parents in higher class positions are also seen as being likely to provide their children with more advice, assistance, and encouragement in their job search. Last, parents in higher class positions are thought to be more likely to have extensive professional networks with people in similar class positions, which their children can draw on in their job search (see Bernardi and Ballarino, 2016; Loury, 2006).

A further explanation of the 'direct' association between social origin and social destination that is not mediated by education focuses on cross-class differences in cognitive ability. In their controversial volume *The Bell Curve*, Herrnstein and Murray (1994) suggest that most of the association between individuals' social origin and social destination can be accounted for by cross-class differences in cognitive ability, suggesting that cognitive ability also mediates most of the 'direct' effect of social origin. This view continues to have an influence in the academic community, as manifest in the more recent work by Marks (2014). Given the persistent influence of this view, it constitutes an important limitation of the existing literature that to date, there are no estimates of the proportion of the direct effect of people's social background on their social position in later life that is mediated by their cognitive ability.

Going beyond the focus on the role of cognitive ability in the intergenerational transmission of inequality, there is now also an emerging and fast growing literature suggesting that *non-cognitive* attributes play a role in channelling the intergenerational transmission of inequality (see, e.g., Stumm et al., 2009, 2010; Cheng and Furnham, 2012; Sorjonen, 2012; Deary et al., 2005; Gugushvili et al., 2017; Ryberg et al., 2017; Bernardi, 2012; Bowles et al., 2001b; Jencks et al., 1972; Heckman et al., 2006). It is argued that, due to their socialization, children from higher class backgrounds are generally more likely to have personality traits such as a strong sense of control over their lives, strong self-confidence, as well as specific cultural tastes and knowledge that are an advantage in obtaining jobs in higher social classes, and particularly in high-end service sector industries, such as in leisure, entertainment, or hospitality industries, high-value sales, customer services, or public relations (Goldthorpe, 2007; Goldthorpe and Jackson, 2008). However, as is the case for cognitive ability, we still lack estimates

of the proportion of the parental class effect on individuals' social destination that is mediated by non-cognitive attributes.

Last, it should be noted that some studies find an interaction effect between social origin, educational attainment, and social destination. Goldthorpe (2013) discusses two ways of interpreting this effect (also see Bernardi and Ballarino, 2016). One interpretation is that the association between social origin and social destination is weaker for individuals with higher educational attainment (Hout, 1988; Breen and Luijkx, 2004), and that this is a consequence of the hiring for high end jobs being more strongly based on applicants' merits (see Mastekaasa, 2011; Torche, 2011). An alternative interpretation is that the association between educational attainment and social destination is weaker for individuals with higher class backgrounds, and that this is due to these individuals being able to compensate for a low level of educational attainment, for instance by drawing on their parents' professional networks to obtain a high social class position (Goldthorpe and Jackson, 2008).

*Macro-level determinants of intergenerational social mobility*

The micro-level factors that underpin the intergenerational transmission of inequality are themselves conditioned by the macro-level structures in which they are situated. For example, an individual's educational choice depends on the different educational pathways that exist in a given country, and on the way access to these pathways is structured. Recent research on intergenerational social mobility has begun to pay more attention to the effects of macro-level institutions and structural changes on social mobility. According to Treiman and Ganzeboom (2000) this constitutes a fourth generation of social mobility research, which follows on from earlier sociological

studies of the effects of structural changes at the macro-level on intergenerational social mobility (see, e.g., Treiman, 1970; Blau and Duncan, 1967). This section reviews the existing literature on the relationship between macro-level factors and intergenerational social mobility, focusing on the institutional structures and changes of educational systems and labour markets respectively. We also discuss what we see as the main limitations of this body of research.

An important characteristic of educational systems that is generally recognised as inhibiting intergenerational social mobility is the stratification of education into different school tracks (see, e.g., Werfhorst and Mijs, 2010; Breen and Jonsson, 2005; Brunello and Checchi, 2007; Pfeffer, 2008). In highly stratified educational systems, such as in Germany, students are separated into different tracks at an early age and are given little opportunity to change tracks later on. In less stratified systems, such as in Britain, students attend the same type of educational institution for most of their educational career or are separated into tracks only at a later age. Based on a comparison of different country cases, Brunello and Checchi (2007) and Pfeffer (2008) find a negative association between the level of educational stratification and the level of intergenerational social mobility. This association has been attributed to the fact that children from lower social classes are more likely to be placed in lower school tracks, where they receive less support for their cognitive development and obtain lower school qualifications, thus setting them on a trajectory of increasing relative disadvantage (also see Müller and Pollak, 2010; Werfhorst and Mijs, 2010).

An important change within educational systems that has been argued to have had a bearing on the level of intergenerational social mobility is the process of 'educational expansion', i.e. the substantial increase in the share of people with high levels of educational attainment during the second half of the twentieth century in

most European countries (see, e.g., Hadjar and Becker, 2009). The educational reforms that brought about this expansion occurred mainly in the 1960s and 1970s and it was expected that these reforms would significantly reduce educational inequalities both between the sexes and between social classes (ibid.). Gender inequalities in educational attainment did indeed decline substantially, but it has been shown that educational inequalities between individuals from different social class backgrounds have persisted to a large degree, and, if anything, have only marginally declined (Shavit and Blossfeld, 1993; Goldthorpe, 2007). Scholars have observed that with educational expansion there has been a shift in educational inequality from the secondary to the tertiary level (see, e.g., Lörz and Schindler, 2009; Mayer et al., 2007). Moreover, it has been found that in countries where access to upper-secondary and tertiary education has increased, new forms of formal and informal re-stratification have emerged *within* these levels of education – concerning differences between private and public institutions, between different degree programs offered and between different subject areas – which result in new forms of educational inequality (Ichou and Vallet, 2011; Boliver, 2011).

Institutional characteristics of labour markets that have received most attention in research on social mobility are those that have a bearing on the level of economic inequality within societies (see, e.g., Goldthorpe, 2007; Corak, 2013; Jackson and Jonsson, 2013). These include institutions of collective wage bargaining (Busemeyer and Jensen, 2012), the tax system, and the redistributive institutions of the welfare state, such as unemployment insurance schemes (Esping-Andersen and Wagner, 2012). The level of economic inequality in society is seen as affecting intergenerational social mobility as it shapes the difference in the resources that parents from different social classes can draw on to support their children's educational and occupational careers. As discussed above, these differences in parental support have

been suggested to result in differences in school performance, educational choice and in the school-to-work trajectory of young people from different social class backgrounds. Journalist Timothy Noah (2012) sums up the expected effect of income inequality on intergenerational mobility with the metaphor of a ladder which becomes harder to climb the further apart its rungs are. In other words, the larger the difference in the resources that parents in different class positions have to support their children, the lower the level of intergenerational social mobility, and vice versa. Studies that have empirically examined the relation between income inequality and intergenerational social mobility include cross-national comparisons (see, e.g. Corak, 2013) and case studies of countries known to have relatively little inequality of condition, such as Sweden during the post-WWII period or Hungary under socialist rule (Bukodi and Goldthorpe, 2010; Goldthorpe, 2007, pp. 179-185). While these works generally find a positive association between inequality of condition and intergenerational social mobility – referred to as the 'Great Gatsby Curve' by US Chairman of the Council of Economic Advisers, Alan Krueger (2012) – more recent research has questioned the robustness of the existing evidence of this association (see Bukodi et al., 2017).

With respect to changes in the structure of labour markets, scholars have highlighted the 'modernization' of the economy, as well as the growth of the service sector and the decline of manufacturing as dynamics that are likely to have had an effect on the level of intergenerational social mobility. Functionalist theories of intergenerational social mobility have argued that, as production techniques become more technologically advanced, the demand for skilled workers can be expected to increase and education systems and labour markets are likely to become more meritocratic in order to yield the needed supply of skilled workers (Treiman, 1970; Blau and Duncan, 1967, Ch. 12; Treiman and Yip, 1989). Similarly, theorists of post-

industrialism have argued that, as economies are becoming ever more knowledge intensive, the need to more effectively utilise human capital leads to a meritocratisation of educational systems and labour markets (Bell, 1976). These theories have received strong criticism on both theoretical and empirical grounds. The main theoretical criticism has been that functionalist theories exclusively discuss macro-level processes and fail to consider how changes at the macro level influence and are influenced by the preferences and actions of people at the micro level, and why the latter would be in line with the functional requirements of economic change (Goldthorpe, 2007, 2013). As discussed above, there is also little evidence of educational systems and labour markets becoming more meritocratic. In fact, if any over-time trend can be observed in European countries, it is a weakening of the association between educational attainment and social destination over the past few decades (see, e.g., Whelan and Layte, 2002; Goldthorpe and Jackson, 2008; Goldthorpe, 1996; Breen, 2004).

One important limitation of the literature on the role of macro-level factors in intergenerational social mobility is that much of it relies on relatively weak evidence from comparisons of a limited number of country cases or broad over-time trends. Given the problem of unobserved heterogeneity in cross-national comparisons, they generally do not licence causal inference regarding the effects of policies (Gangl, 2010; Angrist and Pischke, 2009). Similarly, most studies of the effect of over-time trends, such as educational expansion or the post-socialist transition, are limited by the fact that they cannot be certain that their findings are not confounded by other over-time trends. In order to identify the effect of macro-level factors on intergenerational social mobility, what is therefore needed are detailed evaluations of specific policy reforms or structural changes – preferably using research designs that licence causal inference. Such research constitutes a key requisite for policy makers to effectively address the

persistent lack of equality of opportunity in European societies and for the public to hold policy makers accountable to this task.

**Contributions**

This section outlines how the four papers of the dissertation contribute to addressing the limitations of the literature on intergenerational social mobility reviewed in the previous section, as well as the methods and data sources used to this end. The four papers of this dissertation use different statistical methods, depending on the specific research aims they seek to address. Most of our analyses are descriptive in the sense that they investigate the pattern of association between two or more variables of interest, but do not aim to identify causal relationships. Therefore, unless otherwise noted, we use the term 'effect' to refer to the empirical associations between the variables we examine, without claiming to have identified causal relationships between them. However, as elaborated below, some of our analyses use quasi-experimental methods with the explicit aim of revealing causal relationships.

We adopt a probabilistic – as opposed to a deterministic – view of causality. Different understandings of causality are appropriate for different fields of inquiry (see Goldthorpe, 2016; Cox and Wermuth, 2001). While a deterministic view of causality may be adequate in certain areas of the natural sciences, most causal relationships in the social world are probabilistic (ibid.). By extension, the language of necessary or sufficient conditions, is generally unfit to describe these relationships. For instance, coming from a working-class background can be a cause of attaining a low level of educational attainment without being either necessary or sufficient. Instead, such an

association should be understood as implying that coming from a working-class background may *increase the likelihood* of attaining a low level of educational attainment.

As noted above, one limitation of the existing literature is that it mostly focuses on examining over-time change in intergenerational social mobility in society at large. We therefore know relatively little about how the social mobility chances of specific groups have changed over time. The first paper of this dissertation, titled *Left behind? Over-time change in the social mobility of individuals from unskilled working-class backgrounds in Germany*, seeks to contribute to addressing this issue by providing a descriptive account of the over-time changes in the labour market chances of people from unskilled working-class backgrounds, relative to people from skilled working-class and more advantaged backgrounds. As explained in further detail in the paper, the first part of the paper uses a series of binary logistic regression models to examine the odds of different social origin groups to cross specific 'thresholds' in the social class hierarchy and how these have changed across four cohorts of people born between 1940 and 1979 in Germany. We interpret our findings with reference to the key historical trends of post-WWII Germany that parallel the life-courses of the individuals in the four birth cohorts we examine. Yet, it is not the aim of this paper to establish the causal effects of these trends on the relative labour market chances of the different social origin groups we examine.

Having established the over-time pattern in the inequality in labour market chances between individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds, the second part of the first paper examines the extent to which this inequality can be attributed to cross-class differences in educational attainment. More specifically, we examine to what extent children from unskilled working-class backgrounds receive lower levels of educational attainment

than children from higher social class backgrounds and whether these differences then result in an inequality in the labour market chances between these social origin groups. In order to investigate the proportion of the association between individuals' parental class background and their social class position that is mediated by education, we use a non-linear decomposition method, developed by Karlson, Holm and Breen (2012). It is important to note that this method does not allow us to identify the causal role of education in the intergenerational transmission of inequality, but sheds light on the pattern of association between individuals' social origin, educational attainment, and social destination.

Papers two and three of the dissertation seek to contribute to addressing the lack of robust evidence on the effects of macro-level institutional changes on the level of intergenerational social mobility in society. As noted in our review of the existing literature above, one important limitation of past research on the role of macro-level factors in intergenerational social mobility is that much of it relies on relatively weak evidence from broad over-time trends or comparisons of a limited number of country cases. Given the problem of unobserved heterogeneity, these studies do not licence causal inference regarding the effects of institutional changes or policy reforms on the intergenerational transmission of inequality.

Our second paper, titled *Educational inequality after state socialism: The effect of German unification revisited*, seeks to overcome this limitation by exploiting the quasi-experimental nature of German unification. The reform trajectory of East Germany is particularly well suited for examining the effects of large-scale institutional change on the equality of opportunity in society. Not only were the educational system and economy fundamentally restructured under state socialism in the German Democratic Republic (GDR), but this restructuring was then abruptly reversed with German

unification in 1990, when the GDR was reintegrated into the Federal Republic of Germany (FRG). Moreover, the strong institutional continuity of the FRG's education system and economy throughout the second half of the twentieth century makes the FRG a robust control case, demonstrating the development of educational inequalities in the absence of state-socialist reforms and their reversal with unification.

Drawing on this 'natural experiment' of German unification, our second paper examines, first, whether state socialism in the GDR succeeded in realising its ideological commitment to increasing the educational attainment of children from working-class backgrounds, relative to children from more advantaged backgrounds. Second, it assesses whether the restructuring of the East German educational system and economy in the wake of German unification led to a convergence in the level of educational inequality in East Germany towards that of West Germany.

To address the two research aims, we first review the institutional differences between East and West Germany, pre- and post-unification, and formulate theoretical expectations regarding the effects of these differences on educational inequalities between individuals from working-class backgrounds and people from higher social class backgrounds. We base these expectations on the existing theories on the link between individuals' social origin and their educational attainment as well as existing theories on the role of macro-level institutions in shaping this relationship, which we reviewed above. We test the validity of these expectations by using a difference-in-difference design and compare the level of educational inequality between individuals from different social class backgrounds in East and West Germany across six five-year birth cohorts: 1960-64, 1965-69, 1970-74, 1975-79, 1980-84, 1985-89. This multiple cohort design and the use of West Germany as a comparison case allows us to distinguish the unification effect from potentially confounding over-time trends in

educational inequality. Furthermore, it enables us to examine both the short- and long-term consequences of German unification.

Given that the institutional structure of the educational system and the economy of the GDR and the FGR differed in multiple ways, we do not claim to be able to identify the causal role of any specific institution in accounting for the potential differences in educational inequality between the two countries or any over-time change therein. Instead we aim to assess the extent to which the combined institutional differences between the GDR and the FRG led to a difference in the level of educational inequality between the two countries, and whether this difference declined as a result of the institutional assimilation of the GDR into the FRG with German unification.

While the second paper examines the effects of the large-scale institutional change that occurred with German unification, the third paper, titled *Fostering equality of opportunity? Compulsory schooling reform and social mobility in Germany*, focuses on evaluating the effects of one specific reform – the extension of compulsory schooling – on the educational and labour market inequalities between people from different social class backgrounds in Germany. The existing literature has formulated the expectation that extending compulsory schooling may compress educational inequalities (Müller and Haun, 1994: 7; Müller and Pollak, 2004: 84). More specifically, and as discussed in more detail in the second paper, it is thought that by shortening the period of additional schooling required to attain an educational qualification above the most basic qualification, the extension of compulsory schooling reduces the relative cost of attaining such higher qualification. This, in turn, is expected to incentivise particularly the most disadvantaged individuals – who face considerable financial constraints as they complete their education – to stay in school longer and to

attain a higher educational qualification (ibid.). Given the important role of education in channelling the intergenerational transmission of inequality – discussed in our review of the existing literature above – the resulting decrease in educational inequality may further be expected to equalise the labour market prospects of people from different social class backgrounds, thus increasing intergenerational social mobility.

While these arguments are theoretically plausible, they have thus far not been subject to rigorous empirical testing. The first aim of the third paper is to examine whether the extension of compulsory schooling has led to a narrowing in the educational attainment gap between people from different social class backgrounds in Germany. Second, we seek to examine whether a potential decline in educational inequality further translated into a decrease in the labour market inequality between these different social origin groups. Given the expectation of the existing literature that the extension of compulsory schooling mainly affected the most disadvantaged youth, we pay particular attention to examining the reform effect on children from unskilled working-class backgrounds, as compared to children from skilled working-class and more advantaged backgrounds.

In order to evaluate the effect of extending compulsory schooling on educational inequality and social mobility in Germany, we exploit the variation in the timing of the compulsory schooling reform across different West German states (*Bundesländer)*. West German *Bundesländer* extended the period of compulsory schooling from eight to nine years at different times during the three decades following World War II. This within-country variation constitutes a quasi-experimental setting which allows for the use of a *difference-in-difference* design to estimate the causal reform effects on educational and labour market inequalities between different social origin groups (Angrist and Pischke, 2009; Gangl, 2010). Using this quasi-experimental research

design permits us to overcome the limitations of the existing literature on the effects of macro-level factors on intergenerational social mobility, discussed above.

For our first three papers, we use the German Socio-Economic Panel Study (SOEP) as the primary data set for our analyses (Wagner et al., 2007).[8] To avoid any potential bias due to survey specificities, we verify the robustness of our results by replicating all our analyses on a secondary data set. For this purpose, we use the German General Social Survey (ALLBUS/GGSS) (Wasmer et al., 2014).[9] Both the SOEP and the ALLBUS provide detailed information on the social class position and education of respondents and their parents, and the two data sets have been widely used for the analysis of intergenerational social mobility in Germany (see, e.g., Pollak, 2000; Pollak and Müller, 2004; Hertel, 2017). Most of the existing research on social stratification uses the 'complete case analysis' approach and relies on the assumption that missingness in the data is completely at random (White et al., 2010). This is a strong assumption, given that item missingness in the data is likely to differ across respondents from different socio-economic backgrounds. In order to limit the risk of potential bias in our results related to systematic item missingness in our data, we therefore impute missing data points using multiple imputation by chained equations.[10]

Contrasting with the focus of the first three papers on the role of macro-level factors in the intergenerational transmission of inequality, the fourth paper of this dissertation, titled *Understanding the mobility chances of children from working-class backgrounds in Britain: How important are cognitive ability and locus of control?*, seeks to contribute to our understanding of the micro-level processes that account for the tendency of

[8] The SOEP data can be accessed via the website of the DIW (https://www.diw.de/en/soep).
[9] The ALLBUS data can be accessed via the web- site of GESIS (http://www.gesis.org/en/allbus/download).
[10] For a detailed discussion of the advantages of multiple imputation using chained equations in research on social stratification, see Kuha (2013).

individuals from working-class backgrounds to obtain lower levels of educational attainment and lower labour market positions than individuals from higher social class backgrounds. As noted above, there continues to be much debate and uncertainty over the role of different individual-level characteristics in accounting for educational and labour market inequalities between different social origin groups. Our paper takes a path-analytical approach to shed light on the role of two individual-level characteristics, cognitive ability locus of control – i.e. people's sense of control over their own lives – in mediating the effect of coming from a working-class background, as opposed to a higher social class background, on individuals' educational attainment and social class position in Britain.

As noted in the review of the existing literature above, the controversial volume *The Bell Curve* by Herrnstein and Murray (1994) suggests that educational and labour market inequalities between children from different social backgrounds are mainly due to differences in cognitive ability between them. This view continues to be held by some scholars, as reflected in the more recent work by Marks (2014) and Saunders (1996, 2010), and it has also gained considerable traction within policy circles (see, e.g., Cummings, 2013). The first aim of paper four is to empirically test the arguments advanced by these authors by estimating the proportion of the effect of coming from a working-class background, rather than a higher social class background, on individuals' educational attainment and social class position that is mediated by cognitive ability.

If it was the case that – contrary to the claims made by Herrnstein and Murray (1994), Marks (2014) and Saunders (1996, 2010) – a considerable proportion of the effect of individuals' social background is not accounted for by individuals' cognitive ability, the question arises which other individual-level attribute could account for this

effect. As noted in our review of the literature, a growing body of research suggests that socio-emotional attributes play a role in channelling the intergenerational transmission of inequality. This research has found that – more so than other socio-emotional attributes – individuals' locus of control is associated both with their social background and their educational and labour market outcomes (Gugushvili et al., 2017; Stumm et al., 2009; Caliendo et al., 2015; Ng-Knight and Schoon, 2017; Joshi, 2014). However, to date there are no estimates of the importance of locus of control in mediating the parental class effect on individuals' educational attainment and social class position, and how this mediating role of locus of control compares to that of cognitive ability. The second aim of our fourth paper is therefor to examine whether and to what extent locus of control mediates the effect of growing up in a working-class family on individuals' educational attainment and labour market position.

In order to address the two research aims of our fourth paper, we use linear probability models in a path-analytical framework to estimate the strengths of association between individuals' parental class background, their cognitive ability, locus of control, educational attainment and social class position. Based on these estimates, we then calculate the proportions of the parental class effect on individuals' educational attainment and social class position that are mediated by individuals' cognitive ability and locus of control. We also test the robustness of our findings using the non-linear decomposition method developed by Karlson and colleagues (Karlson et al., 2012).

For our analyses in paper four, we use data from the 1970 British Cohort Study (BCS70). The BCS70 is a nationally representative, longitudinal panel survey which follows the life courses of individuals born in Britain in one week in 1970 (see Power and Elliott, 2006; Betthäuser and Bourne, 2017). This data set provides information

on respondents' complete educational and labour market histories, as well as information on their parental class background, cognitive ability and locus of control in early childhood. To our knowledge such data does not (yet) exist for the German case.[11] The primary reason for focusing the fourth article on the British case is therefore the availability of adequate data for our analysis. In discussing the findings of this article, the conclusion of the dissertation considers the extent to which the results obtained for the British case can be expected to also hold with regard to the German case. It should be noted that it is not the aim of this dissertation to provide a comparative analysis of the intergenerational social mobility of individuals from working-class backgrounds in Germany and Britain. Yet, we consider this to be an interesting avenue for future research that could build on the findings of the dissertation.

The four papers of this dissertation are rooted in the discipline of sociology, which is reflected both in the dissertation's focus on social class as a measure of social position, as well as its attention to historical and institutional context and to the generative processes that are expected to underlie the associations we examine. Accordingly, the four papers have been submitted to leading sociological journals. Paper one is currently being revised for resubmission in *Acta Sociologica*. Paper two is currently under review at the *European Sociological Review*. Paper three has been published in the *European Sociological Review* (see Betthäuser, 2017). Paper four, which is co-authored with Mollie Bourne, is currently under review at the *British Journal of Sociology*.

Given the focus of the second and third paper of the dissertation on the effects of institutional changes and educational policy reforms on intergenerational social

[11] However, the National Educational Panel Study (NEPS) in Germany constitutes a survey programme that – if continued over the coming decades – will provide comparable information for the German case (see Blossfeld et al., 2011).

mobility, this dissertation also speaks to the subject-specific fields of social policy and education. Earlier versions of the dissertation papers have thus been presented at conferences and workshops in sociology, social policy and education, including the annual meeting of the *European Consortium of Sociological Research* (ECSR), the annual meeting of the *Research Committee 28 on Social Stratification and Mobility (RC28) of the International Sociological Association (ISA)*, the annual meeting of the *European Network for Social Policy Analysis* (ESPAnet), the Anglo-German Workshop Series on Skill Formation in Context at the *Berlin Social Science Center* (WZB), the Quantitative Methods Hub Seminar Series at the *Department of Education,* University of Oxford, and the Departmental Colloquium and the Social Inequality Research Group Seminar Series of the *Department of Social Policy and Intervention*, University of Oxford.

The remainder of the dissertation proceeds in the following way. The next four chapters consist of the four papers that comprise the main body of the dissertation. Given the self-contained nature of the four papers, references and appendices are given at the end of each paper, respectively, and figures and tables are numbered individually for each paper. The four papers are followed by a concluding chapter which summarises the main findings of the four papers, discusses their relevance to the field of social mobility research, and highlights the key policy implications. As part of the conclusion, we also outline a potential avenue for future research that would build on the findings of this dissertation.

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PAPER 1

## Left behind? Over-time change in the social mobility of children from unskilled working-class backgrounds in Germany

ABSTRACT: *Research on intergenerational social mobility tends to focus on examining the level of overall social fluidity in society. However, from a social justice perspective it can be argued that the type of social fluidity that matters most is upward mobility from the lowest rung of the social ladder. This article examines the labour market chances of children from parents in unskilled working-class positions, relative to children from skilled working-class and higher social class backgrounds, and how they have changed across four birth cohorts in post-WWII Germany. We find that individuals from unskilled working-class backgrounds have substantially lower labour market chances than individuals from skilled working-class or higher social class backgrounds. Moreover, contrasting with recent findings of an increase in overall social fluidity in Germany, we find no evidence of a narrowing of the gap in labour market chances between individuals from unskilled working-class backgrounds and individuals from more advantaged backgrounds. Our results suggest that an important factor underlying this sustained labour market inequality is a persistently high level of educational inequality between these groups.*

## Introduction

Existing research on intergenerational social mobility tends to focus on examining the level of overall social fluidity in society. Consequently, we still know relatively little about the social mobility of specific groups and how it has changed over time. This article focuses on the over-time change in the labour market chances of children from unskilled working-class backgrounds. Having been born into a family at the very bottom of the social class spectrum, these individuals can be seen as having drawn the worst ticket in the 'lottery of birth' (Rawls, 1971). It follows that, from a normative, social justice perspective, whether or not they can improve their social position by being upwardly mobile is of greater concern than is the social mobility of individuals coming from more advantaged social backgrounds.

Past research on over-time change in social fluidity in Germany finds a trend of increasing social fluidity over the course of the 20th century, i.e. a weakening of the association between individuals' social class position and that of their parents, net of changes in the social class structure (Müller and Pollak, 2015, 2004; Breen and Luijk, 2007; Breen, 2010). However, there is some evidence that this trend of increasing social fluidity may have started to level out for people born in the late 1960s (Mayer and Aisenbrey, 2007). In light of these broader trends, the first aim of this article is to examine the over-time change in the labour market chances of individuals from unskilled working-class backgrounds, relative to individuals from higher social class backgrounds, across four cohorts of people born in 1940-49, 1950-59, 1960-69 and 1970-79.[1] As discussed in further detail in the next section of the paper, comparing

[1] Given that individuals' educational experiences are known to be an important determinant of their labour market chances in Germany (Müller and Gangl, 2003), and since educational experiences vary primarily by birth cohort, we adopt a cohort perspective rather than a period perspective on over-time change (see, Breen and Jonsson, 2007; Breen and Luinkx, 2007).

individuals across these four birth cohorts is of particular interest as they grew up and entered the labour market under highly distinct economic circumstances. Given that the institutional context and the dynamics of intergenerational transmission of inequality have been shown to differ substantially between former East and West Germany (see, e.g., Mayer and Solga, 1994; Pollak and Müller, 2004; Betthäuser, 2017), we focus our analysis on individuals born in West Germany.

The second aim of this article is to examine the role of educational inequality in accounting for the difference in the labour market chances of children from unskilled working-class backgrounds and their more advantaged peers, and how it has changed over time. As illustrated by the well-known 'OED triangle', the total effect of individuals' social origin on their social destination can be decomposed into two parts: one that is mediated by children's educational attainment and one not mediated by education – the so-called 'direct' effect of social origin (see, e.g., Goldthorpe, 2007, p. 159; Bernardi and Ballarino, 2016, Gugushvili et al., 2017). Past research suggests that in Germany a substantial proportion of the total effect of parents' social class background on their offspring's labour market position is meditated via individuals' educational attainment (Müller and Pollak, 2004, p. 107). However, it has been argued that this mediating role of education is weaker for people from unskilled working-class backgrounds (Ishida et al., 1995, p. 177). We use a new decomposition method developed by Karlson, Holm and Breen (2012) and a series of logistic regression models to estimate the proportion of the effect of social origin on social destination that is mediated by education and the extent to which the associations between the different components of the OED triangle have changed over time.

This paper uses social class as an indicator of individuals' position in society, as it is known to be a key determinant of individuals' economic security in industrial

and post-industrial economies (Breen and Rottman, 1995; Marshall, 1997; Goldthorpe and Marshall, 1992; Wright, 2008; Crompton, 2008; Scott, 1996). As such, parents' social class position is a key determinant of the economic resources available to their children during their educational trajectory and transition into the labour market (see, e.g., Shavit and Blossfeld, 1993; Bernardi and Ballarino, 2016; Pfeffer and Hällsten, 2012). Children of parents in unskilled working-class positions are considered to be at a particular disadvantage, as in Germany the working and living conditions between the unskilled and skilled working class differ substantially. In the German 'dual labour market', people in skilled working-class positions enjoy a relatively high level of economic security due to labour market institutions such as collective wage bargaining, employment protection legislation and high unemployment insurance benefits, while individuals in the unskilled working class generally receive substantially less institutional support (Leibfried and Tennstedt, 1985; Lindbeck and Snower, 1988; Emmenegger et al, 2012; Palier and Thelen, 2010).

**Why expect over-time change in the labour market chances of individuals from unskilled working-class backgrounds?**

Changes in educational inequality and economic inequality in society are generally thought to be two important macro-level factors shaping the level of intergenerational social mobility in society. This section discusses whether and how changes in these two domains may be expected to have affected the labour market chances of individuals from unskilled working-class backgrounds, relative to individuals from higher social class backgrounds.

Attempts of explaining the trend of increasing overall social fluidity in Germany have highlighted the role of a decline in educational inequality between individuals from different social class origins and an increase in the share of people with high levels of educational attainment, the latter being generally referred to as 'educational expansion'. More specifically, past research attests a decline in educational inequality in Germany over the course of the 20th century (see, e.g., Müller and Pollak, 2004), which – given the known role of education in mediating the association between social origin and destination – is thought to have led to an increase in social fluidity (Breen, 2010). Moreover, based on the observation that the origin-destination association tends to be weaker for people with higher levels of educational attainment in Germany and other western societies (Breen, 2010; Breen and Jonsson, 2007, Hout, 1988), it has been argued that the educational expansion in Germany also contributed to an increase in overall social fluidity (Breen, 2010; Breen et al., 2009, 2010).

If the trends of educational equalization and expansion were to have had an effect on the inequality in labour market chances between individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds, we would expect to find a gradual increase in the relative labour market chances of individuals from unskilled working-class backgrounds across the four cohorts we consider. However, while these trends may account for the observed increase in overall social fluidity during the 20th century, it is not clear that they also led to an increase in the mobility chances of individuals from unskilled working-class backgrounds. With the notable exception of an extension of compulsory schooling in all German states (*Bundesländer*) during the two decades following World War II (see Müller and Haun, 1994), there have been few reforms of the German education system which can be expected to have substantially reduced the educational inequality between this group

and people from more advantaged backgrounds (see, Schneider, 2006; Neugebauer et al., 2013; Bukodi et al., 2017). Moreover, given the generally low level of educational attainment of people from disadvantaged backgrounds (Shavit and Blossfeld, 1993), it is questionable whether the trend of educational expansion in Germany has increased the educational attainment of this group to an extent that would have given rise to a weakening of the effect of their parental class background on their labour market chances. It thus remains an empirical question to what degree there has been a decline in the educational inequality at the bottom of the social class structure and whether educational expansion has led to an increase in the relative labour market chances of people from unskilled working-class backgrounds.

Aside from the dynamics of educational equalization and expansion, the level of economic inequality in society is generally thought to be an important macro-level factor affecting the level of social fluidity in society (Corak, 2013; Andrews and Leigh, 2009). It has been argued that the level of economic resources that parents can use to support their children's education and transition into the labour market is a key determinant of the latter's educational attainment and labour market position (Erikson and Goldthorpe, 1992). Consequently, a high level of inequality in economic resources in the parental generation is seen to lead to a high level of inequality in the educational and labour market chances of children from different social backgrounds (Corak, 2013; Andrews and Leigh, 2009, but see Bukodi et al., 2017), and *vice versa*. Changes in the level of parental economic resources are likely to have a particularly strong effect at the bottom of the social class structure, where parents have to make hard choices about the amount of economic resources they can devote to supporting their children's early development, education and labour market entry.

The level of economic security of people in unskilled working-class positions, relative to people in higher social class positions, has varied considerably across the four birth cohorts we examine. Following the post-war economic depression, the rapid economic growth and the expansion of the welfare state during the *Wirtschaftswunder* of the 1950s and 60s led to full employment, rising living conditions and social security, which is likely to have benefitted particularly people in at the bottom of the income distribution (see Kaelble, 2007: 187-8; Atkinson, 2008, p. 230). By contrast, the relative economic security of this group can be expected to have declined during the period following the 1970s Oil Crisis, which saw a substantial increase in unemployment, economic inequality, relative poverty and a retrenchment of unemployment benefits for people with low unemployment insurance contribution records (Leibfried et al., 1995; BMAS, 2001; OECD, 2011; Ostheim and Schmidt, 2007; Eichhorst and Marx, 2011; Emmenegger et al, 2012).

If these historic developments were to have had a bearing on the relative labour market chances of people from unskilled working-class backgrounds, we would expect the post-war depression to have had a negative effect on the relative labour market chances of this group in the 1940s cohort, while individuals from unskilled working-class backgrounds in the 1950s cohort and to some extent in the 1960s cohort may be expected to have benefitted from the shared prosperity of the *Wirtschaftswunder* (see Table 1). The relative labour market chances of people from unskilled working-class backgrounds in the 1970s cohort may be expected to have been negatively affected by the Oil Crisis and the welfare state retrenchment that began in the early 1970s. It should be noted that we do not aim to establish the causal effects of these macro-level trends, but rather use them to guide our empirical analysis and to interpret our findings in relation to the historical context of post-WWII Germany.

**Table 1**. Expected effects of key macro-level trends on the relative labour market chances of individuals from unskilled working-class backgrounds, by birth cohort

| | *Birth cohort* | | | |
|---|---|---|---|---|
| | *1940-49* | *1950-59* | *1960-69* | *1970-79* |
| Educational equalization and expansion | o | o | o | o |
| Post-war depression | – | | | |
| Wirtschaftswunder / welfare state expansion | | + + | + | |
| Oil-crisis / welfare state retrenchment | | | | – – |

*Notes*: +/- indicate the expected effects of the respective macro-level trend on the relative labour market chances of individuals from unskilled working-class backgrounds.
'o' indicates that no clear expectation could be derived.

## Data and variables

We use the German Socio-Economic Panel Study (SOEP) as the primary dataset for our analyses (see Wagner et al., 2007). In order to avoid any potential bias due to survey specificities, we verify the robustness of our results by running all our models on a secondary dataset, the German General Social Survey (ALLBUS/GGSS) (see Wasmer et al., 2014). Both the SOEP and the ALLBUS provide detailed information on the social class position and education of respondents and their parents, and the two datasets have been widely used for the analysis of intergenerational social mobility in Germany (see, e.g., Pollak, 2000; Pollak and Müller, 2004; Hertel, 2017). All results reported in the main body of the text are based on the SOEP data. The results from our replication analyses based on the ALLBUS data are given in the Appendix. While most previous research on educational and labour market inequalities in Germany uses the 'complete case analysis' approach and thus relies on the assumption that missingness in the data is completely at random (White et al., 2010), we impute missing

data points using multiple imputation by chained equations and thereby limit the risk of potential bias related to systematic item missingness in our data.

Individuals' and parents' social class position is operationalised using the European Socio-Economic Classification (ESeC), which was developed by Rose and Harrison (2010) and has been validated for Germany and other European countries (Wirth et al., 2010). The ESeC class schema is particularly well suited for our analysis as it allows for a clear differentiation of the unskilled working class (ESeC 9) from the skilled working class (ESeC 7 and 8) and higher classes.[2] Given that individuals' social class position tends to stabilise after age 34 (see, e.g., Bukodi and Goldthorpe, 2009, 2011), we reduce our sample to individuals aged 34 and 64 and control for age in all our analyses.

The main dependent variables of our analyses are two binary variables, the first indicating whether individuals have attained a labour market position in the skilled working class or above, and the second indicating whether individuals have attained a position in the intermediate class or the salariat. As discussed above, obtaining a position in the skilled working class in Germany provides people with substantially more secure working and living conditions, compared to being in the unskilled working class. In turn, gaining a position in the intermediate class or the salariat can be expected to constitute a further significant increase in the level of economic security, mainly due to the higher earnings of individuals in these class positions. Using these two 'labour market thresholds' as dependent variables allows us to examine both the short- and long-range mobility chances of individuals from unskilled working-class backgrounds.

[2] It should be noted that here the terms 'skilled' and 'unskilled' refer to the level of skill typically used in a given occupational group, not the level of educational attainment of the observed individuals in either occupational group (Rose and Harrison, 2010).

Mirroring our dependent variable, parents' class position is measured using a three-category version of the ESeC schema, differentiating between (1) the unskilled working class, (2) the skilled working class, and (3) the intermediate class and salariat. We derive parents' class position from fathers' and mothers' class positions using the dominance approach, which allocates parents to a social class position according to the higher social class position of the two spouses (see Erikson, 1984). The parental class position is measured at age fifteen of the cohort members, i.e. when they were at the end of their lower-secondary education.

Cohort members' educational attainment is measured using a four-category variable distinguishing between individuals whose highest educational qualification is (1) a mid-secondary qualification (*Realschulabschluss*), lower secondary qualification (*Hauptschulabschluss*) or less, (2) an upper secondary qualification (*Abitur* or *Berufsausbildung*), (3) a post-secondary qualification (*Meister* or equivalent), or (4) a tertiary qualification (*Universitätsabschluss* or *Fachhochschulabschluss*). We measure individuals' educational attainment at the age at which we observe their social class position. We control for individuals' gender in all our analyses and have conducted separate robustness checks which lead us to the same conclusions for both women and men.

Table 2 shows the distribution of our focal variables across the four birth cohorts we examine. In the parental generation, there has been an expansion of the intermediate class and salariat across the four cohorts, which is mirrored by a contraction of the skilled working class, while the share of people in the unskilled working class has remained relatively stable. By contrast, the social class structure remained stable across the four cohorts in the respondents' generation. This is in line with previous findings on the development of the German social class structure (see,

e.g., Müller and Pollack, 2015). As expected, we observe a trend of educational expansion across our four birth cohorts.

**Table 2**. Distribution of key variables across birth cohorts (%)

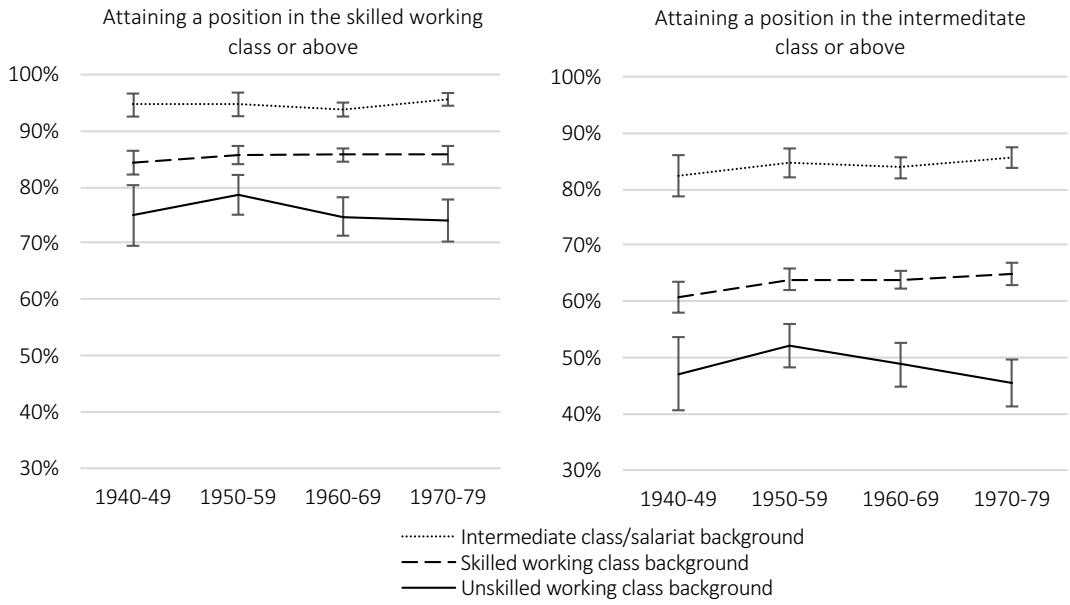
| | *Birth Cohort* | | | |
|---|---|---|---|---|
| | *1940-49* | *1950-59* | *1960-69* | *1970-79* |
| Social class position of parents | | | | |
| 1. Unskilled working class | 14.6 | 16.0 | 14.4 | 13.9 |
| 2. Skilled working class | 61.2 | 59.9 | 57.3 | 53.8 |
| 3. Salariat & Intermediate | 24.2 | 24.1 | 28.4 | 32.3 |
| Social class position of cohort members | | | | |
| 1. Unskilled working class | 14.4 | 13.2 | 13.5 | 12.5 |
| 2. Skilled working class | 45.7 | 45.8 | 45.9 | 45.0 |
| 3. Salariat & Intermediate | 39.9 | 41.0 | 40.6 | 42.4 |
| Educational attainment | | | | |
| 1. Mid-secondary or less | 12.2 | 10.2 | 8.7 | 8.0 |
| 2. Upper-secondary | 51.8 | 49.7 | 47.5 | 45.2 |
| 3. Post-secondary | 1.5 | 3.7 | 7.9 | 10.4 |
| 4. Tertiary | 34.5 | 36.4 | 35.9 | 36.4 |

N: 19,578 (SOEP)

**Results 1: Over-time change in the labour market chances of individuals from unskilled working-class backgrounds**

As noted above, our first aim is to provide a descriptive account of labour market inequality between people from unskilled working-class backgrounds and people from more advantaged backgrounds, and how this has changed over time. To this end, we apply two binary logit models for each of our two dependent variables, i.e. attaining a position in the skilled working class or above (Threshold 1), and attaining a position in the intermediate class or above (Threshold 2). We include our measure of parental class as the focal explanatory variable, as well as an interaction between parental class and birth cohort membership.

Figure 1. Predicted probability of attaining a position above the first and second labour market threshold, by birth cohort, binomial logit




*Notes*: 95% Confidence Intervals; Predicted probabilities based on M2 and M4 in Table A1 (SOEP)

Based on these models, Figure 1 shows the predicted probabilities of individuals from different social class backgrounds to attain a position above the two labour market thresholds. All odds ratios of the models are shown in Table A1 in the Appendix. As indicated by the distance between the lines in Figure 1, there is a substantial difference in the labour market chances of people from unskilled working-class backgrounds, people from skilled working-class backgrounds and people from intermediate class and salariat backgrounds. The probability of people from unskilled working-class backgrounds born in the 1940s to attain a position in the skilled working class or above, i.e. to cross Threshold 1, was about 75 percent, while it was about 85 percent for people from skilled working-class positions and about 95 percent for people from intermediate class or salariat backgrounds. Similarly, the probability of people from unskilled working-class backgrounds to attain a position in the intermediate class or above, i.e. to cross Threshold 2, was about 48 percent, while it was about 60 percent for people from skilled working-class backgrounds and about 82 percent for people

from intermediate class or salariat backgrounds. In short, the difference in the labour market chances of individuals from unskilled working-class backgrounds and people from more advantaged backgrounds was about ten percentage points or higher in the 1940s birth cohort.

With regards to over-time change across the first two birth cohorts – i.e. the 1940s and the 1950s cohorts – Figure 1 suggests that there may have been an increase in the labour market chances of individuals from unskilled working-class backgrounds, relative to individuals from skilled working-class and higher social class backgrounds. However, this over-time change is not statistically significant (see Table A1, M2). With regards to the second labour market threshold, we find a statistically significant general increase in the *absolute* likelihood of all individuals to obtain a position in the intermediate class or above between the 1940s and 1950s cohorts (see Figure 1 and Table A1, M3). This reflects an increase in the proportion of jobs in higher social class positions at the time of the German *Wirtschaftswunder*. Yet, this shift in the social class structure appears to have benefitted people from unskilled working-class backgrounds and people from higher social class backgrounds to similar extents, thus leaving the *relative* labour market chances between them unchanged. In sum, we do not find evidence for the expectation that the expansion of the welfare state and the rise in economic prosperity during the *Wirtschaftswunder* increased the relative labour market chances of people from unskilled working-class backgrounds.

With respect to over-time change across the last three birth cohorts – i.e. the 1950s, 1960s and 1970s cohorts – we also find no evidence for a decline in the labour market inequality between people from unskilled working-class backgrounds and people from higher social class backgrounds. Instead, Figure 1 suggests that, if anything, there may have been a modest widening of the gap in labour market chances

between these groups across the three birth cohorts. However, this trend is only statistically significant at the second labour market threshold for the contrast between individuals from unskilled and skilled working-class backgrounds (Table A1, M2 and M4). While this constitutes only weak evidence for an increase in inequality, our results do strongly suggest that there has been no decline in the gap in labour market chances between individuals from working-class backgrounds and people from more advantaged backgrounds.[3] This finding indicates that the trend of increasing social fluidity during the 20th century in Germany (Müller and Pollak, 2015, 2004; Breen and Luijk, 2007; Breen, 2010), does not seem to hold for individuals from unskilled working-class backgrounds across the four birth cohorts we consider.

**Results 2: Education as a channel for the intergenerational transmission of disadvantage**

Our second research question focuses on the role of educational inequality in accounting for the persistent inequality in the labour market chances of people from unskilled working-class backgrounds and people from more advantaged backgrounds. More specifically, we seek to assess to what extent educational attainment mediates the effect of growing up in an unskilled working-class family on individuals' own social class position and how this mediating role has changed over-time

As noted above, we use the decomposition method developed by Karlson, Holm and Breen (2012) to estimate the percentage of the total effect of parental class

[3] Replicating our models using the ALLBUS data leads us to the same conclusions (see Table A2 and Figure A1 in the Appendix). However, it should be noted that the ALLBUS data show the increase in the inequality between individuals from unskilled and skilled working-class backgroudns to be statisitically signifiacnt for the first labour market threshold, but not for the second labour market threshold.

on individuals' labour market chances that is mediated via individuals' educational attainment.[4] Figure 2 shows this mediation percentage for each of our four birth cohorts, separately for the two labour market thresholds. By way of example, the first dot in Figure 2 indicates that for people born in the 1940s about half of the effect of being born into a skilled working-class family as opposed to being born into an unskilled working-class family (the reference category) is mediated by educational attainment. Importantly, this proportion appears to be highly stable across the four birth cohorts and across both labour market thresholds.[5,6] In other words, in all four birth cohorts about half of the labour market disadvantage of individuals from unskilled working-class backgrounds can be explained by the fact that they leave the educational system with lower educational qualifications than is the case for individuals from higher social class backgrounds.[7] Importantly, this finding contradicts past research which claims that education does not play a prominent role in explaining the labour market disadvantage experienced by children from unskilled working-class families (cf. Ishida et al., 1995: 177).

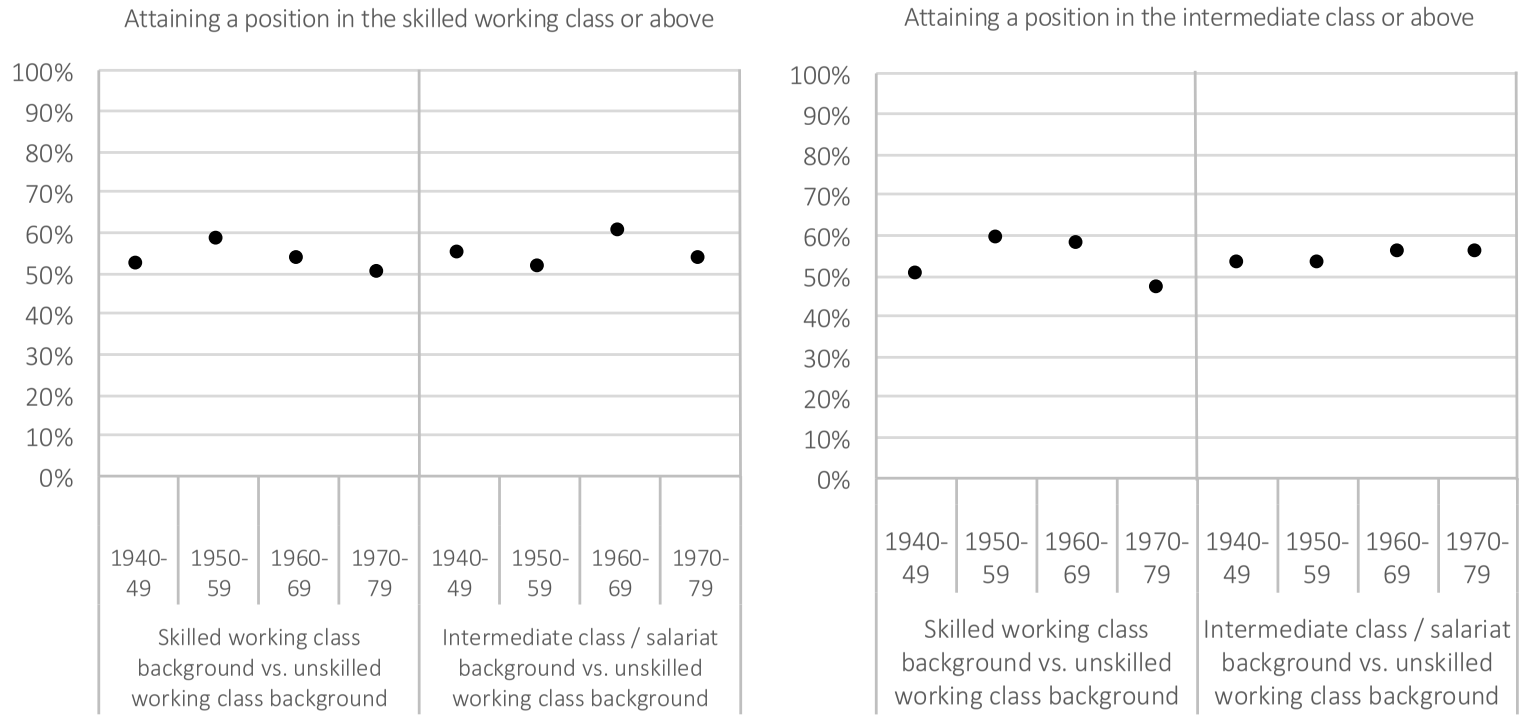
[4] This method extends the decomposition properties of linear models to nonlinear probability models. It is derived from a linear latent variable model assumed to underlie the logit or probit model. For an in-depth discussion of this method see Karlson et al. (2012). The method developed by Karlson et al. (2012) does not provide confidence intervals for the estimated mediation percentages.

[5] This finding also emerges from our seperate analyses using the ALLBUS data (see Figure A2 in the Appendix).

[6] Perhaps surprisingly, given the known importance of educational qualifications in determining individuals' labour market position in Germany, our results correspond closely to those of Breen and Karlson (2014), who find that in Britain educational attainment also accounts for about half of the effect of parental class on individuals' social class position.

[7] It should be noted that our estimates of the proportion of the parental class effect on individuals' social class position that is mediated by educational attainment are lower-bound estimates, since there is likely to be some more subtle variation in individuals' educational attainment (such as the prestige of the school or university attended) which is not captured in our data, but which may affect individuals' social class position.

**Figure 2**. Percentage of effect of parental class on individuals' social class position mediated by educational attainment




*Note*: Based on SOEP data

While Figure 2 suggests stability in the role of education in channelling the intergenerational transmission of disadvantage in Germany, this stability may mask more subtle changes in the associations within in the abovementioned 'OED triangle', i.e. (i) the association between individuals' parental class background and their educational attainment, (ii) the association between individuals' educational attainment and their social class position, and (iii) the 'direct' association between individuals' parental class background and their social class position, not mediated by education. Given the expansion of the 'knowledge economy' that began in Germany in the early 1970s (Wren, 2013; Seeleib-Kaiser et al., 2011), one could, for example, expect a strengthening of the association between individuals' educational attainment and their social class position (cf. Bell, 1976), which may have compensated a possible

Table 3. Over-time change in the effect of parental class on educational attainment, ordered logit, odds ratios

| | *M1* | *M2* |
|---|---|---|
| Parental class | | |
| 1. Unskilled working class (rf.) | | |
| 2. Skilled working class | 2.101 *** | 1.949 *** |
| 3. Salariat & Intermediate | 7.296 *** | 7.200 *** |
| Birth cohort | | |
| 1940-49 | 0.765 *** | 0.761 * |
| 1950-59 (*rf*.) | | |
| 1960-69 | 1.110 ** | 1.011 |
| 1970-79 | 1.241 *** | 1.160 |
| Birth cohort * Parental class | | |
| 1940-49 * Skilled working class | | 1.006 |
| 1940-49 * Salariat & Intermediate | | 1.009 |
| 1960-69 * Skilled working class | | 1.167 |
| 1960-69 * Salariat & Intermediate | | 1.006 |
| 1970-79 * Skilled working class | | 1.087 |
| 1970-79 * Salariat & Intermediate | | 1.059 |

* p < 0.05, ** p < 0.01, *** p < 0.001, N: 19,578 (SOEP)

*Notes*: Gender and age controlled for in all models (not shown)

weakening in the association between parental class and educational attainment. Such over-time change may not be reflected in any change in the proportion of the parental class effect that is mediated by education, which we estimated above.

Table 4. Over-time change in the effect of parental class and individuals' educational attainment on their social class position at age 34, binary logit, odds ratios

| | *Attaining a position in the skilled working class or above* | | *Attaining a position in the intermediate class or above* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Educational attainment | | | | |
| 1. Mid-sec. or less (*rf.* ) | | | | |
| 2. Up-sec. | 3.772 *** | 4.495 *** | 2.818 *** | 3.735 *** |
| 3. Post-sec. | 13.805 *** | 16.007 *** | 9.612 *** | 11.460 *** |
| 4. Tertiary | 30.825 *** | 24.040 *** | 26.720 *** | 26.710 *** |
| Parental class | | | | |
| 1. Unskilled working class (rf.) | | | | |
| 2. Skilled working class | 1.437 *** | 1.268 * | 1.417 *** | 1.280 |
| 3. Salariat & Intermediate | 2.439 *** | 2.354 *** | 2.574 *** | 2.489 ** |
| Birth cohort | | | | |
| 1940-49 | 1.000 | 0.870 | 0.959 | 0.984 |
| 1950-59 *(rf.)* | | | | |
| 1960-69 | 0.851 * | 0.956 | 0.886 * | 1.208 |
| 1970-79 | 0.848 * | 0.854 | 0.869 | 0.985 |
| Birth cohort * Education | | | | |
| 1940-49 * 2. Up-sec. | | 1.028 | | 0.867 |
| 1940-49 * 3. Post-sec. | | 0.977 | | 1.151 |
| 1940-49 * 4. Tertiary | | 1.969 | | 1.150 * |
| 1960-69 * 2. Up-sec. | | 0.724 * | | 0.635 * |
| 1960-69 * 3. Post-sec. | | 0.777 | | 0.735 |
| 1960-69 * 4. Tertiary | | 1.193 | | 0.832 |
| 1970-79 * 2. Up-sec. | | 0.725 * | | 0.614 |
| 1970-79 * 3. Post-sec. | | 0.763 | | 0.710 |
| 1970-79 * 4. Tertiary | | 1.497 | | 1.152 |
| Birth cohort * Parental class | | | | |
| 1940-49 * Skilled working class | | 1.112 | | 1.088 |
| 1940-49 * Salariat & Intermediate | | 1.092 | | 1.016 |
| 1960-69 * Skilled working class | | 1.171 | | 1.078 |
| 1960-69 * Salariat & Intermediate | | 0.915 | | 0.990 |
| 1970-79 * Skilled working class | | 1.254 | | 1.325 |
| 1970-79 * Salariat & Intermediate | | 1.304 | | 1.180 |

* p < 0.05, ** p < 0.01, *** p < 0.001, N: 19,578 (SOEP)

*Notes*: Gender and age controlled for in all models (not shown)

In order to examine whether there have been any over-time changes in the associations that comprise the OED triangle, we first focus on the association between individuals' parental class background and their educational attainment. To this end, we run two ordered logit models with the four-category educational attainment variable described above as the dependent variable, first including parental class as the main explanatory variable (Table 3, M1) and then adding an interaction between parental class and birth cohort membership (Table 3, M2).[8] The interaction terms shown in M2 of Table 3 suggest a persistent gap in the educational attainment between individuals from unskilled working-class backgrounds and people from higher social class backgrounds across the four birth cohorts we examine. This finding contrasts with the finding of a decline of educational inequality in Germany over the course of the 20th century (see, e.g., Breen 2010), and suggests that this general trend does not appear to have benefitted children from unskilled working-class backgrounds in the four cohorts we examine.

The next step of our analysis examines, first, the association between individuals' educational attainment and their labour market position, and second the direct effect of peoples' social class background on their labour market position, net of educational attainment. We apply two sets of binary logit models for each of the two labour market thresholds. In the first set of models we include individuals' educational attainment and parental class background as the focal explanatory variables (Table 4, M1 and M3). In the second set of models we then add an interaction between educational attainment and birth cohort membership, as well as an interaction

[8] We checked that the parallel regression assumption holds by running a series of binary logit models for different educational thresholds, which confirmed that the finding holds across the different educational thresholds.

between parental class background and birth cohort membership (Table 4, M2 and M4).

As expected, the main effect of our measure of educational attainment shown in M1 and M3 indicates that individuals' level of education exerts a strong influence on their chances to attain a position above either of the two labour market thresholds. However, the interaction terms between educational attainment and birth cohort membership shown in M2 and M4 suggests that there has been no systematic change in this association across the four birth cohorts we examine. This finding contradicts the expectation that the 'knowledge economy' has led to a strengthening of this association across the birth cohorts we examine.

With regards to the direct effect of individuals' social class background on their labour market position, net of educational attainment, the main effect of our measure of parental class shown in M1 and M3 confirms our finding from the decomposition analysis that parents' class position affects individuals labour market position not only via their educational attainment, but also 'directly', or rather through other mechanisms.[9] However, the interaction between parental class and birth cohort in M2 and M4 suggests little evidence for any systematic change in this direct effect of peoples' parental class background on their labour market chances across the four birth cohorts we consider.[10]

[9] The existing literature suggests several potential mechanisms that may account for this 'direct' effect of parental class on children's class destination, including the role of parents' professional networks and wealth in aiding individuals' transition into the labour market (see, e.g., Bernardi and Ballarino, 2016; Pfeffer and Hällsten, 2012), as well as individuals' cognitive and non-cognitive development (see, e.g., Gugushvili et al., 2017).

[10] As is the case for the results from our decompostion analysis, running our models seperately using the SOEP and the ALLBUS data lead us to the same conclusions with regards to ovet-time changes in the associations of the OED triangle (see Tables A2 and A3 in the Appendix).

**Conclusions**

While past research on intergenerational social mobility has focussed on measuring the level of overall social fluidity in society, this paper examined the social mobility chances of the specific group of individuals born into unskilled working-class families. From a normative, social justice standpoint, we consider the mobility chances of individuals in this group to be of particular importance, given their disadvantaged position at birth. This paper has sought, first, to provide a descriptive account of the inequality in the labour market chances between this group and people from higher social class backgrounds, and of how this inequality has changed over time. Second, we examined the role of educational inequality in accounting for the difference in the labour market chances of children from unskilled working-class backgrounds and their more advantaged peers, as well as the over-time change therein.

Our first main finding is that there appears to be a substantial gap between the labour market chances of individuals from unskilled and skilled working-class backgrounds. More specifically, we find a difference of about ten percentage points in the chances of the individuals in these groups to attain a position above the two labour market thresholds we examine. This finding confirms our expectation that the stratification within the working class plays an important role in the intergenerational transmission of inequality in Germany.

Second, contrasting with the finding of previous research of a trend of increasing social fluidity in Germany over the course of the 20$^{th}$ century (Müller and Pollak, 2015, 2004; Breen and Luijk, 2007; Breen, 2010), we do not find any narrowing of the gap in the labour market chances between people from unskilled working-class backgrounds and people from higher social class backgrounds across the four cohorts

we consider. This finding is in line with the finding by Mayer and Aisenbrey (2007) of a levelling-out of the trend of increasing social fluidity in Germany for people born in the late 1960s. While there appears to have been an increase in the overall level of *absolute* upward mobility between the 1940s and 1950s cohorts at the time of the German *Wirtschaftswunder*, this trend seems to have benefitted individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds to similar extends, thus leaving *relative* social mobility rates of these groups unchanged. Similarly, with regards to over-time change between the 1950s and the 1970s cohorts, we find no evidence for a substantial change in the educational and labour market inequality between individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds in the context of the 1970s Oil Crisis and the era of welfare state retrenchment.

Our third main finding is that about half of the gap in the labour market chances between people from unskilled working-class backgrounds and people from more advantaged backgrounds can be attributed to the fact that children from unskilled working-class families tend leave school with lower educational qualifications than is the case for children from more advantaged backgrounds. This considerable role of education in channelling the effect of individuals' class background on their labour market chances appears to be stable across the four birth cohorts we examine. The finding of over-time stability in the mediating role of education is confirmed by the results of our step-wise analysis of the associations between individuals' social origin, their educational attainment and their social destination, as conceptualised through the OED triangle. Contrasting with past observations of a general trend of declining educational inequality over the course of the 20$^{th}$ century in Germany (Müller and Pollak, 2004; Breen 2010), we do not find any evidence of a narrowing gap in the

educational attainment of individuals from unskilled working-class backgrounds and individuals from more advantaged backgrounds across the four cohorts we examine. Similarly, we find a persistent 'direct' effect of individuals' parental class background on their labour market chances, net of their educational attainment, and we find no systematic change in the link between individuals' educational attainment and their labour market chances.

When interpreting the persistent disadvantage of people from unskilled working-class backgrounds in terms of their educational and labour market prospects, it is important to consider possible over-time changes in the composition of this group with regards to different individual-level characteristics, such as cognitive and socio-emotional attributes or the educational and socio-cultural resources these individuals can rely on during their education and labour market entry. Such compositional changes may have counteracted or cancelled out any potential effects of the institutional and economic circumstances under which the different birth cohorts received their education and entered the labour market. While a comprehensive investigation of possible compositional changes with regards to all relevant individual-level characteristics lies beyond the scope of this article, we investigate whether there has been any over-time change in the cultural and educational resources that children in this group can draw on, relative to people from more advantaged backgrounds, as indicated by their parents' social status and educational attainment (Bukodi and Goldthorpe, 2013). We find that there has been no substantial change in this regard across the four cohorts we consider (see Table A5 in the Appendix). Furthermore, the fact that the proportion of individuals with parents in unskilled working-class positions did not change substantially across the four birth cohorts we examine renders substantial changes in the composition of this group unlikely (see Table 2).

The overall picture of sustained educational and labour market inequality between individuals from unskilled working-class backgrounds and their more advantaged peers that emerges from our analyses suggests that the drastic economic changes and the educational expansion during the German post-war era did not lead to substantial changes in the educational and labour market prospects of children from unskilled working-class backgrounds, relative to individuals from higher social class backgrounds. However, considering the descriptive nature of our findings and given our focus on long-term trends at the societal level, it is important to note that our finding of stability in the relative labour market chances of this group may mask the effects of more specific macro-level changes. A fruitful avenue for future research would therefore be to use quasi-experimental methods to evaluate the effects of specific changes in the German educational system or labour market on the educational and labour market chances of different social origin groups.

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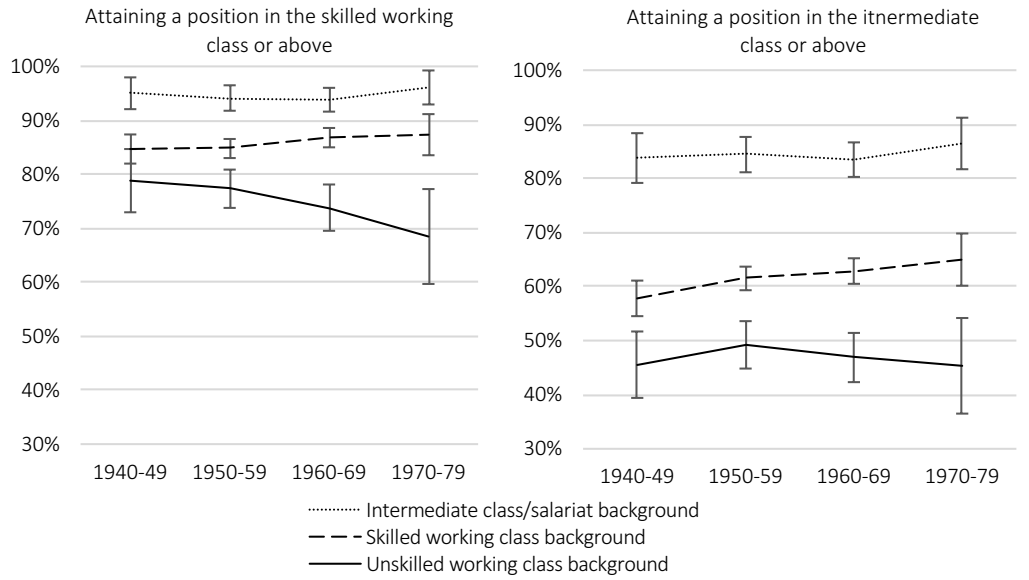
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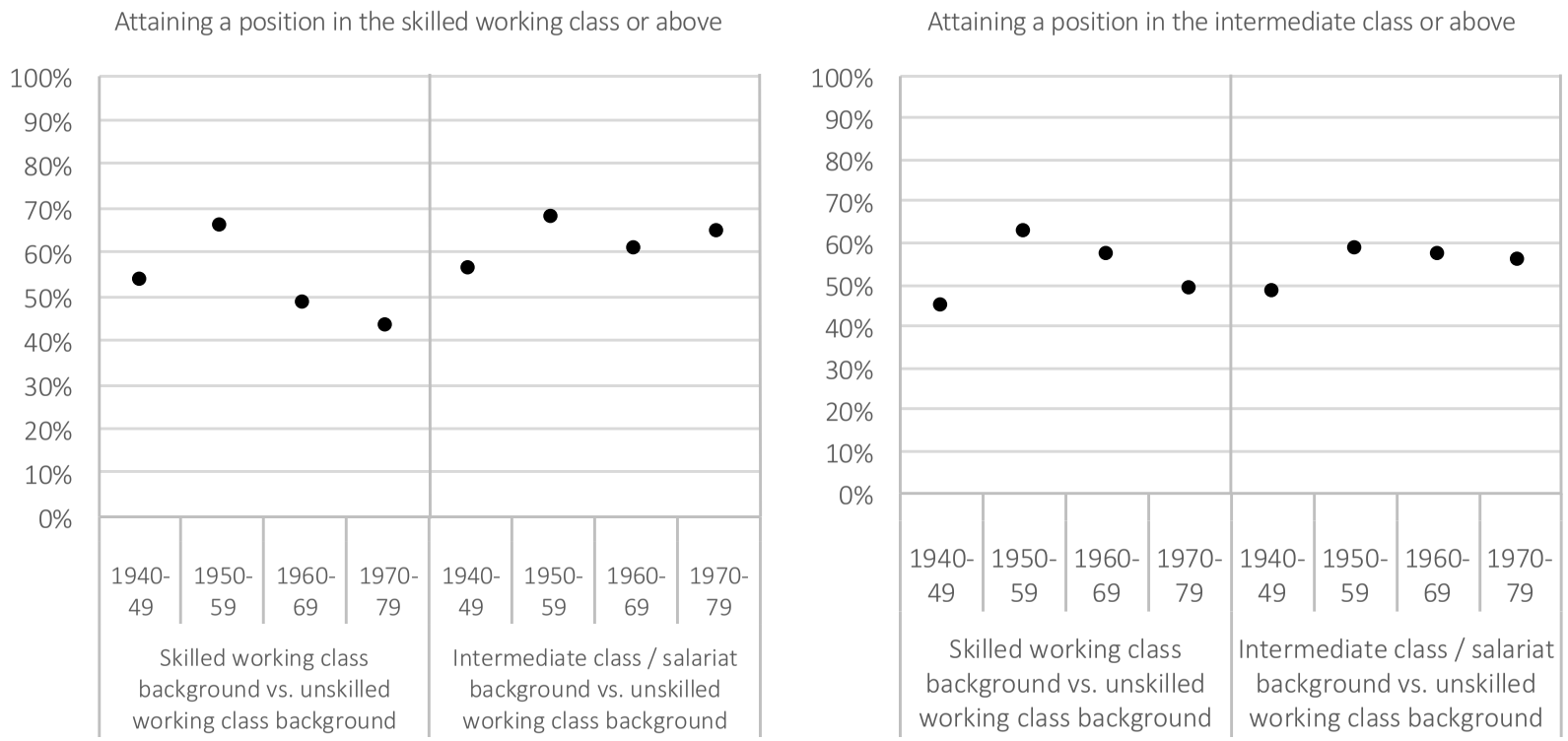
## Appendix

**Figure A1**. Predicted probability of attaining a position above the first and second labour market threshold, binomial logit (ALLBUS)




*Notes*: 95% Confidence Intervals;
Predicted probabilities based on M2 and M4 in Table A2 (ALLBUS)

**Figure A2**. Percentage of effect of parental class on individuals' social class position mediated by educational attainment




*Note*: Based on ALLBUS data

Table A1. Over-time change in the effect of parental class on labour market position at age 34, binary logit, odds ratios

| | *1st Labour Market* | | *2nd Labour Market* | |
|---|---|---|---|---|
| | M1 | M2 | M3 | M4 |
| Parental class | | | | |
| 1. Unskilled working class (rf.) | | | | |
| 2. Skilled working class | 1.893 *** | 1.628 *** | 1.847 *** | 1.629 *** |
| 3. Salariat & Intermediate | 5.622 *** | 4.873 *** | 5.656 *** | 5.070 *** |
| Birth cohort | | | | |
| 1940-49 | 0.887 | 0.816 | 0.857 ** | 0.819 |
| 1950-59 (*rf* .) | | | | |
| 1960-69 | 0.922 | 0.802 | 0.960 | 0.873 |
| 1970-79 | 0.967 | 0.778 | 0.994 | 0.766 * |
| Birth cohort * Parental class | | | | |
| 1940-49 * Skilled working class | | 1.106 | | 1.065 |
| 1940-49 * Salariat & Intermediate | | 1.204 | | 1.034 |
| 1960-69 * Skilled working class | | 1.240 | | 1.141 |
| 1960-69 * Salariat & Intermediate | | 1.044 | | 1.072 |
| 1970-79 * Skilled working class | | 1.287 | | 1.360 * |
| 1970-79 * Salariat & Intermediate | | 1.560 | | 1.405 |

* p < 0.05, ** p < 0.01, *** p < 0.001, N: 19,578 (SOEP)

*Notes*: Gender and age controlled for in all models (not shown)

Table A2. Over-time change in the effect of parental class on labour market position at age 34, binary logit, odds ratios

| | *1st Labour Market Threshold* | | *2nd Labour Market Threshold* | |
|---|---|---|---|---|
| | M1 | M2 | M3 | M4 |
| Parental class | | | | |
| 1. Unskilled working class (rf.) | | | | |
| 2. Skilled working class | 1.923 *** | 1.642 *** | 1.779 *** | 1.648 *** |
| 3. Salariat & Intermediate | 5.449 *** | 4.775 *** | 5.894 *** | 5.583 *** |
| Birth cohort | | | | |
| 1940-49 | 1.069 | 1.145 | 0.867 * | 0.863 |
| 1950-59 (*rf* .) | | | | |
| 1960-69 | 1.032 | 0.819 | 1.010 | 0.910 |
| 1970-79 | 1.106 | 0.693 | 1.090 | 0.856 |
| Birth cohort * Parental class | | | | |
| 1940-49 * Skilled working class | | 0.906 | | 0.994 |
| 1940-49 * Salariat & Intermediate | | 1.085 | | 1.106 |
| 1960-69 * Skilled working class | | 1.426 | | 1.164 |
| 1960-69 * Salariat & Intermediate | | 1.132 | | 1.025 |
| 1970-79 * Skilled working class | | 1.941 * | | 1.357 |
| 1970-79 * Salariat & Intermediate | | 2.397 | | 1.379 |

* p < 0.05, ** p < 0.01, *** p < 0.001, N: 8,798 (ALLBUS)
*Notes*: Gender and age controlled for in all models (not shown)

Table A3. Over-time change in the effect of parental background on educational attainment, ordered logit, odds ratios

| | *M1* | *M2* |
|---|---|---|
| Parental class | | |
| 1. Unskilled working class (rf.) | | |
| 2. Skilled working class | 2.023 *** | 1.979 *** |
| 3. Salariat & Intermediate | 7.800 *** | 7.930 *** |
| Birth cohort | | |
| 1940-49 | 0.649 *** | 0.721 * |
| 1950-59 (*rf* .) | | |
| 1960-69 | 1.205 *** | 1.135 |
| 1970-79 | 1.336 *** | 1.178 |
| Birth cohort * Parental class | | |
| 1940-49 * Skilled working class | | 0.852 |
| 1940-49 * Salariat & Intermediate | | 0.984 |
| 1960-69 * Skilled working class | | 1.123 |
| 1960-69 * Salariat & Intermediate | | 0.940 |
| 1970-79 * Skilled working class | | 1.164 |
| 1970-79 * Salariat & Intermediate | | 1.160 |

* p < 0.05, ** p < 0.01, *** p < 0.001, N: 8,798 (ALLBUS)
*Notes*: Gender and age controlled for in all models (not shown)

Table A4. Over-time change in the effect of educational attainment on labour market position at age 34, binary logit, odds ratios (ALLBUS)

| | *Attaining a position in the skilled working class or above* | | *Attaining a position in the intermediate class or above* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Educational attainment | | | | |
| 1. Mid-sec. or less (*rf.* ) | | | | |
| 2. Up-sec. | 5.924 *** | 5.792 *** | 3.604 *** | 3.530 *** |
| 3. Post-sec. | 25.322 *** | 29.489 *** | 15.199 *** | 16.929 *** |
| 4. Tertiary | 57.310 *** | 60.685 *** | 34.243 *** | 33.507 *** |
| Parental class | | | | |
| 1. Unskilled working class (rf.) | | | | |
| 2. Skilled working class | 1.469 *** | 1.248 | 1.371 *** | 1.268 * |
| 3. Salariat & Intermediate | 2.100 *** | 1.834 * | 2.574 *** | 2.416 *** |
| Birth cohort | | | | |
| 1940-49 | 1.399 ** | 1.354 | 1.066 | 1.145 |
| 1950-59 *(rf.)* | | | | |
| 1960-69 | 0.938 | 0.778 | 0.891 | 0.698 |
| 1970-79 | 0.969 | 0.543 | 0.914 | 0.545 |
| Birth cohort * Educational attainmer | | | | |
| 1940-49 * 2. Up-sec. | | 1.057 | | 0.865 |
| 1940-49 * 3. Post-sec. | | 0.476 | | 0.558 |
| 1940-49 * 4. Tertiary | | 0.745 | | 0.766 |
| 1960-69 * 2. Up-sec. | | 0.993 | | 1.193 |
| 1960-69 * 3. Post-sec. | | 0.994 | | 1.072 |
| 1960-69 * 4. Tertiary | | 0.755 | | 1.241 |
| 1970-79 * 2. Up-sec. | | 1.123 | | 1.405 |
| 1970-79 * 3. Post-sec. | | 0.629 | | 1.074 |
| 1970-79 * 4. Tertiary | | 1.000 | | 1.471 |
| Birth cohort * Parental class | | | | |
| 1940-49 * Skilled working class | | 1.017 | | 1.086 |
| 1940-49 * Salariat & Intermediate | | 1.190 | | 1.209 |
| 1960-69 * Skilled working class | | 1.368 | | 1.117 |
| 1960-69 * Salariat & Intermediate | | 1.170 | | 1.029 |
| 1970-79 * Skilled working class | | 1.958 * | | 1.327 |
| 1970-79 * Salariat & Intermediate | | 1.718 | | 1.231 |

* p < 0.05, ** p < 0.01, *** p < 0.001, N: 8,798 (ALLBUS)

*Notes*: Gender and age controlled for in all models (not shown)

Table A5. Composition of social origin groups by parental status score and parental education score (%)

| | *Birth Cohort* | | | |
|---|---|---|---|---|
| | *1940-49* | *1950-59* | *1960-69* | *1970-79* |
| | *Unskilled working class background* | | | |
| Parental status score | 30.04 | 30.34 | 31.87 | 32.48 |
| Parental education score | 24.57 | 24.20 | 29.58 | 32.17 |
| | *Skilled working clss background* | | | |
| Parental status score | 38.43 | 38.59 | 39.48 | 40.05 |
| Parental education score | 33.38 | 34.81 | 38.96 | 41.68 |
| | *Intermeduate class and salariat background* | | | |
| Parental status score | 56.06 | 55.68 | 57.16 | 59.01 |
| Parental education score | 47.46 | 50.28 | 55.53 | 60.60 |

N: 19,578 (SOEP)

PAPER 2

## Educational inequality after state socialism: The effect of German unification revisited

ABSTRACT: *In 1990, German unification led to an abrupt and extensive restructuring of the educational system and economy of the German Democratic Republic (GDR) as the latter was reintegrated into the Federal Republic of Germany (FRG). However, the consequences of this large-scale institutional change for the educational inequality between children from different social class backgrounds in East Germany continue to be poorly understood. This article seeks to shed new light on this question by using a quasi-experimental approach to examine the difference in educational inequality between East and West Germany before and after German unification. We compare changes in the class gradient in educational attainment in East and West Germany across six birth cohorts, including three cohorts of individuals who completed their schooling after unification. We find that before unification, educational inequality at the mid-secondary, upper- secondary and tertiary level was substantially lower in East Germany than in West Germany and that unification led to a substantial and sustained convergence of the level of educational inequality in East Germany towards that of West Germany.*

## Introduction

The ideological basis of the German Democratic Republic (GDR) as a 'worker and peasant state' mandated a strong commitment to educational equality and the promotion of educational opportunities for working-class youth (Fischer, 1992; Below, 1997). The ruling Socialist Unity Party of Germany (SED) sought to achieve this goal by fundamentally restructuring the GDR's educational system and economy during the post-war transition to communism (Connelly, 2000; Geißler, 1983). Accordingly, the *Law for the Democratization of the German School* that was passed in 1946 stated that "[…] the new school system must be structured in a way that guarantees to all youth, girls and boys, children from urban and rural areas, independent of the economic resources of their parents, an equal right to education and its realization according to their ability and predisposition" (as cited in Fischer, 1992, p. 34, author translation).

The substantial restructuring of the educational system and economy that occurred in the GDR and other state-socialist regimes of Central and Eastern Europe renders them a large-scale historical experiment in increasing equality of opportunity by way of institutional reform (Szelényi, 1998). Amongst all state-socialist countries, the reform trajectory of GDR is particularly well suited for empirical analysis. Not only were the educational system and the economy of the GDR fundamentally restructured under state socialism, but this restructuring was then abruptly reversed with German unification in 1990, when the GDR was reintegrated into the Federal Republic of Germany (FRG). Moreover, the strong institutional continuity of the FRG's education system and economy throughout the second half of the twentieth century makes the FRG a robust control case, demonstrating the development of educational inequalities in the absence of state-socialist reforms and their reversal with unification.

Despite the unique reform trajectory of East Germany, there continues to be little evidence on the extent to which the GDR succeeded in reducing educational inequality between children from different social class backgrounds, and on whether these achievements were subsequently reversed after unification. Some studies found a decline in educational inequality in the early years of the GDR (see e.g., Below, 1997; Geißler, 1983). Yet, these studies tend to draw on official statistics from the GDR that are of questionable reliability and do not allow for a precise measurement of individuals' parental class background.[1] Moreover, there is some evidence of an increase in educational inequality in the GDR starting in the mid-1970s (Solga, 1997; Geißler, 1983). This finding is consistent with the 'socialist transformation hypothesis', which expects an initial decline in educational inequality as socialist reforms are implemented, but suggests that these early gains in educational inequality are lost as parents in advantaged positions adapt to the changed institutional context and find new ways to advantage their children (see Blossfeld and Shavit, 1993; Szelényi, 1998). However, it is not clear whether in the late phase of the GDR, the level of educational inequality in the GDR had reverted fully towards that of the FRG, or whether working class children in the GDR still had better educational prospects than their peers in the FRG.

Evidence on changes in educational inequality in other state-socialist countries is mixed. With regards to Hungary, Bukodi and Goldthorpe (2010) find a decline in educational inequality in the early period of state socialism and a subsequent increase in later years as the country transitioned to a market-based economy (also see Szelényi and Aschaffenburg, 1993, and Szelényi, 1998). A similar pattern is found in Russia by

[1] GDR statistics tend to be based on a very broad definition of 'the working class', which at times includes state bureaucrats. Furthermore, rather vague categories such as 'the intelligence' (*die Intelligenz*) are used to describe privileged social groups (see, Below, 1997; Geißler, 1983).

Gerber and Hout (1995). However, with regards to Czechoslovakia and Poland, Mateju (1993) and Heyns and Bialecki (1993) find that educational inequality between individuals from different social backgrounds did not decline or may even have increased compared to the pre-socialist period.

Aside from the lack of comparable evidence on the level of educational inequality in the GDR and the FDR before unification, few studies have systematically examined whether and to what extent the level of educational inequality in the GDR changed with the fundamental restructuring of the GDR's educational system and economy in the wake of German unification. A notable exception is the study by Kesler (2003), which seeks to examine the level of educational inequality in East and West Germany before and after unification. However, Kesler acknowledges several serious limitations of her study. First and most importantly, in Kesler's study the sample of individuals who obtained their schooling in East Germany before unification is comprised of only 270 individuals and the sample of individuals who obtained their schooling in East Germany after unification consists of only 152 individuals (Kesler, 2003, p. 474). Given that the study further subdivides respondents into groups of individuals from six distinct social class backgrounds, this small sample size puts Kesler's study at risk of making a type II error (false negative), i.e. concluding that there are no differences between her comparison groups, when in fact such differences exist. This casts doubt on the robustness of Kesler's findings that there was little difference in educational inequality between East and West Germany before unification, and that unification did not increase educational inequality in East Germany.

A second limitation of the study by Kesler – in part due to the study having been conducted only about a decade after German unification – is that it compares

only one pre-unification cohort and one post-unification cohort, as opposed to examining over-time change across multiple cohorts in East and West Germany. This prevents her study from identifying whether a potential change in educational inequality after unification reflects only a short-lived effect that may be due to the economic crisis triggered by unification, or whether unification had a sustained effect on educational inequality which may be attributed to the institutional restructuring of the East German educational system and economy. Moreover, examining only one post-unification cohort prevents Kesler's study from discerning whether a potential over-time change in the difference in educational inequality between East and West Germany is due to the institutional changes that occurred in the wake of unification, or simply reflects a difference in the longer-term trends in educational inequality in East and West Germany. In other words, having only one pre-unification cohort and one post-unification cohort does not allow for testing the parallel trends assumption which is central to any over-time comparison across multiple units of observation (see Angrist and Pischke, 2009, pp. 221-48).

Third, Kesler's study is limited in that it only considers educational inequality in terms of individuals' completion of upper-secondary education. Therefore, it remains unclear whether potential differences in educational inequality between East and West Germany pre- and post-unification apply to the upper-secondary level only, or whether they are already visible at the mid-secondary level and carry through to the tertiary level. This is problematic, particularly considering the substantial reforms of mid-secondary schooling in East Germany – discussed in further detail below – and given the known importance of tertiary qualifications for individuals' labour market chances in Germany (Müller et al., 1998).

Kesler's finding that educational inequality did not increase with German unification contrasts with studies of other post-socialist countries, which generally find an increase in the intergenerational transmission of inequality after the post-socialist transition (see Gerber and Hout, 2004, on Russia, Lippényi and Gerber, 2016, and Bukodi and Goldthorpe, 2010, on Hungary; and the cross-national study by Jackson and Evans, 2017). However, as discussed in further detail below, these studies are themselves limited in that they tend to only focus on one or more (post-)socialist countries, and thus lack a control case that would permit them to identify the observed over-time changes in inequality as resulting from the post-socialist transition *per se*, as opposed to other over-time trends at the time that are not primarily related to the post-socialist transition, such as the trend of educational expansion or the growth of the service economy (see Hadjar and Becker, 2009; Wren, 2013).

The main aim of this article is to overcome the abovementioned limitations of the existing literature in order to address the following two research questions: First, was educational inequality lower in East Germany than in West Germany before unification? Second, if such east-west difference in educational inequality existed before unification, did the level of educational inequality in East Germany increase and converge towards the level of educational inequality in West Germany after unification? In order to address these two questions, we compare the level of educational inequality between individuals from different social class backgrounds in East and West Germany across six five-year birth cohorts: 1960-64, 1965-69, 1970-74, 1975-79, 1980-84, 1985-89. This multiple cohort design and the use of West Germany as a comparison case allows us to distinguish the unification effect from potentially confounding over-time trends in educational inequality. Furthermore, it enables us to examine both the short and long-term consequences of German unification. Rather

than relying on official statistics from the GDR, we work with data from two German survey programmes which provide comparable information on the social class backgrounds and educational careers of a large sample of East and West German individuals.

**Why expect educational inequality to be lower in the GDR than in the FRG?**

With the goal of breaking the 'educational privilege' of the middle and upper classes and to advance the educational and labour market chances of individuals from working-class backgrounds the Socialist Unity Party of Germany (SED) radically restructured the educational system and economy of East Germany after the Second World War (Geißler, 1983; Below, 1997). This interventionist approach by the GDR leadership stands in sharp contrast to the liberal educational and economic policies of the FRG, which largely upheld the institutional structure of the pre-war period.

One key reform implemented by the GDR leadership was the universalization of education up until the mid-secondary level and the abolishment of the traditional tripartite structure that allocated students into a lower-secondary, mid-secondary and upper-secondary school track after primary school (Below, 1997). This tripartite system had been in place before the war and prevailed in the FDR thereafter (Cortina et al., 2008). In the GDR, it was replaced by a comprehensive school, the *Polytechnische Oberschule* (POS), which jointly schooled all children until grade ten (Below, 1997). Contrasting with the universalisation of mid-secondary education, upper-secondary education in the GDR continued to be highly selective. Importantly however, the GDR administration implemented a series of 'counter-privileging' measures that were designed to facilitate the access of children from working-class backgrounds to the

upper-secondary school, the *Erweiterte Oberschule* (EOS). Accordingly, the selection of pupils into upper-secondary school was not only based on their performance, but also depended on their social background – by way of a quota system that positively discriminated in favour of children from working-class backgrounds – and on the 'political attitude and societal engagement' of children and their parents (Marggraf, 1993). Moreover, the GDR provided several alternative avenues for obtaining the *Abitur*, including via advanced dual vocational training (the *Berufsausbildung mit Abitur*) and via so-called Worker and Farmer Colleges (*Arbeiter-und-Bauern-Fakultäten*) (Geißler, 1983). By contrast, in the FRG alternative routes to the *Abitur* were relatively scarce and admission to the upper-secondary school track was primarily based on teacher recommendations as well as parents' preferences (Cortina et al., 2008).

Both the universalization of mid-secondary education and the 'counter-privileging' measures at the upper-secondary level can be expected to have decreased cross-class inequalities in educational attainment at the mid- and upper-secondary level in the GDR. This may be expected to further have translated into increased educational equality at the tertiary level, which is likely to have been reinforced by the provision of stipends for children from working-class backgrounds and targeted publicity campaigns (*Bildungswerbung*) that informed members of the working class and the rural population of the benefits of pursuing higher education (Geißler, 1983).

Aside from the educational reforms discussed above, the flattening of the income distribution in the planned economy of the GDR (Speder and Habich, 1999) can also be expected to have had a bearing on the educational inequality between children from different parental class backgrounds. The reduced level of inequality in the economic resources that parents in different social class positions in the GDR could devote to the development and education of their children – e.g., via providing

additional tutoring and learning materials – can be expected to have further decreased educational inequality. By contrast, the higher level of economic inequality in the 'social market economy' of the FRG (ibid.) is likely to have reinforced cross-class differences in educational attainment.

While the educational and economic characteristics of the GDR reviewed above would lead one to expect a lower level of educational inequality in the GDR, as compared to the FRG, it is important to note potentially countervailing forces that may have muted or offset potential advances in equalizing educational opportunity in the GDR. As suggested by the abovementioned socialist transformation hypothesis (Blossfeld and Shavit, 1993), parents from higher social class positions may have adapted to the counter-privileging reforms in the GDR by finding new ways of leveraging their economic, political and cultural resources to advantage their children. This expectation has received some support by research suggesting that that the political elite in the GDR used their political clout to advance their children's educational and labour market career (see Solga, 1994). Such dynamic may have been reinforced by the substantial in-kind privileges – such as luxury homes and goods – that accompanied high political office in the GDR (see Lenski, 1994) and by the founding of 'special schools' (*Spezialschulen*) that predominantly admitted students from privileged social backgrounds (see Opitz, 1979; Meier and Reimann, 1977).[2] It thus remains an empirical question to what extent the GDR succeeded in realizing its ideological commitment to reducing the level of educational inequality, relative to that of the FRG.

[2] These *Spezialschulen* were designed to support exceptionally gifted children in achieving outstanding performances in the sciences, arts and sports. Only about 2-5 percent of pupils were enrolled in these *Spezialschulen* (Opitz, 1979; Meier and Reimann, 1977).

**Why expect a unification effect on educational inequality in East Germany?**

German unification in 1990 led to an abrupt reintegration of the educational system of the GDR into that of the FRG. Starting in 1991 pupils in East Germany found themselves attending the same type of schools as their West German peers. Similarly, the East German economy was remoulded along the lines of West Germany's social market economy in a rapid process of economic liberalization. The radical institutional reconfiguration of the East German educational system and economy contrasts with what can be described as a 'frozen landscape' of institutional stasis in West Germany at the time of unification (see, e.g., Cortina et al., 2008).

The assimilation of the East German educational system into the West German model meant that universal schooling until the mid-secondary level was abolished and ability tracking into different school types after fourth grade was reintroduced.[3] At the same time, the abovementioned measures of positive discrimination in favour or working class youth at the secondary and tertiary level were abandoned (Mintrop and Weiler, 1994). Considering the likely equalizing effects of the reforms of the educational system in the GDR discussed in the previous section, the reversal of these reforms with German unification can be expected to have led to an increase in educational inequality in East Germany (i.e. the former GDR) after unification. Given the known class-gradient in lower-secondary attainment in West Germany (Blossfeld, 1993; Betthäuser, 2017), the re-introduction of the lower-secondary school track and the lower-secondary qualification (*Hauptschulabschluss*) is

[3] The upper-secondary school track (*Gymnasium*) was reinstated as a school form in all East German states and even in states where the lower and mid-secondary tracks (*Hauptschule* and *Realschule*) were combined in one school – this was the case in Saxony and Thuringia – pupils were separated into distinct ability groups. The lower-secondary qualification (*Hauptschulabschluss*) after ninth grade was re-established as a school leaving qualification.

likely to have increased the proportion of children from working-class backgrounds who leave school before obtaining a mid-secondary qualification, thus increasing educational inequality at the mid-secondary level. Similarly, the abolition of positive discrimination in favour of working-class youth and the removal of the vocational route to obtaining the *Abitur* can be expected to have led to an increase in educational inequality at the upper-secondary and tertiary level.

Key reforms of the East German economy included the liberalization of prices and trade and the privatization of previously state-run businesses in the span of four years (Mayer 2006; Gebel, 2011; Windorf, 1996). These reforms stood in sharp contrast to the planned economy of the GDR. As was the case for most other former member states of the soviet bloc, the East German 'shock therapy' was more shock than therapy and led a to a deep economic recession that was accompanied by a vast increase in unemployment, economic insecurity and income inequality (Hunt, 2008; Hauser and Becker, 2000; Gebel, 2011). Given the likely rigidifying consequences of economic inequality for educational inequality (see Jackson and Evans, 2017), the crisis may have reinforced the effects of the educational restructuring on educational inequality in East Germany after unification. In our analysis, we therefore examine both the short-run effect of German unification on educational inequality, which may be magnified by the effects of the economic recession, and the long-run effect, which can be taken to reflect the institutional changes that occurred with German unification.

**Method, data and variables**

The abrupt assimilation of the institutional structure of the East German educational system and economy into that of West Germany with unification constitutes a unique

quasi-experimental setting for studying the effects of large-scale institutional change on educational inequality. We examine the effects of this institutional restructuring by way of a *difference-in-difference* design, comparing the difference in educational inequality in East and West Germany before and after unification (Angrist and Pischke, 2009; Gangl, 2010).[4] Using West Germany as a control unit allows us to examine whether any over-time change in educational inequality in East Germany is due to the institutional restructuring in the wake of unification, as opposed to other potentially confounding over-time changes. For this reason, using a *difference-in-difference* design constitutes an advantage over existing studies of the post-socialist transition which lack a comparison unit (cf. Jackson and Evans, 2017; Gerber and Hout, 2004, Lippényi and Gerber, 2016, Bukodi and Goldthorpe, 2010).

We examine the level of educational inequality between individuals from different social class backgrounds in East and West Germany across six five-year birth cohorts: 1960-64, 1965-69, 1970-74, 1975-79, 1980-84, 1985-89.[5] The 1970-74 cohort is the last cohort of individuals who received their full schooling before unification. We therefore use this cohort as the reference category in all our analyses. All members of the 1975-79 cohort made the transition to upper-secondary education after unification and the younger members of this cohort received their full secondary education in unified Germany. Similarly, all members of the 1980-84 and 1985-89 cohorts received their full secondary education after unification. Accordingly, if the institutional changes in East Germany in the wake of unification had an effect on

[4] A similar research design has been used by Goldstein and Kreyenfeld (2011) to study the effects of German unification on fertility.

[5] Individuals were allocated to these cohorts based on their year of birth, and to East and West Germany based on whether they attended school in East or West Germany.

educational inequality, we would expect to see a convergence in the level of educational inequality between East and West Germany in the younger three cohorts.

We use the German Socio-Economic Panel (SOEP) as the primary dataset for our analyses (see Wagner et al., 2007). In order to avoid any potential bias due to survey specificities, we replicate our results by running all our models on a secondary dataset. For this purpose, we use the German General Social Survey (ALLBUS/GGSS) (see Wasmer et al., 2014). All results from our replication analyses are reported in the Appendix. While most previous studies on educational and labour market inequalities in Germany use the 'complete case analysis' approach and thus rely on the assumption that missingness in the data is completely at random (White et al., 2010), we impute missing data points using multiple imputation by chained equations and thereby limit the risk of potential bias related to systematic item missingness in our data.[6]

The dependent variables of our analyses are three binary educational threshold variables, measuring first, whether individuals have attained a school qualification at the mid-secondary level or above, second, whether they have attained a school qualification at the upper-secondary level, and third, whether they obtained a tertiary level qualification. Our focal independent variable, parental class, is operationalised using the European Socio-Economic Classification (ESeC). The ESeC schema allocates individuals to different social class positions based on their occupation and employment status (see Wirth et al., 2010; Rose and Harrison 2010). This clear and transparent allocation principle allows for a consistent classification of parents in East and West Germany and permits us to avoid issues of comparability due to different interpretations of the meaning and scope of social class categories, which constituted

[6] For a detailed discussion of the advantages of multiple imputation using chained equations in research on social stratification see Kuha (2013).

a serious limitation of previous studies of social inequality in the GDR (see, e.g., Below, 1997, and Geißler, 1983).

We measure parents' social class position using a four-category version of the ESeC schema, differentiating between (1) the unskilled working class, (2) the skilled working class, (3) the intermediate class and (4) the salariat. We differentiate between individuals from unskilled and skilled working-class backgrounds, as our first paper has shown a substantial difference in the educational attainment between these two groups in Germany. However, given the ideological agenda of the GDR, we expect its reforms to have affected the educational attainment of individuals from working-class backgrounds at large. We derive the parental class position from fathers' and mothers' class positions using the dominance approach (Erikson, 1984). This approach allocates parents to a social class position according to the higher social class position of the two spouses. Parents' social class position is measured at age fifteen of the cohort members. We control for individuals' gender and age in all our models.[7] The distributions of our focal variables are shown in Table A13 in the Appendix.

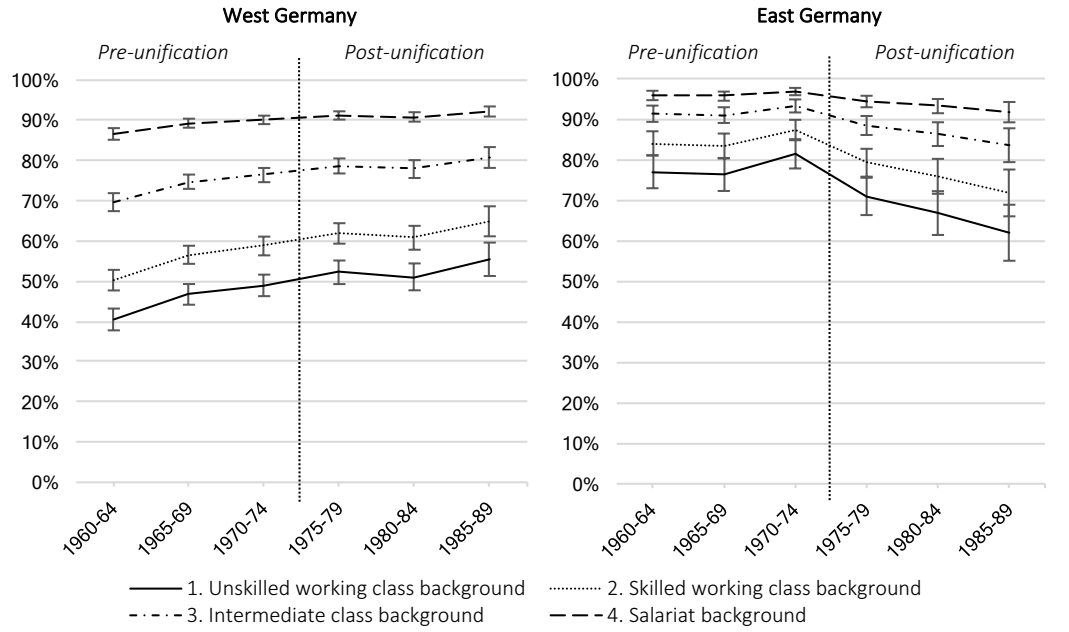
**Results**

As noted above, the first aim of this paper is to assess whether and to what extent educational inequality was lower in the GDR than in the FRG before unification. Second, we seek to examine whether, if such east-west difference in educational inequality existed before unification, the level of educational inequality in the East Germany increased and converged towards the level of educational inequality in West

[7] We also ran all our models separately by gender, which led to the same conclusions for both women and men. Controlling for age is important particularly in the East German context, given the prominence of alternative avenues for obtaining secondary and tertiary qualifications (Geißler, 1983).

Germany after unification. To address these questions, we run a series of binary logit models for East and West Germany respectively with the three binary educational thresholds as the outcome variables. Our focal explanatory variables are individuals' parental class background and birth cohort. We present our results in the form of a series of figures showing the predicted probabilities of crossing the three educational thresholds for different social origin groups in East and West Germany. Tables reporting average marginal effects and their statistical significance are given in the Appendix (Tables A1-A6). We replicated all our results using the ALLBUS data (see Tables A7-A12 in the Appendix) and found the results to be highly consistent between the SOEP and the ALLBUS data.

Figure 1. Predicted probabilities of obtaining a mid-secondary education for different birth cohorts in West and East Germany




*Notes*: Predicted probabilities based on M2 and M4 of Table A1 (SOEP).

Figure 1 shows the predicted probability of children from different social class backgrounds to obtain a qualification at the mid-secondary level or above, for each birth cohort in East and West Germany respectively. For the three birth cohorts of

children who completed their schooling before unification, we observe, first, that the total share of pupils attaining an educational qualification at the mid-secondary level or above was higher in the GDR than was the case in the FRG. Second, we observe that educational inequality was substantially lower in the GDR than was the case in the FRG.[8] Both the higher overall level of mid-secondary attainment and the lower level of educational inequality between individuals from working-class backgrounds and individuals from higher class backgrounds at the mid-secondary level are likely to be the result of efforts in the GDR to universalise education up until tenth grade. However, Figure 1 also shows that even in the late phase of the GDR, there was still a substantial proportion of pupils who did not attain the mid-secondary qualification and a considerable class gradient in mid-secondary attainment.

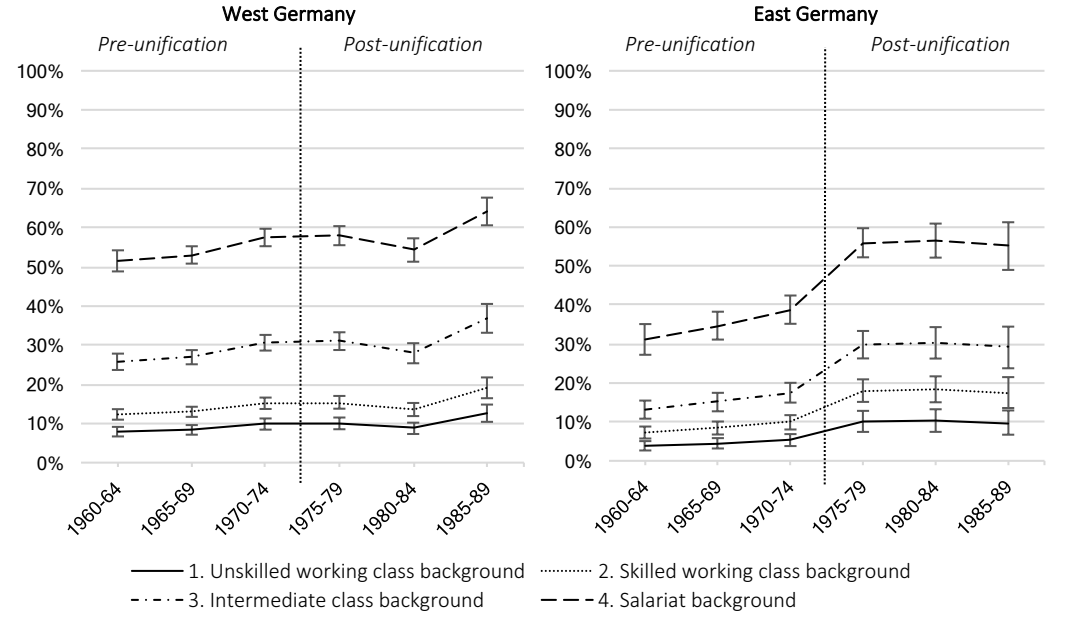
With regards to the effect of unification, we observe a notable drop in the overall proportion of pupils who obtain a qualification at the mid-secondary level or above between the third and fourth birth cohort in East Germany. This development likely reflects the reintroduction of the lower-secondary school track (*Hauptschule*) and the lower-secondary leaving qualification (*Hauptschulabschluss*) after unification. Importantly however, the drop in mid-secondary attainment appears to have been concentrated amongst children from working-class backgrounds, thus leading to an increase in the educational inequality between this group and individuals from intermediate class and salariat backgrounds.[9] This increase in educational inequality

[8] To confirm the statistical significance of the difference in educational inequality between East and West Germany before unification, we run a binary logit model for the combined pre-unification cohorts including an interaction between parental class and a dummy variable indicating whether individuals received their schooling in East or West Germany (See M2 in Table A2 in the Appendix). The statistically significant interaction terms confirm the difference in educational inequality at the mid-secondary level between East and West Germany that we observe in Figure 1.

[9] M4 of Table A1 in the Appendix shows a substantial and statistically significant rise in the inequality between children from unskilled working-class backgrounds (the reference category) and children from intermediate class and salariat backgrounds for the last three cohorts. While the average marginal effects

appears to persist across the three birth cohorts who completed their schooling after unification, suggesting that it is not primarily a result of the post-unification economic crisis, but instead can be attributed to the institutional changes that occurred with unification. It is important to note, however, that despite a clear convergence in the level of inequality in mid-secondary attainment in East Germany towards that of West Germany, educational inequality at the mid-secondary level remained lower in East Germany compared to West Germany even after unification.[10]

**Figure 2**. Predicted probabilities of obtaining an upper-secondary education for different birth cohorts in West and East Germany




*Notes*: Predicted probabilities based on M2 and M4 of Table A3 (SOEP).

Figure 2 shows the predicted probabilities of attaining a qualification at the upper-secondary level for different social origin groups in East and West Germany respectively. In contrast to our findings for the mid-secondary level, for the three pre-

also suggest a rise in the educational inequality between children from unskilled and skilled working-class backgrounds, this is not statistically significant.

[10] The statistical significance of this post-unification difference is indicated by the interaction terms in M4 of Table A2.

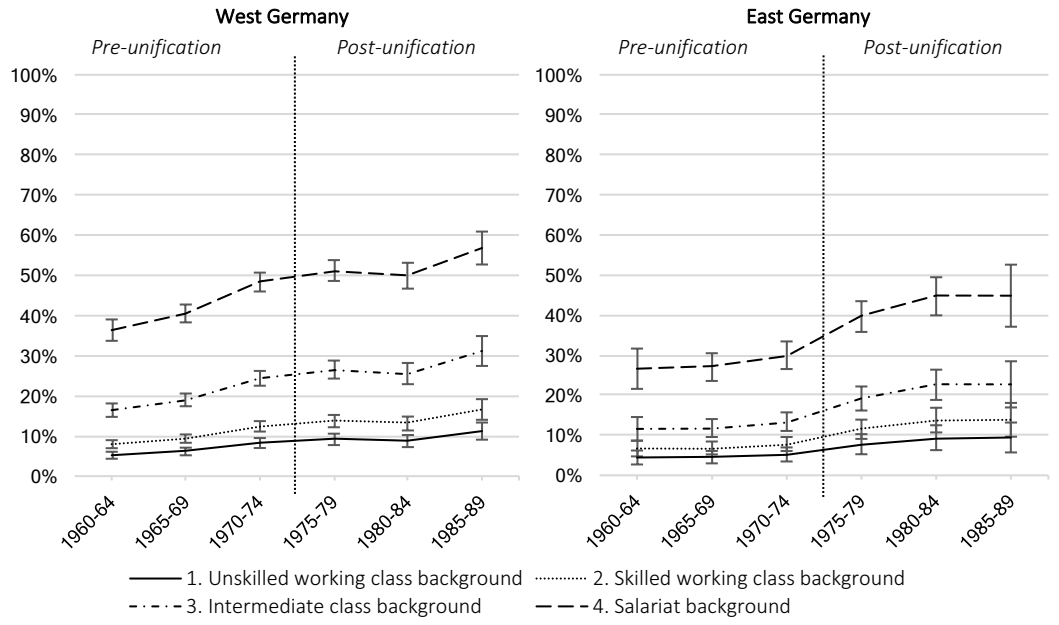
unification cohorts we find that the overall share of pupils attaining an upper-secondary qualification was substantially lower in the GDR than in the FRG. This is likely to be a consequence of the restrictive admission requirements for upper-secondary enrolment in the GDR (Gebel, 2011). We also observe a considerable level of inequality in upper-secondary attainment in the GDR. Children from salariat backgrounds were about 25 percentage points more likely to obtain an upper-secondary qualification than was the case for children from working-class backgrounds. However, the left-hand panel of Figure 2 shows that in the FRG the level of inequality in upper-secondary attainment between children from salariat and working-class backgrounds was larger yet, at about 40 percentage points.[11] Hence, while a considerable level of inequality in upper-secondary attainment remained in the GDR, the counter-privileging measures in the country appear to have succeeded in compressing cross-class inequality at this level, relative to the FRG.

Regarding the effect of unification, we observe a notable rise in the proportion of individuals who obtain the upper-secondary qualification between the third and fourth birth cohort in East Germany. This development is consistent with past findings and has been attributed to the relaxation of admission criteria and the founding of new upper-secondary schools (*Gymnasien*) in East Germany (Schreier, 1996; Below, 1997; Gebel, 2011). However, this rise in upper-secondary attainment appears to have mainly benefitted children from salariat and intermediate class backgrounds, while the probability of obtaining an upper-secondary qualification rose to a much lower degree for children from unskilled and skilled working-class backgrounds. Consequently, educational inequality at the upper-secondary level in

[11] The statistical significance of this East-West difference is confirmed by the interactions terms shown in M2 of Table A4 in the Appendix.

East Germany increased after unification, and came to closely resemble the level of educational inequality in West Germany.[12] Similar to the observed increase in inequality at the mid-secondary level, this rise in educational inequality at the upper-secondary level was sustained across all three post-unification cohorts. It can thus not be attributed principally to the rigidifying effects of the economic post-unification crisis, but is likely to reflect the institutional changes that occurred with unification, particularly the re-introduction of early ability tracking and the abolishment of positive discrimination in favour of pupils from working-class backgrounds.

**Figure 3**. Predicted probabilities of obtaining a tertiary education for different birth cohorts in West and East Germany




*Notes*: Predicted probabilities based on M2 and M4 of Table A5 (SOEP).

Figure 3 demonstrates that the east-west differences and over-time development in educational inequality at the upper-secondary level are mirrored at the tertiary level. For the three pre-unification cohorts, we find that the overall share of individuals

[12] The statistical significance of this increase in educational inequality after unification is confirmed by the interactions terms shown in M4 of Table A3 in the Appendix.

attaining a tertiary qualification appears to have been notably lower in the GDR than in the FRG. Again, this is consistent with previous findings and has been attributed to the lower share of individuals who obtained an upper-secondary qualification in the GDR (Gebel, 2011; Kehm, 2004). While we observe a considerable gap in tertiary-level attainment between different social origin groups in the GDR, this gap was substantially larger in the FRG.[13] This East-West difference in the inequality in tertiary-level attainment is likely to be a consequence of the lower degree of inequality in upper-secondary attainment in the GDR, relative to that in the FRG, and may also reflect the abovementioned provision of stipends for working-class youth and the publicity campaigns targeted at this group to inform them about the benefits of higher education (*Bildungswerbung*).

With unification, we observe a notable rise in the proportion of individuals who obtain a tertiary-level qualification in East Germany. This development is likely to be a result of the increase in the share of people with an upper-secondary qualification and the founding of new tertiary level institutions, particularly technical universities (*Fachhochschulen*) (see Kehm, 2004). As was the case for the expansion of upper-secondary education in East Germany after unification, the expansion of tertiary education appears to have mainly benefitted children from salariat and intermediate class backgrounds, while the probability of obtaining a tertiary qualification only rose marginally for children from unskilled and skilled working-class backgrounds. Consequently, educational inequality at the tertiary level increased after unification and almost completely converged towards the level of educational inequality in West

[13] The statistical significance of this East-West difference is confirmed by the interactions terms shown in M2 of Table A6 in the Appendix.

Germany.[14] This rise in educational inequality at the tertiary level after unification is sustained across the three post-unification cohorts and as such appears not to result mainly from the post-unification economic crisis. Instead it may be attributed to the sustained increase in inequality at the upper-secondary level and the abolishment of stipends and information campaigns targeted at individuals from working-class backgrounds in East Germany.

**Conclusion**

Using the FRG as a comparison case, our article has sought, first, to examine the extent to which state socialism in the GDR succeeded in reducing educational inequalities between children from different social class backgrounds. Second, we investigated whether the institutional assimilation of the (former) GDR into the FRG with German unification led to a convergence of the level of educational inequality in East Germany towards that of West Germany.

Our first main finding is that educational inequality at the mid-secondary, upper-secondary and tertiary level was substantially lower in the GDR than in the FRG, even in the late phase of the GDR. This lower level of educational inequality in the GDR is likely to reflect the efforts of the GDR leadership to universalise mid-secondary education, as well as a range of 'counter-privileging' measures that sought to promote the educational attainment of children from working-class backgrounds at the upper-secondary and tertiary level. These measures included a quota-system that positively discriminated in favour of working class children in the admission to upper-secondary schools (*Erweiterte Oberschulen*), as well as stipends and information

[14] The statistical significance of this increase in educational inequality after unification is confirmed by the interactions terms shown in M4 of Table A5 in the Appendix.

campaigns targeted at increasing the participation of working class children in tertiary education.

Our second main finding is that educational inequality at the mid-secondary, upper-secondary and tertiary level in East Germany increased substantially after German unification and converged towards the level of educational inequality in West Germany. While the level of educational inequality at the mid-secondary level in East Germany remained somewhat below that of West Germany, the degree of educational inequality at the upper-secondary and tertiary level all but resembled that of West Germany after unification. Children from working-class backgrounds in East Germany lost out most in relative terms after unification. They were over-represented in the increased proportion of children leaving school before completing mid-secondary education and they hardly benefitted from the educational expansion that occurred at the upper-secondary and tertiary level in the wake of unification.

Importantly, our multiple cohort design allowed us to examine whether this increase in educational inequality in East Germany after unification was merely a short-term phenomenon that may have been caused be the post-unification economic crisis, or whether the increase in educational inequality persisted in the long-run, reflecting the permanent changes in the institutional structure of the East German educational system and economy that occurred in the wake of unification. We find the latter to be the case, as the post-unification increase in educational inequality in East Germany was sustained across the three post-unification cohorts we examine.

Our findings suggest that the results of the study by Kesler (2003) that showed little difference in educational inequality between East and West Germany before unification and no increase educational inequality in East Germany after unification are likely to be false negatives that are due to the very small sample size used in her

study. To the contrary, our findings are in line with studies from other post-socialist countries that have shown an increase in the intergenerational transmission of inequality after the post-socialist transition (Gerber and Hout, 2004, Lippényi and Gerber, 2016, and Bukodi and Goldthorpe, 2010; Jackson and Evans, 2017).

Last, our findings also speak forcefully to the debate in social stratification research on the role of institutional change in the intergenerational transmission of inequality (Blossfeld and Shavit, 1993; Goldthorpe, 2016; Betthäuser, 2017; Esping-Andersen and Wagner, 2012). The tenor of much of the literature on this issue has been that educational inequality is highly persistent across-generations and largely immune to efforts to decrease educational inequality by way of policy reforms. While our study does not allow us to identify the role of any specific institution in accounting for the east-west and over-time differences in educational inequality that we observe, it provides strong evidence that the combined institutional differences between the GDR and the FRG had a substantial effect on the relative level of educational inequality in the two countries and that the institutional restructuring of the East German educational system and economy after unification led to a marked increase in educational inequality.

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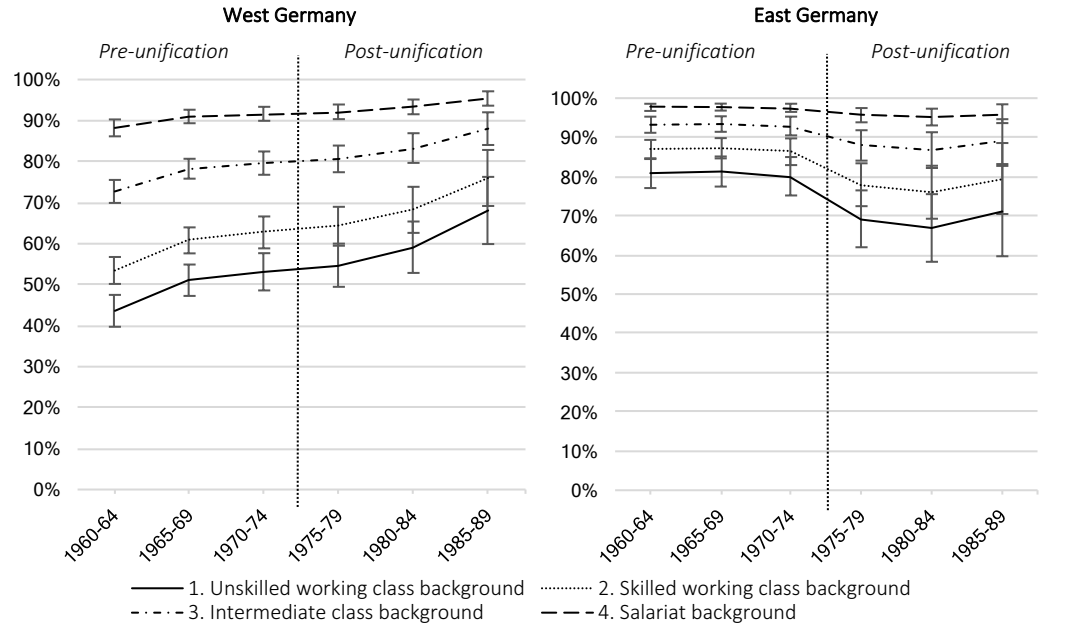
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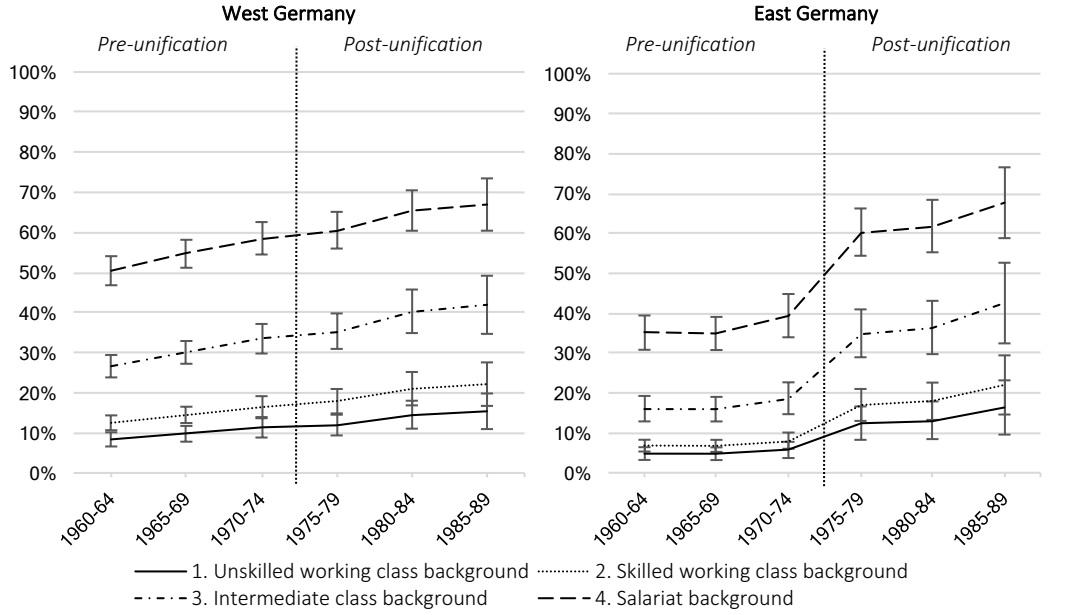
## Appendix

Figure A1. Predicted probabilities of obtaining a mid-secondary education for different birth cohorts in West and East Germany (ALLBUS)



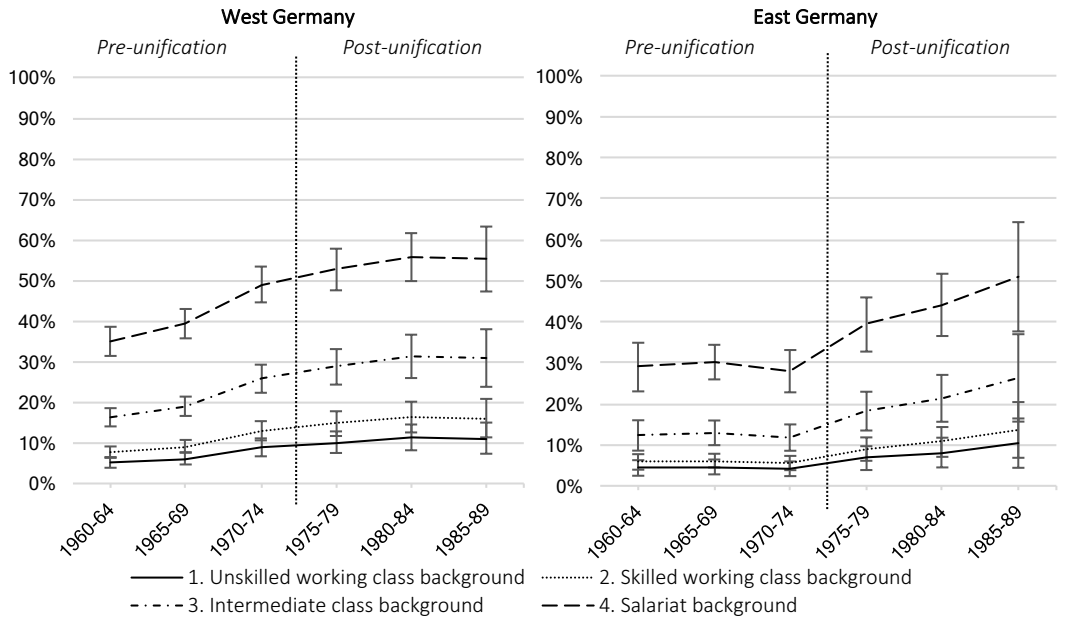

*Notes*: Predicted probabilities based on M2 and M4 of Table A7 (ALLBUS).

Figure A2. Predicted probabilities of obtaining an upper-secondary education for different birth cohorts in West and East Germany (ALLBUS)




*Notes*: Predicted probabilities based on M2 and M4 of Table A9.

**Figure A3**. Predicted probabilities of obtaining a tertiary education for different birth cohorts in West and East Germany (ALLBUS)




*Notes*: Predicted probabilities based on M2 and M4 of Table A11.

**Table A1**. Effect of parental class background on mid-secondary attainment in West and East Germany, binomial logit, avg. marginal effects (SOEP)

| | *West Germany* | | *East Germany* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (ref.) | | | | |
| 2. Skilled working class | 0.098 *** | 0.098 *** | 0.076 *** | 0.058 *** |
| 3. Intermediate class | 0.277 *** | 0.274 *** | 0.156 *** | 0.116 *** |
| 4. Salariat | 0.419 *** | 0.412 *** | 0.206 *** | 0.151 *** |
| Birth cohort | | | | |
| 1960-64 | -0.069 *** | -0.085 *** | -0.020 | -0.044 |
| 1965-69 | -0.017 | -0.022 | -0.023 * | -0.052 * |
| 1970-74 (ref.) | | | | |
| 1975-79 | 0.023 * | 0.033 * | -0.050 *** | -0.106 *** |
| 1980-84 | 0.015 | 0.021 ** | -0.072 *** | -0.147 *** |
| 1985-90 | 0.045 ** | 0.065 ** | -0.100 *** | -0.196 *** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | 0.096 *** | 0.124 *** | 0.054 *** | 0.110 *** |
| Age | 0.003 *** | 0.004 *** | 0.000 | 0.001 |
| Parental class * 1960-64 birth cohort | | | | |
| 2. Skilled working class | | 0.000 | | 0.011 |
| 3. Intermediate class | | 0.017 | | 0.025 |
| 4. Salariat | | 0.050 | | 0.035 |
| Parental class * 1965-69 birth cohort | | | | |
| 2. Skilled working class | | 0.000 | | 0.013 |
| 3. Intermediate class | | 0.006 | | 0.030 |
| 4. Salariat | | 0.014 | | 0.041 |
| Parental class * 1975-79 birth cohort | | | | |
| 2. Skilled working class | | -0.001 | | 0.025 |
| 3. Intermediate class | | -0.010 | | 0.058 |
| 4. Salariat | | -0.022 | | 0.082 ** |
| Parental class * 1980-84 birth cohort | | | | |
| 2. Skilled working class | | -0.001 | | 0.033 |
| 3. Intermediate class | | -0.006 | | 0.079 * |
| 4. Salariat | | -0.014 | | 0.112 ** |
| Parental class * 1985-90 birth cohort | | | | |
| 2. Skilled working class | | -0.004 | | 0.041 |
| 3. Intermediate class | | -0.021 | | 0.101 * |
| 4. Salariat | | -0.044 | | 0.147 ** |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 25,726*

**Table A2.** Effect of parental class background on mid-secondary attainment pre- and post-unification, binomial logit, avg. marginal effects (SOEP)

| | *Pre-unification* | | *Post-unification* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (ref.) | | | | |
| 2. Skilled working class | 0.108 *** | 0.113 *** | 0.078 *** | 0.081 *** |
| 3. Intermediate class | 0.257 *** | 0.286 *** | 0.241 *** | 0.257 *** |
| 4. Salariat | 0.366 *** | 0.427 *** | 0.356 *** | 0.389 *** |
| Region | | | | |
| West Germany (ref.) | | | | |
| East Germany | 0.189 *** | 0.318 *** | 0.097 *** | 0.160 *** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | 0.089 *** | 0.133 *** | 0.077 *** | 0.119 *** |
| Age | 0.001 | 0.001 | 0.002 * | 0.003 * |
| Parental class * East Germany | | | | |
| 2. Skilled working class | | -0.044 | | -0.013 |
| 3. Intermediate class | | -0.140 *** | | -0.063 |
| 4. Salariat | | -0.235 *** | | -0.116 ** |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 25,726*

**Table A3**. Effect of parental class background on upper-secondary attainment, binomial logit, avg. marginal effects (SOEP)

| | *West Germany* | | *East Germany* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (ref.) | | | | |
| 2. Skilled working class | 0.050 *** | 0.053 *** | 0.053 *** | 0.046 *** |
| 3. Intermediate class | 0.197 *** | 0.208 *** | 0.138 *** | 0.121 *** |
| 4. Salariat | 0.462 *** | 0.476 *** | 0.366 *** | 0.334 *** |
| Birth cohort | | | | |
| 1960-64 | -0.047 *** | -0.019 *** | -0.044 ** | -0.015 ** |
| 1965-69 | -0.036 ** | -0.015 ** | -0.024 | -0.008 |
| 1970-74 (ref.) | | | | |
| 1975-79 | 0.004 | 0.002 | 0.125 *** | 0.048 *** |
| 1980-84 | -0.026 | -0.011 | 0.130 *** | 0.050 *** |
| 1985-90 | 0.060 ** | 0.028 ** | 0.118 *** | 0.045 *** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | 0.005 | 0.002 | 0.031 ** | 0.011 ** |
| Age | 0.002 ** | 0.001 ** | 0.000 | 0.000 |
| Parental class * 1960-64 birth cohort | | | | |
| 2. Skilled working class | | -0.009 | | -0.012 |
| 3. Intermediate class | | -0.029 | | -0.029 |
| 4. Salariat | | -0.040 | | -0.062 |
| Parental class * 1965-69 birth cohort | | | | |
| 2. Skilled working class | | -0.007 | | -0.006 |
| 3. Intermediate class | | -0.022 | | -0.016 |
| 4. Salariat | | -0.030 | | -0.033 |
| Parental class * 1975-79 birth cohort | | | | |
| 2. Skilled working class | | 0.001 | | 0.033 |
| 3. Intermediate class | | 0.002 | | 0.075 ** |
| 4. Salariat | | 0.003 | | 0.124 *** |
| Parental class * 1980-84 birth cohort | | | | |
| 2. Skilled working class | | -0.005 | | 0.035 |
| 3. Intermediate class | | -0.016 | | 0.078 ** |
| 4. Salariat | | -0.021 | | 0.127 *** |
| Parental class * 1985-90 birth cohort | | | | |
| 2. Skilled working class | | 0.012 | | 0.031 |
| 3. Intermediate class | | 0.035 | | 0.071 ** |
| 4. Salariat | | 0.039 | | 0.118 *** |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 25,726*

**Table A4**. Effect of parental class background on upper-secondary attainment pre- and post-unification, binomial logit, avg. marginal effects (SOEP)

| | *Pre-unification* | | *Post-unification* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (ref.) | | | | |
| 2. Skilled working class | 0.056 *** | 0.065 *** | 0.040 *** | 0.039 *** |
| 3. Intermediate class | 0.183 *** | 0.208 *** | 0.177 *** | 0.176 *** |
| 4. Salariat | 0.422 *** | 0.458 *** | 0.459 *** | 0.458 *** |
| Region | | | | |
| West Germany (ref.) | | | | |
| East Germany | -0.120 *** | -0.042 *** | 0.008 | 0.004 |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.003 | -0.001 | 0.044 *** | 0.020 *** |
| Age | 0.000 | 0.000 | 0.000 | 0.000 |
| Parental class * East Germany | | | | |
| 2. Skilled working class | | -0.031 * | | 0.001 |
| 3. Intermediate class | | -0.087 *** | | 0.004 |
| 4. Salariat | | -0.143 *** | | 0.006 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 25,726*

**Table A5**. Effect of parental class background on tertiary-level attainment in West and East Germany, binomial logit, avg. marginal effects (SOEP)

| | *West Germany* | | *East Germany* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (rf.) | | | | |
| 2. Skilled working class | 0.037 *** | 0.042 *** | 0.032 ** | 0.041 *** |
| 3. Intermediate class | 0.147 *** | 0.161 *** | 0.096 *** | 0.117 *** |
| 4. Salariat | 0.378 *** | 0.401 *** | 0.275 *** | 0.320 *** |
| Birth cohort | | | | |
| 1960-64 | -0.076 *** | -0.030 *** | -0.020 | -0.008 |
| 1965-69 | -0.052 *** | -0.021 *** | -0.016 | -0.007 |
| 1970-74 (rf.) | | | | |
| 1975-79 | 0.021 | 0.009 | 0.061 *** | 0.026 *** |
| 1980-84 | 0.011 | 0.005 | 0.095 *** | 0.043 *** |
| 1985-90 | 0.066 ** | 0.030 ** | 0.098 *** | 0.044 *** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.057 *** | -0.023 *** | 0.029 ** | 0.013 ** |
| Age | 0.008 *** | 0.003 *** | 0.006 *** | 0.002 *** |
| Parental class * 1960-64 birth cohort | | | | |
| 2. Skilled working class | | -0.014 | | -0.004 |
| 3. Intermediate class | | -0.049 ** | | -0.011 |
| 4. Salariat | | -0.089 *** | | -0.027 |
| Parental class * 1965-69 birth cohort | | | | |
| 2. Skilled working class | | -0.010 | | -0.003 |
| 3. Intermediate class | | -0.033 | | -0.009 |
| 4. Salariat | | -0.057 ** | | -0.022 |
| Parental class * 1975-79 birth cohort | | | | |
| 2. Skilled working class | | 0.004 | | 0.012 |
| 3. Intermediate class | | 0.013 | | 0.032 |
| 4. Salariat | | 0.020 | | 0.069 |
| Parental class * 1980-84 birth cohort | | | | |
| 2. Skilled working class | | 0.002 | | 0.019 |
| 3. Intermediate class | | 0.007 | | 0.050 |
| 4. Salariat | | 0.011 | | 0.102 * |
| Parental class * 1985-90 birth cohort | | | | |
| 2. Skilled working class | | 0.012 | | 0.019 |
| 3. Intermediate class | | 0.038 | | 0.051 |
| 4. Salariat | | 0.055 * | | 0.104 * |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 25,726*

**Table A6**. Effect of parental class background on tertiary attainment pre- and post-unification, binomial logit, avg. marginal effects (SOEP)

| | *Pre-unification* | | *Post-unification* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (*rf.* ) | | | | |
| 2. Skilled working class | 0.043 *** | 0.048 *** | 0.022 * | 0.023 ** |
| 3. Intermediate class | 0.135 *** | 0.148 *** | 0.130 *** | 0.136 *** |
| 4. Salariat | 0.351 *** | 0.374 *** | 0.348 *** | 0.358 *** |
| Region | | | | |
| West Germany (*rf.* ) | | | | |
| East Germany | -0.072 *** | -0.029 *** | -0.031 ** | -0.012 ** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.047 *** | -0.019 *** | -0.001 | -0.001 |
| Age | 0.004 *** | 0.002 *** | 0.009 *** | 0.003 *** |
| Parental class * East Germany | | | | |
| 2. Skilled working class | | -0.016 | | -0.004 |
| 3. Intermediate class | | -0.046 ** | | -0.019 |
| 4. Salariat | | -0.088 *** | | -0.035 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 25,726*

**Table A7**. Effect of parental class background on mid-secondary attainment, binomial logit, avg. marginal effects (ALLBUS)

| | *West Germany* | | *East Germany* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (ref.) | | | | |
| 2. Skilled working class | 0.097 *** | 0.096 *** | 0.066 *** | 0.062 *** |
| 3. Intermediate class | 0.273 *** | 0.265 *** | 0.136 *** | 0.127 *** |
| 4. Salariat | 0.401 *** | 0.385 *** | 0.185 *** | 0.172 *** |
| Birth cohort | | | | |
| 1960-64 | -0.075 *** | -0.095 *** | 0.004 | 0.008 |
| 1965-69 | -0.015 | -0.021 | 0.005 | 0.012 |
| 1970-74 (ref.) | | | | |
| 1975-79 | 0.011 | 0.016 | -0.054 ** | -0.109 ** |
| 1980-84 | 0.041 | 0.060 | -0.067 ** | -0.133 ** |
| 1985-90 | 0.094 *** | 0.150 *** | -0.043 | -0.089 |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | 0.082 *** | 0.108 *** | 0.039 *** | 0.083 *** |
| Age | 0.000 | 0.000 | -0.001 | -0.001 |
| Parental class * 1960-64 birth cohort | | | | |
| 2. Skilled working class | | 0.002 | | -0.002 |
| 3. Intermediate class | | 0.026 | | -0.005 |
| 4. Salariat | | 0.061 | | -0.007 |
| Parental class * 1965-69 birth cohort | | | | |
| 2. Skilled working class | | 0.001 | | -0.003 |
| 3. Intermediate class | | 0.007 | | -0.007 |
| 4. Salariat | | 0.014 | | -0.010 |
| Parental class * 1975-79 birth cohort | | | | |
| 2. Skilled working class | | -0.001 | | 0.025 |
| 3. Intermediate class | | -0.006 | | 0.060 |
| 4. Salariat | | -0.011 | | 0.091 |
| Parental class * 1980-84 birth cohort | | | | |
| 2. Skilled working class | | -0.005 | | 0.030 |
| 3. Intermediate class | | -0.023 | | 0.072 |
| 4. Salariat | | -0.043 | | 0.110 |
| Parental class * 1985-90 birth cohort | | | | |
| 2. Skilled working class | | -0.017 | | 0.021 |
| 3. Intermediate class | | -0.066 | | 0.050 |
| 4. Salariat | | -0.112 * | | 0.074 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 10,720*

**Table A8**. Effect of parental class background on mid-secondary attainment pre- and post-unification, binomial logit, avg. marginal effects (ALLBUS)

| | *Pre-unification* | | *Post-unification* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (*rf.* ) | | | | |
| 2. Skilled working class | 0.087 *** | 0.099 *** | 0.086 * | 0.090 * |
| 3. Intermediate class | 0.217 *** | 0.271 *** | 0.241 *** | 0.263 *** |
| 4. Salariat | 0.303 *** | 0.403 *** | 0.342 *** | 0.381 *** |
| Region | | | | |
| West Germany (*rf.* ) | | | | |
| East Germany | 0.203 *** | 0.325 *** | 0.062 *** | 0.125 *** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | 0.069 *** | 0.108 *** | 0.062 *** | 0.089 *** |
| Age | -0.001 | -0.001 | -0.004 | -0.009 |
| Parental class * East Germany | | | | |
| 2. Skilled working class | | -0.046 | | -0.015 |
| 3. Intermediate class | | -0.150 *** | | -0.061 |
| 4. Salariat | | -0.243 *** | | -0.104 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 10,720*

**Table A9**. Effect of parental class background on upper-secondary attainment, binomial logit, avg. marginal effects (ALLBUS)

| | *West Germany* | | *East Germany* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (*rf.* ) | | | | |
| 2. Skilled working class | 0.049 *** | 0.053 *** | 0.025 * | 0.023 * |
| 3. Intermediate class | 0.210 *** | 0.222 *** | 0.138 *** | 0.129 *** |
| 4. Salariat | 0.458 *** | 0.473 *** | 0.352 *** | 0.336 *** |
| Birth cohort | | | | |
| 1960-64 | -0.062 ** | -0.029 ** | -0.022 | -0.009 |
| 1965-69 | -0.031 | -0.015 | -0.023 | -0.009 |
| 1970-74 (rf.) | | | | |
| 1975-79 | 0.017 | 0.009 | 0.144 *** | 0.067 *** |
| 1980-84 | 0.064 * | 0.033 * | 0.157 *** | 0.074 *** |
| 1985-90 | 0.079 * | 0.041 * | 0.215 *** | 0.106 *** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.010 | -0.005 | 0.025 * | 0.011 * |
| Age | 0.000 | 0.000 | 0.001 | 0.000 |
| Parental class * 1960-64 birth cohort | | | | |
| 2. Skilled working class | | -0.012 | | -0.003 |
| 3. Intermediate class | | -0.040 | | -0.017 |
| 4. Salariat | | -0.052 | | -0.033 |
| Parental class * 1965-69 birth cohort | | | | |
| 2. Skilled working class | | -0.006 | | -0.004 |
| 3. Intermediate class | | -0.019 | | -0.018 |
| 4. Salariat | | -0.024 | | -0.035 |
| Parental class * 1975-79 birth cohort | | | | |
| 2. Skilled working class | | 0.003 | | 0.022 |
| 3. Intermediate class | | 0.010 | | 0.096 * |
| 4. Salariat | | 0.012 | | 0.142 ** |
| Parental class * 1980-84 birth cohort | | | | |
| 2. Skilled working class | | 0.012 | | 0.024 |
| 3. Intermediate class | | 0.036 | | 0.103 * |
| 4. Salariat | | 0.036 | | 0.150 ** |
| Parental class * 1985-90 birth cohort | | | | |
| 2. Skilled working class | | 0.015 | | 0.033 |
| 3. Intermediate class | | 0.043 | | 0.132 * |
| 4. Salariat | | 0.043 | | 0.177 ** |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 10,720*

**Table A10**. Effect of parental class background on upper-secondary attainment pre- and post-unification, binomial logit, avg. marginal effects (ALLBUS)

| | *Pre-unification* | | *Post-unification* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (*rf.* ) | | | | |
| 2. Skilled working class | 0.027 ** | 0.033 ** | 0.082 *** | 0.085 *** |
| 3. Intermediate class | 0.155 *** | 0.186 *** | 0.278 *** | 0.284 *** |
| 4. Salariat | 0.385 *** | 0.432 *** | 0.528 *** | 0.534 *** |
| Region | | | | |
| West Germany (*rf.* ) | | | | |
| East Germany | -0.107 *** | -0.051 *** | -0.026 | -0.010 |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.007 | -0.003 | 0.051 * | 0.021 * |
| Age | 0.000 | 0.000 | -0.007 | -0.003 |
| Parental class * East Germany | | | | |
| 2. Skilled working class | | -0.015 | | -0.007 |
| 3. Intermediate class | | -0.074 ** | | -0.016 |
| 4. Salariat | | -0.126 *** | | -0.016 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 10,720*

**Table A11**. Effect of parental class background on tertiary-level attainment, binomial logit, avg. marginal effects (ALLBUS)

| | *West Germany* | | *East Germany* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (*rf.* ) | | | | |
| 2. Skilled working class | 0.033 ** | 0.041 ** | 0.009 | 0.007 |
| 3. Intermediate class | 0.142 *** | 0.169 *** | 0.086 *** | 0.071 *** |
| 4. Salariat | 0.357 *** | 0.401 *** | 0.281 *** | 0.243 *** |
| Birth cohort | | | | |
| 1960-64 | -0.085 *** | -0.037 *** | 0.018 | 0.009 |
| 1965-69 | -0.061 *** | -0.027 *** | 0.014 | 0.007 |
| 1970-74 (rf.) | | | | |
| 1975-79 | 0.027 | 0.013 | 0.057 ** | 0.029 * |
| 1980-84 | 0.050 | 0.024 | 0.082 ** | 0.042 ** |
| 1985-90 | 0.047 | 0.023 | 0.128 ** | 0.068 ** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.043 *** | -0.019 *** | 0.027 ** | 0.014 * |
| Age | 0.008 *** | 0.003 *** | 0.005 *** | 0.002 *** |
| Parental class * 1960-64 birth cohort | | | | |
| 2. Skilled working class | | -0.016 | | 0.001 |
| 3. Intermediate class | | -0.058 * | | 0.011 |
| 4. Salariat | | -0.103 ** | | 0.029 |
| Parental class * 1965-69 birth cohort | | | | |
| 2. Skilled working class | | -0.011 | | 0.001 |
| 3. Intermediate class | | -0.041 | | 0.009 |
| 4. Salariat | | -0.069 | | 0.023 |
| Parental class * 1975-79 birth cohort | | | | |
| 2. Skilled working class | | 0.005 | | 0.004 |
| 3. Intermediate class | | 0.017 | | 0.033 |
| 4. Salariat | | 0.024 | | 0.081 |
| Parental class * 1980-84 birth cohort | | | | |
| 2. Skilled working class | | 0.009 | | 0.005 |
| 3. Intermediate class | | 0.031 | | 0.046 |
| 4. Salariat | | 0.043 | | 0.108 * |
| Parental class * 1985-90 birth cohort | | | | |
| 2. Skilled working class | | 0.009 | | 0.008 |
| 3. Intermediate class | | 0.028 | | 0.070 |
| 4. Salariat | | 0.040 | | 0.151 * |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 10,720*

**Table A12**. Effect of parental class background on tertiary attainment pre- and post-unification, binomial logit, avg. marginal effects (ALLBUS)

| | *Pre-unification* | | *Post-unification* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class (*rf.* ) | | | | |
| 2. Skilled working class | 0.022 * | 0.025 * | 0.023 | 0.026 |
| 3. Intermediate class | 0.113 *** | 0.125 *** | 0.150 *** | 0.166 *** |
| 4. Salariat | 0.320 *** | 0.343 *** | 0.358 *** | 0.384 *** |
| Region | | | | |
| West Germany (*rf.* ) | | | | |
| East Germany | -0.045 *** | -0.022 *** | -0.057 ** | -0.021 ** |
| Gender | | | | |
| Male (ref.) | | | | |
| Female | -0.022 ** | -0.011 *** | 0.017 | 0.006 |
| Age | 0.005 *** | 0.002 *** | 0.014 *** | 0.005 *** |
| Parental class * East Germany | | | | |
| 2. Skilled working class | | -0.006 | | -0.007 |
| 3. Intermediate class | | -0.029 | | -0.040 |
| 4. Salariat | | -0.060 * | | -0.069 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 10,720*

**Table A13**. Descriptive statistics of key variables

| | SOEP | | ALLBUS | |
|---|---|---|---|---|
| | *N* | *%* | *N* | *%* |
| Parental class | | | | |
| 1. Unskilled working class | 3,237 | 11.17 | 1,870 | 14.69 |
| 2. Skilled working class | 5,413 | 18.68 | 3,330 | 26.15 |
| 3. Intermediate | 6,298 | 21.73 | 2,914 | 22.88 |
| 4. Salariat | 7,712 | 26.61 | 3,091 | 24.27 |
| *Missing* | 6,320 | 21.81 | 1,529 | 12.01 |
| School qualification | | | | |
| 1. Lower-secondary or less | 7,066 | 24.38 | 2,692 | 21.14 |
| 2. Mid-secondary | 11,128 | 38.40 | 5,492 | 43.13 |
| 3. Uppers-secodnary | 10,313 | 35.59 | 4,398 | 34.54 |
| *Missing* | 473 | 1.63 | 152 | 1.19 |
| Tertiary degree | | | | |
| No | 19,764 | 68.20 | 8,626 | 67.74 |
| Yes | 5,964 | 20.58 | 2,147 | 16.86 |
| *Missing* | 3,252 | 11.22 | 1,961 | 15.40 |
| Region | | | | |
| West Germany | 20,868 | 72.01 | 7,745 | 60.82 |
| East Germany | 8,112 | 27.99 | 4,989 | 39.18 |
| Birth cohort | | | | |
| 1960-64 | 5,730 | 19.77 | 3,545 | 27.84 |
| 1965-69 | 6,265 | 21.62 | 3,198 | 25.11 |
| 1970-74 | 5,121 | 17.67 | 2,109 | 16.56 |
| 1975-79 | 4,628 | 15.97 | 1,495 | 11.74 |
| 1980-84 | 4,241 | 14.63 | 1,417 | 11.13 |
| 1985-89 | 2,995 | 10.33 | 970 | 7.62 |
| Gender | | | | |
| Male | 13,535 | 46.70 | 6,318 | 49.62 |
| Female | 15,445 | 53.30 | 6,416 | 50.38 |
| Age (mean) | — | 37.51 | — | 34.39 |
| *Total* | 28,980 | 100.00 | 12,734 | 100.00 |

PAPER 3

## Fostering equality of opportunity? Compulsory schooling reform and social mobility in Germany

ABSTRACT: *There is an ongoing debate in the field of social mobility research about whether intergenerational social mobility can be increased by way of education policy. However, evidence on the effects of specific education policies on social mobility continues to be scarce. This paper analyses the effect of one specific policy reform, the extension of compulsory schooling in Germany, which has been argued to have led to a decrease in educational inequality and an increase in social mobility. Using a difference-in-difference design, the paper exploits the variation in the timing of the reform across German states to estimate the reform effect on the educational attainment and labour market chances of individuals from different social class backgrounds. We find that the reform resulted in a substantial narrowing of the gap in educational attainment between different social origin groups. This decline in educational inequality further translated into a reduction in the inequality in labour market chances between people from different social class backgrounds, thus increasing intergenerational social mobility. Our findings suggest that educational policy can lead to substantial increases in intergenerational social mobility, which may have been overlooked in past research on societal-level, long- run trends in social mobility.*

## Introduction

It is well known that, across all European societies, children from low social class backgrounds have substantially lower chances of obtaining a position in the middle or upper classes than is the case for people from higher social class backgrounds (Breen, 2004; Erikson and Goldthorpe, 1992). As a result, social class inequalities and associated inequalities in economic security, health and wellbeing tend to be reproduced across generations. This is highly problematic both from a normative as well as from an efficiency perspective. Normatively, it can be argued that in a fair society all people should have the same life chances, irrespective of their parental class backgrounds (Rawls, 1971). From an efficiency perspective, it is desirable that individuals' labour market position should be solely determined by her talent and true ability, and not depend on her parents' financial resources, network or social capital (Heckman and Masterov, 2007; Gray and Moshinsky, 1935). Tackling the inequality of opportunity between people from different social class backgrounds remains a fundamental challenge for all European governments. But still very little is known about the effectiveness of different social policies in achieving this aim.

In academic and policy circles, as well as in public discourse, education policy is widely seen as the most effective policy tool to increase intergenerational social mobility (see, e.g., OECD, 2010: 183; HM Government, 2011; Saunders; 2012). This belief is based on the observation that a substantial part of the inequality in the labour market prospects of people from different social class backgrounds can be attributed to an inequality in the educational attainment between these groups (Ishida et al., 1995; Breen and Karlson, 2014; Erikson and Jonsson, 1996). However, some scholars of social stratification have argued that education policies may in fact not be

the most effective means to increase intergenerational social mobility (Goldthorpe, 2016, 2007; Sturgis and Buscha, 2015). These scholars highlight that despite considerable educational reforms in European societies over the past decades, there has been little improvement in intergenerational social mobility in these societies. Yet, as much as one should not assume that educational policy is an effective tool for increasing intergenerational social mobility one also should not rely on evidence of long-term, societal-level trends in social mobility to conclude that past educational reforms have failed to achieve this aim. Instead, what is needed are detailed analyses of specific educational policy reforms and their effects on educational and labour market inequalities between different societal groups.

One specific educational policy reform that has been put forward as a potential means of reducing educational inequality between people from different social class backgrounds is the extension of compulsory schooling (Müller and Haun, 1994: 7; Müller and Pollak, 2004: 84). As discussed in further detail below, increasing the length of compulsory schooling is thought to reduce the relative cost of attaining an educational qualification above the most basic school-leaving qualification (ibid.). This in turn is thought to incentivise particularly the most disadvantaged individuals – who face considerable financial constraints as they complete their education – to stay in school longer and to attain a mid- or upper-secondary qualification. The resulting decrease in educational inequality may further be expected to equalise the labour market prospects of people from different social class backgrounds, thus increasing intergenerational social mobility.

While these arguments are theoretically plausible, they have thus far not been subject to rigorous empirical testing. As noted above, existing research on over-time change in social mobility in European societies has generally focused on long-term

trends at the national level, which has prevented it from drawing conclusions on specific reform effects (see, e.g., Breen, 2004; Erikson and Goldthorpe, 1992; Müller and Pollak, 2004). An exception is the evaluation of the 1972 extension of compulsory schooling in Britain by Sturgis and Buscha (2015), who find that the reform decreased educational inequality, but did not lead to an increase in intergenerational social mobility. However, this study is limited by a lack of within-country variation in the implementation of the compulsory schooling reform, which prevents it from disentangling the effects of the reform from the effects of other structural and institutional changes that occurred around the same time.

Our paper overcomes these problems of estimating the effect of compulsory schooling reform on educational inequality and social mobility by exploiting the variation in the timing of compulsory schooling reform across different West German states (*Bundesländer).* As discussed in further detail below, West German *Bundesländer* extended the period of compulsory schooling from eight to nine years at different times during the three decades following World War II. This within-country variation constitutes a quasi-experimental setting which allows for the use of a *difference-in-difference* design and robust estimates of the reform effects on educational and labour market inequalities (Angrist and Pischke, 2009; Gangl, 2010).

The first aim of this article is to empirically examine whether the extension of compulsory schooling has led to a narrowing in the educational attainment gap between people from different social class backgrounds. Second, we seek to examine whether a potential decline in educational inequality further translated into a decrease in the inequality in labour market chances of different social origin groups. Given the expectation of the existing literature that the extension of compulsory schooling mainly affected the most disadvantaged youth, we pay particular attention to

examining the reform effect on this group relative to individuals from more advantaged backgrounds. We define the most disadvantaged youth as people who were born into families with parents in unskilled working class positions. Individuals in this group are particularly disadvantaged in terms of the low level of parental economic resources they rely on during their early development and schooling and, given the strong link between parental class background and children's educational attainment, they are likely to leave school earlier than people from more advantaged backgrounds (Blossfeld, 1993; Betthäuser, 2016). It follows that the reduction in the relative cost of different secondary-level qualifications that resulted from the extension of compulsory schooling may be expected to have had a particularly pronounced effect on the educational attainment and labour market position of children from unskilled working class families.

**The German education system and the compulsory schooling reform**

The German system of ability tracking allocates students to different school types after they complete four years of primary education at around age ten. Pupils deemed to be of low ability are sent to the basic secondary track *(Hauptschule)* and generally leave full-time education after eight or nine years of schooling with a lower-secondary qualification. Pupils of intermediary ability are placed into the middle track *(Realschule)* and generally leave full-time education after ten years of schooling with a mid-secondary qualification. High ability pupils are allocated to the highest track *(Gymnasium)* and typically leave school after twelve or thirteen years of schooling with an upper-secondary qualification, which allows them to enrol in university. The

secondary track placement of children is based on the recommendation of primary school teachers and on the preference of parents (Jähnen and Helbig, 2015).[1]

The transition to secondary education is a crucial point in the educational trajectory of German youth. The type of secondary school that pupils attend generally exerts a strong influence on the type of further training they can receive and on their future labour market prospects (Müller et al., 1998). Attending the *Hauptschule* and leaving school with a lower-secondary qualification constitutes a substantial disadvantage when applying for apprenticeships or further school-based training, as compared to leaving school with a mid-secondary qualification or an upper-secondary qualification (ibid.). It is well documented that children from low social class backgrounds are substantially more likely than children from higher social class backgrounds to attend the *Hauptschule* and to leave school with a lower-secondary qualification (see, e.g., Betthäuser, 2016; Blossfeld, 1993).

After World War II, the compulsory schooling period was eight years, after which pupils were awarded the lower-secondary qualification. However, in the three decades following World War II the West German *Bundesländer* increased the length of compulsory schooling and the time required to obtain a lower-secondary qualification to nine years (Petzold, 1981; LeSchinsky, 1981; Friedeburg, 1992; Geißler, 2011). Hamburg and Berlin were the first *Bundesländer* to implement this reform in 1949 (see Table A1 in the Appendix). Any child who entered school in this year or later was obliged to attend school for nine years, while children who entered school before this year were required to receive only eight years of schooling. During the immediate post-war period the high level of unemployment and the lack of apprenticeship positions were important concerns which the state-level governments

[1] The relative importance of teacher recommendations and parental preferences for the secondary track placement of children varies across German states (see Jähnen and Helbig, 2015)

sought to address by delaying the labour market entry of young people (Petzold, 1981; Pischke and Wachter, 2008).[2] Almost a decade later, Schleswig-Holstein and Bremen also implemented the reform in 1956 and 1958 respectively, and Niedersachsen and Saarland followed suit in 1962 and 1964. At this time, labour market conditions had improved as a result of the 'economic miracle' (*Wirtschaftswunder*), and the main motivations for the reform centred on the perceived importance of the school environment for the development of 15-year old adolescents and the need for them to attain further theoretical training before beginning an apprenticeship (Petzold, 1981; LeSchinsky, 1981; Pischke and Wachter, 2008). The *Bundesländer* that had not already extended compulsory schooling by the early 1960s did so following the *1964 Hamburg Accord*, an agreement between the ministers of education of all *Bundesländer* which sought to harmonise the length of compulsory schooling across the *Bundesländer* (Friedeburg 1992; Geißler 2011). In line with the *1964 Hamburg Accord*, Nordrhein-Westfalen, Hessen, Rheinland-Pfalz and Baden Württemberg extended compulsory schooling to nine years in 1967 and Bayern did so in 1969.

**Why expect an effect on educational and labour market inequality?**

Leading scholars of social stratification have argued that the extension of compulsory schooling in Germany is likely to have led to a decrease in educational inequality between people from different social class backgrounds (Müller and Haun, 1994: 7; Müller and Pollak, 2004: 84). The proponents of this argument contend that the extension of compulsory schooling effectively reduced the relative cost of attaining a

[2] In Germany, education policy is in the hands of the individual Bundesländer, which generally coordinate their activities through framework agreements made by the Ministers of Culture Conference (Kultusministerkonferenz) (Müller et al., 1998).

mid-secondary or upper-secondary qualification as opposed to obtaining a lower-secondary qualification. While before the reform attaining a mid-secondary qualification in the *Realschule* instead of a lower-secondary qualification in the *Hauptschule* required two more years of schooling, after the reform only one additional year of schooling was required to obtain this qualification. Similarly, the additional schooling required to attain an upper-secondary qualification in the *Gymnasium* instead of a lower-secondary qualification decreased from five to four years. As a result, parents in low social class positions, who before the reform would have chosen to send their children to the *Hauptschule* instead of a higher track due to financial considerations may have become more inclined to invest in the additional schooling required for their children to attain a mid- or upper-secondary qualification in the *Realschule* or *Gymnasium* after the reform.

One can arrive at different expectations as to which social origin group has been most affected by the extension of compulsory schooling. Given the low economic resources of parents in unskilled working class positions, the effect of the reduction in the relative cost of the mid- and upper secondary qualification that resulted from the reform may be expected to have been most pronounced for the children of this group. Since parents in skilled working class or intermediate class positions have lower economic constraints, one can expect the reform effect on the preferences of this group to be less pronounced. Parents in salariat positions are unlikely to have been affected by the reform at all, as financial concerns are likely to play a minimal role in shaping their preference for their child's secondary track placement. Consequently, one may expect the extension of compulsory schooling to have led to a decrease in the educational inequality between children from salariat backgrounds and children from lower social class backgrounds, while the effect can

be expected to be most pronounced for children from unskilled working class backgrounds.

However, the change in the relative cost of secondary-level qualifications may have been too small to affect the preference of parents in unskilled working class positions. Parents in this group may find it to be too costly to send their children to the middle or highest school track even after the relative cost of doing so declined as a result of the compulsory schooling reform. By contrast, given the lower economic constraints of parents in skilled working class and intermediate positions, the preferences of this group may be more sensitive to a change in the relative cost of secondary-level qualifications. This would suggest that the reform effect on children from skilled working class or intermediate class backgrounds may have been as strong or even stronger than on children from unskilled working class backgrounds. Such difference in the reform effect between children from unskilled working class backgrounds, on the one hand, and children from skilled working class and intermediate class backgrounds, on the other hand, may also reflect the higher importance that parents in higher class positions tend to attach to the level of their children's educational qualification in order to ensure that their children maintain their own social status (Breen and Goldthorpe, 1997). This difference in educational preferences may lead parents from skilled working class and intermediate class backgrounds to be more responsive to a change in the relative cost of mid-secondary and upper-secondary qualifications than is the case for parents in unskilled working class positions.

In addition to the potential effect of the extension of compulsory schooling on educational inequality, there are two reasons why one might expect the reform to further have led to an equalization of the labour market prospects of people from

different social class backgrounds. First, given the close link between individuals' educational qualification and their labour market position in Germany (see, e.g., Müller and Gangl, 2003; Shavit and Müller, 1998), one could expect a potential decrease in educational inequality between people from different social class backgrounds to further have translated into an equalization of the labour market prospects of these groups. Second, this dynamic may be reinforced by the fact that people with lower-secondary qualifications receive one additional year of schooling after the reform. This change may be expected to result in an increase of the labour market value of lower-secondary qualifications and a corresponding improvement of the labour market prospects of people from low social class backgrounds, who are more likely to leave school with a lower-secondary qualification than people from more advantaged backgrounds (see, e.g., Blossfeld, 1993).

However, a potential increase in the educational attainment of individuals form lower parental class backgrounds resulting from the compulsory schooling reform does not necessarily translate into a narrowing in the labour market chances between this group and people from more advantaged backgrounds. Children from parents in higher social class positions may compensate for a reduction in their educational advantage by capitalizing on other sources of social advantage, such as their parents' professional networks or their 'soft-skills' and cultural resources (Goldthorpe, 2016; Bukodi and Goldthorpe, 2013) or by pursuing further post-secondary education during their early career (Bukodi, 2017; Gugushvili et al., 2017). In fact, such dynamic may account for the finding of Sturgis and Buscha (2015) that the extension of compulsory schooling in Britain appears to have led to a decrease in educational inequality, but left labour market inequalities between different social

origin groups unchanged. We test whether a similar pattern can be observed in Germany.

**Method, data and variables**

As noted above, we use a *difference-in-difference* design to identify the effect of the extension of compulsory schooling on the educational and labour market inequality between children from different social class backgrounds (Angrist and Pischke, 2009; Gangl, 2010). We identify the reform effect by comparing the extent of educational and labour market inequality amongst pupils who started school under different compulsory schooling regimes. We use a binary independent variable to indicate whether a given child attended school under the old regime of eight years of compulsory schooling or under the new nine-year regulation. Children were allocated to either of these two groups based on their year of birth and the *Bundesland* in which they lived during their childhood.[3] The substantial variation in the timing of the compulsory schooling reform in different *Bundesländer* across two decades (see Table A1 in the Appendix) provides a quasi-experimental setting which minimises the risk that other events confound the reform effect we identify (see Meyer, 1995: 151 on 'government randomization'). We exploit this over-time variation in the implementation of the reform across states by way of a two-way interaction between parental background and the reform dummy that identifies individuals' treatment status based on their birth year and the state in which they received their schooling.[4]

[3] Unfortunately, the data we use does not allow us to account for grade repetition when allocating pupils into the pre- and post-reform groups. This may lead us to somewhat underestimate the reform effect on educational and labour market inequality.

[4] It is important to note that we exploit the over-time variation in the reform of compulsory schooling across *Bundesländer* in order to identify the reform effect on educational and labour market inequality. In contrast to classical difference-in-difference designs, there is no 'pure' control unit of states that did not implement the compulsory schooling reform in Germany. Hence using a three-way interaction as

In order to avoid any confounding effect of over-time trends, such as the educational expansion or changes in the occupational structure, we control for state-specific linear trends by including an interaction between respondents' birth year and the *Bundesland* they lived in during their childhood in all our models.[5] As a result, our research design is very similar to the *difference-in-difference* design used by Pischke and Wachter (2008), who evaluate the effect of compulsory schooling reform on labour market returns to education in Germany. A similar design is also employed by Acemoglu and Angrist (2000), who assess the effect of compulsory schooling reform on returns to education in the United States and by Oreopoulos (2007), who focuses on the United States, Canada, and the United Kingdom.

We use the German Socio-Economic Panel Study (SOEP) as the primary dataset for our analyses (see Wagner et al., 2007). In order to avoid any potential bias due to survey specificities, we verify the robustness of our results by running all our models on a secondary dataset. For this purpose we use the German General Social Survey (ALLBUS/GGSS) (see Wasmer et al., 2014). Both the SOEP and the ALLBUS provide detailed information on the social class position and education of respondents and their parents, and the two datasets have been widely used for the analysis of intergenerational social mobility in Germany (see, e.g., Pollak, 2000; Pollak and Müller, 2004; Hertel, 2017). All results reported in the main body of the text are based on the SOEP data. The results from our replication analyses based on the ALLBUS data are given in the Appendix. While most previous research on educational and labour market inequalities in Germany uses the 'complete case analysis' approach and thus relies on the assumption that missingness in the data is

per the difference-in-difference-in-difference (DDD) approach (see Gangl, 2010) is not practicable for the purposes of our study.

[5] We ran robustness checks using quadratic state-specific trends. This does not change our results.

completely at random (White et al., 2010), we impute missing data points using multiple imputation by chained equations and thereby limit the risk of potential bias related to systematic item missingness in our data.[6]

The main dependent variables of our analyses are two sets of binary variables. The first set of variables indicates individuals' educational attainment and the second set of variables indicates their labour market position. We measure an individuals' educational attainment by way of two educational threshold variables. The first threshold variable indicates whether individuals have attained a school qualification at the mid-secondary level or above, and the second threshold variable indicates whether they have attained a school qualification at the upper secondary level. As noted above, whether German pupils cross these educational thresholds substantially affects their future educational and labour market prospects.

We measure individuals' labour market position in terms of their social class position. More specifically, we use two binary measures indicating, first, whether they have attained a position in the skilled working class or above, and, second, whether they have attained a position in the intermediate class or above. As discussed in the first paper of this dissertation (Betthäuser, 2016), individuals' position with respect to these two 'labour market thresholds' can be expected to carry substantial implications for their economic security (also see Leibfried and Tennstedt, 1985; Emmenegger et al, 2012). Individuals' and parents' social class position is operationalised using the European Socio-Economic Classification (ESeC), which has been validated for Germany (Wirth et al., 2010; Rose and Harrison 2010). Parental class position is measured using a four-category version of the ESeC schema, differentiating between (1) the unskilled working class, (2) the skilled

[6] For a detailed discussion of the advantages of multiple imputation using chained equations in research on social stratification see Kuha (2013).

working class, (3) the intermediate class and (4) the salariat. We derive the parental class position from fathers' and mothers' class positions using the dominance approach. This approach allocates parents to a social class position according to the higher social class position of the two spouses (see Erikson, 1984). Parents' social class position is measured at age fifteen of the cohort members. Individuals' social class position is measured at age 34, i.e. at the age of 'occupational maturity' after which individuals' labour market position tends to stabilise (see Bukodi and Goldthorpe, 2009, 2011). For respondents for whom occupational information was not recorded at age 34 we rely on information from older ages up to age 64. We control for the specific age at which individuals were interviewed (i.e. the age when their occupation was observed), as well as individuals' birth year, gender, state of residence during childhood and state-specific linear trends in all our models.

**Results 1: Inequality in educational attainment**

The first main aim of this paper is to examine whether the extension of compulsory schooling in Germany has led to a narrowing in the educational attainment gap between people from different social class backgrounds. Moreover, we seek to assess whether the reform effect – if any such effect can be observed – was felt most strongly by people from unskilled working class backgrounds, or whether the reform mainly affected people from skilled working class or intermediate class backgrounds. In order to address these questions, we run a series of binary logit models with the two educational thresholds discussed above as our dependent variables. We first include as focal independent variables our four-category measure of the parental class position and the reform dummy indicating the compulsory schooling regime

under which a given respondent started school (Table 1, M1 and M3). Second, we add an interaction between parental class and the reform dummy to identify the effect of the reform on the association between individuals' parental class background and their educational attainment (M2 and M4). We take children from salariat backgrounds as our reference category, since, as noted above, they are unlikely to have changed their educational preferences due to the reform. The reference category for our dependent variables is not having crossed the respective threshold.

The main effect of parental class shown in M1 and M3 confirms the known class gradient in children's educational attainment (see, e.g., Blossfeld, 1993; Betthäuser, 2016). Moreover, the main effect of the reform dummy in M1 and M3 suggests that the reform increased the overall share of German pupils who attained a middle- or upper-secondary qualification. The positive and statistically significant interaction terms in M2 and M4 suggest that this increase in educational attainment mainly occurred for children with parents in skilled working class and intermediate class positions, thus leading to a *decrease in the educational inequality* between these social origin groups, on the one hand, and children from salariat backgrounds, on the other hand. However, we do not find any evidence of an increase in the relative educational attainment of people from unskilled working class backgrounds.[7]

[7] We have tested the robustness of these results by running all models on our secondary dataset, the ALLBUS dataset, which yields the same conclusions (see Table A3 in the Appendix). However, one difference is that the results from the ALLBUS data also show a decrease in the educational attainment gap between individuals from unskilled working class backgrounds and individuals from salariat backgrounds for the first educational threshold. However, the reform effect on this group is smaller than the effect on individuals from skilled working class and intermediate class backgrounds and it is not statistically significant at the second educational threshold. Moreover, we find that the main effect of the reform in M1 is not statistically significant in the ALLBUS data. However, given that the effect is of a similar size in the ALLBUS and the SOEP, the difference in the statistical significance of this effect can be attributed to the smaller sample size in the ALLBUS, as compared to the SOEP.

Table 1. Educational attainment of different social origin groups, binomial logit, odds ratios

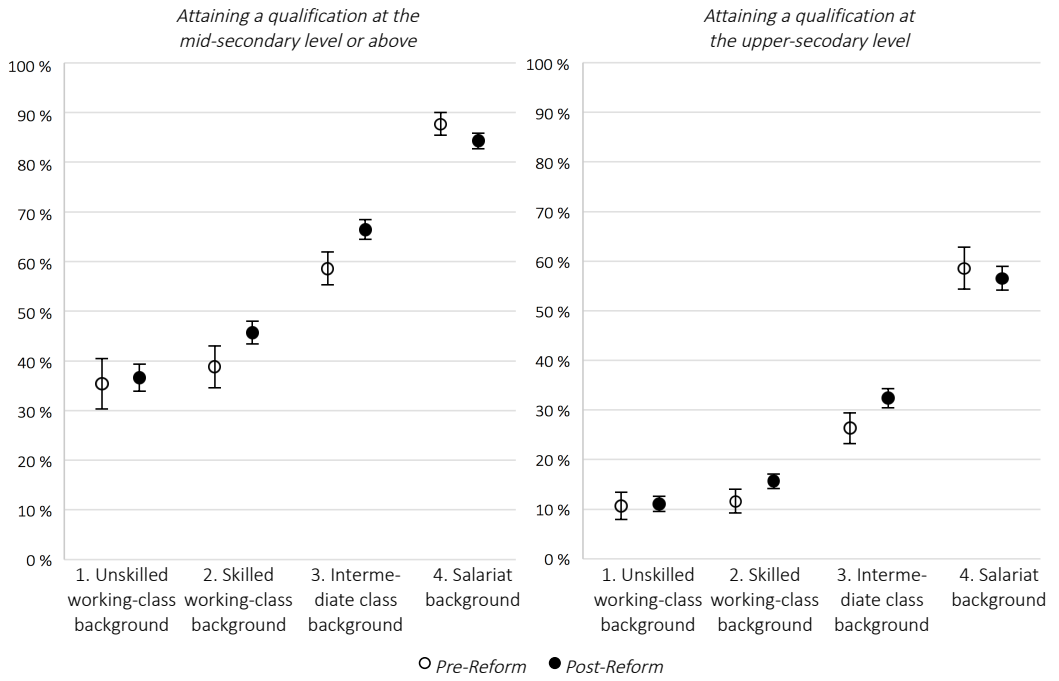
| | *Attaining a qualification at the mid-secondary level or above* | | *Attaining a qualification at the upper-secondary level* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class | 0.096 *** | 0.080 *** | 0.092 *** | 0.084 *** |
| 2. Skilled working class | 0.135 *** | 0.095 *** | 0.129 *** | 0.093 *** |
| 3. Intermediate class | 0.314 *** | 0.225 *** | 0.334 *** | 0.252 *** |
| 4. Salariat (*rf.*) | | | | |
| Reform | 1.199 ** | 0.800 | 1.182 * | 0.919 |
| Parental class * Reform | | | | |
| 1. Unskilled working class | | 1.350 | | 1.135 |
| 2. Skilled working class | | 1.653 *** | | 1.532 ** |
| 3. Intermediate class | | 1.671 *** | | 1.460 *** |
| 4. Salariat (rf.) | | | | |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 22,812*

*Notes:* Control variables are age, gender, birth year, state of residence during childhood and state-specific trends (not shown)

In order to examine the size of the reform effect on the different social origin groups, we plot the predicted probabilities of each of these groups to attain a qualification above the two educational thresholds before and after the reform. Figure 1 suggests that also in absolute terms the reform effect was more pronounced for individuals from skilled working class and intermediate class backgrounds than for people from unskilled working class backgrounds. For people from skilled working class and intermediate class backgrounds the probability to exceed the first educational threshold increased by about nine percentage points, and the probability to exceed the second threshold increased by about six percentage points. Again, we find no evidence for any change in the probability of people from unskilled working class backgrounds to exceed either of the two educational thresholds.

Figure 1. Predicted probabilities of obtaining a qualification above threshold one and two, pre- and post-reform




*Notes:* 95% Confidence Intervals; Predicted probabilities based on M2 and M4 of Table 1

**Results 2: Inequality in labour market chances**

Our second aim is to examine whether, further to its effects on educational inequality, the extension of compulsory schooling also led to an equalization in the labour market prospects of children from different social class backgrounds. We further seek to assess whether this reform effect on labour market inequality – if observed – can be accounted for by the reform effect on educational inequality or by a potential increase in the labour market value of lower secondary qualifications. As discussed above, we investigate the effect of the compulsory schooling reform on individuals chances to attain a position a) in the skilled working class or above and b) in the intermediate class or above. To this end we run a set of binary logit models with these two labour market thresholds as the dependent variables and with parental class and the reform dummy as the focal independent variables (Table 2, M1 and

M5). We then add the interaction between parental class and the reform dummy to identify the effect of the extension of compulsory schooling on the inequality in labour market chances between different social origin groups (M2 and M5). In order to assess whether this reform effect can be accounted for by the reform effect on educational inequality we add a variable measuring whether individuals attained a lower-, mid- or upper-secondary school leaving qualification (M3 and M6). Last, we add an interaction between this variable and the reform dummy in order to examine the potential role of an increase in the labour market value of lower secondary qualifications (M4 and M8).

The main effect of parental class shown in M1 and M5 confirms the known class gradient in individuals' labour market chances (see, e.g., Breen, 2004; Erikson and Goldthorpe, 1992). Importantly, the interaction between parental class and the reform dummy in M2 indicates that the extension of compulsory schooling, further to its effect of reducing educational inequality, also lead to a *decrease in labour market inequality*. More specifically, the inequality between people from skilled working class backgrounds and people in salariat backgrounds in obtaining a position in the skilled working class or above declined as a result of the reform. Similarly, with regards to the second threshold, the interaction terms in M6 suggests that the reform led to a narrowing of the gap between individuals from salariat backgrounds, on the one hand, and individuals from skilled working class and intermediate class backgrounds, on the other hand. By contrast, we find no evidence of a reform effect on the relative labour market chances of people from unskilled working class backgrounds.[8]

[8] As in our analysis of the reform effect on educational inequality, we have tested the robustness of the results presented in this section by running our models on our secondary dataset, the ALLBUS dataset, which again leads us to the same conclusions (see Table A4 in the Appendix).

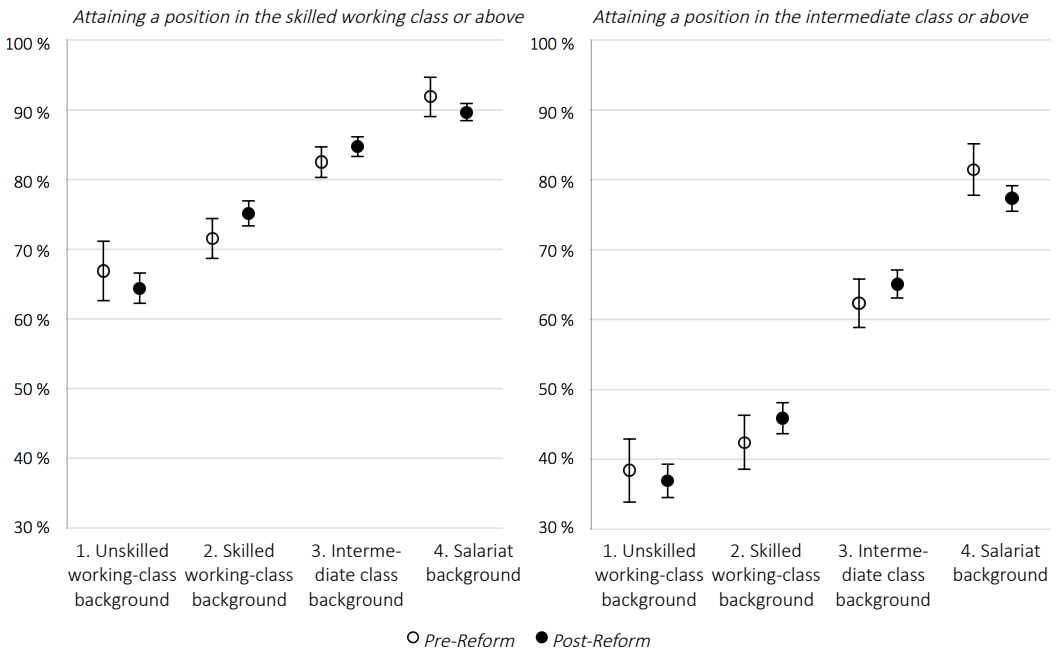
**Table 2**. Social class attainment of different social origin groups, binomial logit, odds ratios

| | *Attaining a position in the skilled working class or above* | | | | *Attaining a position in the intermediate class or above* | | | |
|---|---|---|---|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* | *M5* | *M6* | *M7* | *M8* |
| Parental class | | | | | | | | |
| 1. Unskilled working class | 0.193 *** | 0.173 *** | 0.406 *** | 0.460 *** | 0.164 *** | 0.141 *** | 0.366 *** | 0.416 *** |
| 2. Skilled working class | 0.288 *** | 0.210 *** | 0.478 *** | 0.540 ** | 0.225 *** | 0.167 *** | 0.419 *** | 0.475 *** |
| 3. Intermediate class | 0.547 *** | 0.413 *** | 0.762 | 0.843 | 0.494 *** | 0.376 *** | 0.737 * | 0.820 |
| 4. Salariat (*rf.*) | | | | | | | | |
| Reform | 1.065 | 0.782 | 0.760 | 0.679 | 1.041 | 0.774 | 0.768 | 0.709 |
| Parental class * Reform | | | | | | | | |
| 1. Unskilled working class | | 1.149 | 1.203 | 1.014 | | 1.213 | 1.222 | 1.029 |
| 2. Skilled working class | | 1.548 * | 1.517 | 1.286 | | 1.487 ** | 1.368 | 1.161 |
| 3. Intermediate class | | 1.488 | 1.279 | 1.124 | | 1.455 * | 1.206 | 1.057 |
| 4. Salariat (*rf.*) | | | | | | | | |
| School qualification | | | | | | | | |
| 1. Lower-sec. or less | | | 0.300 *** | 0.230 *** | | | 0.286 *** | 0.217 *** |
| 2. Mid-secondary (*rf.*) | | | | | | | | |
| 3. Upper-secondadry | | | 3.293 *** | 4.417 *** | | | 4.449 *** | 5.553 *** |
| School qualification * Reform | | | | | | | | |
| 1. Lower-sec. or less | | | | 1.426 *** | | | | 1.477 *** |
| 2. Mid-secondary (*rf.*) | | | | | | | | |
| 3. Upper-secondadry | | | | 0.705 | | | | 0.771 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 22,812*

*Notes:* Control variables are age, gender, birth year, state of residence during childhood and state-specific trends (not shown)

Figure 2. Predicted probabilities of obtaining a qualification above threshold one and two, pre- and post-reform




*Notes:* 95% Confidence Intervals; Predicted probabilities based on M2 and M4 of Table 2

In order to examine the size of the reform effect on the different social origin groups, we calculate the predicted probabilities of each of these groups to attain a position above the two labour market thresholds before and after the reform. Figure 2 shows a very similar pattern for the reform effect on the labour market chances of different origin groups as Figure 1 showed for the reform effect on the educational attainment of these groups. In absolute terms, the effect on individuals' labour market chances appears to have been most pronounced for individuals from skilled working class and intermediate class backgrounds, while there has been no change in the labour market chances of people from unskilled working class backgrounds.

In light of the overarching aim of this article, one key question is to what extent the observed reform effect on the labour market inequality between people from different social class origins can be attributed, first, to the observed reform effect on the educational inequality between these groups, and second, to a potential

reform effect on the labour market value of lower-secondary qualifications. Once we include the main effect of school qualification in M3 and M7, the interaction between parental class and the reform dummy weakens considerably. This suggests that the decline in educational inequality between individuals from different parental class backgrounds accounts, at least in part, for the equalisation of labour market chances across these groups. Furthermore, when we add an interaction between school qualification and the reform dummy in M4 and M8, we observe that the labour market value of the lower-secondary qualification, relative to the mid-secondary qualification appears to have increased as a result of the reform. We also observe a further weakening of the interaction between parental class and the reform dummy, which suggests that the increase in the relative value of the lower-secondary qualification constitutes a further mechanism that contributed to the observed decrease in labour market inequality between people from different social class backgrounds.

**Conclusion**

Our paper has sought to contribute to the ongoing debate about the potential of education policy to increase intergenerational social mobility (see, e.g., Goldthorpe, 2016, 2007; Saunders; 2012; Ishida et al., 1995). While this debate has thus far largely relied on indirect evidence concerning the mediating role of education in the intergenerational transmission of disadvantage and long-term trends in intergenerational social mobility, we use a quasi-experimental approach to directly evaluate the effect of one specific education policy reform – the extension of

compulsory schooling in Germany – on the educational and labour market chances of people from different social backgrounds.

Our first key finding is that the extension of compulsory schooling in Germany has led to a substantial decrease in the educational inequality. Relative to people from salariat backgrounds, the reform has increased the chances of people from skilled working class backgrounds and intermediate class backgrounds to obtain a mid- or upper-secondary qualification. This finding is in line with the expectation of Müller and Haun (1994) and Müller and Pollack (2004) of an equalizing effect of the reform. It also parallels the finding of Sturgis and Buscha (2015) who observe a decline in educational inequality as a result of the extension of compulsory schooling in Britain. Surprisingly however, we find no reform effect on the educational attainment of children from unskilled working class backgrounds. This finding contradicts the expectation by Müller and Haun (1994) that the extension of compulsory schooling most strongly affected the educational attainment of pupils who face the most severe constraints in terms of their parents' economic resources. Instead it may be the case that the comparatively higher economic resources of parents in skilled working class and intermediate class positions render their preferences regarding the secondary track placement of their child more susceptible to changes in the relative cost of the different secondary qualifications that resulted from the reform. This finding may also reflect the higher importance that parents in skilled working class and intermediate class positions attach to their children attaining a mid-secondary or upper-secondary qualifications, as these qualifications are more instrumental in ensuring that their children maintain their own social status, than is the case for parents in lower social class positions (Breen and Goldthorpe, 1997).

Our second key finding is that, further to decreasing educational inequality, the extension of compulsory schooling in Germany also led to a substantial narrowing of the gap in labour market chances between people from salariat backgrounds, on the one hand, and people from skilled working class and intermediate class backgrounds, on the other hand. Importantly, we show that this equalizing effect of the extension of compulsory schooling on individuals' labour market chances resulted from the observed reduction of educational inequality and from an increase in the labour market value of lower-secondary qualifications. As one would expect, given the lack of a reform effect on the educational attainment of children from unskilled working class background, we also find no reform effect on the labour market attainment of this group.

Our finding of an equalizing reform effect on individuals' labour market chances contrasts with the observation by Sturgis and Buscha (2015), who do not observe an effect of the extension of compulsory schooling in Britain on individuals' labour market chances. These contrasting findings may reflect the known fact that individuals' labour market position in Germany is substantially more closely linked to their educational qualification than is the case in Britain (see, e.g., Müller and Gangl, 2003; Shavit and Müller, 1998).

Importantly, our results demonstrate that education policy can have a substantial equalizing effect on both the educational and labour market chances of people from different social class backgrounds, and thus increase intergenerational social mobility. This finding underscores the need for social stratification research to evaluate specific policy reforms – preferably using research designs that licence causal inference – in order to understand how educational policies, and social policies more widely, affect social inequality and its intergenerational reproduction.

As the findings of this article suggest, evidence on long-run structural trends in intergenerational social mobility (see, e.g., Breen 2004; Müller and Pollack, 2004; Betthäuser, 2016) may mask changes in social mobility resulting from specific reforms that may be implemented at the subnational level and at differing time points.

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## Appendix

Table A1. Introduction of 9th Grade in Basic Track of Secondary School

| | *Year of implementation* | *First birth cohort affected* |
|---|---|---|
| Hamburg (HH) | 1949 | 1934 |
| Berlin West (BE) | 1949 | 1934 |
| Schleswig - Holstein (SH) | 1956 | 1941 |
| Bremen (HB) | 1958 | 1943 |
| Niedersachsen (NI) | 1962 | 1947 |
| Saarland (SL) | 1964 | 1949 |
| Nordrhein-Westfalen (NW) | 1967 | 1953 |
| Hessen (HE) | 1967 | 1953 |
| Rheinland-Pfalz (RP) | 1967 | 1953 |
| Baden-Württemberg (BW) | 1967 | 1953 |
| Bayern (BY) | 1969 | 1955 |

*Source:* Pischke and Wachter (2008)

Table A2. Descriptive statistics of key variables

| | SOEP | | ALLBUS | |
|---|---|---|---|---|
| | *N* | *%* | *N* | *%* |
| Parental class | | | | |
| 1. Unskilled working class | 2,574 | 9.05 | 1,936 | 14.62 |
| 2. Skilled working class | 4,342 | 15.26 | 3,620 | 27.33 |
| 3. Intermediate | 5,064 | 17.80 | 3,665 | 27.67 |
| 4. Salariat | 4,041 | 14.20 | 1,957 | 14.78 |
| *Missing* | 12,430 | 43.69 | 2,067 | 15.61 |
| Social class of respondent | | | | |
| 1. Unskilled working class | 4,785 | 16.82 | 2,117 | 15.98 |
| 2. Skilled working class | 4,981 | 17.51 | 3,282 | 24.78 |
| 3. Intermediate | 5,522 | 19.41 | 3,773 | 28.49 |
| 4. Salariat | 7,884 | 27.71 | 3,726 | 28.13 |
| *Missing* | 5,279 | 18.55 | 347 | 2.62 |
| School qualification | | | | |
| 1. Lower secondary or less | 13,337 | 46.88 | 6,124 | 46.24 |
| 2. Mid-secondary | 7,207 | 25.33 | 3,518 | 26.56 |
| 3. Upper-secondary | 7,547 | 26.53 | 3,506 | 26.47 |
| *Missing* | 360 | 1.27 | 97 | 0.73 |
| *Total* | 28,451 | 100.00 | 13,245 | 100.00 |

Table A3. Educational attainment of different social origin groups, binomial logit, odds ratios (ALLBUS data)

| | *Attaining a qualification at the mid-secondary level or above* | | *Attaining a qualification at the upper-secondary level* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class | 0.079 *** | 0.064 *** | 0.090 *** | 0.081 *** |
| 2. Skilled working class | 0.105 *** | 0.085 *** | 0.116 *** | 0.084 *** |
| 3. Intermediate class | 0.237 *** | 0.185 *** | 0.286 *** | 0.222 *** |
| 4. Salariat (*rf.*) | | | | |
| Reform | 1.131 | 0.774 | 1.271 ** | 0.954 |
| Parental class * Reform | | | | |
| 1. Unskilled working class | | 1.466 * | | 1.194 |
| 2. Skilled working class | | 1.485 * | | 1.604 ** |
| 3. Intermediate class | | 1.579 ** | | 1.475 ** |
| 4. Salariat (rf.) | | | | |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 12,801*

*Notes:* Control variables are age, gender, birth year, state of residence during childhood and state-specific trends (not shown)

**Table A4**. Social class attainment of different social origin groups, binomial logit, odds ratios (ALLBUS data)

| | *Attaining a position in the skilled working class or above* | | | | *Attaining a position in the intermediate class or above* | | | |
|---|---|---|---|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* | *M5* | *M6* | *M7* | *M8* |
| Parental class | | | | | | | | |
| 1. Unskilled working class | 0.196 *** | 0.183 *** | 0.467 ** | 0.489 *** | 0.160 *** | 0.130 *** | 0.386 *** | 0.416 *** |
| 2. Skilled working class | 0.279 *** | 0.214 *** | 0.516 ** | 0.538 *** | 0.191 *** | 0.145 *** | 0.399 *** | 0.426 *** |
| 3. Intermediate class | 0.511 *** | 0.404 *** | 0.792 | 0.818 | 0.451 *** | 0.354 *** | 0.790 | 0.841 |
| 4. Salariat (rf.) | | | | | | | | |
| Reform | 0.848 | 0.640 * | 0.629 * | 0.473 ** | 0.937 | 0.669 ** | 0.665 ** | 0.572 ** |
| Parental class * Reform | | | | | | | | |
| 1. Unskilled working class | | 1.088 | 1.082 | 1.018 | | 1.365 | 1.302 | 1.170 |
| 2. Skilled working class | | 1.499 * | 1.464 | 1.385 | | 1.518 ** | 1.376 | 1.254 |
| 3. Intermediate class | | 1.428 | 1.229 | 1.183 | | 1.441 * | 1.167 | 1.076 |
| 4. Salariat (rf.) | | | | | | | | |
| School qualification | | | | | | | | |
| 1. Lower-sec. or less (*rf.*) | | | 0.261 *** | 0.196 *** | | | 0.214 *** | 0.170 *** |
| 2. Mid-secondary | | | | | | | | |
| 3. Upper-secondadry | | | 2.476 *** | 1.803 * | | | 3.648 *** | 3.440 *** |
| School qualification * Reform | | | | | | | | |
| 1. Lower-sec. or less (*rf.*) | | | | 1.471 * | | | | 1.430 ** |
| 2. Mid-secondary | | | | | | | | |
| 3. Upper-secondadry | | | | 1.502 | | | | 1.093 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 12,801*

*Notes:* Control variables are age, gender, birth year, state of residence during childhood and state-specific trends (not shown)

Table A5. Educational attainment of different social origin groups, binomial logit, odds ratios

| | *Attaining a qualification at the mid-secondary level or above* | | *Attaining a qualification at the upper-secondary level* | |
|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* |
| Parental class | | | | |
| 1. Unskilled working class | 0.096 *** | 0.080 *** | 0.092 *** | 0.084 *** |
| 2. Skilled working class | 0.135 *** | 0.095 *** | 0.129 *** | 0.093 *** |
| 3. Intermediate class | 0.314 *** | 0.225 *** | 0.334 *** | 0.252 *** |
| 4. Salariat (*rf.*) | | | | |
| Reform | 1.199 ** | 0.800 | 1.182 * | 0.919 |
| Parental class * Reform | | | | |
| 1. Unskilled working class | | 1.350 | | 1.135 |
| 2. Skilled working class | | 1.653 *** | | 1.532 ** |
| 3. Intermediate class | | 1.671 *** | | 1.460 *** |
| 4. Salariat (rf.) | | | | |
| Gender (*male rf.*) | 1.177 *** | 1.177 *** | 0.709 *** | 0.709 *** |
| Age | 0.987 | 0.992 | 1.008 | 1.014 |
| Age (squared) | 1.000 | 1.000 | 1.000 | 1.000 |
| Birth year | 1.076 *** | 1.076 *** | 1.050 *** | 1.050 *** |
| State | | | | |
| 1. Berlin (*rf.*) | | | | |
| 2. Schleswig-Holstein | 1.528 | 1.555 | 1.121 | 1.141 |
| 3. Hamburg | 1.303 | 1.304 | 0.954 | 0.959 |
| 4. Niedersachsen | 0.714 | 0.722 | 1.078 | 1.097 |
| 5. Bremen | 0.385 | 0.380 | 0.753 | 0.750 |
| 6. Nordrhein-Westfalen | 0.723 | 0.729 | 0.973 | 0.989 |
| 7. Hessen | 0.644 | 0.643 | 0.954 | 0.952 |
| 8. Rheinl.-Pfalz, Saarl. | 0.538 | 0.537 | 0.797 | 0.804 |
| 9. Baden-Wuerttemberg | 0.618 | 0.621 | 1.042 | 1.057 |
| 10. Bayern | 0.993 | 1.022 | 1.169 | 1.203 |
| 11. Saarland | 0.738 | 0.721 | 1.439 | 1.409 |
| State * Birth year | | | | |
| 1. Berlin (*rf.*) | | | | |
| 2. Schleswig-Holstein | 0.970 | 0.969 | 0.986 | 0.985 |
| 3. Hamburg | 0.984 | 0.984 | 1.002 | 1.001 |
| 4. Niedersachsen | 0.995 | 0.994 | 0.990 | 0.989 |
| 5. Bremen | 1.031 | 1.031 | 1.013 | 1.012 |
| 6. Nordrhein-Westfalen | 0.996 | 0.995 | 1.004 | 1.003 |
| 7. Hessen | 1.006 | 1.006 | 1.000 | 0.999 |
| 8. Rheinl.-Pfalz, Saarl. | 0.993 | 0.993 | 0.995 | 0.994 |
| 9. Baden-Wuerttemberg | 0.993 | 0.993 | 0.988 | 0.987 |
| 10. Bayern | 0.976 | 0.975 | 0.980 | 0.979 |
| 11. Saarland | 0.986 | 0.986 | 0.984 | 0.984 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 22,812*

*Notes:* Control variables are age, gender, birth year, state of residence during childhood and state-specific trends (not shown); results from SOEP data

**Table A6**. Social class attainment of different social origin groups, binomial logit, odds ratios

| | *Attaining a position in the skilled working class or above* | | | | *Attaining a position in the intermediate class or above* | | | |
|---|---|---|---|---|---|---|---|---|
| | *M1* | *M2* | *M3* | *M4* | | *M6* | *M7* | *M8* |
| Parental class | | | | | | | | |
| 1. Unskilled working class | 0.193 *** | 0.173 *** | 0.406 *** | 0.460 *** | 0.164 *** | 0.141 *** | 0.366 *** | 0.416 *** |
| 2. Skilled working class | 0.288 *** | 0.210 *** | 0.478 *** | 0.540 ** | 0.225 *** | 0.167 *** | 0.419 *** | 0.475 *** |
| 3. Intermediate class | 0.547 *** | 0.413 *** | 0.762 | 0.843 | 0.494 *** | 0.376 *** | 0.737 * | 0.820 |
| 4. Salariat (*rf.*) | | | | | | | | |
| Reform | 1.065 | 0.782 | 0.760 | 0.679 | 1.041 | 0.774 | 0.768 | 0.709 |
| Parental class * Reform | | | | | | | | |
| 1. Unskilled working class | | 1.149 | 1.203 | 1.014 | | 1.213 | 1.222 | 1.029 |
| 2. Skilled working class | | 1.548 * | 1.517 * | 1.286 | | 1.487 ** | 1.368 | 1.161 |
| 3. Intermediate class | | 1.488 | 1.279 | 1.124 | | 1.455 * | 1.206 | 1.057 |
| 4. Salariat (*rf.*) | | | | | | | | |
| School qualification | | | | | | | | |
| 1. Lower-sec. or less | | | 0.300 *** | 0.230 *** | | | 0.286 *** | 0.217 *** |
| 2. Mid-secondary (*rf.*) | | | | | | | | |
| 3. Upper-secondadry | | | 3.293 *** | 4.417 *** | | | 4.449 *** | 5.553 *** |
| School qualification * Reform | | | | | | | | |
| 1. Lower-sec. or less | | | | 1.426 *** | | | | 1.477 *** |
| 2. Mid-secondary (*rf.*) | | | | | | | | |
| 3. Upper-secondadry | | | | 0.705 | | | | 0.771 |

*— continued on next page —*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gender (*male rf.*) | 0.740 *** | 0.739 *** | 0.707 *** | 0.712 *** | 0.918 ** | 0.918 ** | 0.918 ** | 0.926 *** |
| Age | 0.957 | 0.962 | 0.947 | 0.954 | 0.980 | 0.985 | 0.973 | 0.980 |
| Age (squared) | 1.001 | 1.000 | 1.001 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Birth year | 1.036 *** | 1.037 *** | 1.013 | 1.013 | 1.031 *** | 1.031 *** | 1.004 | 1.005 |
| State | | | | | | | | |
| 1. Berlin (*rf.*) | | | | | | | | |
| 2. Schleswig-Holstein | 3.207 ** | 3.255 ** | 3.176 ** | 3.225 ** | 2.562 ** | 2.596 ** | 2.630 ** | 2.693 ** |
| 3. Hamburg | 1.767 | 1.771 | 1.756 | 1.756 | 1.530 | 1.528 | 1.551 | 1.548 |
| 4. Niedersachsen | 1.847 * | 1.897 * | 2.111 * | 2.175 ** | 1.324 | 1.349 | 1.519 | 1.589 |
| 5. Bremen | 0.751 | 0.755 | 0.965 | 0.995 | 0.768 | 0.771 | 0.989 | 1.039 |
| 6. Nordrhein-Westfalen | 1.441 | 1.485 | 1.641 | 1.707 | 1.061 | 1.081 | 1.220 | 1.287 |
| 7. Hessen | 1.024 | 1.047 | 1.154 | 1.191 | 0.994 | 1.004 | 1.141 | 1.204 |
| 8. Rheinl.-Pfalz, Saarl. | 0.988 | 1.016 | 1.129 | 1.195 | 0.828 | 0.842 | 0.978 | 1.069 |
| 9. Baden-Wuerttemberg | 0.976 | 1.005 | 1.077 | 1.129 | 0.714 | 0.726 | 0.765 | 0.811 |
| 10. Bayern | 1.554 | 1.614 | 1.592 | 1.662 | 1.313 | 1.352 | 1.333 | 1.420 |
| 11. Saarland | 1.538 | 1.524 | 1.623 | 1.702 | 1.112 | 1.101 | 1.141 | 1.215 |
| State * Birth year | | | | | | | | |
| 1. Berlin (*rf.*) | | | | | | | | |
| 2. Schleswig-Holstein | 0.961 ** | 0.960 ** | 0.967 ** | 0.966 * | 0.968 ** | 0.967 ** | 0.973 * | 0.972 * |
| 3. Hamburg | 0.983 | 0.983 | 0.985 | 0.985 | 0.988 | 0.988 | 0.990 | 0.990 |
| 4. Niedersachsen | 0.972 * | 0.971 * | 0.972 * | 0.971 * | 0.985 | 0.984 | 0.986 | 0.984 |
| 5. Bremen | 0.994 | 0.993 | 0.983 | 0.983 | 0.998 | 0.997 | 0.986 | 0.985 |
| 6. Nordrhein-Westfalen | 0.983 | 0.982 | 0.982 | 0.981 | 0.994 | 0.994 | 0.992 | 0.990 |
| 7. Hessen | 0.991 | 0.990 | 0.989 | 0.988 | 0.997 | 0.997 | 0.995 | 0.993 |
| 8. Rheinl.-Pfalz, Saarl. | 0.987 | 0.986 | 0.991 | 0.989 | 0.999 | 0.998 | 1.003 | 1.000 |
| 9. Baden-Wuerttemberg | 0.993 | 0.992 | 0.997 | 0.995 | 1.004 | 1.004 | 1.010 | 1.008 |
| 10. Bayern | 0.982 | 0.980 | 0.989 | 0.987 | 0.985 | 0.984 | 0.994 | 0.992 |
| 11. Saarland | 0.972 | 0.972 | 0.977 | 0.975 | 0.987 | 0.987 | 0.992 | 0.990 |

** p < 0.05, ** p < 0.01, *** p < 0.001, N = 22,812*

*Notes:* Control variables are age, gender, birth year, state of residence during childhood and state-specific trends (not shown); results from SOEP data

**Table A7**. Distribution of school qualification across pupils from different parental class backgrounds, by birth cohort (%)

| | | *Birth Cohort* | | | |
|---|---|---|---|---|---|
| *Parental class* | *School qualification* | *1930-39* | *1940-49* | *1950-59* | *1960-69* |
| 1. Unskilled working class | 1. Lower secondary or less | 88.25 | 77.20 | 63.95 | 55.35 |
| | 2. Mid-secondary | 7.20 | 13.17 | 22.87 | 31.35 |
| | 3. Upper-secondary | 4.55 | 9.62 | 13.18 | 13.29 |
| | *Total* | 100.00 | 100.00 | 100.00 | 100.00 |
| 2. Skilled working class | 1. Lower secondary or less | 85.09 | 74.75 | 57.28 | 45.49 |
| | 2. Mid-secondary | 9.94 | 16.11 | 25.36 | 35.23 |
| | 3. Upper-secondary | 4.97 | 9.14 | 17.36 | 19.28 |
| | *Total* | 100.00 | 100.00 | 100.00 | 100.00 |
| 3. Intermediate class | 1. Lower secondary or less | 73.99 | 54.34 | 38.68 | 26.35 |
| | 2. Mid-secondary | 14.41 | 22.74 | 29.37 | 36.04 |
| | 3. Upper-secondary | 11.60 | 22.93 | 31.95 | 37.62 |
| | *Total* | 100.00 | 100.00 | 100.00 | 100.00 |
| 4. Salariat | 1. Lower secondary or less | 34.28 | 20.32 | 15.42 | 12.03 |
| | 2. Mid-secondary | 25.73 | 24.81 | 23.08 | 27.12 |
| | 3. Upper-secondary | 39.98 | 54.87 | 61.50 | 60.85 |
| | *Total* | 100.00 | 100.00 | 100.00 | 100.00 |

*N: 22,812,* SOEP data

PAPER 4

## Understanding the mobility chances of children from working-class backgrounds in Britain: How important are cognitive ability and locus of control?

ABSTRACT: *Research in social stratification has shown that children from working-class backgrounds tend to obtain substantially lower levels of educational attainment and lower labour market positions than children from higher social class backgrounds. However, we still know relatively little about the micro-level processes that account for this empirical regularity. Our study examines the roles of two individual-level characteristics – cognitive ability and locus of control – in mediating the effect of individuals' parental class background on their educational attainment and social class position in Britain. Contrary to recent claims that differences in cognitive ability account for most of the educational and labour market inequalities between individuals from working-class backgrounds and individuals from higher social class backgrounds, we find that cognitive ability mediates less than 40 percent of the parental class effect on individuals' educational attainment and social class position. Moreover, we find that individuals' locus of control also plays a role in mediating the parental class effect, albeit one that is substantially smaller than the mediating role of cognitive ability. Contrasting with previous studies on the subject, we measure individuals' social class positions at two crucial points in their careers: labour market entry and occupational maturity. We find that the mediating roles of cognitive ability and locus of control remain stable across individuals' working lives.*

## Introduction

Herrnstein and Murray's controversial volume *The Bell Curve* (1994) triggered a passionate debate over the role of cognitive ability in intergenerational social mobility (see, e.g., Fischer et al., 1996; Devlin et al., 1997; Jacoby and Glauberman, 1995). More than 20 years later this debate is still ongoing. In a recent contribution, Marks (2014) builds on the views expressed in *The Bell Curve* to suggest that the tendency of individuals from working-class backgrounds to attain lower levels of education and lower social class positions than individuals from higher social class backgrounds is largely due to the former group being on average less intelligent than the latter (also see Saunders, 1996, 1997; Burt, 1959, 1961). This view has also gained considerable traction within policy circles, as evidenced by a recent report by Dominic Cummings (2013), the special advisor to then British Secretary of State for Education, Michael Gove. In this report, Cummings contends that educational inequalities between individuals from different social class backgrounds are mostly due to differences in cognitive ability between them, and that these inequalities therefore reflect meritocratic processes in the education system and do not need to be addressed by policy makers.

The views expressed in *The Bell Curve* have been met with fierce criticism, casting doubt on the empirical basis of their arguments. Evidence from different national contexts serves to refute the claim that differences in cognitive ability account for most of the educational inequalities between children from different social backgrounds. The proportion of the association between individuals' social background and their educational attainment that is mediated by cognitive ability has been estimated at around 50 percent in the US (Hsin and Xie, 2016), around 30 percent in Sweden (see Erikson, 2016; Mood et al., 2012) and around 40 percent in Britain

(Bourne et al., 2017). It has also been shown that in Britain individuals' family background exerts a 'direct' effect on their labour market position, even after individuals' cognitive ability is taken into account (Gugushvili et al., 2017; Stumm et al., 2009). However, to date there are no estimates of the proportion of the association between individuals' social background and their labour market position that is mediated by their cognitive ability. Consequently, we still lack evidence on whether the claims made by Herrnstein and Murray (1994) and Marks (2014) that cognitive ability mediates most of the parental class effect on individuals' labour market position hold true.

If it was the case that – contrary to the claims made by Herrnstein and Murray (1994) and Marks (2014) – a large proportion of the effect of individuals' social background is not accounted for by individuals' cognitive ability, the question arises which other individual-level characteristics could account for this effect. There is an emerging body of literature that examines the role individuals' *non-cognitive* attributes in channelling the intergenerational transmission of inequality (see, e.g., Stumm et al., 2009, 2010; Cheng and Furnham, 2012; Sorjonen, 2012; Deary et al. 2005; Gugushvili et al., 2017; Ryberg et al., 2017; Heckman et al., 2006). This literature finds that particularly the extent to which people believe that they can influence the events and outcomes of their own lives – their *locus of control* – is associated with both their social background and their educational and labour market outcomes, such as their job search behaviour and earnings (Gugushvili et al., 2017; Ng-Knight and Schoon, 2017; Caliendo et al., 2015; Joshi, 2014; Stumm et al. 2009). Existing research from the US suggests that non-cognitive attributes play a weaker role than cognitive ability in mediating the effect of social background on educational outcomes (Hsin and Xie, 2016). But, to our knowledge, there are no existing studies that have sought to draw

this comparison with labour market outcomes as the outcome of interest. Given the known importance of non-cognitive attributes for individuals' labour market attainment (Caliendo et al., 2015; Ng-Knight and Schoon, 2017; Heckman, 2007), their role in mediating the effects of social background on individuals' labour market position may be as strong or stronger than is the case for cognitive ability.

We also lack evidence on whether and how the mediating roles of cognitive ability and non-cognitive attributes change across individuals' working lives, since existing studies on this subject tend to observe individuals at only one point in time, which is generally relatively early in their labour market careers. Yet, it is conceivable that cognitive ability and non-cognitive attributes come to play a more substantial mediating role later in individuals' careers. The existing literature suggests that parents' social background exerts a substantial direct effect on their children's occupational success at the time of labour market entry. Key mechanisms that account for this parental class effect include parents' professional networks, which individuals can draw on during their job search (Erikson and Jonsson, 1998; Bernardi and Ballarino, 2016), and parents' economic resources, which have been shown to function as a financial safety net during individuals transition into the labour market (Pfeffer and Hällsten, 2012). But this direct effect of individuals' parental class background may be weaker in later life, as individuals form their own professional networks, become economically independent, and are generally more removed from the parental context. Hence, as far as individuals' parental background still exerts an effect on their labour market position in later life, this may be channelled to a larger extent through individuals' own characteristics, such as their cognitive ability and non-cognitive attributes.

Our study seeks to contribute to the body of research on the role of cognitive ability and non-cognitive attributes in intergenerational social mobility by examining

the extent to which differences in these individual-level characteristics can account for the tendency of individuals from working-class backgrounds to obtain lower levels of educational attainment and lower labour market positions than children from higher social class backgrounds. From a social justice perspective, understanding the educational and labour market chances of children who are born into families at the low end of the social class spectrum is of particular relevance, as they can be seen to be most disadvantaged by the circumstances of their birth (Rawls, 1971). Based on the abovementioned evidence on the importance of children's locus of control for their later-life outcomes, our study focuses on this particular non-cognitive attribute.[1] Given that individuals' social background is likely to affect their cognitive ability and locus of control mainly during their childhood (see Cunha and Heckman, 2009), and since one of our aims is to examine the importance of these attributes in mediating the association between individuals' parental class background and their educational attainment, we focus on individuals' cognitive ability and locus of control in early life, measured at the age of ten.[2]

The two main research questions our study seeks to address are the following: First, to what extent does cognitive ability mediate the effect of coming from a working-class background, as compared to coming from a higher social-class background, on (i) individuals' educational attainment, (ii) individuals' social class

[1] While a set of additional indicators of non-cognitive attributes is available in the data we use, our preliminary analyses have shown that, across a range of educational and labour market outcomes, these other attributes do not appear to play a systematic and significant role in mediating the parental class effect. This finding is consistent with past studies that find that individuals' locus of control stands out in its role of mediating the effect of individuals' social background on their educational and labour market attainment (see, e.g., Gugushvili et al., 2017; Stumm et al., 2009).

[2] It is generally accepted that individuals' cognitive ability develops early in life and remains relatively stable thereafter. With regards to non-cognitive attributes such as locus of control, there is some evidence that they are more malleable and develop over a longer period of time, possibly into early adulthood (Borghans et al., 2008; Cunha and Heckman, 2009). However, since one of our aims is to draw comparisons between the mediating roles of cognitive ability and locus of control, we measure them both at the same age.

position at the point of labour market entry, and (iii) individuals' social class position later on in their careers?[3] Addressing this question allows us to directly and comprehensively test the argument put forward by Marks (2014) that the educational and labour market inequalities between individuals from working-class backgrounds and individuals from higher social class backgrounds is principally due to the former group being on average less intelligent than the latter.

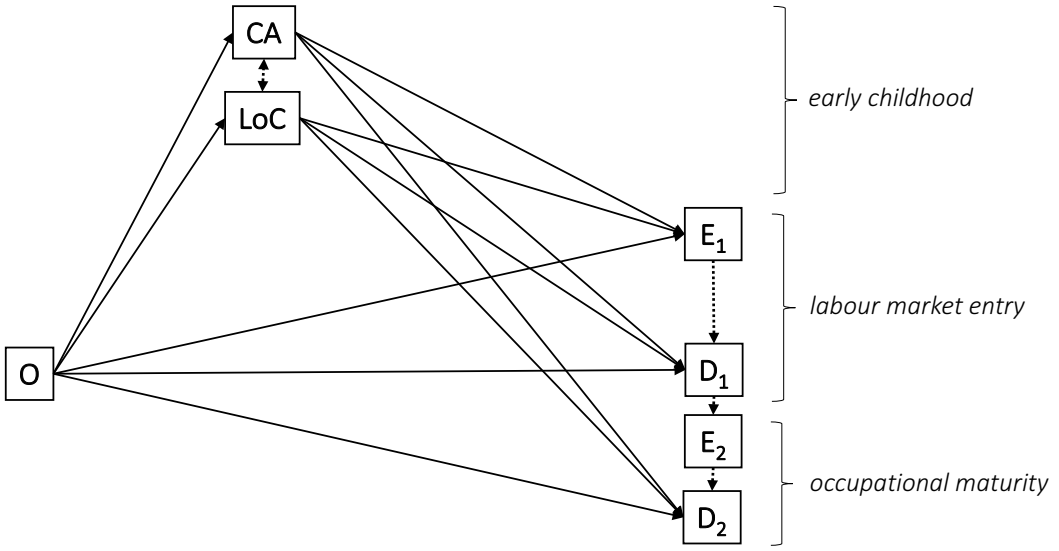
Second, insofar as a direct effect of parental class on individuals' educational attainment and social class position still exists even after taking cognitive ability into account, to what extent does locus of control mediate this remaining effect of parental social class on (i) individuals' educational attainment, (ii) individuals' social class position at the point of labour market entry, and (iii) individuals' social class position later on in their careers? Addressing this question permits us to investigate whether the role of locus of control in mediating the parental class effect on individuals' social class position is more pronounced than its role in mediating the parental class effect on individuals' educational attainment. It also allows us to examine whether the relative importance of the mediating role of locus of control, when compared to the mediating role of cognitive ability, is greater with regards to occupational outcomes than is the case for educational outcomes.

Figure 1 shows our conceptual framework. The outcomes of interest are individuals' educational attainment at the time of labour market entry ($E_1$), their social class position at the time of labour market entry ($D_1$), and their social class position at the time of 'occupational maturity' ($D_2$). We define the point of labour market entry as the beginning of individuals' first employment spell that lasts six months or longer.

[3] We use the term 'effect' in the statistical sense. Our study does not aim to identify causal relationships, but rather seeks to show the patterns of association between our focal variables.

Social class position at occupational maturity is measured at age 38, as it has been shown that individuals' social class position tends to stabilize after they reach their mid-thirties (see Bukodi and Goldthorpe, 2009, 2011). It is important to note that with respect to individuals' labour market position at labour market entry and occupational maturity (outcomes $D_1$ and $D_2$), we seek to assess the mediating role of cognitive ability and locus of control *net of individuals' educational attainment*, and we therefore control for individuals' educational attainment at these two life stages [$E_1$ and $E_2$].

Figure 1. Path-diagram of the associations between social origin, cognitive ability, locus of control, educational attainment and social destination




*Notes*: O = Parental class, CA = Cognitive ability, LoC = Locus of control, $E_1$ = Educational attainment at labour market entry, $D_1$ = Social class at labour market entry, $E_2$ = Educational attainment at occupational maturity, $D_2$ = Social class at occupational maturity.

**Data and variables**

We use data from the 1970 British Cohort Study (BCS70). The BCS70 is a longitudinal panel survey which follows the life courses of individuals born in one week in 1970 in Britain (see Power and Elliott, 2006; Betthäuser and Bourne, 2017). This dataset provides information on individuals' complete educational and labour market

histories, their parents' occupations, and their cognitive ability and locus of control in early childhood. Most previous studies on educational and labour market inequalities in Britain restrict their analyses to cases with complete information and thus rely on the assumption that missingness in the data is completely at random (White et al., 2010). By contrast, we impute missing data points using multiple imputation by chained equations, which limits the risk of potential bias related to systematic item missingness in our data.[4]

**Table 1**. Educational categories and thresholds

| |
|---|
| 1. Teritary-level degree or higher degree / NVQ 5 or NVQ 6 [upper tertiary] |
| 2. Tertiary-level sub-degree qualification / NVQ 4 [lower tertiary] |
| *Threshold 2* |
| 3. 2+ A-level passes [upper secondary] |
| *Threshold 1* |
| 4. 5+ O-level passes / 1 A-level pass / NVQ 3 [lower secondary – high perfromance] |
| 5. 1–4 O-level passes / NVQ 2 [lower secondary – low perfromance] |
| 6. Below O-level / NVQ 1 [sub-secondary] |
| 7. No qualifications |

We measure educational attainment by way of two binary threshold variables that are based on the seven-category, ordered scale of educational qualifications in Britain shown in Table 1. This scale has been used extensively in previous research on educational inequality in Britain (see, e.g., Bukodi and Goldthorpe, 2013; Bukodi et al. 2017). The first threshold distinguishes between individuals who achieved at least two academic qualifications at the upper-secondary level (A-levels) and those with lower educational qualifications. The second threshold distinguishes individuals with a tertiary qualification (sub-degree or degree-level qualification) from those without a

[4] For a detailed discussion of the advantages of multiple imputation using chained equations in research on social stratification see Kuha (2013).

tertiary qualification. We also account for individuals' vocational qualifications at the secondary and tertiary level, measured using the National Vocational Qualifications (NVQs) framework (see Wolf, 2006), as shown in Table 1.

**Table 2**. Social class cut-offs in NS-SEC

| |
|---|
| NS-SEC 1 and 2: Managerial and professional occupations |
| *Cut-off 4* |
| NS-SEC 3: Intermediate occupations |
| *Cut-off 3* |
| NS-SEC 4: Small employers and own-account workers |
| *Cut-off 2* |
| NS-SEC 5: Lower supervisory and technical occupations |
| *Cut-off 1* |
| NS-SEC 6 and 7: Routine and semi-routine occupations |

Individuals' social class position is measured using a five-category, collapsed version of the seven-category British National Statistics Socio-Economic Classification (NS-SEC) (see Rose and Pevalin, 2005, p. 38). Based on this classification, we generate four binary dependent variables shown in Table 2, that allow us to contrast different social class categories in a stepwise approach. The first social class 'cut-off' identifies whether an individual obtained a position in the working class, i.e. in a routine or semi-routine occupation (NS-SEC 6 or 7) or in any of the more advantaged classes (NS-SEC 1-5). The second social class measure separates individuals in manual occupations (NS-SEC 5-7) from those in predominantly non-manual occupations (NS-SEC 1-4). In the British context, non-manual occupations are known to be regarded as granting a higher social status, as compared to manual occupations (Chan and Goldthorpe, 2004). Since the class category of small employers and own-account workers (NS-SEC 4) in part also includes manual workers the third measure constitutes an alternative comparison whereby this category is combined with NS-SEC 5-7 and compared to NS-SEC 1-3. Finally, the fourth measure identifies whether individuals obtain a position in the

salariat, i.e. in a managerial or professional occupation (NS-SEC 1-2), or in any of the lower social classes (NS-SEC 3-7). Working with these four two-way comparisons allows us to examine whether the roles of cognitive ability and locus of control in mediating the parental class effect on individuals' social class position differs across the social class distribution.

In line with our focus on the life-chances of individuals from the most disadvantaged backgrounds, parental class is operationalised using a binary variable distinguishing between individuals from working-class backgrounds (NS-SEC 6-7) and those from higher social class backgrounds (NS-SEC 1-5). We control for respondents' age at labour market entry when individuals' social class position at labour market entry is the dependent variable, and for individuals' educational attainment when individuals' social class position at labour market entry and occupational maturity are the dependent variables. For this purpose, we use the seven-category, ordered scale of educational qualifications shown in Table 1. We also control for respondents' gender in all our analyses.[5]

We take what has now become the conventional approach to measuring cognitive ability by capturing the common variance across several indicators of individuals' verbal and non-verbal aptitudes (Colom et al., 2002; Deary, 2001). In the BCS70 these indicators are based on four subtests of the British Ability Scales (BAS) that were administered to respondents at age ten. We carry out a principal components analysis (PCA), saving scores from the first component extracted.[6] Our measure of

[5] We ran auxiliary analyses which show that the main empirical patterns we find hold for both women and men. We note any observed differences when discussing the results of our analyses below.

[6] Principal components analysis is commonly used on such subtests with the aim of capturing the underlying latent construct of general intelligence (*g*) (see Spearman, 1904, on the theoretical background, and Schoon, 2008; Bukodi et al., 2014; and Galindo-Rueda and Vignoles, 2005 on the methodological aspects).

locus of control is based on the 16-item CARALOC scale that was completed by respondents at age ten (see Gammage, 1975). We generate a continuous latent measure using the first principal component scores of the binary responses ('yes' or 'no') to these items. We z-standardise our measures of cognitive ability and locus of control, and since the two measures are correlated (at about 0.4), we control for locus of control when examining the mediating role of cognitive ability and vice versa. Tables A1 and A2 in the Appendix present the distributions of our dependent and independent variables, respectively.

**Results**

In order to address our research questions, we first use linear probability models to estimate the path coefficients for the path diagram shown in Figure 1. From these, we then calculate the proportions of the parental class effect on individuals' educational attainment and social class position that are mediated by individuals' cognitive ability and locus of control.[7] For our purposes, linear probability models in a path-analytical context are preferable to binary logistic regressions, as differences in the unobserved heterogeneity across nested non-linear probability models may bias estimates of the mediation proportions we seek to estimate (see Karlson et al., 2012; Mood, 2010; Bourne, 2017). Linear probability models have been shown to provide accurate estimates for models with binary outcomes provided that their distributions are not

[7] These mediation percentages are estimated following standard path-analytical procedure (see Agresti and Finlay, 2013; Garson, 2013). The indirect effect through cognitive ability is the product of the paths linking parental class to cognitive ability and cognitive ability to the dependent variable in question. The direct effect is simply the path coefficient for parental class, and the total effect is then the summation of the direct and indirect effects. The mediation percentages simply reflect the size of the indirect effect, relative to the total effect. To the best of our knowledge, there is no dependable way to compute confidence intervals for mediation percentages in the path-analytical framework. We therefore focus on the empirical patterns in our results to gauge the robustness of our findings.

extreme; i.e. with either response category containing between 20-80 percent of the observations (see Cox and Wermuth, 1992). As shown in Table A1, this condition is met by all our outcome variables, none of which have substantially fewer than 20 percent of individuals in either response category. We also test the robustness of our findings using the non-linear decomposition method developed by Karlson and colleagues (Karlson et al., 2012), which seeks to correct for the bias from unobserved heterogeneity across logistic regression models.[8] Our results are robust across these two methodological approaches.

Table 3 shows the path coefficients we obtain using linear probability models to estimate the associations between individuals' parental class, cognitive ability, locus of control and our different outcome variables. In line with our expectations from the existing literature, we find clear and statistically significant associations between individuals' parental class background and their cognitive ability and locus of control (see Table 3, M1-2). However, the association between parental class and cognitive ability appears to be substantially stronger than the association between parental class and locus of control. On average, working-class children's cognitive ability score is 0.40 standard deviations lower than is the case for children from higher social class backgrounds. For locus of control, this difference is 0.15 standard deviations. This finding is line with recent evidence from the US (Hsin and Xie, 2016).

[8] We do not use this approach as the main method for our analyses since, when used with multiply imputed data, it does not permit researchers to examine the individual mediating roles of multiple intervening variables. Moreover, this method does not provide path coefficients for the associations between our focal variables, thus limiting the interpretability of the results.

**Table 3**. Path coefficients for path model (Figure 1)

| | Dependent variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *CA* | *LoC* | *Education* | | *Social class at labour market entry* | | | | *Social class at occupational maturity* | | | |
| | | | Tresh. 1 | Tresh. 2 | Cut-off 1 | Cut-off 2 | Cut-off 3 | Cut-off 4 | Cut-off 1 | Cut-off 2 | Cut-off 3 | Cut-off 4 |
| Independent variables | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 |
| Parental class | | | | | | | | | | | | |
| Working class (rf) | | | | | | | | | | | | |
| Intermediate class/salariat | 0.40 *** | 0.15 *** | 0.09 *** | 0.08 *** | 0.08 *** | 0.07 *** | 0.07 *** | 0.04 *** | 0.08 *** | 0.09 *** | 0.07 *** | 0.05 *** |
| Cognitive ability | | 0.42 *** | 0.14 *** | 0.11 *** | 0.06 *** | 0.06 *** | 0.07 *** | 0.04 *** | 0.06 *** | 0.06 *** | 0.07 *** | 0.06 *** |
| Locus of control | 0.40 *** | | 0.04 *** | 0.03 *** | 0.04 *** | 0.04 *** | 0.04 *** | 0.03 *** | 0.03 *** | 0.04 *** | 0.04 *** | 0.04 *** |
| Gender (male rf) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age at labour market entry | | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| Education at labour mkt. entry | | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| Education at occ. maturity | | | | | | | | | ✓ | ✓ | ✓ | ✓ |

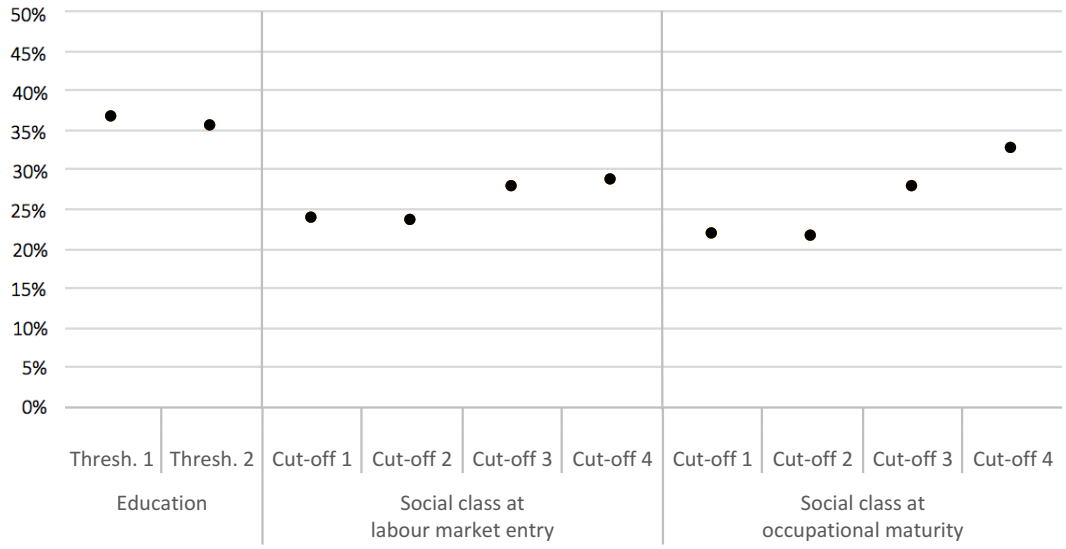
** p < 0.05, ** p < 0.01, *** p < 0.001, N = 9,391*

We also find significant effects of individuals' cognitive ability and locus of control on their educational attainment and on their social class positions at the time of labour market entry and occupational maturity, net of educational attainment. Importantly, the effect of cognitive ability on educational attainment is more than three times larger than the effect of locus of control (see Table 3, M3-4), while the effects of cognitive ability and locus of control on individuals' social class position are more similar in magnitude (see Table 3, M5-12). The fact that individuals' cognitive ability and locus of control are significantly associated with both their parental class background and with their educational and social class attainment suggests that these two characteristics play a role in channelling the intergenerational transmission of disadvantage in Britain. However, the coefficients for parental class shown in Table 3, M3-13, also indicate that parental class exerts a substantial and statistically significant 'direct' effect on individuals' educational and social class attainment that is not mediated by cognitive ability or locus of control.

Based on the path coefficients shown in Table 3, we calculate the proportions of the effect of parental class on individuals' educational attainment and social class position that are mediated by cognitive ability. Figure 2 plots these proportions for each of our outcome measures. With regards to individuals' educational attainment, we find that cognitive ability mediates about 36 percent of the parental class effect on individuals' likelihood of crossing either of the two educational thresholds we consider. This is in line with previous findings on Britain (see Bourne et al., 2017) and stands in sharp contrast to Marks's (2014) assertion that the effect of individuals' social background on their educational attainment is trivial once cognitive ability is accounted for. To the contrary, our results suggest that more than 60 percent of the parental class

effect on individuals' educational attainment is *not* accounted for by individuals' cognitive ability.

**Figure 2**. Percentages of the parental class effect that are mediated by cognitive ability




As compared to our findings for educational outcomes, the mediating role of cognitive ability for individuals' social class position at labour market entry is considerably smaller. Depending on the specific class cut-off we examine, between 24 and 29 percent of the parental class effect is mediated by cognitive ability, and thus more than 70 percent is channelled via other mechanisms.[9] This may be indicative of specific parental resources, such as professional contacts and networks, playing a more important role in individuals' transition into the labour market than with respect to their educational attainment (Loury, 2006).

We also find the mediating role of cognitive ability to be remarkably stable across individuals' working lives. As we show in Figure 2, the mediation proportions are very similar when individuals' social class position is measured at labour market

[9] As indicated by the path coefficients shown in Table 3, this is due to a somewhat weaker association between individuals' cognitive ability and their social class position (M5-12), as compared to their educational attainment (M3-4).

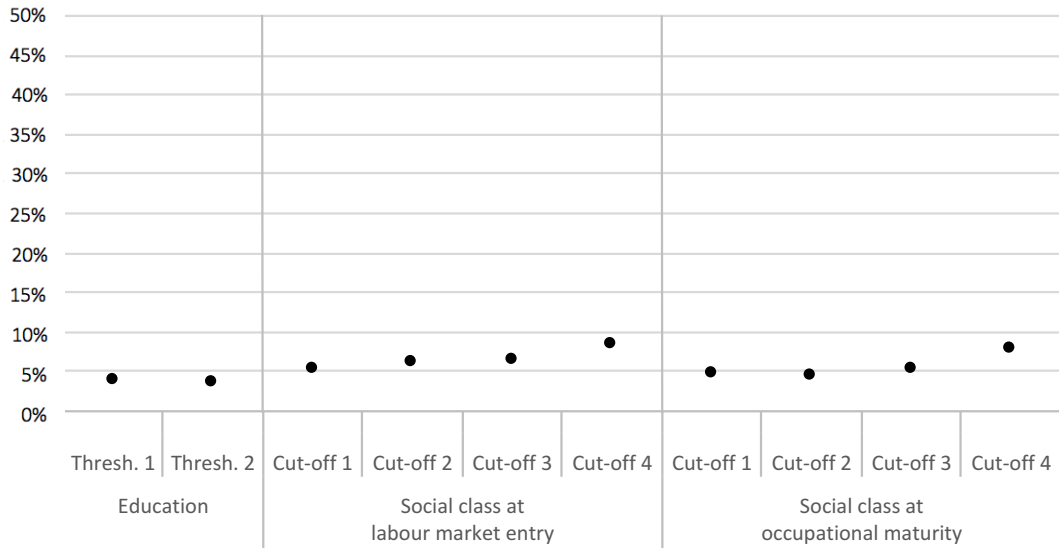
entry and at occupational maturity. We thus find no evidence for the expectation that the parental class effect is increasingly mediated by cognitive ability as individuals progress through their careers.

Interestingly, we find that the proportions of the social origin effect on individuals' social class position that are mediated by cognitive ability differ across the social class distribution. For example, while the proportion of the social origin effect on obtaining a position above the working class vs. in the working class at the time of occupational maturity (cut-off 1) that is mediated by cognitive ability is around 22 percent, it is around 33 percent for the social origin effect on obtaining a position in the salariat vs. a lower social class (cut-off 4). A similar pattern holds with respect to individuals' social class position at occupational maturity. As suggested by the path coefficients shown in Table 3, M5-12, these differences in the mediation percentages across the social class distribution result mainly from a smaller direct effect of parental class for higher social class cut-offs, rather than a larger effect of cognitive ability. This smaller direct effect of parental class for higher social class cut-offs may be a consequence of educational qualifications – which we hold constant in our analysis – playing a more important role for obtaining a position in the salariat, as compared to obtaining a position in a lower social class, thus leaving less scope for parental class to exert a direct effect.

In sum, we can reject the claims by Marks (2014) that educational and labour market inequalities between individuals from working-class backgrounds and their counterparts from higher social class backgrounds are primarily explained by differences in cognitive ability between them. To the contrary, our results show that less than 40 percent of the parental class effect on individuals' educational attainment is mediated by individuals' cognitive ability. The proportion of the parental class effect

on individuals' social class position that is mediated by cognitive ability is even lower, at about 30 percent or less. This is the case irrespective of whether we consider individuals' social class position at labour market entry or occupational maturity.[10]

**Figure 3**. Percentages of the parental class effect that are mediated by locus of control




Having established that a substantial effect of parental class on individuals' educational attainment and social class position remains even after taking cognitive ability into account, we now turn to examining the extent to which peoples' believe that they can influence the events and outcomes of their own lives – their locus of control – mediates this remaining parental class effect, and how the mediating role of locus of control compares to the mediating role of cognitive ability. Figure 3 shows the percentages of the parental class effect on each of our outcomes of interest that are mediated by locus of control. With regards to both educational thresholds, we find that locus of control mediates only around four percent of the parental class effect – a *substantially smaller* proportion than that mediated by cognitive ability (around 36

[10] Our results hold for both men and women. Figures A1 and A2 show the mediation percentages of cognitive ability, separately by gender.

percent). The path coefficients shown in Table 3 suggest that this difference results both from the abovementioned weaker association between parental class and locus of control, compared to the association between parental class and cognitive ability, and from a weaker association between locus of control and educational attainment, compared to the association between cognitive ability and educational attainment.

With regards to individuals' social class position at labour market entry, we find that the proportion of the parental class effect that is mediated by locus of control is, if anything, only slightly higher than is the case for individuals' educational attainment. As shown in Figure 3, about six to nine percent of the association between parental class and individuals' social class position at labour market entry is mediated by individuals' locus of control, once educational attainment is taken into account.[11] We thus find no evidence in support of the expectation that individuals' locus of control plays a substantially more pronounced role in mediating the parental class effect on individuals' social class position, as compared to its role in mediating the parental class effect on individuals' educational attainment.

As is the case for cognitive ability, the proportion of the parental class effect that is mediated by locus of control is very similar with regards to individuals' social class position at labour market entry (between six and nine percent) and individuals' social class position at occupational maturity (between five and eight percent) (see Figure 3). Taken together with our earlier finding of the stable mediating role of cognitive ability, this result suggests that there is a large 'direct' effect of individuals'

[11] When running our models separately by gender, we find that the role of locus of control in mediating the parental class effect on individuals' likelihood of obtaining a position in the salariat (as opposed to obtaining a position in a lower class) is higher for women than for men (see Figure A3 and A4). Aside from this difference, the empirical patterns we find with regards to the mediating role of locus of control are very similar across genders.

parental class background on their own social class position even later in their career, which is not mediated by either cognitive ability or locus of control.[12]

## Conclusion

In their controversial volume, *The Bell Curve*, Herrnstein and Murray (1994) claim that educational and labour market inequalities between people from different social class backgrounds are primarily due to differences in cognitive ability between them. More than 20 years later this view still has influence in both academic and policy circles (see, e.g., Marks, 2014; Cummings, 2013).

The first aim of this article has been to empirically test the arguments advanced in *The Bell Curve* and more recent iterations thereof by examining the extent to which differences in cognitive ability can explain educational and labour market inequalities between individuals from working-class backgrounds and individuals from higher social class backgrounds. We find that, contrary to the claims made by these authors, cognitive ability mediates less than 40 percent of the parental class effect on individuals' educational attainment. In other words, educational inequalities between children from working-class backgrounds and children from higher social class backgrounds are *not* primarily due to differences in cognitive ability between these groups, but are mainly channelled via other mechanisms. This finding is consistent with the existing literature that has identified a substantial 'direct' effect of parental

[12] As noted above, we test the robustness of our findings using the non-linear decomposition method developed by Karlson and colleagues, the 'KHB method' (Karlson et. al., 2012). We find that the same empirical patters emerge when using this method. Figures A5 and A6 in the Appendix compare our main results obtained from linear probability models with those derived using the KHB method. These figures plot the percentage of the association between parental class and the different outcome measures that is jointly mediated by cognitive ability and locus of control. As noted above, the KHB method does not allow for the calculation of individual mediating percentages pertaining to multiple mediating variables when using multiply imputed data.

class on individuals' educational attainment, net of cognitive ability (Bukodi et al., 2017; Bourne et al., 2017; Erikson, 2016; Mood et al., 2012; Hsin and Xie, 2016).

While much of the existing literature in this area has focused on individuals' educational attainment as the main outcome of interest, our article also considers the proportion of the parental class effect on individuals' social class position that is mediated by cognitive ability at different points in their careers. As expected, when we consider individuals' social class position at labour market entry, we find that cognitive ability mediates less of the parental class effect than is the case for individuals' educational outcomes. Our results show that between 24 and 29 percent of the association between parental class and individuals' social class position at labour market entry is mediated by cognitive ability, and this mediation percentage remains remarkably stable across individuals' working lives. While this finding indicates that differences in cognitive ability play some role in explaining the inequality in labour market chances between individuals from working-class backgrounds and individuals from more advantaged backgrounds, their mediating role is much more limited than has been suggested by Herrnstein and Murray (1994) and Marks (2014). In other words, we find no evidence in support of the claim that tendency of individuals from working-class backgrounds to obtain lower social class positions than individuals from higher social class backgrounds is mainly due to the former being on average less intelligent than the latter.

Our findings also pose a direct challenge to Cumming's (2013) assertion that social class inequalities in educational attainment require little policy attention because they arise mostly as a result of meritocratic processes in the educational system. We see this view as unwarranted on two counts. First, our results show that working-class children in Britain are at a distinct disadvantage in terms of their cognitive

development, even before they begin lower secondary education. Given the existing evidence on the role of environmental factors on children's cognitive development (Cunha & Heckman 2007; Heckman, 2007), we see a clear need for policies to decrease educational inequalities by equalizing the cognitive development of children from different social class backgrounds. Particularly interventions during pregnancy and the first years of life, such as the 'A Better Start' programme that is currently being implemented across different sites in Britain, may be an effective means to this end (see Barlow, 2015). Second, our finding that a substantial part of the inequality in educational and social attainment between people from working-class backgrounds and people from higher class backgrounds is not in fact accounted for by cross-class differences in cognitive ability shows that there is a need for researchers and policy makers to identify and address the channels through which individuals' parental class background shapes their life chances, above any beyond its effects on individuals' cognitive development.

An important question that follows from our finding on the limited mediating role of cognitive ability is what other individual-level characteristics may play a role in channelling the intergenerational transmission of inequality. Building on the growing literature on the importance of non-cognitive attributes for individuals' live chances, the second aim of our article was to examine whether and to what extent people's sense of control over their lives – their locus of control – mediates the effect of growing up in a working-class family on individuals' educational attainment and social class position, and how this mediating role compares to that of cognitive ability. We find that locus of control does indeed play a role in mediating the parental class effect, but that this mediating role of locus of control is substantially smaller than that of cognitive ability. More specifically, our results indicate that locus of control mediates

only about four percent of the association between parental class and individuals' educational attainment and about five to nine percent of the association between parental class and individuals' social class position. As is the case for cognitive ability, our results indicate that the mediating role of locus of control remains stable across individuals' working lives.

One limitation of our study is that we are unable to gauge to what extent the relatively low scores of locus of control of children from working-class backgrounds reflects a reasonable estimate by these children of the level of control they truly have over their lives. Many working-class children will learn, observing the hardships faced by their parents and other family members, that their chances for upward mobility are constrained. Particularly for those living in areas of high poverty and unemployment, they are right to believe their fate is somewhat out of their control. However, this low sense of control is likely to reinforce the educational and labour market disadvantage of individuals from working-class backgrounds, and may thus become a self-fulfilling prophecy. Policies that serve to strengthen the sense of control amongst disadvantaged children – such as establishing youth centres in which children from disadvantaged backgrounds can engage in extracurricular activities and receive mentoring and guidance from trained coaches – may go some way in countering this vicious cycle of social disadvantage. However, the most effective means to increase the sense of control and the life chances of children from unskilled working-class backgrounds will be the provision of high-quality job opportunities, particularly in the country's 'mobility coldspots' (Social Mobility Commission, 2016) and vocational training programmes designed to equip young people from disadvantaged backgrounds with the necessary skillset to enter these jobs.

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## Appendix

**Figure A1**. Percentages of the parental class effect mediated by cognitive ability (men)

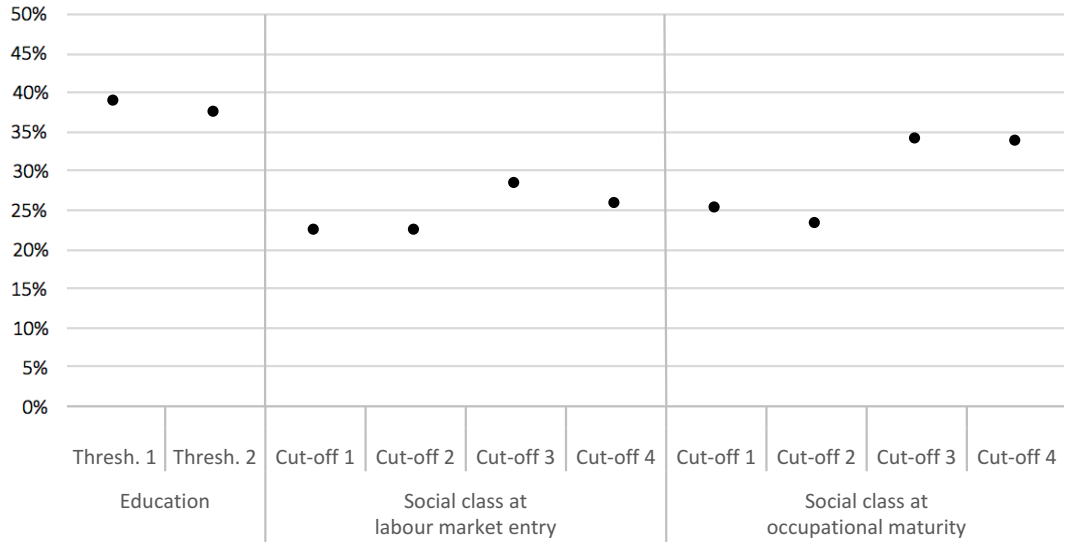



**Figure A2**. Percentages of the parental class effect mediated by cognitive ability (women)

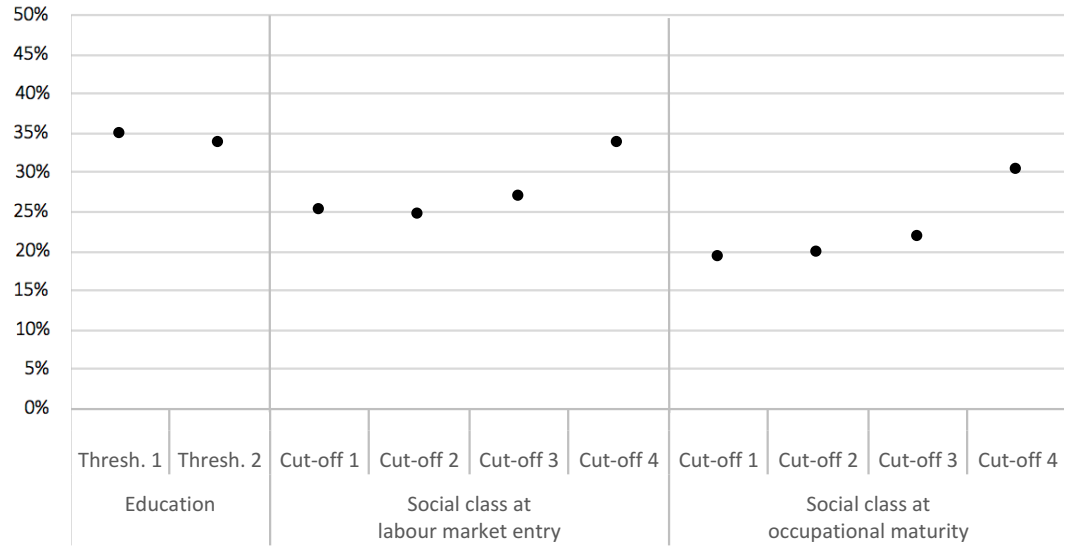


**Figure A3**. Percentages of the parental class effect mediated by locus of control (men)

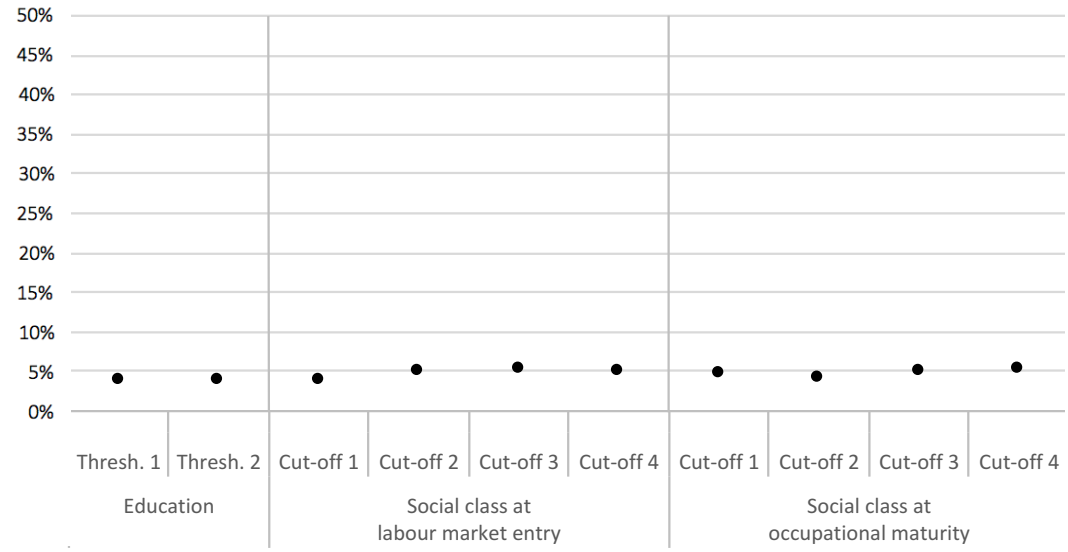



**Figure A4**. Percentages of the parental class effect mediated by locus of control (women)

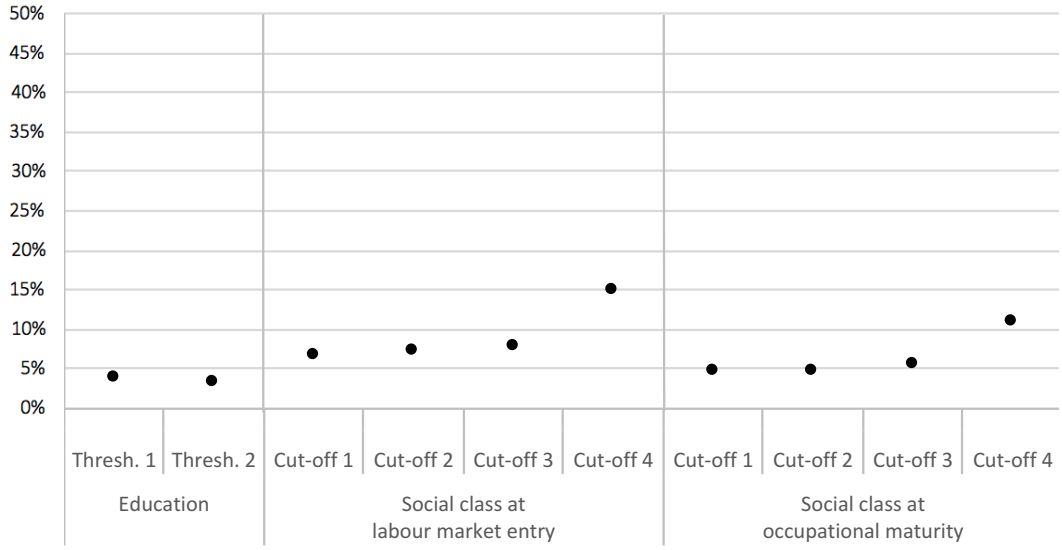


**Figure A5**. Combined mediation percentages of cognitive ability and locus of control (Linear Probability Models)

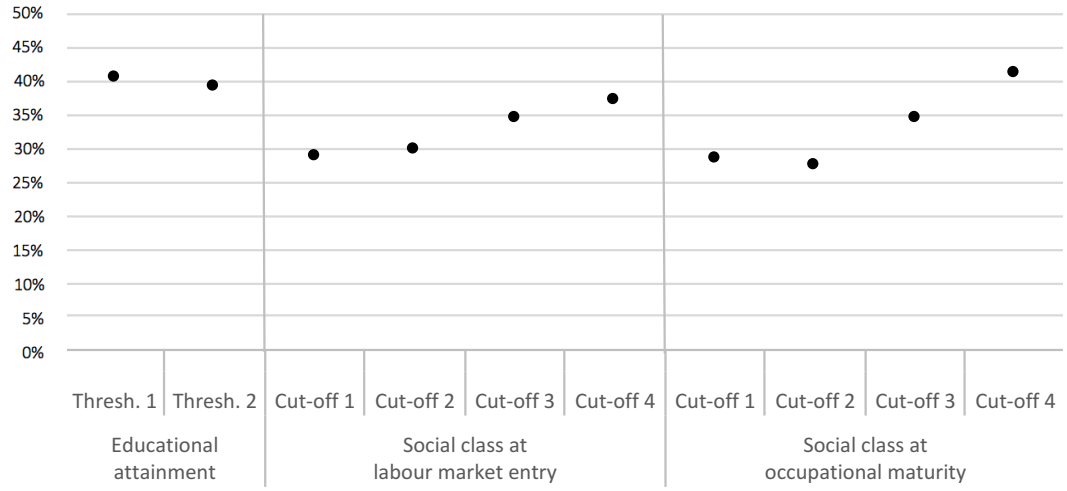



**Figure A6**. Combined mediation percentages of cognitive ability and locus of control (KHB method)

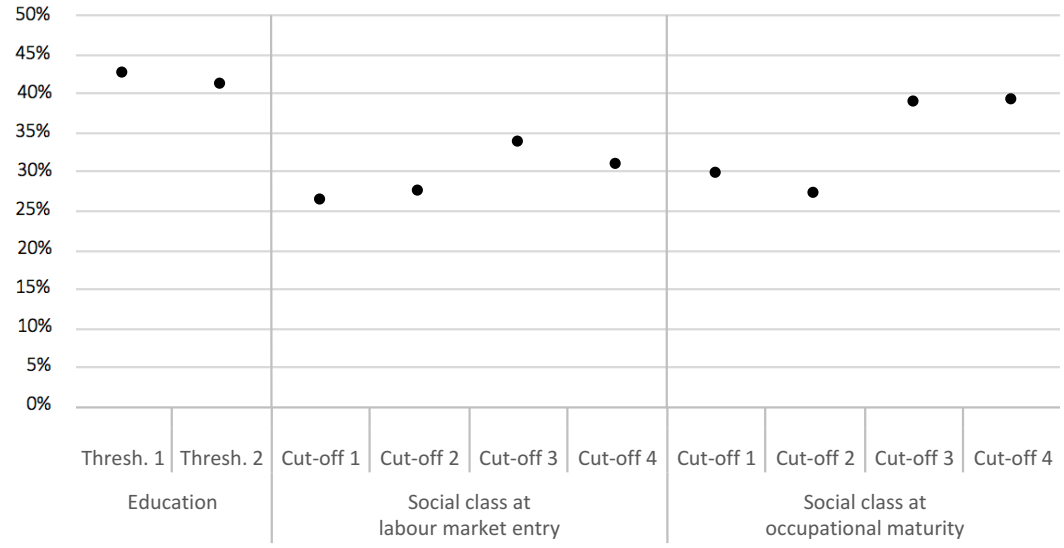


Table A1. Summary of distributions: Dependent variables

| | % | Freq. |
|---|---|---|
| **Outcome measures (%)** | | |
| Educational threshold 1 | | |
| Exceeded | 23.93 | 2274 |
| Did not exceed | 76.07 | 7117 |
| Educational threshold 2 | | |
| Exceeded | 19.27 | 1810 |
| Did not exceed | 80.73 | 7581 |
| Labour market entry cut off 1 | | |
| Exceeded | 57.48 | 5398 |
| Did not exceed | 42.52 | 3993 |
| Labour market entry cut off 2 | | |
| Exceeded | 49.71 | 4668 |
| Did not exceed | 50.29 | 4723 |
| Labour market entry cut off 3 | | |
| Exceeded | 45.59 | 4281 |
| Did not exceed | 54.41 | 5110 |
| Labour market entry cut off 4 | | |
| Exceeded | 20.60 | 1935 |
| Did not exceed | 79.40 | 7456 |
| Occupational maturity cut off 1 | | |
| Exceeded | 72.06 | 6767 |
| Did not exceed | 27.94 | 2624 |
| Occupational maturity cut off 2 | | |
| Exceeded | 67.26 | 6316 |
| Did not exceed | 32.74 | 3075 |
| Occupational maturity cut off 3 | | |
| Exceeded | 57.02 | 5355 |
| Did not exceed | 42.98 | 4036 |
| Occupational maturity cut off 4 | | |
| Exceeded | 38.89 | 3652 |
| Did not exceed | 61.11 | 5739 |
| | | *N = 9,391* |

Table A2. Summary of distributions: Key independent variables and controls

| | Mean or % | Freq. |
|---|---|---|
| **Social origin (%)** | | |
| Salariat and intermediate classes | 73.83 | 6934 |
| Routine and semi-routine classes | 26.16 | 2457 |
| | | |
| **Mediators (Mean (SD))** | | |
| Cognitive ability | 0.00 (1.00) | 9391 |
| Locus of control | 0.00 (1.00) | 9391 |
| | | |
| **Educational attainment at labour market entry (%)** | | |
| 7. Degree or higher degree, NVQ 5 or 6 [higher tertiary] | 13.95 | 1310 |
| 6. Tertiary sub-degree qualification, NVQ 4 [lower tertiary] | 5.32 | 500 |
| 5. 2+ A-level passes [higher secondary] | 4.65 | 437 |
| 4. 5+ O-level passes or 1 A-level pass, NVQ 3 [lower sec. - high performance] | 21.27 | 1997 |
| 3. 1-4 O-level passes, NVQ 2 [lower sec. - low performance] | 18.91 | 1776 |
| 2. Below O-level, NVQ 1 [sub-secondary] | 9.65 | 906 |
| 1. No qualifications | 26.25 | 2465 |
| | | |
| **Educational attainment at occupational maturity (%)** | | |
| 7. Degree or higher degree, NVQ 5 or 6 [higher tertiary] | 20.47 | 1922 |
| 6. Tertiary sub-degree qualification, NVQ 4 [lower tertiary] | 15.56 | 1461 |
| 5. 2+ A-level passes [higher secondary] | 2.62 | 246 |
| 4. 5+ O-level passes or 1 A-level pass, NVQ 3 [lower sec. - high performance] | 21.87 | 2054 |
| 3. 1-4 O-level passes, NVQ 2 [lower sec. - low performance] | 20.55 | 1930 |
| 2. Below O-level, NVQ 1 [sub-secondary] | 7.22 | 678 |
| 1. No qualifications | 11.71 | 1100 |

*N = 9,391*

# CONCLUSION

While the level of *equality of condition* that should prevail in society and the redistributive measures necessary to achieve this continue to be the subject of heated normative debates, most people would agree to the basic view that every individual's chances to have a secure and fulfilling life should be equal and unrelated to ascribed characteristics such as social class background, gender or ethnicity. In other words, *equality of opportunity* is generally regarded as a desirable condition by people from across the political spectrum. And yet, we know that such equality of opportunity is far from being realised even in advanced democracies. This is clearly borne out by the fact that children with parents in working-class positions have substantially lower educational and labour market chances than their peers from more advantaged backgrounds (see, e.g., Shavit and Blossfeld, 1993; Erikson and Goldthorpe, 1992; Breen, 2004). The overarching aim of this dissertation was to contribute to a better understanding of the macro-level determinants and the micro-level processes that account for the inequality of opportunity between individuals from working-class backgrounds and people from higher social class backgrounds.

In the introduction to this dissertation we identified three key limitations of the existing body of research on intergenerational social mobility. First, since research on over-time change in intergenerational social mobility has focused on examining changes in the overall social fluidity in society, still little is known about over-time changes in the mobility chances of specific groups in society, particularly individuals from unskilled and skilled working-class backgrounds. Second, since existing studies have mostly focused on long-term, societal-level trends in social mobility, there is little evidence on the effects of specific, macro-level institutional changes and policy

reforms on intergenerational social mobility, and on the educational and labour market chances of individuals from working-class backgrounds in particular. Third, we still know little about the role and relative importance of different micro-level processes that channel the intergenerational transmission of disadvantage.

This concluding chapter summarises the main findings of the four empirical papers of the dissertation, discusses how they address the three limitation of the existing literature noted above, and considers their wider implications for the field of research on intergenerational social mobility and for social policies that aim to increase the level of equality of opportunity in society. We discuss, first, our findings on the over-time change in the social mobility of individuals from unskilled working-class backgrounds in Germany, second, our findings on the relationship between macro-level institutions and the level of intergenerational social mobility in society, and third, our findings on the importance of the role of two individual-level characteristics – cognitive ability and locus of control – in the intergenerational transmission of inequality. The fourth and last section then outlines one promising avenue for future research, which focuses on the relationship between equality of condition and equality of opportunity, and which builds on the findings of this dissertation.

**Over-time change in the social mobility of individuals from unskilled working-class backgrounds in Germany**

Research on over-time change in Germany has found an increase in social fluidity over the course of the 20$^{th}$ century. However, we still know little about whether this increase in social fluidity also benefitted individuals who were born into families at the very bottom of the social class hierarchy, namely children from unskilled working-class backgrounds. The mobility chances of individuals in this group are arguably of

particular concern, since these individuals are most disadvantaged by the circumstances of their birth (Rawls, 1971). The first paper of the dissertation examined how the labour market chances of this group have changed across four birth cohorts born between 1940 and 1979. Moreover, it investigated the extent to which differences in educational attainment between children from unskilled working-class backgrounds and children from higher social class backgrounds can account for the inequalities in labour market chances between them and how this has changed over time.

Our first main finding of the first paper is that there appears to be a substantial gap in the labour market chances of people from unskilled and skilled working-class backgrounds in Germany. More specifically, we find a difference of about ten percentage points in the chances of people in these two groups to attain a position above the two labour market thresholds we examine. This important role of intra-class differences in the intergenerational transmission of inequality may reflect the known difference in the level of economic resources and security of individuals in unskilled and skilled working-class positions in the German 'dual labour market' (see, e.g., Leibfried and Tennstedt, 1985; Lindbeck and Snower, 1988; Emmenegger et al, 2012; Palier and Thelen, 2010). The difference in the economic resources that parents in unskilled and skilled working-class positions can draw on to support the development, education and labour market entry of their children is likely to account for the observed inequality in the labour market chances of children from unskilled and skilled working-class backgrounds.

The second key finding of our first paper is that, in contrast to past findings of an increase in overall social fluidity in Germany, there has been no increase in the labour market chances of individuals from unskilled working-class backgrounds, relative to people from higher social class backgrounds, across the four cohorts we

examine. While there appears to have been an increase in the overall level of *absolute* upward mobility between the 1940s and 1950s cohorts at the time of the German *Wirtschaftswunder*, this trend appears to have benefitted individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds to similar extends, thus leaving *relative* social mobility rates of these groups unchanged. Similarly, with regards to over-time change between the 1950s and the 1970s cohorts, we find no evidence for a substantial change in the educational and labour market inequality between individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds in the context of the 1970s Oil Crisis and the era of welfare state retrenchment.

Our finding of a sustained educational and labour market inequality between individuals from unskilled working-class backgrounds and individuals from higher social class backgrounds suggests that the marked economic changes and the educational expansion during the German post-war era did not lead to substantial changes in the labour market prospects of children from unskilled working-class backgrounds, relative to individuals from higher social class backgrounds. However, considering the descriptive nature of our findings and given our focus on long-term trends at the societal level, it is important to note that our finding of overall stability may mask more specific over-time changes due to particular institutional reforms. As discussed in further detail below, there is a need for research that uses quasi-experimental methods to examine the effects of specific changes in the labour market and educational system on the educational and labour market chances of individuals unskilled working-class backgrounds, relative to individuals from more advantaged backgrounds.

The third main finding of our first paper is that about half of the inequality in labour market chances between children from unskilled working-class backgrounds and children from higher social class backgrounds in all four birth cohorts we examine can be attributed to the fact that individuals in the former group attain relatively lower levels of education, which in turn limits their labour market prospects. This finding contrasts with past research which claims that education does not play a prominent role in explaining the labour market disadvantage experienced by children from unskilled working-class families in Germany (cf. Ishida et al., 1995: 177).

Our finding of a considerable role of education in channelling the intergenerational transmission of inequality in Germany may lead one to the expectation that educational reforms would be an effective way to increase intergenerational social mobility. However, for the following reasons, this is not necessarily the case. First, reducing cross-class inequalities in educational attainment by way of educational reforms may not be feasible, as parents in high social class positions may compensate changes in the educational system by drawing on their superior economic and cultural resources in order to maintain the educational advantage of their children (Goldthorpe, 2016). Second, even if educational reforms succeed in narrowing the attainment gap between children from different social class backgrounds, this does not necessarily translate into an equalization of the labour market chances between them. Instead, the 'job competition theory' by Thurow (1975, 1983) – which we discussed in our review of the relevant literature in the introduction to the dissertation – suggests that labour market inequalities are likely to persist as long as the relative ordering of individuals from different social class backgrounds in terms of their educational attainment remains unchanged. Whether and to what extent educational reforms can equalise educational and labour market outcomes between

children from different social class backgrounds thus constitutes an empirical question. The second and third papers of the dissertation sought to contribute to addressing this question, as discussed in further detail in the following section.

**Institutional change, educational inequality and social mobility**

There is an ongoing debate in the field of social mobility research about the role of institutions in shaping educational and labour market inequalities between people from different social backgrounds. Some scholars see the institutional structure of educational systems and labour markets as having a strong bearing on such educational and labour market inequalities (Esping-Andersen and Wagner, 2012; Werfhorst and Mijs, 2010; Müller and Haun, 1994). Others maintain that institutional differences between countries or institutional changes over time have no – or at any rate only very weak – effects on these inequalities (see, e.g., Goldthorpe, 2016, 2007; Shavit and Blossfeld, 1993). Yet, the existing evidence on this subject is limited, since past studies have largely relied on cross-sectional comparisons of a small number of country cases or have examined over-time change in single country cases. For the reasons we discussed in the introduction to the dissertation, neither of these approaches allows researchers to draw strong conclusions on the causal role of institutions in the intergenerational transmission of inequality.

The second paper of the dissertation sought to overcome this limitation of the existing literature by exploiting the quasi-experimental nature of German unification. German unification led to a rapid and profound restructuring of the educational system and economy of the German Democratic Republic (GDR) as the latter was reintegrated into the Federal Republic of Germany (FRG). As part of the assimilation of the East-German educational system into the West German model, universal

schooling until the mid-secondary level was abolished and ability tracking into different school types after fourth grade was reinstated. Moreover, policies of positive discrimination at the secondary and tertiary levels in favour of children from working-class origins were discontinued. Alongside the restructuring of the East German educational system, the East German economy was fundamentally reformed according to the principles of free-market capitalism. In contrast to the radical institutional reconfiguration of the East German educational system and economy, there were no substantial changes in the institutional structure of the West German educational system and economy at the time of unification.

The consequences of the large-scale institutional change in East Germany for the educational inequality between children from different social class backgrounds continue to be poorly understood. The second paper used a *difference-in-difference* design to examine, first, whether state socialism in the GDR succeeded in achieving its ideological goal of increasing the educational chances of children from working-class origins, relative to children from higher class origins. Second, it investigated whether the remodelling of the East German educational system and economy at the time of German unification resulted in a convergence in the level of educational inequality in East Germany towards that of West Germany. To address these two research objectives, the paper compared changes in cross-class inequalities in educational attainment in East and West Germany across six birth cohorts, including three cohorts of individuals who completed their schooling after unification.

In part, our second paper constitutes a replication of an earlier study by Kesler (2003), which finds no difference in educational inequality between East and West Germany before unification and no increase in educational inequality in East Germany after unification. However, Kesler's study has a number of severe limitations, which

may be attributed to the study having been conducted only about a decade after German unification. These limitations concern the very small size of the study's sample, the fact that it only examines one pre-unification cohort and one post-unification cohort, and the fact that it only considers educational inequalities at the upper-secondary level. Our second paper overcomes these limitations by drawing on data from two large population surveys, by comparing multiple pre- and post-unification birth cohorts, and by examining educational inequalities not only at the upper-secondary, but also at the mid-secondary and tertiary levels.

Our first main finding is that educational inequality at the mid-secondary, upper-secondary and tertiary levels was substantially lower in the GDR than in the FRG, even in the late phase of the GDR. We interpret this lower level of educational inequality as likely reflecting the efforts of the GDR to universalise mid-secondary education, as well as the abovementioned positive discrimination that sought to promote the educational attainment of children from working-class backgrounds at the upper-secondary and tertiary levels.

The second main finding of the second paper is that educational inequality at the mid-secondary, upper-secondary and tertiary levels in East Germany increased considerably after German unification and converged towards the level of educational inequality in West Germany. While the extent of educational inequality at the mid-secondary level in East Germany stayed somewhat below that of West Germany, the level of educational inequality at the upper-secondary and tertiary levels essentially resembled that of West Germany after unification.

Importantly, our multiple cohort design allowed us to investigate whether this increase in educational inequality in East Germany after unification was only a short-term phenomenon that could be attributed to the post-unification economic crisis, or

whether the increase in educational inequality persisted in the long-run, reflecting the permanent changes in the institutional structure of the East German educational system and economy that occurred in the wake of unification. We found that the latter is the case, as the post-unification rise in educational inequality in East Germany persisted across the three post-unification cohorts we examine.

Our findings of (i) a lower level of educational inequality in East Germany as compared to West Germany before unification, and (ii) a convergence of the level of educational inequality in East Germany towards that of West Germany after unification, stand in direct opposition to the findings reported by Kesler, who finds no difference in educational inequality between East and West Germany before unification and no increase in educational inequality in East Germany after unification. We attribute this difference between the findings of our study and Kesler's study to the much smaller sample size used by Kesler. Considering this small sample size, Kesler's findings are likely to constitute false negatives (i.e. type II errors).

That Kesler's findings constitute a false negative, is also suggested by the fact that these findings contradict most of the existing literature from other post-socialist countries, while our findings are in line with this literature. Most of the existing studies in this area find an increase in the intergenerational transmission of inequality after the post-socialist transition of the countries they examine. With regards to Hungary, for instance, Bukodi and Goldthorpe (2010) find an increase in educational inequality as the country transitioned to a market-based economy (also see Szelényi and Aschaffenburg, 1993, and Szelényi, 1998). A similar pattern is found by Gerber and Hout (2004) with respect to intergenerational class mobility in Russia, and by Jackson and Evans (2017) with respect to intergenerational class mobility in a group of 13 central and eastern European countries.

The fact that we arrive at substantially different conclusions than Kesler underscores the importance of replication studies, particularly when new data sources become available that are better suited to address the research question at hand. It also highlights the need to work with samples that are large enough for examining the associations of interest, and it serves as a reminder not to 'accept' the null-hypothesis, when there is insufficient evidence to reject it.

Our finding of a sizable unification effect on educational inequality in East Germany also constitutes strong evidence that large-scale institutional change can have a profound and lasting effect on the level of educational inequality in society. This finding contrasts with the abovementioned literature that suggests that institutional reforms have little or no bearing on educational inequality. Admittedly, German unification constitutes a most-likely case with respect to the role of institutional change in shaping educational inequality, because of the far-reaching and abrupt changes in the East German educational system and economy that occurred with German unification. Moreover, given these synchronous changes in these institutions, we are unable to identify the causal role of any specific institution in accounting for the observed increase in educational inequality in East Germany after unification. This highlights the need for future research to evaluate the effects of specific institutional changes and policy reforms, preferably using research designs that permit causal inference.

The third paper of this dissertation begins to take on this task by evaluating the effects of one specific educational reform – the extension of compulsory schooling – on educational and labour market inequalities between individuals from different social class backgrounds in Germany. In doing so, it also addresses the abovementioned two puzzles raised by the first paper: first, whether education policy

can effectively decrease the educational attainment gap between children from different social origin groups, and second, whether such a decrease in educational inequality can further translate into an equalization of the labour market chances of these groups, thus increasing intergenerational social mobility.

In their work on the determinants of educational inequality, Müller and Haun (1994: 7) suggest that extending compulsory schooling may compress educational inequalities by reducing the relative cost of attaining an educational qualification above the most basic school-leaving qualification (also see Müller and Pollak, 2004: 84). This reduction in the relative costs of educational qualifications is thought to prompt particularly children from low social class backgrounds to remain in school longer and to attain a higher educational qualification (ibid.). The resulting decrease in educational inequality can further be expected to lead to an equalization of the labour market prospects of people from different social class backgrounds and to thereby increase intergenerational social mobility.

The third paper tested these theoretical expectations by exploiting the variation in the timing of the compulsory schooling reform across different West German states. West German states extended the period of compulsory schooling from eight to nine years at different times during the three decades following World War II. This within-country variation constitutes a quasi-experimental setting which allows for the use of a *difference-in-difference* design and robust estimates of the reform effects on educational and labour market inequalities. Given the expectation of the existing literature that the extension of compulsory schooling mainly affected the most disadvantaged youth, we paid particular attention to examining the effect of this reform on children from unskilled working-class backgrounds, as compared to children from more advantaged backgrounds.

Our first key finding of the third paper is that the extension of compulsory schooling in Germany resulted in a substantial decrease in educational inequality. Relative to people from salariat backgrounds, the reform increased the likelihood of individuals from skilled working-class backgrounds and intermediate-class backgrounds to attain a mid- or upper-secondary qualification. This finding is in line with the expectation of Müller and Haun (1994) of an equalizing effect of the reform. Surprisingly however, we find no evidence of a reform effect on the educational attainment of children from unskilled working-class backgrounds. This finding stands in contrast to the expectation by Müller and Haun (1994) that the extension of compulsory schooling would most strongly affect the educational attainment of pupils who are most disadvantaged in terms of their parents' economic resources. Our finding that the reform increased the educational attainment of individuals from intermediate and skilled working-class backgrounds, but had no effect on the educational attainment of individuals from unskilled working-class backgrounds, may reflect the greater value that parents in skilled working-class and intermediate-class positions attach to their children attaining mid-secondary or upper-secondary qualifications, as they are more likely to see these qualifications as a precondition for their children to maintain their own social status, than is the case for parents in lower social class positions (Breen and Goldthorpe, 1997). Moreover, it could be the case that the higher economic resources of parents in skilled working-class and intermediate-class positions make their preferences regarding the secondary track placement of their child more susceptible to changes in the relative cost of the different secondary qualifications that resulted from the reform.

The second key finding of our third paper is that, in addition to decreasing educational inequality, the extension of compulsory schooling in Germany also

resulted in a substantial narrowing of the inequality in labour market chances between people from salariat backgrounds, on the one hand, and people from skilled working class and intermediate-class backgrounds, on the other hand. We showed that this equalizing effect of the extension of compulsory schooling on individuals' labour market chances was a consequence of the observed reduction of educational inequality and of an increase in the labour market value of lower-secondary qualifications. As one would expect based on the fact that there was no reform effect on the educational attainment of children from unskilled working-class backgrounds, we also found that the reform did not increase the labour market attainment of this group.

The results of our third paper corroborate the finding of the second paper that institutional change can have a substantial effect on the intergenerational transmission of inequality. More specifically, our results show that educational policy reforms can not only effectively decrease the educational attainment gap between children from different social origin groups, but that such a decrease can further translate into an equalization of the labour market chances of these groups. Contrasting with the view that educational reforms have little effect on intergenerational social mobility, our paper thus suggests that educational reforms can constitute an effective policy tool for increasing intergenerational social mobility.

However, our finding that the extension of compulsory schooling hardly affected the educational and labour market chances of individuals from unskilled working-class backgrounds suggests that this group may be particularly hard to reach. Policies that seek to improve the educational and labour market chances of children from unskilled working-class backgrounds will have to compensate for the substantial disadvantage, particularly in terms of parental economic resources, but also in terms

of parental educational and socio-cultural resources, that these children face as they go through the educational system and enter the labour market.

While our paper provides strong evidence on the effects of one specific educational reform – the extension of compulsory schooling – it clearly does not allow us to comment on the effectiveness of other educational policies that may be expected to have the potential to decrease educational and labour market inequalities between children from different social class backgrounds. Examples of such policies include the increased provision of comprehensive schooling, as opposed to early ability tracking, the provision of stipends for disadvantaged youth, and the provision of extensive afterschool programmes. From a policy perspective, a fruitful avenue for future research will be to examine the effectiveness of different educational policies with regards to increasing intergenerational social mobility, preferably using research designs that permit causal inference. Moreover, given that the educational and labour market disadvantages of children from unskilled working-class backgrounds appear to be particularly entrenched, emphasis should be placed on examining reforms that may increase the relative educational attainment and labour market chances of this group.

Last, it should be noted that our paper traded off external for internal validity. While our quasi-experimental research design allowed us to identify the causal effect of the extension of compulsory schooling in Germany, we cannot be certain that this reform would have a similar effect in other national settings. In this regard, it should be noted that our finding of an effect of compulsory schooling on educational inequality is in line with evidence from Britain, which indicates that the extension of compulsory schooling in 1972 in this country also led to a decline in educational inequality (Sturgis and Buscha, 2015). However, in contrast to our findings, this study finds that in Britain the observed decrease in educational inequality did not further

translate into a decline in labour market inequalities between different social origin groups. These contrasting findings may reflect the known fact that individuals' labour market position in Germany is more closely linked to their educational qualifications than is the case in Britain (Shavit and Müller, 1998; Müller and Gangl, 2003). Broadly speaking, it may therefore be the case that educational policy reforms are less effective in increasing intergenerational social mobility in countries where the link between educational qualifications and labour market outcomes is weaker than is the case in Germany.

**The importance of cognitive ability and locus of control in the intergenerational transmission of inequality**

While the first three papers of the dissertation examined over-time change in the educational and labour market chances of children from working-class backgrounds and the macro-level determinants thereof, the fourth paper sought to make a contribution to our understanding of the micro-level processes that explain why individuals from working-class backgrounds tend to obtain lower levels of educational attainment and lower social class positions than is the case for children from higher social class backgrounds. More specifically, the forth paper investigated the role of two individual-level characteristics, cognitive ability and locus of control – i.e. people's perception of the extent to which they have control over their own lives – in mediating the effect of individuals' parental class background on their educational attainment and social class position in Britain. This paper focused on Britain for the very pragmatic reason that data is available for this country, which is nationally representative and provides rich information on individuals' cognitive ability and locus of control in early-life as well as their complete educational and occupational histories.

As noted in the review of the existing literature in the introduction of the dissertation, the controversial volume *The Bell Curve* by Herrnstein and Murray (1994) suggests that educational and labour market inequalities between children from different social backgrounds can mainly be attributed to differences in cognitive ability between them. This view continues to be held by some scholars, as reflected in the more recent work by Marks (2014), and it has also gained considerable traction within policy circles (see, e.g., Cummings, 2013).

The views propagated in *The Bell Curve* have been strongly criticised, particularly since they effectively reinforce stereotypes and prejudice against individuals from working-class backgrounds. However, to our knowledge there are no estimates of the extent to which cognitive ability channels the intergenerational transmission of inequality, and we thus still lack evidence on whether the claims made by Herrnstein and Murray (1994) and more recently by Marks (2014) are true. The first aim of the forth paper of the dissertation was to address this limitation in the literature by estimating the proportion of the effect of coming from a working-class background, rather than a higher social class background, on individuals' educational attainment and social class position that is mediated by cognitive ability.

In addressing our first research aim, we found that differences in cognitive ability account for less than 40 percent of the educational inequality between individuals from different social class backgrounds and for less than 33 percent of the inequality in social class attainment between them (controlling for educational attainment). We found that this holds true independently of whether one measures individuals' social class position at the time of labour market entry or at the time of occupational maturity. Our findings thus contradict the claims made by Marks (2014) that educational and labour market inequalities between individuals from working-

class backgrounds and their counterparts from higher social class backgrounds are primarily explained by differences in cognitive ability between them. By contrast, more than 60 percent of the effect of individuals' parental class background on their educational and labour market chances appears to be due to factors other than cognitive ability.

Nevertheless, cognitive ability does still play a considerable role in the intergenerational transmission of inequality. Given the existing evidence on the role of environmental factors on children's cognitive development even at an early age (Cunha and Heckman, 2007; Heckman, 2007), we therefore see a strong need for social interventions to equalize the cognitive development of children from different social class backgrounds. Particularly interventions that start during pregnancy and the early years of life, such as the 'A Better Start' and 'Sure Start' programmes in Britain (Barlow, 2015; Glass, 1999), may be an effective means to this end. Moreover, our finding that a large part of social class inequalities in educational and occupational attainment is not explained by cross-class differences in cognitive ability implies a strong need for researchers and policy makers to identify and address the channels through which individuals' parental class background shapes their life chances, above any beyond its effects on individuals' cognitive development.

Our article began to shed some light on the importance of other characteristics that may be thought to channel the intergenerational reproduction of disadvantage by examining the role of individuals' locus of control in mediating the parental class effect on individuals' educational attainment and social class position. Our results indicate that locus of control does indeed mediate the parental class effect, but that it does so to a substantially smaller extent than is the case for cognitive ability. More specifically, we found that that locus of control mediates less than eight percent of the effect of

coming from a working-class background, as opposed to a higher social class background, on individuals' educational and social class attainment.

Despite the relatively small mediating role of locus of control, social policies that succeed in bolstering the sense of self-direction and control of individuals from working-class backgrounds may still be an effective means of reducing the gap in the educational and labour market chances between this group and their counterparts from higher social class backgrounds. Policies that may achieve this include the provision of youth centres in which disadvantaged children can engage in extracurricular activities and receive mentoring and guidance from trained coaches. However, the most effective means to increase the sense of control and the actual life chances of children from unskilled working-class backgrounds is likely to be the provision of high-quality job opportunities and vocational training programmes that prepare young people from disadvantaged backgrounds with the necessary skillset to enter these jobs.

It should be noted that the empirical patterns we observe in Britain concerning the micro-level processes may well look different in other countries. For instance, the finding that in Britain cognitive ability still mediates a considerable part (between 24 and 34 percent) of the parental class effect on individuals' social class position, *net of their educational attainment*, may be due to the relatively generalist education system in Britain, which may lead employers to place less emphasis on individuals' educational qualifications and greater emphasis on individual-level characteristics such as cognitive ability when hiring employees. By contrast, one may expect the role of cognitive ability in mediating the effect of parental class on individuals' social class position to be lower in countries like Germany, where the link between individuals' educational qualifications and their social class position has been shown to be particularly strong (see Müller and Gangl, 2003).

**A potential avenue for future research: Examining the relationship between equality of condition and equality of opportunity**

This dissertation has shown that education policy can decrease educational and labour market inequalities between children from different social class backgrounds. However, there is an emerging literature that suggests that educational reforms may not be the most effective means to this end. This literature argues that rather than focusing on reforming the educational system to limit the extent to which parents in high social class positions can use their superior economic resources to advantage their children, it may be more effective to directly reduce the inequality in economic resources in the parental generation by way of pre- or re-distributive social policies (see Goldthorpe, 2016; Corak, 2013; Krueger, 2012).[1] In other words, using social policies to reduce the inequality in the economic resources that parents in different social class positions can devote to supporting their children's early development, education, and transition into the labour market, may be expected to result in an equalization of the educational and labour market chances of children from different social class backgrounds.

The expectation that decreasing economic inequality in society may increase intergenerational social mobility is in line with past research that has argued that the level of parents' economic resources affects their children's school performance, educational choice and school-to-work trajectory (see, e.g., Erikson and Goldthorpe, 1992; Pfeffer and Hällsten, 2012). Studies that have empirically examined the relation between income inequality and intergenerational social mobility include cross-national

[1] Pre-distributive social policies are generally understood to refer to policies that lower the inequality in labour market incomes (before taxes and transfers) within society.

comparisons (see, e.g. Corak, 2013; Bukodi et al., 2017) and case studies of countries known to have relatively little inequality of condition, such as Sweden during the post-WWII period or Hungary under socialist rule (Bukodi and Goldthorpe, 2010; Goldthorpe, 2007, pp. 179-185). Some of these studies find a positive association between inequality of condition and intergenerational social mobility (Corak, 2013; Andrew and Leigh, 2009), which has been referred to as the 'Great Gatsby Curve' by US Chairman of the Council of Economic Advisers, Alan Krueger (2012). Yet, more recent work comparing the level of economic inequality and intergenerational social mobility across European countries has questioned whether there is a robust association between economic inequality and intergenerational social mobility (see Bukodi et al., 2017).

However, since cross-national and over-time variation in economic inequality is likely to co-vary with other institutional and structural factors, existing studies have been unable to establish whether and to what extent there is a *causal* relationship between equality of condition and equality of opportunity. Countries that vary in terms of their level of income inequality also tend to vary on a range of other characteristics, and over-time changes in inequality are often accompanied by other structural changes (see, e.g., Hall and Soskice, 2001; Esping-Andersen, 1990). This may cause any observed association between social inequality and intergenerational social mobility to be spurious. In order to identify the effect of social inequality on intergenerational social mobility, what is therefore needed are detailed evaluations of specific policy reforms or structural changes – preferably using research designs that licence causal inference.

One promising avenue for future research would therefore be to evaluate the effect of different pre- and re-distributive policies in Britain and Germany on the

educational and labour market chances of individuals from working-class backgrounds, relative to individuals from more advantaged backgrounds. More specifically, it could be revealing to evaluate the effects of social policy reforms that can be expected to have increased or decreased the economic resources that individuals in this group can draw on during their early development, educational attainment and transition to the labour market, relative to people from more advantaged backgrounds. These include reforms of (i) pre-distributive policies such as minimum wage regulation, (ii) direct re-distributive policies such as social assistance programmes or financial aid provision to children from disadvantaged backgrounds, and (iii) indirect re-distributive policies, such as public childcare provision, which can be expected to have a disproportionately positive effect on the economic resources of families with parents in unskilled working-class positions.

In order to examine whether and how the effects of pre- and re-distributive policies vary across different institutional contexts, it would be fruitful to adopt a cross-nationally comparative perspective. Comparing Germany and Britain could be of particular interest, since the two countries differ substantially with respect to the stratification of their educational systems and labour markets. While Germany has a highly stratified educational system, manifested in the early ability tracking of children around age eleven, the educational system in Britain is comparatively less stratified (Hörner et al., 2007). Similarly, and not least because of its stratified education system, the German 'dualised' labour market is known to be substantially more segregated than is the case for Britain. Overall, one may expect the pronounced stratification of the German education system and labour market to result in lower effects of pre- and re-distributive policies on the intergenerational transmission of disadvantage, as

compared to Britain. Yet, the extent to which this is the case remains an empirical question.

To identify the effects of pre- and re-distributive policies, one could draw on a data from the German micro census (MZS) and the British Office of National Statistics Longitudinal Study (ONS-LS). The large sample size of these datasets would allow for the accurate and robust estimation of the effects of the abovementioned policies on the intergenerational transmission of inequality. In order to establish the causal effects of social policy reforms, different quasi-experimental methods could be applied, including difference-in-difference, regression discontinuity, and instrumental variable designs, as well as propensity score matching (see Angrist and Pischke, 2007; Gangl, 2010).

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