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# **Inequality in adult learning and education participation: The effects of social origins and social inequality**

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## **Abstract**

This comparative study examines patterns of inequality in participation in two different types of adult learning and education (ALE) – job-related formal ALE (JFALE) and job-related non-formal ALE (JNFALE) – as related to social origins at the micro-level and three categories of social inequality at the macro-level at the macro level (economic, education and skill inequality). Using data from the Programme for the International Assessment of Adult Competencies (PIAAC), two methods are used to analyse 19 selected OECD countries: multivariate binary logistic regressions to explore the extent to which individuals' social origins are associated with ALE participation and two-stage multilevel analysis to examine the relationship between social origins' advantages in ALE participation and social inequality. Statistically significant advantages in ALE participation of social origins were observed in some countries. Additionally, statistically significant positive relationships between social inequality and social origins' advantages in JNFALE participation are found, which implies that increases in social inequality strengthen advantages associated with social origins.

Keywords: adult learning and education participation, social inequality, social origins, PIAAC

## **Introduction**

Adult learning and education (ALE) is regarded as a route for continuing education and training to obtain new knowledge, skills, and competencies to keep up with the demands generated by today's knowledge economy (UNESCO, 2015). Moreover, given that formal ALE (FALE) and non-formal ALE (NFALE) are found to have positive influence on employment outcomes (e.g. employment stability and reducing unemployment risks) and preventing downward mobility (de Vihena, Kilpi-Jakonen, Schuhrer, & Blossfeld, 2014), ALE may be considered a way to alleviate educational and social inequalities by promoting the supply of competent workers to the labour market. Van der Veen and Preece (2006) hold that ALE helps countries remain competitive in the global economy through a wide range of competencies including literacy, basic education, and vocational education. Accordingly, ALE is becoming increasingly important along with the initial formal education system, fulfilling its mission to provide additional educational opportunities for adults. ALE participation rates have actually increased since the 1970s in

industrialized countries (Bélanger, 2011).

Increasing participation rates are not equivalent to equitable access to ALE participation, however. Opportunities for ALE participation do not seem to be distributed equally among individual adult learners. Specifically, a great degree of inequality in ALE participation has been found within countries. What may cause this inequality? On a within-country level, individual characteristics (e.g. age and educational attainment) have been examined as determinants of subjective readiness for ALE participation and the capacity to utilize actual opportunities for ALE in some comparative studies (e.g. Desjardins, Rubenson, & Milana, 2006; Blossfeld, Kilpi-Jakonen, de Vilhena, & Buchholz, 2014). A Matthew Principle of accumulative advantage (i.e. those who already have will receive more, and those who do not have will receive less) is strongly suggested to be relevant in determining ALE participation in most societies (see Desjardins et al., 2006; Boeren, 2009). Especially, social mechanisms, including inequality and class differences, are critical elements in determining ALE participation (Boeren, 2016). To take skill inequality as an example, a workers' skill level affects ALE participation rates: approximately 30% of adults with low literacy skills vs approximately 74% of adults with high literacy skills (OECD, 2014). Individuals in need of improving their job-related skills and knowledge are rather less likely to seize ALE opportunities, which leads to further imbalance at the expense of low-skilled workers in the labour market (Boeren, 2009).

On the other hand, inequality in ALE participation has been found between countries. Participation rates are above 60% in the Scandinavian countries on average, approximately 50% in Korea, and 33% or below in Italy and the Russian Federation (OECD, 2014). Macro-level factors such as structural barriers to ALE participation at the country level have been discussed at a conceptual in previous studies (e.g. Boeren, 2016; Desjardins, 2017; Groenez & Desmedt, 2008; Rubenson & Desjardins, 2009). For example, social inequality and institutional settings, including labour market structure, labour union density, and the characteristics of the ALE system are explored as macro-level determinants of ALE participation (Dämmrich, de Vilhena, & Reichart, 2014; Lee, 2018).

Given these multilevel determinants of ALE participation, an integration of macro-level factors into existing micro-level models is needed to comprehensively understand inequality in ALE participation. This need is well discussed conceptually in some studies (e.g. Boeren, 2016; Kilpi-Jakonen, de Vilhena, & Blossfeld, 2015; Lee, 2018), but more efforts should be made to empirically examine them. With an understanding that it is critical to understand how individuals are influenced by structural processes and how these processes are likely to change individuals' perception of ALE and actual participation, this article aims to empirically examine the cross-national patterns of inequality in ALE participation caused by social origins as a micro-level factor and its association with social inequality as a macro-level factor. To our best knowledge, social inequality has not been empirically examined as a macro-level variable affecting ALE participation. There are two specific research questions guiding this analysis of inequality in ALE participation: "How different is the degree to which individuals' social origins affect ALE participation across countries?" (RQ 1: social origins' advantages in ALE participation at the individual level within country) and (2) "How is social inequality at the macro-level associated with individuals' social origins in determining ALE participation?" (RQ 2: social origins' advantages in ALE participation in association with social inequality at the country level). These

questions will be addressed through a cross-national comparative study with a focus on 19 selected Organization for Economic Co-operation and Development (OECD) member countries: Austria, Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, South Korea, Poland, Spain, Sweden, the United Kingdom, and the United States. Consequently, this article aims to contribute to the building of an integrated framework for theory and research on ALE participation by showing the degree to which social inequality at the macro-level can affect ALE participation in addition to one's social origins at the micro-level.

## **Background**

As afore-mentioned, this article intends to empirically examine inequality in ALE participation in relation to within- and between-country variation and in relation to the association of a micro-level factor with a macro-level factor. The conceptual framework underpinning the empirical analysis in this article relies on the conceptual foundation for understanding micro- and macro-level dimensions linked to inequality in ALE participation discussed by Lee (2018). Lee (2018) inquired into inequality in ALE participation in connection with social origins as a micro-level factor and social inequality and institutional settings (i.e. active labour market policies and strictness of employment protection) as a macro-level factors. In a broader context, Lee (2018)'s discussion can be understood in relation to the bounded agency model (Rubenson & Desjardins, 2009) that sheds light on the interaction of individual attributes with structural factors in determining ALE participation. Individuals' decisions on ALE participation are made through an intricate underlying decision-making process (Boeren, 2016), which, however, does not always proceed as desired, because individuals also face the circumstances created by macro-level structural conditions that puts some limitations on individuals' choices and can restrict their actions (Lee, 2018; Rubenson, 2010).

Social origins can be measured and treated in terms of different components (e.g. parental social status, parents' occupational prestige, and/or parental education), all of which may be intertwined to understand the complex nature of social origins (Bukodi & Goldthorpe, 2013). This article particularly employs parental education as the indicator of an individual's social origins mainly because the Programme for the International Assessment of Adult Competencies (PIAAC) data, which is the main dataset used for the empirical analysis, contains parental education only. Parental education has been used as a proxy for individuals' social origins in some studies (e.g. Breen & Jonsson, 2005; Blanden & McNally, 2014) and its relationship with relationship with ALE participation has also been empirically examined (e.g. Boudard & Rubenson, 2003; Desjardins et al., 2006). The impacts of parental education on ALE participation can be understood in the same way individual background characteristics affect ALE participation that are examined in many previous studies. This can be specifically explained within the context of the intergenerational transmission of education (see Antoni, 2011; Feinstein, Duckworth, & Sabates, 2004; Fischer & Lipovska, 2013). Parental education can be transmitted inter-generationally through various pathways such as being a moderator between the educational attainment of children and other distal factors (e.g. income and the characteristics of family) affecting educational participation (Feinstein et al., 2004). In the field of ALE, parental education often serves as the mechanism underlying intergenerational transmission of education, i.e., the level of parental education is positively related to children's formal and non-formal

education participation in adulthood (see Antoni, 2011). Similarly, Fischer and Lipovska (2013) empirically examined and confirmed positive relationships between parents' level of education and children's level of initial formal education attainment and also between the non-formal and informal participation of parents and children. It can be thus assumed that individuals' social origins affect their educational attainment and ability to acquire skills, which subsequently influences participation in further learning and education beyond initial formal education.

On the other hand, social origins' effects on ALE participation can be strengthened or lessened, depending on macro-level (Lee, 2018). The underlying rationale of this understanding is that learning and education depend not only on individual attributes, but also on the social context in which they take place (Bourdieu & Wacquant, 1992). Thus, patterns of inequality in ALE participation are likely to reflect broader structural inequalities (Rubenson, 2009). From this perspective, this article examines social inequality as a potential macro-level factor affecting inequality in ALE participation, which can be conceptually explained from a micro-sociological perspective (see Boeren, 2016). Social inequality, although its conceptualization and measurement are complicated, can be defined as "differences between groups of people that are hierarchical in nature and the hierarchical distribution of social, political, economic, and cultural resources" (Habibis & Walter, 2015, p. 2). It is also multi-dimensional in nature, as implied by the fact that various dynamics of inequality intersect and intertwine (Butler & Watt, 2007). Diverse studies have examined the relationships between different dimensions of social inequality and the effects of inequality on ALE participation (e.g. Kilpi-Jakonen et al., 2015; Willingham, 2012). Kilpi-Jakonen et al. (2015) pointed to the relatively similar mechanisms of social inequality in job-related ALE participation identified across countries. Lee (2018) identified three dimensions of social inequality: economic, education, and skill inequality and discussed the intertwined relationships between them within the context of social origins differences in ALE participation. Considering intergenerational inequality in educational investments, i.e., high-income and highly-educated parents spending seven times more on education and enrichment activities for their children than low-income parents (Duncan & Murnane, 2011), it is reasonable to presume that distributional inequality of social and financial resources (i.e. economic inequality) begets inequality of educational opportunities and attainment. Furthermore, inequality in education levels (i.e. education inequality) functions as a strong predictor of skills inequality among adults (Green, Green, & Pensiero, 2015) because higher-educated individuals are likely to work in more demanding and knowledge-intensive occupations requiring additional education and training so that they could utilize better opportunities to increase their skills and knowledge (OECD, 2013). Skill inequality is mirrored in wage differentials since the latter is partly determined by the former (Van Damme, 2014), which implies that skill inequality may result in income inequality. It is therefore, legitimate to assume that social origin's advantages in ALE participation are positively associated with social inequality across countries, i.e., as the level of social inequality increases, social origin's advantages in ALE participation would become stronger across countries.

## **Methodology**

### ***Methods of analysis***

To answer RQ 1, multivariate binary logistic regressions were run by estimating odds ratios

reflecting the relative likelihood that adults with tertiary-educated parents would participate in ALE compared to adults with parents with below secondary education (SE). Additionally, as odds ratios can be misleading and difficult to interpret from a practical standpoint, average marginal effects (AMEs) were computed for explicit interpretations and comparisons. AMEs estimate marginal effects at every observed value of the independent variables and the average across the resulting effect estimates.

To examine whether the country variation in social origins differences in ALE participation is related to social inequality (RQ 2), a two-stage multilevel analysis is used which is preferable to pooled models with cross-level interactions (see Lewis & Linzer, 2005). It is more efficient under certain circumstances: (1) analyses based on a large number of level-1 units, but small number of level-2 units (19 in this article) (Steenbergen & Jones, 2002); (2) the need to calculate country-individual slopes in the first stage and then compare these afterwards in a second stage, rather than to treat the effects of country-level factors as random slopes (Dämmrich, Kosyakova, & Blossfeld, 2015); (3) the need for more flexible and robust analyses to allow coefficients of covariates to vary across countries (Heisig, 2011). In the two-stage multilevel analysis, the multivariate binary logistic regression above was actually the first stage, wherein individual-level parameters were separately estimated for each country. In the second stage (ordinary least-squares regressions), the country-specific beta coefficients for individuals' social origins which were estimated from the first stage served as the dependent variables and were regressed on social inequality. Error terms were composed of two components in the second stage: the sampling error resulting from the fact that the dependent variables were estimated and the residual variance from the second-stage regressions. If sampling variance differs across observations, the first error component is likely to be heteroscedastic (Lewis & Linzer, 2005). To account for heteroscedasticity in the first error component, the beta coefficients were weighted by their standard errors in accordance with the feasible generalized least squares (FGLS) estimation method. Lewis and Linzer (2005) developed this method to handle the concern of heteroscedasticity without assuming the second error component is heteroscedastic. The user-written Stata command *edvreg* was used to run the second-stage regressions<sup>1</sup> (see Lewis & Linzer, 2005).

It should be also noted that in addressing RQ 2, another statistical model is deployed, where country-specific beta coefficients for individuals' social origins are based on the total effects (i.e. a combination of direct and indirect effects) and used as the dependent variable in the second stage (see Table 1). The total effects were estimated by using the Stata *ldecomp* command<sup>2</sup> (see Buis, 2010). This is important because beta coefficients from a logistic regression model only account for direct effects and thus do not account for the indirect effect of social origins on ALE participation via other covariates such as own level of education and literacy skill which are also influenced by social origins. Ignoring such indirect effects may lead to bias and incorrect

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<sup>1</sup> *edvreg* is a function to fit the estimated dependent variable regression through applying a weighted least-squares estimation with robust standard errors to data.

<sup>2</sup> *ldecomp* is Stata module that decomposes the total effects of a categorical variable in logistic regression into direct and indirect effects.

interpretation of the total effect of social origins on participation in ALE<sup>3</sup>. To illustrate as an example, when the covariates were added to the model, the direct effects of social origins on ALE participation decreased and became statistically insignificant for approximately half of the countries<sup>4</sup>. Future, own level of education and level of literacy skill appeared to statistically significantly mediate social origins and ALE participation. This suggests that social origins is indirectly related to ALE participation via its effects on own level of education and level of literacy skills. At a conceptual level, as in the discussion of intergenerational transmission of education above, parents' educational attainment can serve as a predictor of their children's educational attainment through supportive parental beliefs and practices that shape parents' expectations about their children's academic aspirations and achievement (e.g. Melby, Conger, Fang, Wickrama, & Conger, 2008; Hauser-Cram, 2009). Parents with economic, educational, and occupational success invest more in the development of their children through stimulation of learning, provision of stimulating materials, and access to experiences that foster later success (Conger, Conger, & Martin, 2010). Consequently, the results from these two models using different dependent variables were compared.

### ***Data source***

The analysis is based on the PIAAC public-use data file. PIAAC was developed as a large-scale international study (survey) under the guidance of the OECD and conducted in 24 countries from 2011-2012 to assess key cognitive skills and workplace skills in jobs among adults between the ages of 16 and 65. It also reported participation in learning activities in the 12 months preceding the survey. However, due to limited availability of macro-level comparable data, this article was restricted to the analysis of 19 countries. Additionally, data on social inequality at the macro-level (particularly, income and education inequality) were obtained from OECD publications (OECD, 2014, 2017), while skill inequality was estimated by using the PIAAC data. Lastly, although the working-age population is defined as adults aged 25 to 65 since individuals aged 16 to 24 are likely to still be in the regular cycle of formal education.

### ***The variables of interest***

For multivariate binary logistic regressions, the main dependent variable was ALE participation, which occurred in the 12 months prior to the PIAAC survey. Given that in today's knowledge economy, both FALE and NFALE contribute to knowledge and skills acquisition and the stock of human capital (OECD, 2011)<sup>5</sup>, ALE was divided accordingly. Then, job-relatedness was added to this division because of high ALE participation rates for job-related reasons: on average (the 19 sample countries), approximately 75.4% participated in job-related formal ALE

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<sup>3</sup> The first-stage regression model only covers social origins' direct effects on ALE participation.

<sup>4</sup> The results from bivariate analyses can be provided upon request. These are omitted to conserve space.

<sup>5</sup> Informal type of ALE and ALE for other purposes (e.g. active citizenship and literacy as well as basic skills) are also offered, which vary widely across countries. This article focuses on job-related FALE and NFALE (continuing education, training, and professional development).

(JRFALE) and 76.1% participated in job-related non-formal ALE (JRNFALE). Ultimately, JRFALE and JRNFALE were examined as two dependent variables. For the second stage regressions that include the macro-level factors, the dependent variables were the estimated parameters that identify the differences in ALE participation by social origins.

As mentioned, parental education (i.e. the highest of at least one parent's level of education achieved) is used as a proxy for social origins. Covariates include specific socio-demographic (age and gender) and socioeconomic factors including job-related factors (own educational attainment, level of literacy skill, job contract type, and occupational status), all of which are frequently included in previous empirical studies on ALE participation (e.g. Dämmrich et al., 2014; Desjardins et al., 2006). They were selected based on the following understandings. Social background, educational attainment, and position in the labour market can affect adults' subjective readiness to participate and thus determine ALE participation (Rubenson, 2018). Specifically, more educated adults are, on average, 3-5 times more likely to participate in ALE (Desjardins, 2015), which indicates that education level mediates opportunities for ALE. Moreover, because growing ALE participation rates are closely linked to the elemental changes that have taken place in the world of work over the past several decades (Rubenson, 2018), job-related factors are also relevant. Rubenson (2018) found that participation in formal and informal ALE is determined by the relationship between literacy skill, formal education, and job requirements and that, particularly, individuals who have high skills and occupation with high engagement in literacy have the highest job-related ALE participation.

Social inequality at the macro-level refers to three types of inequality: economic, education, and skill inequality (see Table 2). Economic inequality was measured as income inequality using the Gini coefficient as an international summary measure of economic inequalities, based on the comparison of cumulative proportions of the population against cumulative proportions of the income they receive (OECD, 2017). Education inequality was the likelihood of participating in tertiary education (TE) by individuals aged 20-34 by parents' educational attainment (i.e. tertiary-educated parents compared with parents having only below upper secondary education) (see OECD, 2014, Table A4.1b). Higher values indicate a stronger impact of socioeconomic background on educational activities in the sense that educational disadvantages are transmitted from one generation to the next (Busemeyer, 2015). Skills inequality was measured as a score-point difference in the average literacy proficiency between adults with at least one tertiary-educated parent and those with parents with less than an upper secondary education (see Van Damme, 2014).

### ***Empirical models***

The multivariate binary logistic model designed to estimate the impacts of individuals' social origins on ALE participation by controlling for covariates can be expressed as follows:

$$\text{Logit}(Y_{ij}) = \ln\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \dots + \beta_k X_{kij} + \varepsilon_{ij} + u_j \quad (1)$$

$Y_{ij}$  denoting ALE participation is the  $i$ -th expected log of the odds for individuals  $i$  in countries  $j$ , where ALE participation occurs, being dependent upon  $X_{kij}$ ;  $X_k$  is the vector of the primary



independent variable and covariates;  $\beta_s$  are a  $k$  dimensional column vector of unknown coefficients to be measured;  $u_j$  and  $\varepsilon_{ij}$  are unobserved country-level errors and individual-level errors. A fitted value for the dependent variable represents the logarithm of the odds that  $Y$  equals 1.  $\beta_i$  are the regression coefficients indicative of the change in the expected logarithm of the odds for a one unit change in the primary independent variable, controlling for all the covariates.

The first-stage regression is specified in Equation (1) above. The second-stage regression model is set up to explore the sources of the variation of the coefficients  $\beta_{1i}$  in Equation (1) by introducing social inequality indicators. The second-stage regression (i.e. FGLS) specifications are as follows:

$$\beta_j = \gamma_0 + \gamma_l Z_j + v_j \quad (2)$$

where  $\beta_j$  is the  $m$  dimensional column vector composed of the first coefficient in each of the regression specifications of Equation (1) and of the total effects of social origins;  $\gamma_l$  is a  $g$  dimensional vector of coefficients to be estimated;  $Z_j$  is an  $m \times g$  matrix of social inequality indicators;  $v_j$  is the corresponding disturbance with variance  $\omega^2$ ;  $v_j$  is assumed to be independent of  $u_j$ . The sign and significance on the coefficient ( $\gamma_l$ ) are used to examine the association of social inequality with social origins' advantages in ALE participation: a negative (positive) sign implies that as the level of social inequality increases, the advantages of individuals' social origins in ALE participation diminishes (strengthens).

## Findings

### *RQ 1: Social origins' advantages*

Tables 3 and 4 display the results of multivariate binary logistic regressions (also the first-stage regression of a two-stage multilevel analysis) estimating the impacts of individuals' social origins on JRFALE and JRNFALE participation for each country, with relevant individual background characteristics included as covariates. The differences in JRFALE participation between adults whose parents have below secondary education and those with tertiary-educated parents, holding all the covariates in the model constant, were statistically significant in seven countries (Austria, Estonia, Italy, Korea, Netherlands, Poland, and Sweden), but not the differences in JRFALE participation between adults whose parents have below secondary education and those whose parents have secondary education in all the countries. This finding indicates that adults with tertiary-educated parents may be more advantaged in JRFALE participation than those with parents with below secondary education in these countries. Italy and Poland appear to be the countries with the highest degree of inequality in JRFALE participation (an odds ratio of 2.7), followed by Austria (2.3) and Estonia (2.1). It can be interpreted that the odds of participating in JRFALE for adults with tertiary-educated parents are 2.7 times the odds for those whose parents have below secondary education in Italy and Poland. In terms of average marginal effects (AMEs), for Poland, the change in the predicted probability of JRFALE participation, when parental education went from below secondary education to TE, controlling for all other covariates, was .05 (i.e. an increase by 5 percentage points), which was statistically significant. In other words, the probability of JRFALE participation was on average 5 percentage points higher for adults having tertiary-educated parents than those with parents having below

secondary education in Poland. It was 4 percentage points (AME of .04) higher for adults having tertiary-educated parents in Estonia and 3 percentage points (.03) higher in Austria, Canada, Germany, and Sweden.

Moreover, compared to adults whose parents have below secondary education, statistically significant advantages of having tertiary-educated parents in JRNFALE participation were found in seven countries (Canada, Estonia, France, Korea, Poland, Sweden, and the UK). The odds of participating in JRNFALE for an adult in Poland with tertiary-educated parents were 110% higher (an odds ratio of 2.1) than an adult whose parents have below secondary education, 60% higher (1.6) in Estonia and the UK, 40% higher (1.4) in France, and 30% higher (1.3) in Canada, Korea, and Sweden. Statistically significant advantages of having parents with secondary education in JRFALE participation were present in five countries: 40% higher in Estonia, 30% higher in Canada, France, and Norway, and 20% in Korea. Additionally, the JRNFALE participation probability for adults with tertiary-educated parents compared to those whose parents with below secondary education was 11 percentage points (AME of .11) higher in Poland, 10 percentage points (.10) in the UK, and 6 percentage points (.06) in Canada, Estonia, and Japan. Having tertiary-educated parents is associated with JRNFALE participation increasing by 11%.

In summary, there appears to be cross-country variation in the degree to which social origins affect ALE participation, which is also dependent upon types of ALE. Advantages of having tertiary-educated parents in ALE participation were found in some countries, though to varying degrees. Estonia, Korea, Poland, and Sweden showed statistically significant advantages of having tertiary-educated parents in participation in both JRFALE and JRNFALE. The magnitude of the advantages were higher for Estonia and Poland than for Korea and Sweden.

### ***RQ 2: Social origins' advantages in association with social inequality***

Table 5 displays the results of the second-stage regression of a two-stage multilevel analysis examining the relationship between social origins' advantages (in particular, having tertiary-educated parents) in ALE participation and social inequality at the country level. When looking at the models using social origins' direct effects (JFM1a – JFM3a), negative relationships (negative beta coefficients) were estimated between social origins' advantages in JRFALE participation and economic (JFM1a) as well as skill inequality (JFM3a). These findings indicate that countries with a higher level of economic and skill inequality show fewer advantages for adults with tertiary-educated parents in JRFALE participation. The positive beta coefficient was estimated for education inequality in JRFALE participation (JFM2a). However, the coefficient for skill inequality in JRFALE participation (JFM3a) is the only one found to be statistically significant, which indicates that if skill inequality increases by one unit, social origins' advantages in JRFALE participation decrease by .01. On the other hand, positive relationships between all the social inequality indicators and social origins' advantages in JRNFALE participation (JNFM1a – JNFM3a) were identified, which were, however, statistically insignificant.

In contrast, when using the total effects of social origins as the dependent variable, the estimates appeared to approximate the expected relationships (see JFM1b – JFM3b and JNFM1b –

JNFM3b in Table 5). However, on the one hand, the relationships between each of the social inequality indicators at the macro-level and advantages of having tertiary-educated parents in JRFALE participation were statistically insignificant. On the other hand, the associations of advantages of having tertiary-educated parents in JRNFALE participation with social inequality were statistically significant. Thus, a one-unit increase in economic, education, and skill inequality is associated with an increase in advantages of having tertiary-educated parents in JRNFALE participation by 2.18 (JNFM1b), .08 (JNFM2b), and .02 (JNFM3b), respectively, across countries. Accordingly, in countries with higher levels of social inequality, there is a tendency for adults with more advantaged social origins to have a higher a probability of participating in JRNFALE compared to countries with lower levels of social inequality.

## **Discussion**

Overall, the analyses of job-related non-formal ALE (JRNFALE) produced results that were consistent with expected outcomes, while the results for job-related formal ALE (JRFALE) were not as predicted. Although the signs of beta coefficients for JRFALE and JRNFALE were expected to be the same, the opposite was observed. Specifically, social origins' advantages in participating in JRFALE decreased when social inequality increased. These findings can be understood from both a micro- and macro-level perspective. From a micro-level perspective, the behavioural perspective on lifelong learning participation that Boeren (2016) discusses provides a possible explanation of this finding. Needs, planned and intended behaviour, and motivation are a few important constructs useful to explain ALE participation. At a conceptual level, adults presumably have varying levels of appreciation for the needs and purposes of ALE participation, depending on different factors such as their employment status in a labour market characterized by uncertainty and career instability. Some adults may seek opportunities for JRFALE if they lack the necessary formal educational credentials to give them a competitive edge in the labour market, regardless of external circumstances including social inequality and public support for ALE. Under such conditions, social origins' advantages in JRFALE participation may not be distinctly perceptible.

From a combination of a micro- and macro-level perspective, there has been a higher demand for JRNFALE than for JRFALE among adults in the changing labour market, requiring the acquisition of new knowledge and skills in today's knowledge society. Then, it is legitimate to assume that all adults who are employed may share the predicted fulfilment of their needs, intentions, and motivation for JRNFALE participation to a similar level. They may thus seek opportunities for JRNFALE to further develop their job skills and competencies and to enhance their employment security. On the other hand, high demand is indicative of intense competition, i.e., the competition is more intense for JRNFALE participation than JRFALE participation. Then, who is more likely to win this competition? Considering the argument of Boeren (2016) that decisions to participate in lifelong learning activities can be greatly dependent upon the choice of learning activities being offered in an accessible way, the answer would be those who have more choices to choose. Put it differently, in this competitive condition, it is logical to assume that individuals with advanced educational qualifications and a higher skill level would be more likely to outlive those who are less educated and less skilled and to seize opportunities for JRNFALE. Adults with sufficient resources to invest in their education and training including JRNFALE are also more likely to be successful in utilizing opportunities for JRNFALE. This

understanding indicates that structural inequality can determine the extent of individuals' capacity to take opportunities for ALE participation. This trend may be more prevalent in countries with a higher level of social inequality unless some policy actions are taken to address advantages of social origins in ALE participation and social inequality affecting ALE participation.

## **Conclusion**

This article examined inequality in ALE participation across 19 selected OECD countries with a focus on social origins' advantages in JRFALE and JRNFALE participation. Statistically significant advantages for participating in ALE are found in some countries for those who have tertiary-educated parents. Further, some evidence is found to suggest that this relationship is related to the degree of social inequality at the country level but not for all types of ALE. Specifically, findings revealed that advantages of having tertiary-educated parents are higher in countries with higher social inequality for non-formal related types of ALE but less so for formal types of ALE. These findings imply that the degree of social inequality can help explain why social origins are more deterministic for ALE participation in some countries.

These findings were made possible by deploying an integrated approach to analysing the factors related to inequality in ALE participation, namely by drawing links between micro- and macro-levels. However, caution should be taken in interpreting country-level estimates (the second-stage regression) because they did not reflect unobserved differences across countries and because the effects of social origins on ALE participation were not consistent or found in all countries. Further comparative analysis with greater country-specific detail may be a legitimate next step to take. Additionally, further efforts need to be made to confirm the findings of this article and to look into applicability of its analytical approach to another macro-level setting, employing other types of macro-level factors including other dimensions of social inequality. In doing so, the most challenging problem is to acquire reliable and comparable country-level data to improve the validity of cross-national comparisons. Another issue related to availability of comparable data is the need of integrating other dimensions to parental education to more comprehensively approximate social origins. Lastly, given that there are cross-country variations in advantages of social origins in ALE participation, it is necessary to explore what countries where the advantages of social origins appear to be less influential might have done to overcome the deterministic value of social origins.

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## APPENDICES

Table 1. Social origins' total effects on ALE participation with indirect effects of own education attainment and literacy skill

	Austria			Belgium			Canada			Denmark		
	Beta	SE	%	Beta	SE	%	Beta	SE	%	Beta	SE	%
JRFALE	1.95	.18	35.4	.92	.21	31.8	.97	.04	25.3	.98	.11	26.0
JRNFALE	.74	.08	84.5	1.19	.09	62.4	.85	.04	64.5	.73	.07	80.7
	Estonia			Finland			France			Germany		
	Beta	SE	%	Beta	SE	%	Beta	SE	%	Beta	SE	%
JRFALE	1.81	.20	21.4	1.24	.11	21.7	1.37	.19	56.7	1.23	.35	32.5
JRNFALE	.89	.08	49.7	.74	.09	74.3	1.00	.09	78.9	1.13	.13	69.2
	Ireland			Italy			Japan			Korea		
	Beta	SE	%	Beta	SE	%	Beta	SE	%	Beta	SE	%
JRFALE	.86	.11	49.1	2.15	.25	41.8	.98	.31	13.2	1.83	.18	36.9
JRNFALE	.75	.07	90.5	1.04	.11	104.2	.81	.09	62.1	.89	.10	77.3
	Netherlands			Norway			Poland			Spain		
	Beta	SE	%	Beta	SE	%	Beta	SE	%	Beta	SE	%
JRFALE	.67	.12	39.5	.82	.14	31.8	2.94	.25	37.6	1.25	.15	53.5
JRNFALE	.66	.09	90.8	.71	.08	65.0	1.78	.11	49.4	.88	.09	89.9
	Sweden			UK			US					
	Beta	SE	%	Beta	SE	%	Beta	SE	%			
JRFALE	1.13	.15	26.0	.98	.10	57.2	.76	.19	59.9			
JRNFALE	.60	.08	73.6	1.17	.07	62.0	1.12	.10	66.2			

Source: PIAAC PUF (2016); analyses of current study.

Notes: All Betas are statistical significant at the .001 level. Beta refers to total effects (direct effect of social origins + indirect effects of education level and literacy skill), SE standard error, and % proportion of indirect effect within total effect, respectively. Beta compares parents with below SE and tertiary-educated parents.



Table 2. Social inequality by type (2012)

Country	Economic inequality	Education inequality	Skill inequality
Austria	0.275	5.1	39.11
Belgium	0.265	5.7	45.09
Canada	0.320	2.6	42.00
Denmark	0.250	3.0	34.61
Estonia	0.326	4.7	26.79
Finland	0.268	1.4	44.37
France	0.308	6.0	47.46
Germany	0.298	5.1	51.78
Ireland	0.310	3.3	34.70
Italy	0.330	9.5	36.89
Japan	0.332	5.1	31.83
Korea	0.294	1.1	32.59
Netherlands	0.288	2.8	35.51
Norway	0.260	2.0	36.20
Poland	0.297	9.5	53.60
Spain	0.334	3.9	40.83
Sweden	0.268	2.3	32.60
UK	0.347	6.3	44.04
US	0.387	6.8	57.56

Source: OECD (2014, 2017), PIAAC PUF (2016).

Notes: Economic inequality is the Gini index; education inequality is the odds ratio reflecting the relative likelihood of participating in TE by parental education; skill inequality is a measure of difference in the average literacy score by parental education, estimated by the author.

Table 3. JRFALE participation for adults aged 25-65, adjusted for individual background characteristics

	Austria			Belgium			Canada			Denmark			Estonia			Finland		
	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR
<b>Parental education</b>																		
<i>Below secondary</i>																		
Secondary	.63	.02	1.9	-.08	-.00	.92	-.05	-.00	1.0	.23	.02	1.3	.52	.03*	1.7	-.13	-.01	.88
Tertiary	.83*	.03*	2.3	-.06	-.00	.94	.27	.03*	1.3	.17	.02	1.2	.74*	.04**	2.1	.04	.00	1.0
<b>Gender</b>																		
<i>Male</i>																		
Female	-.26	-.01	.77	-.41*	-.02*	.66	-.00	-.00	1.0	.14	.01	1.2	.37*	.02*	1.4	.08	.01	1.1
<b>Age</b>																		
<i>25-34</i>																		
35-44	-1.5***	-.07***	.22	-.51*	-.03*	.60	-.47***	-.06***	.62	-.76***	-.10***	.47	-.65***	-.05***	.52	-.59***	-.08***	.56
45-54	-1.8***	-.08***	.17	-.99***	-.05***	.37	-.93***	-.11***	.39	-1.0***	-.12***	.40	-1.6***	-.09***	.21	-.81***	-.10***	.44
55-65	-2.0***	-.08***	.13	-1.5***	-.07***	.22	-1.5***	-.14***	.23	-1.9***	-.18***	.14	-1.8***	-.10***	.16	-1.9***	-.17***	.15
<b>Education level</b>																		
<i>Below upper secondary</i>																		
Upper secondary	-.10	-.003	.91	-.01	-.00	.99	1.1*	.07***	2.9	.34	.03	1.4	.10	.01	1.1	.88**	.07**	2.4
Tertiary	.34	.01	1.4	.10	.00	1.1	1.4***	.10***	4.2	.92***	.09***	2.5	.13	.01	1.1	.87**	.07**	2.4
<b>Literacy skill</b>																		
<i>Level 1 or below</i>																		
Level 2	.68	.02	2.0	-.05	-.00	.95	-.10	-.01	.90	-.27	-.03	.76	.97*	.04***	2.6	-.07	-.01	.93
Level 3	1.1	.03*	2.9	-.12	-.01	.89	.09	.01	1.1	-.04	-.00	.96	.99*	.04***	2.7	.08	.01	1.1
Level 4 & 5	1.5*	.05**	4.4	-.57	-.02	.57	-.15	-.01	.86	.02	.00	1.0	1.1*	.05***	3.1	-.08	-.01	.92
<b>Occupation status</b>																		
<i>Elementary</i>																		
Semi-skilled	.34	.01	1.4	.21	.01*	1.2	.44	.04*	1.6	-.01	.00	.99	.79	.02	2.2	.20	.01	1.2
Skilled	1.1	.04*	2.9	.79	.03	2.2	.48	.04*	1.6	.07	.01	1.1	1.6**	.07***	5.0	.68*	.07*	2.0
<b>Contract type</b>																		
<i>Indefinite duration</i>																		
Other types of contract	1.2***	.06***	3.2	1.2***	.09***	3.3	.38**	.04***	1.5	1.1***	.14***	3.1	.72***	.05***	2.0	.85***	.11***	2.4
Constant	-4.6***			-2.7***			-3.3***			-2.2***			-5.1***			-2.7***		
$R^2$ (Cox & Snell)	.07			.03			.05			.09			.07			.06		

	France			Germany			Ireland			Italy			Japan			Korea		
	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR
<b>Parental education</b>																		
<i>Below secondary</i>																		
Secondary	-.04	-.001	.96	.56	.02	1.7	.02	.002	1.0	.60*	.02	1.8	-.01	.00	.99	-.11	-.00	.89
Tertiary	.31	.01	1.4	.85	.03*	2.3	.11	.00	1.1	1.0*	.04	2.7	-.01	.00	.99	.59*	.03	1.8
<b>Gender</b>																		
<i>Male</i>																		
Female	-.07	-.002	.93	.08	.003	1.1	-.10	-.01	.90	.64*	.02	1.9	-.29	-.005	.75	.40	.02	1.5
<b>Age</b>																		
<i>25-34</i>																		
35-44	-.49*	-.02*	.61	-1.5***	-.09***	.23	-.18	-.02	.83	-.17	-.01	.85	-.28	-.01	.75	-.70**	-.03**	.50
45-54	-.68*	-.03*	.51	-2.7***	-.12***	.07	-.63***	-.07***	.53	-.71	-.02	.49	-.39	-.01	.68	-.66*	-.03*	.52
55-65	-2.7**	-.06***	.07	-3.2***	-.12***	.04	-1.2***	-.11***	.29	-3.4*	-.04***	.04	-.98*	-.02	.37	-1.9*	-.06***	.14
<b>Education level</b>																		
<i>Below upper secondary</i>																		
Upper secondary	-.03	-.00	.97	-.28	-.01	.76	.47	.03	1.6	.45	.01	1.6	.02	.00	1.0			
Tertiary	.93	.03*	2.5	-.15	-.01	.86	1.4***	.13***	3.9	1.5**	.05*	4.5	.28	.01	1.3			
<b>Literacy skill</b>																		
<i>Level 1 or below</i>																		
Level 2	.63	.02	1.9	.26	.01	1.3	-.32	-.04	.72	-.72*	-.02	.49	-.06	.00	.94	.15	.00	1.2
Level 3	.70	.02	2.0	.27	.01	1.3	-.30	-.04	.74	-.56	-.02	.57	-.18	-.00	.83	.75	.03	2.1
Level 4 & 5	.97	.03*	2.6	.28	.01	1.3	-.29	-.04	.75	-.09	-.03	.92	-.48	-.01	.62	.78	.03	2.2
<b>Occupation status</b>																		
<i>Elementary</i>																		
Semi-skilled	-.32	-.01	.72	.55	.02	1.7	.36	.04	1.4	-.57	.02	.57						
Skilled	-.46	-.02	.63	.86	.03	2.4	.43	.04	1.5	-.21	.01	.81						
<b>Contract type</b>																		
<i>Indefinite duration</i>																		
Other types of contract	1.1***	.06***	2.9	1.2***	.07***	3.5	.58***	.07***	1.8	.76**	.03	2.1	.97***	.02**	2.6	.24	.01	1.3
Constant	-3.7***			-3.5***			-2.7***			-3.8***			-20.8			-36.5		
$R^2$ (Cox & Snell)	.04			.08			.06			.05			.01			.05		

	Netherlands			Norway			Poland			Spain			Sweden			UK			US		
	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR
<b>Parental education</b>																					
<i>Below secondary</i>																					
Secondary	.20	.02	1.2	.03	.00	1.0	.85*	.04**	2.3	.24	.02	1.3	.20	.01	1.2	.03	.00	1.0	.18	.01	1.2
Tertiary	.29*	.03	1.3	.19	.02	1.2	.99*	.05*	2.7	.29	.02	1.3	.43*	.03*	1.5	-.01	-.00	1.0	.11	.01	1.1
<b>Gender</b>																					
<i>Male</i>																					
Female	-.24*	-.03	.79	.27*	.03*	1.3	.22	.01	1.2	.31*	.02	1.4	.59***	.04***	1.8	.16	.02	1.2	.22	.02	1.3
<b>Age</b>																					
<i>25-34</i>																					
35-44	-.07	-.01	.93	-.39**	-.05**	.68	-.55**	-.03*	.58	-.58***	-.05**	.56	-.33*	-.03	.72	-.28*	-.04	.76	-.62***	-.08***	.54
45-54	-.38*	-.04*	.68	-.43**	-.06**	.65	-.80***	-.05**	.45	-1.0***	-.08***	.37	-.41*	-.04*	.66	-.38*	-.05*	.69	-1.1***	-.12***	.32
55-65	-1.2***	-.10***	.31	-1.3***	-.13***	.26				-1.7***	-.11***	.19	-1.7***	-.10***	.19	-.89***	-.11***	.41	-1.4***	-.14***	.25
<b>Education level</b>																					
<i>Below upper secondary</i>																					
Upper secondary	.61***	.06***	1.8	.53**	.05*	1.7	-1.1*	-.06	.34	.05	.003	1.0	-.01	-.00	.99	.73***	.08**	2.1	.89*	.06**	2.4
Tertiary	.42*	.04*	1.5	.97***	.10***	2.6	-.07	-.01	.94	.46	.03	1.6	1.3***	.10***	3.7	.91***	.10***	2.5	1.3**	.10***	3.6
<b>Literacy skill</b>																					
<i>Level 1 or below</i>																					
Level 2	.36	.04	1.4	-.09	-.01	.91	.08	.004	.11	.19	.01	1.2	.01	.001	1.0	-.44*	-.06	.65	.09	-.01	1.1
Level 3	.34	.03	1.4	-.16	-.02	.86	.46	.03	1.6	.34	.02	1.4	.24	.02	1.3	-.39	-.05	.68	.28	.01	1.3
Level 4 & 5	.24	.02	1.3	-.24	-.03	.79	.39	.02	1.5	1.2***	.11***	3.4	-.04	-.002	1.0	-.00	-.00	1.0	.72**	.06	2.0
<b>Occupation status</b>																					
<i>Elementary</i>																					
Semi-skilled	.38	.04	1.5	-.02	-.00	.98	.18	.01	1.2	.59	.03	1.8	-.29	-.03	.75	.61*	.07	1.8	.33	.03	1.4
Skilled	.49	.05	1.6	-.11	-.01	.90	.67	.04	2.0	1.3***	.07***	3.7	-.47	-.04	.63	.62*	.07	1.9	.23	.02	1.3
<b>Contract type</b>																					
<i>Indefinite duration</i>																					
Other types of contract	.21	.02	1.2	.59***	.08***	1.8	.29	.02	1.3	.57***	.05**	1.8	1.0***	.10***	2.9	.26	.04	1.3	.26*	.02	1.3
Constant	-2.8***			-2.2***			-3.5***			-3.6***			-3.0***			-2.5***			-3.5***		
R <sup>2</sup> (Cox & Snell)	.03			.04			.07			.08			.08			.03			.05		

Source: PIAAC PUF (2016).

Notes: Reference categories are italicized for each variable.  $\beta$  logit coefficients. AME stands for average marginal effects and OR odds ratio. Statistical significance: \*p < .05; \*\*p < .01; \*\*\*p < .001.

Table 4. JRNFALE participation for adults aged 25-65

	Austria			Belgium			Canada			Denmark			Estonia			Finland		
	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR
<b>Parental education</b>																		
<i>Below secondary</i>																		
Secondary	.00	-.00	1.0	.02	.02	1.0	.29**	.06***	1.3	.08	.02	1.1	.36**	.05*	1.4	.14	.03	1.1
Tertiary	.03	-.01	1.0	.15	.04	1.2	.30**	.06***	1.3	.11	.02	1.1	.46***	.06**	1.6	.23	.03	1.3
<b>Gender</b>																		
<i>Male</i>																		
Female	-.18*	-.05*	.84	-.01	-.03	.99	-.06	-.01	.95	.01	.004	1.0	.16	.03	1.2	-.04	-.01	.97
<b>Age</b>																		
<i>25-34</i>																		
35-44	.06	.002	1.1	.23	.04	1.3	.14	.02	1.1	.09	.02	1.1	.07	.01	1.1	.27*	.05*	1.3
45-54	.06	.01	1.1	.11	.01	1.1	.29**	.05**	1.3	.10	.02	1.1	-.01	-.01	.99	.29*	.04	1.3
55-65	-.53***	-.11**	.59	-.16	-.03	.85	.04	-.00	1.0	-.06	-.01	.94	-.05	-.01	.95	.23	.04	1.3
<b>Education level</b>																		
<i>Below upper secondary</i>																		
Upper secondary	.32*	.05	1.4	.30	.06	1.3	.45*	.09**	1.6	.35**	.05	1.4	.22	.03	1.3	.63***	.13***	1.9
Tertiary	.67***	.13**	1.9	.94***	.18***	2.6	.69***	.13***	2.0	.75***	.13***	2.1	.69***	.11**	2.0	1.0***	.19***	2.9
<b>Literacy skill</b>																		
<i>Level 1 or below</i>																		
Level 2	.32*	.06	1.4	.11	.01	1.1	.39**	.09***	1.5	.50***	.10***	1.7	.19	.03	1.2	.08	.04	1.1
Level 3	.49***	.10**	1.6	.39*	.06	1.5	.84***	.19***	2.3	.65***	.13***	1.9	.29	.05	1.3	.23	.06	1.3
Level 4 & 5	.76***	.15***	2.1	.26	.05	1.3	.98***	.22***	2.7	.50**	.09*	1.6	.11	.02	1.1	.27	.07	1.3
<b>Occupation status</b>																		
<i>Elementary</i>																		
Semi-killed	1.1***	.21***	2.9	.75***	.14***	2.1	.45*	.07*	1.6	.61***	.11***	1.8	.94***	.16***	2.6	.65***	.09	1.9
Skilled	1.8***	.36***	5.9	1.6***	.32***	4.9	.97***	.17***	2.6	1.4***	.26***	3.9	2.1***	.37***	7.9	1.5***	.23***	4.3
<b>Contract type</b>																		
<i>Indefinite duration</i>																		
Other types of contract	-.13	-.04	.88	-.17	-.06	.78	-.18	-.05**	.83	-.69***	-.15***	.50	-.39***	-.11***	.67	-.50***	-.09***	.61
Constant	-.2.2***			-.2.3***			-.1.9***			-.1.4***			-.2.6***			-.1.7***		
$R^2$ (Cox & Snell)	.11			.16			.10			.12			.17			.12		

	France			Germany			Ireland			Italy			Japan			Korea		
	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR
<b>Parental education</b>																		
<i>Below secondary</i>																		
Secondary	.26*	.04	1.3	-.01	-.01	.99	.07	.02	1.1	-.09	-.04	.91	.05	.03	1.1	.21*	.05*	1.2
Tertiary	.30*	.04	1.4	.11	.01	1.1	-.09	-.03	.92	.41	.04	1.5	.23	.06*	1.3	.30*	.05	1.3
<b>Gender</b>																		
<i>Male</i>																		
Female	-.02	-.02	.98	-.22**	-.05*	.81	-.39***	-.08***	.68	-.02	-.01	.99	-.15	-.05*	.86	-.19*	-.03	.85
<b>Age</b>																		
<i>25-34</i>																		
35-44	.16	.03	1.2	.29**	.06*	1.3	.20	.04	1.2	.08	.01	1.1	-.24*	-.05	.79	.07	.01	1.1
45-54	.42**	.08***	1.5	.13	.03	1.1	.47***	.09**	1.6	.23	.02	1.3	-.16	-.03	.85	-.18	-.02	.91
55-65	-.09	-.03	.91	-.42**	-.07*	.66	.33*	.08	1.4	.15	.02	1.2	-.61***	-.13***	.55	-.33	-.03	.86
<b>Education level</b>																		
<i>Below upper secondary</i>																		
Upper secondary	.56***	.10***	1.8	.69**	.13*	1.9	.42**	.09*	1.5	.51***	.08*	1.7	.36	.03	1.4	.71***	.11**	1.7
Tertiary	.85***	.17***	2.3	1.1***	.21***	3.1	1.1***	.21***	2.9	.95***	.15***	2.6	.85***	.13***	2.3	1.6***	.29***	3.6
<b>Literacy skill</b>																		
<i>Level 1 or below</i>																		
Level 2	.49**	.10***	1.6	.33*	.10**	1.4	.13	.03	1.1	.06	.00	1.1	-.20	-.05	.82	.24	.08*	1.4
Level 3	.65***	.14***	1.9	.68***	.15***	1.9	.42**	.07	1.5	.47**	.09**	1.6	-.09	-.02	.91	.44*	.12**	1.7
Level 4 & 5	1.0***	.21***	2.7	.71***	.17***	2.0	.39*	.07	1.5	.70**	.11*	2.0	.01	-.01	1.0	.60*	.14**	1.9
<b>Occupation status</b>																		
<i>Elementary</i>																		
Semi-skilled	.55*	.09**	1.7	1.7***	.30***	5.6	.32	.05	1.4	.03	.002	1.0	1.4***	.17***	4.1	.76***	.13***	1.8
Skilled	1.3***	.21***	3.5	2.5***	.47***	12.7	.97***	.18***	2.6	1.1***	.17***	2.9	2.5***	.39***	12.7	1.1***	.17***	2.2
<b>Contract type</b>																		
<i>Indefinite duration</i>																		
Other types of contract	-.34*	-.07*	.72	-.40***	-.07**	.67	-.42***	-.08**	.66	-.65***	-.09**	.52	-.08	-.01	.97	-.63***	-.11***	.59
Constant	-2.9***			-3.3***			-1.3***			-2.3***			-2.5***			-2.0***		
$R^2$ (Cox & Snell)	.13			.18			.13			.14			.16			.20		

	Netherlands			Norway			Poland			Spain			Sweden			UK			US		
	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR	$\beta$	AME	OR
<b>Parental education</b>																					
<i>Below secondary</i>																					
Secondary	.19	.03	1.2	.28**	.06**	1.3	.56***	.09**	1.7	.12	.02	1.1	.05	.01	1.1	.14	.04	1.2	.24	.06	1.3
Tertiary	.19	.04	1.2	.21	.04	1.2	.75***	.11**	2.1	.15	.02	1.2	.25*	.04	1.3	.47***	.10**	1.6	.20	.05	1.2
<b>Gender</b>																					
<i>Male</i>																					
Female	-.06	-.01	.94	.01	-.003	1.0	-.03	-.03	.97	-.13	-.05*	.88	.10	.01	1.1	.10	.01	1.1	-.04	-.01	.96
<b>Age</b>																					
<i>25-34</i>																					
35-44	-.17	-.03	.84	-.04	-.005	.96	.18	.02	1.2	.13	.03	1.1	-.05	-.03	.95	.30*	.06	1.4	.24*	.03	1.3
45-54	.05	-.01	1.1	.08	.02	1.1	.12	-.001	1.1	.36**	.07*	1.4	-.06	-.03	.94	.37**	.07*	1.4	.23*	.04	1.3
55-65	-.31*	-.07*	.73	-.43**	-.08**	.65	-.10	-.002	.91	-.10	-.03	.91	-.10	-.04	.90	.25	.05	1.3	.24	.04	1.3
<b>Education level</b>																					
<i>Below upper secondary</i>																					
Upper secondary	.35**	.05*	1.4	.59***	.10***	1.8	-.31	.00	.74	.66***	.11***	1.9	.42***	.08**	1.5	.38**	.04	1.5	.57**	.10	1.8
Tertiary	.73***	.12***	2.1	.77***	.14***	2.2	.39	.13*	1.5	1.0***	.21***	2.8	.29	.05	1.3	.48**	.05	1.6	.99***	.18**	2.7
<b>Literacy skill</b>																					
<i>Level 1 or below</i>																					
Level 2	.06	-.01	1.1	.50***	.11**	1.7	-.02	.01	.98	.36**	.08**	1.4	.43**	.10*	1.5	-.14	.01	.87	.46***	.08*	1.6
Level 3	.34*	.06	1.4	.46**	.10*	1.5	.19	.04	1.2	.13	.03	1.1	.49***	.11**	1.6	.41*	.11*	1.5	.66***	.12**	1.9
Level 4 & 5	.14	.01	1.1	.47**	.11*	1.6	.23	.05	1.3	.30	.05	1.4	.75***	.16***	2.1	.41*	.11*	1.5	.76***	.14**	2.1
<b>Occupation status</b>																					
<i>Elementary</i>																					
Semi-skilled	1.0***	.19***	2.9	.36	.04	1.4	.28	.01	.13	.49**	.07	1.6	.32	.07	1.4	.45*	.13**	1.6	.68**	.10	1.9
Skilled	1.8***	.33***	6.1	.87***	.13*	2.4	1.3***	.19***	3.6	1.3***	.23***	3.7	1.3***	.26***	3.7	1.1***	.25***	3.1	1.5***	.25***	4.3
<b>Contract type</b>																					
<i>Indefinite duration</i>																					
Other types of contract	-.71***	-.13***	.49	-.68***	-.12***	.51	-.28*	-.07**	.76	-.33**	-.07**	.72	-.51***	-.10**	.60	-.27*	-.05	.76	.03	.01	1.0
Constant	-.14***			-.13***			-.18***			-.18***			-.13***			-.14***			-.23***		
$R^2$ (Cox & Snell)	.13			.09			.17			.15			.11			.11			.13		

Source: PIAAC PUF (2016).

Notes: Statistical significance: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Table 5. Social origins' conditional effects (ordinary least squares coefficient) on ALE participation by social inequality

	JRFALE						JRNFALE					
	JFM1a	JFM1b	JFM2a	JFM2b	JFM3a	JFM3b	JNFM1a	JNFM1b	JNFM2a	JNFM2b	JNFM3a	JNFM3b
Economic inequality	-.69	-1.50					1.00	2.18*				
Education inequality			.01	.08					.02	.08***		
Skill inequality					-.01*	-.03					.002	.02*
Constant	.43	1.49***	.18**	.79***	.76**	1.13	-.14	.19	.11***	.62***	.08	.15
R <sup>2</sup>	.02	.02	.02	.16	.24	.02	.08	.12	.14	.58	.02	.33

Source: PIAAC PUF (2016).

Notes: Statistical significance: \*p < .05; \*\*p < .01; \*\*\*p < .001. M model (i.e. JFM1a = JRFALE model 1a; and JNFM1a = JRNFALE model 1a). The conditional effects (Beta) of adults with tertiary-educated parents for M1a, M2a, and M3a are obtained from logistic regression analyses. The conditional effects of adults with tertiary-educated parents for M1b, M2b, and M3b are obtained from total effect estimates in Table 1.