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DOI <https://doi.org/10.1007/s11159-015-9498-5>

CITATION Kilpi-Jakonen, E., de Vilhena, D. V., & Blossfeld, H.-P. (2015). Adult learning and social inequalities: Processes of equalisation or cumulative disadvantage? *International Review of Education*, 61(4), 529–546. <https://doi.org/10.1007/s11159-015-9498-5>

Adult learning and social inequalities: Processes of equalization or cumulative advantage?

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Acknowledgements

The eduLIFE project is supported by an ERC Advanced Grant to Hans-Peter Blossfeld. The first two authors were also employed on the project during the adult learning phase. The authors of this paper wish to thank all the collaborators in the adult learning phase of the eduLIFE project for their valuable contributions.

Abstract

Adult learning is an increasingly important form of education in globalized and aging societies. Our aim in this paper is to examine the social inequalities related to adult learning by exploring cross-national patterns of participation in different adult learning activities and the consequences of participation on individuals' labour market trajectories. The empirical basis of the paper is an analysis of 13 country studies (as well as two cross-national analyses) brought together by the *eduLIFE* (Education as a Lifelong Process – Comparing Educational Trajectories in Modern Societies) project. Despite wide variations in the prevalence of participation across countries, mechanisms of social inequality related to adult learning tend to be relatively similar across countries, in particular with regard to non-formal learning. These processes tend to be ones of cumulative advantage, though in some countries a certain degree of equalization is noticeable with regard to formal adult education. We conclude that public policy makers should place greater emphasis on making adult learning more accessible to underrepresented groups.

1. Introduction

Adult learning has begun to receive increasing attention in contemporary global and aging societies. For example, the European Union has placed considerable emphasis on adult learning in both its Lisbon Strategy and its more recent Europe 2020 agenda. The primary policy focus with regard to adult learning has been to increase participation rates (the 2020 target is for average participation rates to be 15% for adults aged 25–64). However, there are strong reasons for being equally interested in the social inequalities of participation and for focusing on the (educational) selectivity of participants. In order to gain a complete picture about adult learning and its relationship with social inequality, we argue that it is also important to examine outcomes of participation as well as to pay attention to differences within the broad category of adult learning.

Our aim in this paper is, therefore, to examine the social inequalities related to adult learning by exploring cross-national patterns of participation in different adult learning activities and the consequences of participation on individuals' labour market trajectories using a life-course approach. We focus on social inequalities related to (prior) educational attainment. We aim to assess the extent to which there are cross-national commonalities and differences in

the mechanisms of social inequality related to adult learning in two different types of adult learning, namely formal and non-formal job-related adult learning. As our empirical basis we use the results of 13 country studies and two cross-national studies that were conducted within the *eduLIFE* project (Blossfeld et al. 2014). As far as possible these studies used longitudinal data and statistical modelling that enables the analysis of causal mechanisms over the life course. Although previous research on these issues exists, these often only focus on either participation or outcomes and usually examine only one type of adult learning or include all types together. We measure returns to (formal) adult learning by comparing individuals who acquire new formal qualification as an adult with those who do not, in particular their prior selves. This contrasts with research that compares so-called mature graduates with individuals acquiring the same qualifications at a younger (normative) age. As far as we are aware, we are the first to combine the study of both inequalities in participation and outcomes and to examine whether the processes of social inequality are similar across two different types of adult learning.

With regard to educational opportunities of young people, the debate about educational equality has been strengthened by the OECD's international learning assessments (PISA, see e.g. OECD 2004b). More recently, the OECD has highlighted the skill inequalities among adults that exist both within and between countries (OECD 2013). While the potential for adult learning to reduce social inequality exists if disadvantaged individuals acquire new skills (and thereby improve their labour market chances), adult learning may also be associated with processes of cumulative advantage if it is mainly the highly skilled who are able to access adult learning. The European Commission also recognizes that providing opportunities to the most disadvantaged groups, who are likely to need learning the most, is a challenge (European Commission 2014). In addition, a trade-off between equality and labour market rewards has been found for initial education (Bol and van de Werfhorst 2013) and it is important to ask whether such a trade-off also exists for adult learning.

The social inequality processes of adult learning may differ by type of adult learning. Adult learning can be divided into formal, non-formal and informal learning. In this paper, we examine only the first two and we further focus on learning related to the labour market due to the centrality of employment in modern societies. We view formal adult education as learning that leads to recognized certificates that can also be obtained along the typical educational career; it often takes place in formal educational institutions. In contrast, non-

formal adult learning consists of (often) shorter training courses and is often at least partly sponsored by employers, though it also encompasses community-based education and adult basic and literacy education. Non-formal adult learning may also be certified, but these certificates are not widely recognized qualifications in the same way as those obtained from formal education are. Finally, informal adult learning differs from these two by being less institutionalized; it is often self-directed. It should also be noted that countries differ in the way that adult learning is organized, which means that there is some variation in how each country in the *eduLIFE* project operationalized the two types of learning. In particular, there is variation in the types of courses that are included under non-formal learning and how related they are to the labour market.

In the next section, we present a brief overview of the theoretical mechanisms related to educational selectivity in adult learning as well as the consequences of adult learning for career progress. We then present the countries included in this analysis and shortly describe the data and methods used. In the section that follows, we describe the commonalities and differences among the countries analysed. The discussion section focuses on bringing together the results from the different aspects (selectivity and outcomes) and types (formal and non-formal) of adult learning and discusses some of the mechanisms behind these results. We finish with an examination of the conclusions that can be drawn from our analyses, paying particular attention to potential implications for policy makers.

2. Theoretical overview

Participation in learning often displays a pattern of cumulative advantage, whereby those who are already better endowed also receive more (also known as a Matthew effect, from Merton 1968). With regard to *non-formal learning*, this pattern has been explained by employers' incentives since it is employers who play a major role in sponsoring learning after labour market entry. It has been argued that the higher educated are more trainable, which means that each unit of training produces a greater enhancement in the productivity of highly educated workers compared to those with lower education (Boeren et al. 2010; Dieckhoff 2007; Oosterbeek 1998). In addition, the occupations that the highly educated tend to work in are likely to require more training due to being knowledge intensive and thus requiring knowledge and skills to be kept constantly up to date, whereas low-skilled jobs may remain

more stable in their required tasks but have a greater risk of becoming obsolete in the long run due to technological innovations (OECD 2013).

On the other hand, individuals' incentives and barriers are likely to be more relevant for explaining educational selectivity for participation in *formal education*. In particular, low prior educational attainment can be a barrier for entry despite the expansion of tertiary education and new possibilities for individuals who do not fulfil traditional entry requirements. Moreover, psychological reasons such as prior schooling experiences may also act as an indirect barrier (Field 2000; Illeris 2003; Rubenson and Desjardins 2009). On the other hand, there are likely to be few incentives for individuals who are already highly educated to enter time-consuming formal education. In addition, there may also be ceiling effects so that at some point individuals are no longer able to climb the (formal) educational ladder. Overall, it is likely that the benefits of participation in formal education are highest and the barriers impeding it are lowest for individuals with medium levels of education.

While our focus here is on social inequalities related to (prior) educational attainment, this is by no means the only axis of social inequality of relevance. For example, prior research has often highlighted women's unequal access to employer-sponsored training, which has been attributed to employers' reluctance to invest in the training of women who are likely to interrupt their employment careers for family reasons (Dieckhoff and Steiber 2011). Including other measures – such as labour market status, income, age, immigrant origin, and ethnicity – is, however, beyond the scope of this paper (though see Blossfeld et al. 2014 for broader analyses).

Adult learning should generally be expected to be associated with positive labour market returns due to increased productivity as a consequence of the accumulation of human capital, despite the fact that human capital is not always the primary determinant of labour market success (e.g. Bowles and Gintis 2002; Jackson 2007). In this paper, we focus on what we term 'career progress': depending on the country in question, this has been measured in terms of occupational prestige, social class or earnings. However, *formal adult education* does not always take place as an upgrade from the previously held level of education but can also be an educational side-step, particularly when individuals want to change careers. In these cases, occupational status or earnings may not be any higher than they were before participation. On the other hand, participation in formal adult education (because it is time consuming) is also

likely to act as a signal of higher motivation to employers, which should also increase employment outcomes. Furthermore, entry into many higher-status occupations tends to be restricted to individuals with the requisite qualifications, thus opening access to individuals who acquire those (often tertiary-level) qualifications. Previous research analysing income trajectories of adults acquiring new qualifications later in life has tended to find positive effects (e.g. Blanden et al. 2012; Hällsten 2012) but contrary evidence of null effects also exists (e.g. Jenkins et al. 2003).

Non-formal learning is likely to more clearly lead to productivity increases, particularly when sponsored by the employer, though these increases are likely to be smaller in size due to the shorter length of training courses. On the other hand, the productivity-enhancing effects of training may be overestimated if participants are already selected on the basis of higher productivity (or productivity potential) (e.g. Albert et al. 2010). A review of studies that have been able to measure both wage and productivity growth concludes that individuals are able to capture only between one-fifth and a half of the financial returns to training, and the rest of the benefit goes to employers (Hansson 2008). Due to our focus on the benefits to the individual, our results are likely to reflect only a part of the overall benefits of training participation. Finally, it has also been suggested that not all types of non-formal learning lead to productivity increases either because they are not designed to do so (e.g. because they are related to statutory requirements, such as health and safety courses, Field 2000) or because the compulsion to attend specific courses leads to low motivation and poor learning outcomes (e.g. some active labour market programs, Illeris 2003).

Overall, we expect the main mechanisms behind educational selectivity and adult learning's effect on career progress to be relatively similar across countries. However, it should also be recognized that the countries included in our analysis differ substantially in their institutional configurations, some which are expected to affect different aspects of adult learning (e.g. Brunello 2001; Dieckhoff et al. 2007; Wolbers 2005; see also Dämmrich et al. 2014; Triventi and Barone 2014). Our purpose here is not to assess the effect of specific institutions on particular aspects of adult learning but rather to build a broader picture of adult learning across the different aspects and the two types that are analysed.

3. Data and methods

This paper focuses on 13 country studies, which are based on longitudinal data, as well as two cross-national studies, based on cross-sectional data. These studies were conducted within the *eduLIFE* project (Blossfeld et al. 2014). The countries analysed and the data used in these analyses is summarized in Table 1. The table also specifies the labour market outcome(s) analysed in this paper and their operationalization in each country.

[TABLE 1 APPROXIMATELY HERE]

The two major research questions guiding the analyses in all country studies are (1) whether participation in different types of adult learning was related to social inequality in terms of prior educational attainment, labour market attachment and success, as well as gender – though we only focus on education in this paper, and (2) whether positive labour market outcomes followed from participation. The latter question encompasses a variety of measures of labour market success, but here we focus on measures related to career progress.

The best available data has been used in each country and the analyses have been guided by the same research questions and often the same statistical models have been used. Nevertheless, this approach – including the use of the best (longitudinal) data in all countries – means that the results are not fully comparable between countries because the same variables are not available in all datasets. This can also be seen from the variety of ways in which career progress has been measured.

The data has been modelled with multivariate statistical models, often using either event history analysis or methods of panel data analysis (such as random and fixed effects models) (see Appendix table 1 for details). In the majority of analyses, the results that are included refer to models where the impact of other individual-level characteristics (such as age and labour force status) has been taken into account. Moreover, the analyses have often been run separately for women and men in order to take into account gender-specific life courses.

4. Results

Table 2 presents the main findings for the 13 countries under analysis. In addition to results relating to the educational selectivity of participants and whether participation improves

career chances, the table also includes an indication of the participation rates in the two types of adult learning. Overall, participation rates display a great deal of heterogeneity among countries and the rates in non-formal learning tend to be higher than those in formal learning. However, the same countries tend to be at the top and the bottom regardless of the type analysed: the highest prevalence can be found in Nordic countries (in Sweden 53% participated in non-formal learning in the preceding 12 months and 13% in formal, and in Finland 36% and 10%), whereas the lowest rates can be found in Southern and Eastern European countries (for example Hungary 2% and 2 %, the Czech Republic 5% and 4%, and Italy 6% and 4%). Most non-formal learning is sponsored by employers, particularly in countries where it is prevalent. There is a slight tendency for formal learning not to be sponsored by employers, though this is somewhat country specific and the differences tend to be relatively small.

[TABLE 2 APPROXIMATELY HERE]

The results for *educational selectivity in non-formal learning* are relatively clear-cut and tend to confirm our expectation that those already more highly educated are more likely to participate in learning over the later life course (Matthew effect). There are, however, two exceptions: in Germany and Denmark, the results show that those with tertiary degrees are the least likely to participate in non-formal learning. These particular results can be explained by the lower importance of non-formal learning and the strong country-specific links between certificates and job positions, which narrow down the number of competitors for positions in later career stages to those who have the respective tertiary degrees (Blossfeld and Stockmann 1999).

On the other hand, there is more heterogeneity when it comes to the results concerning *educational selectivity in formal adult education*. At one extreme is Russia, where the lower one's educational attainment is the higher are participation rates; there are also similar tendencies in the US. At the other extreme are most other countries, where the opposite is the case, and the selectivity of formal education mirrors that found for non-formal learning. However, there are also countries that display (some aspects of) the pattern that could also be theoretically expected: individuals with medium levels of education have the highest propensity to attend formal adult education. This was found to be the case particularly in Denmark, Finland, Germany and Spain, with some evidence also from Hungary and Sweden.

With regard to *labour market outcomes*, the results for both types of adult learning generally suggest that there are positive returns to adult learning, though there are some exceptions and sometimes the returns take some time to appear, particularly for formal learning. More specifically, the countries where no significant positive effects on career progress were found for *non-formal learning* are Germany and Spain, in addition it should be noted that the effect of uncertified learning was found to be negative for men in Denmark. Moreover, in Great Britain, a positive effect was found for absolute prestige levels but not for prestige mobility. However, additional analyses with the British data suggest that training can happen simultaneously (within the same year) with mobility; it is unclear whether mobility follows training or whether newly mobile employees are trained in their new jobs (McMullin and Kilpi-Jakonen 2014).

More specific results for *the impact of formal adult education on job outcomes* show that all country studies where this was studied found a positive effect on career progress, but there can be considerable within-country variation in the group that this benefit goes to. Gender differences were found in Estonia, Germany and Spain: in the first two, only women benefit, whereas only men in the last.¹ In Finland and the Russian Federation, only tertiary-level adult education improves career progress, though there were also other countries where university degrees tend to be more beneficial than other new qualifications (Australia, Great Britain, among men in Hungary and younger men in Sweden). In Denmark, vocational upper secondary education was found to be most beneficial for adult learners. In the US, additional education obtained by adults increases prestige but does not affect wages. In a number of cases, the country studies demonstrate that returns to formal adult education take at least a few years to fully materialize.

5. Discussion

In bringing the results of this analysis together, the overwhelming conclusion is that despite wide variation in participation rates, the main mechanisms of adult learning tend to be relatively similar across countries. Adult learning, particularly when it is non-formal, displays

¹ Other countries also displayed gender differences in the magnitude of returns but in these cases the returns were nevertheless significant for both genders.

a pattern of cumulative advantage and improves participants' career progress. Nevertheless, some further observations can be made, in particular relating to the variation found in selectivity into formal adult learning.

One macro-level factor that seems to be related to less selectivity in formal adult learning is the education level of the adult population in the country.² A possible explanation for this may be that in countries with high proportions of tertiary-educated people, there is a greater perceived need among lower-educated adults to acquire additional education.³ This seems to be most keenly felt in Russia, where the social safety net of the state is also relatively sparse and therefore success in the labour market is paramount (Kosyakova 2014). High participation rates among women in Estonia and their greater returns to new formal qualifications compared to men have also been explained by the expansion of higher education, accompanied by rising qualification requirements for certain (female-dominated) occupations, which create pressures on women to gain new qualifications in order to be competitive, whereas men may rely more on their accumulated labour market experience (Saar et al. 2014). On the other hand, country differences in educational and occupational systems can also shape the form that these educational 'needs' take: in Germany, where workers without occupational certificates are basically excluded from more demanding job positions, the unskilled have a strong incentive to gain them (Buchholz et al. 2014).

Although a number of countries were not found to support the expectation that the medium-educated would be most likely to participate in formal adult learning, additional results from many of these countries suggest that the participation pattern is not purely one of cumulative advantage. It is often the case that disadvantages in the labour market also increase participation propensities. This is the case in Australia, for example, where the conclusion is that it is individuals in an intermediate position in the labour market who are most likely to

² The proportion of the population (aged 25–64) with tertiary education in 2002 (OECD 2012) (countries from most to least tertiary educated): Russian Federation 54%, USA 38%, Finland 33%, Australia 31%, Denmark 30%, Estonia 30%, Great Britain 27%, Sweden 26%, Spain 24%, Germany 23%, Hungary 14%, Czech Republic 12%, Italy 10%.

³ It is also possible that high educational levels do not cause more equality in educational opportunities, but rather that equality of opportunity in formal adult education leads to higher educational levels. This is no doubt part of the big picture, but in most cases, adult learners are unlikely to account for such a large proportion of the highly educated as to be able to fully account for this association.

re-enter formal education as adults (Buchler et al. 2014). In Sweden, the long-term income trajectories of adult learners show that they have steadily fallen behind their peers with similar levels of education (Kilpi-Jakonen and Stenberg 2014). Labour market disadvantages can also increase participation in non-formal learning, although normally this is only the case for non-formal learning that is not sponsored by employers (but which is nevertheless related to the labour market). For example in Spain, workers in stable jobs are less likely to have participated in this type of learning than those in precarious jobs or the unemployed – but this type of learning does not tend to improve one's labour market position (Vono de Vilhena and Miret Gamundi 2014).

With regard to how selectivity and career progress following adult learning combine into broader patterns of social inequality, it is relatively clear that almost no country is truly able to reduce social inequalities through adult learning currently. Even in countries where some of the more disadvantaged individuals are able to obtain more adult learning, it is often those who obtain higher levels of (formal) adult learning who benefit more (such as in the Russian Federation and in Finland). The situation is worst in countries such as Hungary, where the disadvantages of low-status groups are amplified because they face considerable barriers to enter any type of adult learning and even when they do, they can only access lower levels of adult education, which are less helpful in the labour market (Csanádi et al. 2014). The same situation tends to hold for employer-sponsored non-formal learning, particularly in countries with strongly segmented insider-outsider labour markets, such as is Italy, where marginal workers (not to mention individuals outside employment) are de facto excluded from profitable training opportunities (Barbieri et al. 2014).

In this sense, many countries seem to display a trade-off between equality and labour market rewards for adult learning, which has been found for initial education (Bol and van de Werfhorst 2013). This is particularly the case for non-formal learning but also to some extent for formal learning. The comparative study also found (short-term) wage returns to formal adult to correlate with wage returns to years of (initial) schooling, suggesting that the institutional mechanisms driving the two are similar (Triventi and Barone 2014). On the other hand, there are suggestions in the results that positive combinations are possible: lower selectivity and relatively widespread beneficial effects are seen in some countries, though only for formal learning, which tends to be much less widespread than non-formal learning. Nevertheless, positive cycles with greater investment in adult learning, the greater

participation of less privileged individuals and gains in the labour market are possible, though not inevitable.

6. Conclusion

Processes of globalization have lead policy-makers and other commentators to increasingly call for the workforce to constantly adapt their skills in response to technological change. Although previously this adaptation could be achieved through generational change, where older workers retire and younger, better-educated workers replace them, this is now seen as insufficient to meet the pace of changing skills requirements of modern economies (Blossfeld and Stockmann 1999; Janossy 1966; see also Field 2000). Therefore, the focus is shifting to keeping workers' skills up-to-date during their working lives; it is no longer appropriate for education to take place solely at the beginning of the life course. Adult learning has been argued to become increasingly necessary in order to enable older workers to remain employed for longer as well as to re-integrate into the labour market individuals who have become marginalized (d'Addio et al. 2010; European Commission 2011; OECD 2004a; Schuller and Watson 2009).

In this paper we have argued that greater attention needs to be paid to the processes of social inequality related to adult learning. As our empirical basis we have used the results from 13 longitudinal country-studies and two cross-sectional comparative studies on participation patterns in and career returns to formal and non-formal adult learning. While current policy recommendations tend to focus on increasing participation rates, we would like to draw greater attention to equality in participation rates. As we have seen, higher participation rates do not necessarily lead to lower social inequalities in participation. Therefore, additional efforts should be made to make adult learning more accessible to underrepresented groups, in particular those disadvantaged educationally and on the labour market (cf. Coffield 1999; Cruikshank 2002).

The most uniform pattern found in our analysis is one of cumulative advantage: those better off in society are better able to access adult learning and tend to see greater benefits from learning. More generally, adult learning tends to reproduce and reinforce the outcomes of initial education. However, there are substantial differences between the two types of adult learning that we have analysed: whereas the processes of cumulative advantage and the trade

off between equality and labour market rewards is clear for non-formal learning, this is less often the case for formal learning. One of the reasons behind this difference may be that non-formal adult learning is more often sponsored by employers than is formal learning, particularly when the non-formal learning is job-related, which is what we have analysed. This means that public policies need to explicitly target older, less-skilled workers as well as immigrants and unemployed individuals because these groups tend to be overlooked in market-based systems (see also OECD 2013). Age-based learning policies are one step in this direction (Schuller and Watson 2009), but a broader conception of different life-cycle-based needs is also necessary (Billet 2010). Moreover, attention needs to be paid to the content of the courses in order to ensure that the participants also benefit from their participation in the labour market. Non-formal learning opportunities that are more directly targeted towards individuals with low levels of education already exist, but because their focus is often not employment-related, they do not fulfil our second social inequality reduction aim. Nevertheless, they may provide stepping-stones towards more formal and non-formal learning opportunities.

It should also be noted that not all employment-related problems are necessarily related to purported skills gaps or skills mismatches (e.g. Levine 2013). The tendency for those already better-off to profit more from their learning is in line with research on job polarization, which suggests that there has been a reduction in the demand for individuals with medium levels of skill (Autor et al. 2008; Goos and Manning 2007). This makes it more difficult for individuals with low levels of skills to profit from increases in their skills levels, and suggests that changes are also required on the labour market rather than only in adult learning.

Overall, since much of the policy discourse related to adult learning places the emphasis on individuals to keep their skills up-to-date and constantly develop themselves, our message is that states need to take more responsibility in distributing opportunities for learning equitably and promoting the learning of individuals who are not intrinsically motivated.

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Table 1. Overview of (country) study data

| Country/study | Data | Observation window | Outcome(s) |
|---------------------------------|--|---------------------------------|---|
| Participation in adult learning | Adult Education Survey (AES) | Cross-section (between 2005–08) | n.a. |
| Returns to adult learning | International Adult Literacy Survey (IALS) | Cross-section (between 1994–98) | Wages |
| Australia | Household Income and Labour Dynamics in Australia (HILDA) | 2001–10 | Occupational status |
| Czech Republic | Labour Force Survey 2011 (LFS), Social Cohesion Survey 2005/2006 (SCS) | 1989–2005, 2008 and 2011 | Upward mobility (increase of at least 5 CAMSIS points between job spells) |
| Denmark | Integrated Database for Labor Market Research (IDA) | 1981–2009 | Upward mobility (annual increase of at least 10% in inflation-adjusted income) |
| Estonia | AES 2007, Family and Fertility Survey 2004/2005 (FFS) | 2005 retrospective and 2008 | Upward mobility (change of at least 6.5 ISEI points between job spells) |
| Finland | Register data from Statistics Finland | 1987–2007 | Income level (annual taxable income divided into deciles) |
| Germany | National Educational Panel Study (NEPS) | 2011 retrospective | Upward mobility (increase of at least 5 CAMSIS points between job spells) |
| Great Britain | British Household Panel Study (BHPS) | 1991/98–2008 | Prestige (CAMSIS score) and upward mobility (yearly increase of at least 5 CAMSIS points) |
| Hungary | Hungarian Household Panel Study (HHP) | 1992–2007 | Upward mobility (any positive change in ISEI between the two panel waves) |
| Italy | Indagine Longitudinale sulle Famiglie Italiane (ILFI) | 1997–2005 | Prestige (CAMSIS score) and upward mobility (yearly increase of at least 5 CAMSIS points) |
| Russia | Russia Longitudinal Monitoring Survey (RLMS-HSE) | 2000–10 | Upward mobility (any yearly increase in ESeC) |
| Spain | Panel Survey on Inequalities in Catalonia (PAD) | 2002–09 | Upward mobility (any yearly increase in ESeC) |
| Sweden | Register data from Statistics Sweden (LISA) | 1990/1994–2010 | Income (logged annual labour income in 2010) |
| USA | National Longitudinal Study of Youth (NLSY79) | 1979–2010 | Wages (logged annual labour income in 2010) and SEI (in 2010) |

Notes: For details about CAMSIS, see Prandy and Jones (2001), for details about ISEI, see Ganzeboom et al. (1992), for details about ESeC, see Rose and Harrison (2007).

Table 2. Summary of results

| Countries | NF prevalence | F prevalence | NF selectivity | F selectivity | NF on career progress | F on career progress |
|--------------|---------------|--------------|----------------|---------------|-----------------------|----------------------|
| Australia | 0 | 0 or + | + | + | n.a. | + |
| Czech Rep. | [-] | [-] | + | + | [+] | + |
| Denmark | [+] | [+] | 0 | 0 | w:+, m:- | (+) |
| Estonia | [+] | [0] | + | w:(+), m:+ | n.a. | w:+, m:0 |
| Finland | [+] | [+] | [+] | 0 | [+] | (+) |
| Germany | [+] | [0] | 0 | 0 | 0 | w:+,m:0 |
| GB | [0] | [+] | + | + | 0/+ | + |
| Hungary | [-] | [-] | [+] | (+) | [+] | + |
| Italy | [-] | [-] | + | [+] | + | [0] |
| Russian Fed. | - | - | + | - | + | (+) |
| Spain | [0] | [0] | + | (0) | 0 | w:0, m:+ |
| Sweden | [+] | [+] | + | (+) | [+] | + |
| USA | + | 0 or + | + | (-) | + | 0/+ |

NF = non-formal adult learning; F = formal adult learning; w = women; m = men

[Results in square parentheses from comparative chapters]

(Results in brackets partial, see text for details)

Prevalence: - low prevalence, 0 medium prevalence, + high prevalence

Selectivity: - inverse selectivity (low educated most likely), 0 mixed selectivity (medium educated most likely),

+ positive selectivity (highly educated most likely), all differences significant at $p < 0.05$, unless indicated as partial, see text for details

Career progress: - negative effect ($p < 0.05$), 0 non-significant effect, + positive effect ($p < 0.05$)

See tables and figures in Blossfeld et al. (2014) for the estimated sizes of effects

Appendix table 1. Country-specific methods for the analysis of participation and outcomes.

| Country | Analysis of participation in non-formal learning | Analysis of participation in formal learning | Analysis of outcomes of non-formal learning | Analysis of outcomes of formal learning |
|----------------|--|--|---|--|
| Australia | Logistic regression of participation in last 12 months (measured in wave 7), independent variables from wave 6 | Panel analysis of entry into adult education | n/a | Linear fixed-effects regression, completion of adult education (during panel, lags tested) as predictor |
| Czech Republic | Logistic regression of participation in learning in the four weeks prior to the survey (2011 LFS) | Descriptive analysis of completion of further education between 1989 and 2006 | n/a | Discrete time event history analysis of upward mobility, completion of (latest) further education during follow-up period as predictor |
| Denmark | Logistic regression of participation during the observation window | Logistic regression of participation during the observation window | Panel analysis, adult learning during observation window as predictor | Panel analysis, adult learning during observation window as predictor |
| Estonia | Logistic regression of participation in the 12 months prior to the survey | Logistic regression of participation in the 12 months prior to the survey | n/a | Piecewise constant exponential model, completion of highest educational level as an adult as predictor |
| Finland | n/a | Panel analysis of enrollment leading to an upgrade or change of field during follow-up (1996-2007) | n/a | Repeated measures linear regression, completion of adult education during observation window as predictor |
| Germany | Logistic regression of participation after labour market entry | Logistic regression of participation after labour market entry | Panel analysis, adult learning after labour market entry as predictor | Panel analysis, adult learning after labour market entry as predictor |
| Great Britain | Panel analysis of participation | Panel analysis of enrollment | Discrete time event history analysis of upward mobility, | Discrete time event history analysis of upward mobility, |

| | | | | |
|---------|--|--|---|---|
| | | | linear fixed effects regression of prestige, learning in three previous waves as predictors | linear fixed effects regression of prestige, completion of qualification (during panel, lags tested) as predictor |
| Hungary | n/a | Logistic regression of obtaining an educational upgrade between 1992 and 2007 | n/a | Logistic regression, educational upgrade between 1992 and 2007 as predictor |
| Italy | Panel analysis of participation | n/a | Fixed effects regression models, learning in previous 12/24 months as predictors | n/a |
| Russia | Panel analysis of participation | Discrete time event history analysis of obtaining a new qualification as an adult | Discrete time event history analysis, learning in four previous waves as predictors | Discrete time event history analysis, new qualifications obtained (during the panel) and their lags as predictors |
| Spain | Panel analysis of completing non-formal learning | Panel analysis of obtaining an educational upgrade | Discrete time event history analysis, learning in three previous waves as predictors | Discrete time event history analysis, educational upgrades obtained (during the panel) and their lags as predictors |
| Sweden | (Descriptive analysis of participation in past 12 months based on LFS) | Logistic regression of enrollment in 1994/5 and logistic regression of educational upgrade by 2010 conditional on enrollment | n/a | OLS regression, number of "education years" obtained between 1994 and 2010 as predictor |
| USA | Descriptive analysis (participation between leaving initial education and 2010, measured (bi)annually) | Descriptive analysis (participation between leaving initial education and 2010, measured (bi)annually) | OLS regression, number of job training spells as predictor | OLS regression, years in education during specific age brackets as predictors |
