"This is the Authors' Original Manuscript of an article published by Routledge Taylor & Francis Group in [Journal of education and work] on [Published online: 20-Dec-2018], available online: https://doi.org/10.1080/13639080.2018.1559281.

Petya Ilieva-Trichkova[1]

Institute for the Study of Societies and Knowledge, Bulgarian Academy of Sciences, Sofia, Bulgaria

1000 Sofia, 13A Moskovska str., Bulgaria

Tel: „00359" – „898 907 529"

E-mail: petya.ilievat@gmail.com

Pepka Boyadjieva

Institute for the Study of Societies and Knowledge, Bulgarian Academy of Sciences, Sofia, Bulgaria

1000 Sofia, 13A Moskovska str., Bulgaria

Tel: „00359" – „899 751 574"

E-mail: pepka7@gmail.com

[1] Corresponding author: Petya Ilieva-Trichkova, Institute for the Study of Societies and Knowledge, BAS, 13A Moskovska str., 1000 Sofia, Bulgaria. Email: petya.ilievat@gmail.com

Abstract

This article examines the role of education in creating differences across European countries with regard to how young people experience job insecurity during their transition from school to work. At theoretical level, two sets of educational system features which influence job insecurity are defined: institutional (stratification, vocational preference, standardisation) and structural (expansion of education, development of lifelong learning, expenditure on education). The empirical basis includes data from the Labour Force Survey (2009), the European Social Survey R5 (2010/2011) and the official statistics. The results show that the vocational specificity of secondary education positively influences young people's capacity to find employment and avoid job insecurity. This study contrasts previous others which have not yet revealed any effects of standardising input and output on experiencing qualification mismatches. Whereas the standardisation of output in educational systems decreases young people's job insecurity, the standardisation of input is associated with increased of their job insecurity. With regard to the structural characteristics of educational systems, it seems that educational expansion has a positive effect and decreases job insecurity: in countries that invest more money in education, the index levels of job insecurity are lower and the odds of young people working part-time jobs also decrease.

Keywords: institutional features of the educational system, structural features of the educational system, job insecurity, young people

Introduction

During the last decade young people have faced serious problems in their transition from school to work. Although the economic and financial crisis from 2008 has hit employment situation of workers of all ages, young people are still disproportionately affected by unemployment, lower incomes and uncertainty about future employment prospects (Eurofound 2014; European Intergenerational Fairness Index 2016). The young people's situation at the labour market echo Ulrich Beck's concerns (1992, 143–144) that in the modern risky society we live in *"a risk-fraught system of flexible, pluralized, decentralized underemployment*", in which "unemployment in the guise of various forms of

underemployment is 'integrated' into the employment system, but in exchange for a *generalization of employment insecurity* that was not known in the 'old' uniform system of industrial society". For instance, the growth in part-time and temporary jobs is seen as way of concealing the extent of unemployment and underemployment and hides the precarious and insecure situation people have at the labour market (Standing 2011).

In modern, knowledge-based societies, education has a crucial role in determining individuals' life trajectories, and this explains the vast amount of research on how the individuals' educational level affects their further educational choices and labour market outcomes (e.g., Jaeger 2007; Verhaest and Omey 2010; Kogan, Noelke, and Gebel 2011). Previous research has also stressed on the importance of educational systems' characteristics in understanding pathways for youth during their transition from school to work. Relying on the seminal work of Allmendinger (1989), authors have shown how cross-country differences in the school-to-work transition are systematically related to the way in which educational systems are organised (Kerckhoff 2001; Müller and Shavit 1998; Van der Velden and Wolbers 2003; Kogan Noelke, and Gebel 2011). Recently, we have witnessed the expansion of both secondary and higher education and increased participation in lifelong learning activities (Blossfeld et al. 2016). This is a significant structural change in the sphere of education throughout the world, shaping the context in which graduates of different educational levels are entering the labour market.

Despite this vast literature on the role of education (both in terms of individual levels of attainment and state educational system characteristics) in people's life trajectories and on the determinants of job insecurity, to the best of our knowledge, no study has yet tried to simultaneously capture the effects of both the individual-related and the systemic characteristics of education on the youth's experience of job insecurity during transition from school to work. Against this background, the main *research question* guiding the following

analysis is: *What is the role of education – understood as a specific attained individual outcome, as a national system and as a structural contextual factor – in creating differences across European countries with regard to how young people experience job insecurity during their transition from school to work?*

Conceptual considerations

Education and skills-formation systems in Europe are very diverse. Although there are many typologies that categorise countries into different regimes that to some extent refer to education (Blossfeld et al. 2016; Esping-Andersen 1990; Hall and Soskice 2001; Walther 2006), most of these typologies do not capture the main differences between educational systems in a comprehensive manner. Exceptions to this can be found in Allmendinger and Leibfried (2003) West and Nikolai (2013) and Atzmüller (2012) but so far, none of these studies have attempted to assess the linkages between a country's educational regime and young people's job insecurity. Given this, we will focus on two kinds of educational system features – the institutional and the structural – which influence job insecurity.

Institutional features of educational systems

There is a consensus within comparative stratification research that the three main dimensions on which educational systems can be classified cross-nationally are stratification, vocational orientation and standardisation, and that although these dimensions might be correlated, they refer to theoretically and empirically distinct institutions (Allmendinger 1989; Shavit and Müller 1998; Bol and Van de Werfhorst 2013a).

Stratification captures the level of differentiation of students with different levels of scholastic ability and achievements. The level of stratification within educational systems influences the school-to-work transitions because it allows for distinction of abilities among

graduates, based on their different school tracks, and thus informs employers about the individual capabilities of job applicants (Müller and Gangl 2003; Levels, van der Velden, and Di Stasio 2014).

Vocational orientation reflects the extent to which systems provide vocationally-specific skills, and is usually defined as the proportion of students in upper-secondary education who are enrolled in vocational tracks. Levels, van der Velden and Di Stasio (2014, 345) emphasise that vocational training is theoretically thought to give vocationally-educated graduates a higher probability of smoother transitions to work, because "vocational training teaches skills that are strongly in demand by employers" and "vocationally-trained students are more directly productive".

Standardisation refers to the level of nation-wide standardisation of regulations, funding, and examinations, i.e., the degree to which the quality of education meets the same standards nationwide (Allmendinger 1989). There are two forms of standardisation: a) of input, which captures "the extent to which schools can make autonomous decisions about what is being taught, how and by whom" and is a result of the existence of nationwide regulations on teacher training, school budgets, books and curricula; and b) of output, which reflects "the extent to which educational performance of pupils or students is tested against external standards, such as a national inspection institute or centralised exit examinations" (Levels, van der Velden and Di Stasio 2014, 345). The level of standardisation can influence the individual school-to-work transition, as provides employers with signals about the type and level of skills that students have acquired (Spence 1973).

Structural characteristics of the social context related to educational development

The last several decades have been marked by the *expansion of education* as a worldwide trend, especially at secondary levels and higher, which is expected to continue in the coming decades (Schofer and Meyer 2005). However, countries differ in the speed of this expansion,

creating different conditions in different countries, since the expansion of education is a structural feature of the context in which school-to-work transition occurs and on which it depends. Some studies show that educational expansion not only changes income returns to different educational levels, but also affects returns to fields of study (Reimer, Noelke, and Kucel 2008). There is a widespread fear that the expansion of higher education has led to qualifications inflation and, on a more global scale, to broken promises of education, jobs and incomes for many people with a university degree (Brown, Lauder, and Ashton 2011).

Another structural feature of the social context related to education is the *development of lifelong learning*. Data show large differences across countries with regard to participation in lifelong learning, and its meaning changes in different societies. As a result, lifelong learning does not have the same social and personal impact in more highly-developed, democratic societies as it does in more weakly-developed ones, although there may be differences engendered by the specific national institutional systems (Boyadjieva and Ilieva-Trichkova 2017).

Educational systems in different countries also differ considerably in their *expenditures on education* and the way funds are distributed among educational institutions and at varying levels of education. In some countries, education suffers from serious underfunding as well as ineffective mechanisms for allocating public funds, which influences both how educational institutions function and the quality of education they can offer. Given this, expenditures on education should be perceived as an important structural feature of the educational system.

Job insecurity

There are different approaches in the literature in defining job insecurity (De Witte and Näswall 2003; Karamessini et al. 2016). De Witte (2005) situates the concept between employment and unemployment and defines it as the perceived threat of job loss and the

worries related to that threat. Other authors prefer to use the term employment insecurity (eg. Chung and Van Oorschoot 2011; Dickerson and Green 2011). While job (in)security refers to a particular job or employment contract, employment (in)security is understood taking into account "the potential for secure and continuous employment, which might entail changing employers and/or jobs" (Chung and van Oorschot 2011, 289). Although authors differ in their definition of concrete dimensions of job insecurity, they all associate it with difficulties in transition from school to work, increased immenences for young people of losing their jobs and incomes and rising offers of precarious work (part-time jobs and temporary contracts, especially involuntary) (De Witte and Näswall 2003; Silla et al. 2009; Chung and van Oorschot 2011).

Another line of discussion regarding the conceptualisation of job security refers to the question whether it is a subjective or an objective phenomena. De Witte and Näswall (2003) highlight that the psychological research is in favour of the study of job insecurity as the employee's perception. However, Bussing (1999) critisises this and pleads for a clearer distinction between the job security as and objective and subjective phenomena. Acknowledging previous research, we use the following understanding of job insecurity: *it refers to increased threats (experienced both objectively and subjectively) for people of losing their jobs and incomes and of falling into situations of social and economic vulnerability*.

Methodology

Data and limitations

The empirical basis includes individual-level data from the 2009 Ad Hoc Module of the European Labour Force Survey (LFS), "Entry of young people into the labour market", the European Social Survey (ESS) R5 rotating module, "Work, Family and Wellbeing"

(2010/2011), and country-level data from official statistics (EUROSTAT and UNESCO) and Bol and Van de Werfhorst (2013a).

The LFS 2009 ad-hoc module provides important data on the entry of young people into the labour market. It was carried out in 31 countries (for more details see Eurostat 2012). The target population of the LFS 2009 ad-hoc module covered every person between the ages of 15 and 34, with three exceptions: Denmark, Iceland and Spain. In Spain and Iceland the target population was aged 16 to 34 years, whereas in Denmark the data for some 15-year-olds were missing due to differences in the definition of age. In terms of survey design, almost all countries used a multistage (two or three-stage) stratified random sampling scheme, as in the core LFS.

The ESS R5 rotating module, 'Work, Family and Wellbeing', was conducted in 2010/2011 and included a variety of core topics repeated from previous rounds of the survey. This module is especially relevant for the present study because of the survey's timing (precisely in the period of the 2008 crisis) and the subjective measure of job insecurity that it provides, which is missing in the more recent rounds. The target population included all persons aged 15 years and over residing in private households in 28 countries (See ESS Round 5: European Social Survey 2016).

We have had to adopt some limitations on the data used. In both surveys, we restricted the data to people aged 20-29 years, with ISCED 0–4. We also limited the number of countries to those for which we had sufficient information about all country-level variables of interest, deleting the missing values from the individual level variables in both datasets. Finally, we worked with 20 countries from the ESS and 24 countries from the LFS – these were countries for which we had sufficient data at country level for all features of the educational systems which we were interested in.

Variables

Here we present the variables we have used. Summary statistics of these variables are available on request.

Dependent Variables

Following our understanding of job insecurity, we have tried to take into account both its objective and subjective dimensions. Specifically, we have relied on existing objective measures of job insecurity, such as the *unemployment rate, the distinction between part-time and full-time employment and limited vs. permanent contracts* and have also included a subjective measure of job insecurity: *whether people assess their current job as insecure or not.*

Independent variables

As we have independent variables from educational systems at country level and at the individual level, we have added a dummy variable which differentiates people with average (ISCED 3–4) to low (ISCED 0–2) levels of education.

For most of the institutional characteristics of education systems, we have built on the work of Bol and Van de Werfhorst (2013a). From their list of indicators, we have selected the following country indicators:

- *Level of stratification:* measured by an index of tracking, which is constructed by performing a factor analysis on three country-level variables that aim to provide a comprehensive overview of tracking, while considering all the dimension's theoretical aspects (including the age of first selection, the length of the tracked curriculum, and

the number of distinct school types available tor 15-year-old students). A higher score on the index implies a higher level of stratification.

- *Level of vocational orientation:* we have chosen two variables. The first has been borrowed from Bol and Van de Werfhorst (2013a): the *prevalence of vocational enrolment*. It is measured by two indicators, following a principal factor analysis: vocational enrolment as a percentage of upper-secondary education, measured by different sources. The higher the value of the index, the more vocational education prevails over general at the upper-secondary level. Bol and Van de Werfhorst (2013a) also suggest that vocational education and training systems differ in the extent to which learning takes place in a school-based or workplace-based format. That is why rather than including the country level, we have selected the individual level as a second indicator for vocational orientation: *whether the education of the individual was mainly (or solely) vocational education in a school-based format, or vocational education that was also workplace-based, as opposed to general*. This was possible only in the case of the LFS.
- *Standardisation of input*: measures the extent to which schools were responsible for textbook use, course content and course offerings, and is constructed via a principal factor analysis of variables that capture these three dimensions. A higher score on the index implies a higher level of standardisation.
- *Standardisation of output*: a dummy variable. When a country conducts central examinations in secondary education, it scores a "one". In the case of Germany, though, the value is 0.44 because centralised exams are not mandatory in all federal states. In cases when the value is below 0.5, we have recoded it to 0.

For most of the structural features of education systems, we have relied on data from the official statistics at country level:

- *Expenditure on education*: government expenditure on education (ISCED 0–4) as a percentage of GDP (%) (Source: http://data.uis.unesco.org/ Extracted on: 22.6.2017). The data are from 2003, with the sole exception of Germany, where the earliest year for which these data are available is 2006.
- *Educational expansion:* population, aged 20-24 years, with upper secondary and post-secondary, non-tertiary education (levels 3 and 4) as of 2008 (%) (Source: Eurostat, Extracted on: 24.6.2017. Data code: edat_lfs_9903).
- *Participation in education and training*: measures the extent to which people participate in lifelong learning. It is included at the individual level. In the LFS, there is a variable regarding education or training either received or not received during the previous four weeks. In the ESS, however, the question is worded differently. QF70: *During the last twelve months, have you taken any course or attended any lecture or conference to improve your knowledge or skills for work?* This longer period allows us to test the influence of one specific form of lifelong learning on job insecurity – work-related learning – for a longer time period.

The last set of dummy variables refers to the countries' grouping (derived from Blossfeld et al. 2015) under the following welfare regimes: liberal, social-democratic, conservative, Mediterranean and post-Socialist. We have selected this distinction because it highlights the critical synergy of institutional settings – such as the structure of educational and vocational training systems, the labour market structure, employment protection legislation, gender culture, and welfare and family policies – which play an important role in labour market entry (ibid.). Thus, in the case of the 20 countries from the ESS, two countries fall under liberal regimes (Great Britain and Ireland); four are under a social-democratic one

(Denmark, Finland, the Netherlands, Norway and Sweden); five countries fall under conservative regimes (Belgium, France, Germany and Switzerland); three are under Mediterranean regimes (Greece, Portugal and Spain); and six fall under post-Socialist ones (Bulgaria, Hungary, the Czech Republic, Poland, Slovakia and Slovenia). In the case of the remaining countries out of the 24 in the LFS, Iceland is classified as a liberal regime, while Austria is conservative, Italy is Mediterranean and Latvia is post-Socialist.

We have calculated the bivariate Pearson correlations between each combination of these macro-level independent variables (available on a request). We have identified correlations between some of the variables, but none of these correlations are adequately explained through them. The correlation coefficients are not higher than 0.60, which means that there is no reason to doubt the results on the grounds of multicollinearity and we can include all these variables in the same model.

Analysis undertaken

To analyse both datasets, we have employed a multilevel modelling technique. The multilevel research design is useful for handling clustered data. It allows for simultaneous modelling of individual and cluster-level characteristics. More specifically, we have used information on both the individual level (level 1) and the country level (level 2). The country where people were interviewed served as the clustering variable. Given that our dependent variables are binary, we have used two-level random intercept logistic models.

For the analysis of each of the four dependent variables, we have estimated three models (Tables 1-4). Model 0 is our (unconditional) baseline model containing the intercept (constant) only. Model 1 includes all individual characteristics and institutional and structural features of the educational systems discussed above. In Model 2, we enter the welfare regimes. In Models 1 and 2, the effects are controlled for respondents' gender and their

parents' educational level. We have used the xtlogit command in Stata 14. Following Rabe-Hesketh and Skrondal (2012), we have interpreted the odds ratios conditionally on the random intercepts of the models. Lastly, we have examined the amount of country-level variance, which the models explain once the variables of interest have been included. The individual level variance in two-level random intercept models is constant across all models. It is $\pi 2/3$ by design, which is about 3.29.

Results

Table 1 presents the results of two-level random-intercept logistic regression models analysing the likelihood of *being unemployed vs. employed*. The baseline model for the unemployment (Model 0) results in an unconditional intraclass correlation (ICC) of 0.074. This shows that about 7.4% of variation in the likelihood of being unemployed is due to differences between the countries where young people live. In Model 1, individual characteristics as well as institutional and structural features of educational systems are added. The conditional odds ratios of being unemployed are 7.9% higher for females than for males. The odds ratios of being unemployed are about 42% lower for people with medium education than for those with a low level of education. Attainment of vocational education decreases the odds by 5.7% for young people to be unemployed. Participation in lifelong learning during the previous four weeks also decreases their odds of being unemployed (by 10.3%). Among the country-level features, the higher the vocational prevalence in a given country, the lower the chances are that young people will experience unemployment.

In Model 2, we have added the regime type of the country. Despite this, our estimates for the characteristics at the individual level are consistent with those from Model 1. At the same time, we can observe some differences with regard to country-level educational features. Thus, similarly to the prevalence of vocational education, the degree of stratification and

standardisation of output decrease the likelihood of young people to be unemployed. Estimates for Model 2 also show that the odds of being unemployed for young people living in a country under a social-democratic regime are 44.4% lower than for young people in a liberal-type country.

[**Table 1.** Results of two-level random intercept logistic regression models concerning whether a person is unemployed vs. employed, near here]

If we examine the decrease in the level 2 variance due to the variables' inclusion in the models, we see that the country-level variance for Model 1 decreases by 44.38%, and by 63.55% in Model 2. This suggests that both models have the power to explain a considerable amount of country-level differences in unemployment.

Table 2 presents the results of two-level random-intercept logistic regression models analysing the likelihood of *working a temporary job/on a limited-duration contract vs. working a permanent job/ on an unlimited contract*. The baseline model (Model 0) results in an unconditional ICC of 0.171, i.e. about 17.1% of variation in the likelihood of working at a temporary job is due to differences between the countries where young people live. In Model 1, we add individual characteristics and institutional and structural features of the educational systems. The conditional odds ratios of working at a temporary job are 20.6% greater for females than for males and 19% higher for people with at least one parent who completed higher education. The odds ratios of working at a temporary job are 14.5% lower for people with medium education than for those with a lower level of education. Attainment of vocational education decreases the odds of working at a temporary job for those educated either mainly in classroom settings or in combined workplace/classroom settings respectively by 16.6% and 26.3%.

[Table 2. Results of two-level random intercept logistic regression models concerning whether a person has temporary job/work on a limited-duration contract vs. has a permanent job/ work on an unlimited contract]

Participating in lifelong education and training during the previous four weeks, however, increases the odds that young people will work at a temporary job by 2.68 times. Among the country-level features, our estimates show no statistically-significant differences. Once we add the regime type of the country, the estimates show that the odds of working at a temporary job in a Mediterranean country are 6.2 times greater than they are for young people in a liberal-type country.

Finally, if we examine the decrease in the level 2 variance due to the inclusion of the variables in the models, we can see that for Model 1, the country-level variance decreases by 8.34% and 39.58%. This suggests that the included variables at country level only partly explain differences regarding the likelihood of young people to hold temporary jobs/ limited-duration contracts vs. permanent jobs/unlimited contracts because of variations across borders.

Table 3 presents the results of two random-intercept logistic regression models analysing the likelihood of *having a part-time job vs. a full-time job*. The baseline model (Model 0) results in an unconditional ICC of 0.207, i.e. about 20.7% of variation in the likelihood of working at a part-time job is due to differences between the countries in which young people live. In Model 1, we add individual characteristics and institutional and structural features of the educational systems. The conditional odds ratios of working part-time are 3.67 times greater for females than for males and 1.43 times higher for people with at least one parent with higher education than for those without a parent with higher education. The odds ratios of working part-time are about 36% higher for people with medium level of

education than they are for people with a lower level of education. Attaining vocational education decreases the odds of working at a temporary job for those educated mainly in classroom settings and for those educated in combined workplace and classroom settings by 39% and 47%, respectively. Participating in education and training during the previous four weeks, however, increases young people's odds of working at a part-time job 3.33 times. Estimates for Model 1 reveal that as the vocational prevalence increases by one standard deviation, the odds of working at a part-time job increase by 69.8%. At the same time, as educational expansion increases by one percent at the country level, the odds that young people will work part-time decrease by 2.6%.

[**Table 3.** Results for two-level random intercept logistic regression models concerning whether a person has a part-time job vs. a full-time job, near here]

Once we add the regime type of the country, we observe that these effects disappearing completely. Estimates for Model 2 also show that the odds of working part-time for young people in a post-Socialist country are 68.1% lower than for young people in a liberal-type country.

Finally, if we examine the decrease in the level 2 variance due to the inclusion of the variables in the models, we see that for Model 1, the country-level variance decreases by 56.30% and 80.56%. This suggests that the included variables at country level can explain a considerable part of these variations in the likelihood of young people having a part-time job vs. a full-time job through cross-country differences.

Table 4 presents the results of two-level random-intercept logistic regression models analysing the likelihood of *subjective feelings of job insecurity*. The baseline model (Model 0) results in an unconditional ICC of 0.171, showing that about 17.1% of the variation in the likelihood of assessing one's job as insecure is due to differences between the countries in

which young people live. In Model 1, we add individual characteristics as well as institutional and structural features of the educational systems. Estimates show that conditional odds ratios of subjective feelings of job insecurity are 42% lower for young people who have taken a course or have attended a lecture or conference to improve their knowledge or work skills. Model 1 reveals that as the vocational prevalence increases by one standard deviation, the odds of assessing one's job as insecure decrease by 43%. At the same time, expenditures on education have a positive influence on subjective perceptions of job security. The higher expenditures on education are, the lower the odds are that young people will perceive their jobs as insecure.

Once we add the regime type of the country, the effect of expenditure on education disappears; however, Model 2's estimates show that the effect of the vocational prevalence remains significant and decreases odds of young people perceiving their jobs as insecure. Additionally, the odds for young people in Mediterranean countries to assess their jobs as insecure are 2.23 times greater than the odds for young people in a liberal-type country. At the same time, the odds ratios of perceiving one's job as unsecure are also more than 2 times higher for young people from the post-Socialist type countries than they are for young people from liberal countries, but this effect is not statistically significant.

[**Table 4.** Results for two-level random intercept logistic regression models concerning subjective feelings of job insecurity, near hear]

Lastly, examining the decrease in the level 2 variance due to the inclusion of the variables in the models shows us that for Model 1, the country-level variance decreases by 65.82% and 89.43%. This suggests that the included variables at country level explain a considerable part of the variations in how likely young people are to express subjective feelings about job insecurity as a result of differences between countries.

The results have shown that the variety of institutional and structural features of educational systems can have a widespread influence, once various dimensions of job insecurity (both objective and subjective) are taken into account. This makes it harder to assess its overall effect. In order to address this issue, and to acknowledge the complexity of job insecurity, we have examined the relationship between the institutional and structural features of educational systems, as well as a more complex measure of job insecurity: the *early job insecurity index*. The latter was developed by Symeonaki, Stamatopoulou and Karamessini (2017) and combines a number of objective indicators which claim to capture the whole spectrum of early job insecurity. This index ranges from –1 to + 1, where the lower the value, the lower the early job insecurity, and vice versa; the values were current for 2013. We have examined this relationship at country level for all 19 countries on which data were available.

We have found that there is a strong negative correlation (Pearson's $r = -0.683$, $p < 0.001$) between early job insecurity and participation rate in lifelong education and training (over the previous 4 weeks) for people aged 20-29 years as of 2008 (Eurostat, data code: trng_lfs_09, extracted on 03.07.2017), suggesting that the higher the participation rate in education, the lower the rate of early job insecurity. There is a negative correlation (Pearson's $r = -0.516$ at $p < 0.05$) between early job insecurity and the prevalence of vocational

education (measured with the index of vocational enrolment, 2004, 2006 (Bol and Werfhorst (2013a), i.e. in countries with higher enrolment in vocational education, early job insecurity is lower. We have also found a negative correlation (Pearson's $r = -0.513$, $p < 0.05$) between early job insecurity and government expenditure on education (ISCED 0–4) as a percentage of GDP (%), 2003 (Source: http://data.uis.unesco.org/ Extracted on: 22.6.2017). This suggests that in countries that invest more money in education, the levels of early job insecurity are lower. Most likely, this has to do with the better quality of education provided in these countries. Finally, there is a positive correlation (Pearson's $r = 0.403$, $p < 0.10$) between early job insecurity and the standardisation of input as of 2006 (Bol and Werfhorst 2013a), which indicates that standardisation of input is associated with higher levels of early job insecurity at country level.

Discussion of the results

In the present article we have focused on the influence of both the individual-related and the systemic characteristics of education on the young people's experience of job insecurity.

Our results are in line with the main findings of a recent comparative study (Karamessini et al. 2016) which shows that the socio-demographic variables (level of education, parental education, and gender) influencing the chances of being unemployed are consistent across the countries studied, and that individual levels of education are a strong predictor of employability. We go further by taking into account the specificity of the individual's acquired level of education. Our results clearly demonstrate that the vocational specificity of secondary education (vocational school-based and vocational workplace-based) positively influences young individuals' capacity to find employment and avoid job insecurity.

We also try to explain differences in job insecurity at country level by considering the characteristics of the educational systems (both institutional and structural). Our results prove consistent with previous research that has pointed out the positive effect of the vocational orientation of educational and training systems, as well as their specificity, in facilitating labour market integration after leaving school (e.g., Barbieri, Cutuli, and Passaretta 2016; Bol and Werfhorst 2013b; Wolbers 2007). Further studies are needed to explain our finding that vocational prevalence has a positive influence on working part-time.

In contrast to previous studies, which have not yet revealed any effect of the standardisation of input and output on experiencing qualification mismatches (e.g., Levels, van der Velden and Di Stasio 2014), we have found that whereas the standardisation of output in educational systems does decrease early job insecurity (when insecurity is measured by the objective indicator of being unemployed), the standardisation of input is associated with increases in early job insecurity. Our findings demonstrate that standardising educational input and output should be regarded separately, as they have different effects. Namely, standardising output has a strong signalling effect on employers, a possible explanation for its positive influence on decreasing unemployment; however, standardising input could potentially limit the individualisation of the educational process – which in the rapidly changing contemporary labour market may reduce young people's adaptability and flexibility, thus increasing their job insecurity.

As regards the structural characteristics of educational systems, it seems that educational expansion has a positive effect on early job insecurity: in countries that make higher investments in education, the levels of early job insecurity index are lower and the odds of young people working part-time jobs decrease. At the same time, expenditures on education decrease the odds of young people perceiving their jobs as insecure. However, the fact that no significant influence of education expenditures on some of the objective measures

of early job insecurity (at an individual level) have been found suggests that what matters is not only the amount of money spent on education, but also where it is spent and how.

Our findings also point to the importance of continuing education and lifelong learning in overcoming job insecurity among young people, which is in line with a recent study by Ayllon and Nollenberg (2016) which shows that the young Europeans, especially (the unskilled) are more likely to enrol in education programs in response of poor labour market conditions. Previous studies have also highlighted that patterns of participation in lifelong learning are more likely to reinforce, rather than mitigate, existing educational inequalities, as people with a higher-level education are more likely to participate in these than their less-educated peers (Boyadjieva and Ilieva-Trichkova 2017). Further analyses are needed to reveal whether the lifelong learning activities of people with different levels of initial education have similar or different effects on individuals' job prospects.

At the level of countries' welfare regimes, our findings suggest that social-democratic welfare states adopt more effective policies for decreasing youth unemployment than liberal states do. As far as other measures of early job insecurity are concerned, the effect of a country's welfare regime is more complicated, and further studies are needed to convincingly explain the results obtained. In all models, except the models for contact permanency, the ICC falls below 0.05, which means that the included independent variables largely explain the differences in outcomes across countries. However, we should emphasise that the characteristics of educational systems (both institutional and structural) alone, or even in combination with the welfare regime as a factor, cannot fully explain young people's job insecurity in the studied countries. This finding is in line with a previous study which explored how national institutional factors, such as the level of skill transparency in the education system and labour market coordination, account for cross-national differences in the relationship between education and occupational status in 14 European countries. It also

suggests that other (individual-level or country-level) factors not included in previous models are also important in predicting occupational status and should be explored further (Andersen and van de Werfhorst 2010). Obviously, although very important, education is not a panacea, and it cannot solve structural problems in other spheres of life, such as the economy or the labour market – especially when the emphasis is only on its instrumental value. This allows us to argue, furthermore, that other aspects and roles of education, for example, its transformative and intrinsic role, should also be taken into account (Boyadjieva and Ilieva-Trichkova 2018).

The results suggest that the institutional features of educational systems at secondary level mainly influence the productive capabilities and skills of people, which is in line with human capital theory. Nevertheless, such features still have a much lower impact on the negotiating power of young people, i.e., on their capacity to find more stable jobs, either under permanent contract and/or full-time. In other words, in the context of the crisis, the institutional features of educational systems exert a weak influence on the opportunity structure of jobs (in terms of negotiating better employment conditions) and on the capabilities of young people who have completed up to a postsecondary, but not tertiary, education to choose secure jobs.

In general, our results reveal that although the countries' educational systems and young people's employability are embedded in the national institutional contexts (types of capitalism and welfare regimes), the educational characteristics at individual and macro levels have a significant and independent influence on young people's job insecurity during their transition from school to work.

Conclusions

The article pays a special attention to the incidence of job insecurity in the early careers of young Europeans, especially relevant in the context of the severe economic crisis which hit Europe in 2008. Our analysis has shown that a considerable amount of variations across countries in terms of youth job insecurity can be attributed to institutional and structural differences in the educational systems, though these did differ according to the various indicators. Secondly, while most previous studies have relied on either objective (e.g., Symeonaki, Stamatopoulou, and Karamessini 2017) or subjective (Chung and van Oorschot 2011; Ištoňová and Fedáková 2015) measures of job insecurity, we have tried to acknowledge both types of indicators. Third, we have contributed to the literature currently attempting to bridge the role of educational institutions, educational outcomes, and welfare regimes (e.g., Allmendinger and Leibfried 2003; West and Nikolai 2013).

Our analyses and results have outlined some possible routes worth pursuing in future research. First, there is a need to capture the complexity of job insecurity by taking into account its objective and subjective aspects, along with the factors at micro, meso and macro levels which influence on it. Second, we have to think of additional variables to add at the country level which could explain the differences in the various measures of job insecurity between the countries. This is especially necessary in the case of the likelihood of young people to hold temporary jobs/ limited-duration contracts vs. permanent jobs/unlimited contracts. Third, future research should consider the divergences between post-Socialist countries. Different authors have convincingly argued that they do not comprise a homogenous group, but rather are heterogeneous in numerous ways (Bohle and Greskovits 2012; Saar and Ure 2013).

The analyses presented in the article could be of interest from a policy point of view as well. They clearly demonstrate that policy reforms should be discussed in taking into account all different institutional, structural and contextual characteristics of education in a given country, as each of them has a specific influence on young people's life trajectories.

Acknowledgements

We would like to thank the anonymous reviewer for his/her valuable comments on an earlier version of this article. This article uses data from the ESS Round 5: European Social Survey Round 5 Data (2010). Data file edition 3.3. NSD - Norwegian Centre for Research Data, Norway – Data Archive and distributor of ESS data for ESS ERIC and Eurostat, Labour Force Survey, 2009, obtained for the needs of Research Project Proposal 124/2016-LFS-AES-CVTS-CSIS. The responsibility for all conclusions drawn from the data lies entirely with the authors.

Funding

This research was undertaken within the ENLIVEN project and received funding from the European Union (EU), Horizon 2020 research and innovation programme under grant agreement No. 693989, the project "Current State and the Opportunities to Optimize Information Flows in the Russian Education System" funded by Russian National Fund under grant agreement No. 18-18-00047 and within the Programme for support of young researchers and doctoral students in Bulgarian Academy of Sciences – 2017 under grant agreement No. 17-173 / 03.08.2017.

References

Allmendinger, J. 1989. "Educational Systems and Labour Market Outcomes." *Educational Sociological Review* 5 (3): 231–250.

Allmendinger, J., and S. Leibfried. 2003. "Education and the Welfare State: the Four Worlds of Competence Production." *Journal of European Social Policy* 13 (1): 63–81.

Andersen R., and H.G. Van de Werfhorst. 2010. "Education and Occupational Status in 14 Countries: The Role of Educational Institutions and Labour Market Coordination". *British Journal of Sociology* 61 (2): 336–355.

Atzmüller, R. 2012. "Dynamics of Educational Regimes and Capability-Oriented Research." *Social Work & Society* 10 (1): 1–15.

Ayllon, S., and N. Nollenberger. 2016. *Are Recessions Good for Human Capital Accumulation?* NEGOTIATE working paper no. 5.1. Accessed January 14, 2018. https://negotiate-research.eu/files/2015/04/NEGOTIATE-working-paper-no-D5.1.pdf

Barbieri, P., G. Cutuli, and G. Passaretta. 2016. "Institutions and the School-to-Work Transition: Disentangling the Role of the Macro-Institutional Context." *Socio-Economic Review* 1–23.

Blossfeld, H.-P., S. Buchholz, J. Dämmrich, E. Kilpi-Jakonen, Y. Kosyakova, and J. Skopek. 2015. "Gender Differences at Labour Market Entry: The Effect of Changing Educational Pathways and Institutional Structures." In *Gender, Education and Employment*, edited by H.-P. Blossfeld, J. Skopek, M. Triventi, and S. Buchholz, 3–38. Cheltenham: Edward Elgar Publishing.

Beck, U. 1992. *Risk Society: Towards a New Modernity*. London: Sage.

Blossfeld, H.-P., S. Buchholz, J. Skopek, and M. Triventi. (Eds.) 2016. *Models of Secondary Education and Social Inequality. An International Comparison*. Cheltenham: Edward Elgar Publishing.

Bohle, D., and B. Greskovits. 2012. *Capitalist Diversity on Europe's Periphery*, Ithaca: Cornell University Press.

Bol, T., and H. Van de Werfhorst. 2013a. The Measurement of Tracking, Vocational Orientation, and Standardization of Educational Systems: A Comparative Approach. AIAS, *GINI Discussion Paper* 81.

Bol, T., and H. Van de Werfhorst. 2013b. "Education Systems and the Trade-off Between Labor Market Allocation and Equality of Educational Opportunity." *Comparative Education Review* 57 (2): 285–308.

Boyadjieva, P., and P. Ilieva-Trichkova. 2018. "Lifelong Learning as an Emancipation Process: A Capability Approach" In *The Palgrave International Handbook on Adult and Lifelong Education and Learning*, edited by M. Milana, S. Webb, J. Holford, R. Waller and P. Jarvis, 267–288. London: Palgrave MacMillan.

Boyadjieva, P., and P. Ilieva-Trichkova. 2017. "Between Inclusion and Fairness Social Justice Perspective to Participation in Adult Education." *Adult Education Quarterly* 67 (2): 97–117.

Breen, R. 2005. "Explaining Cross-national Variation in Youth Unemployment: Market and Industrial Factors." *European Sociological Review* 21 (2): 125–134.

Brown, Ph., H. Lauder, and D. Ashton. 2011. *The Global Auction. The Broken Promises of Education, Jobs and Incomes.* Oxford: University press.

Buchmann, M., C., and I. Kriesi. 2011. "Transition to Adulthood in Europe." *Annual Review of Sociology* 37: 481–503.

Bukodi, E., E. Ebralidze, P. Schmelzer, and H-P. Blossfeld. 2008. "Struggling to Become an Insider. Does Increasing Flexibility at Labor Market Entry Affect Early Careers? An Introduction." In *Young Workers, Globalization and the Labor Market: Comparing Early Working Life in Eleven Countries*, edited by H-P. Blossfeld, S. Buchholz, E.

Bukiodi, and K. Kurz, 3–28. Cheltenham, UK and Northampton, MA, USA: Edward Elgar.

Bussing, A. 1999. “Can Control at Work and Social Support Moderate Psychological Consequences of Job Insecurity? Results from a Quasi-experimental Study in the Steel Industry.” *European Journal of Work and Organizational Psychology*, 8(2): 219–242.

Chung, H., and W.van Oorschot. 2011. “Institutions versus market forces: Explaining the employment insecurity of European individuals during (the beginning of) the financial crisis.” *Journal of European Social Policy*, 21 (4): 287–301.

De Witte, H. 2005. “Job Insecurity: Review of the International Literature on Definitions, Prevalence, Antedecents and Consequences.” *SA Journal of Industrial Psychology* 31 (4): 1–6.

De Witte, H., and K. Näswall. 2003. “Objective vs. Subjective Job Insecurity: Consequences of Temporary Work for Job Satisfaction and Organisational Commitment in Four European Countries.” *Economic and Industrial Democracy* 24 (2): 149–188.

Dickerson, A., and F. Green. 2012. “Fears and Realisations of Employment Insecurity.” *Labour Economics* 19 (2): 198–210.

Esping-Andersen, G. 1990. *The Three Worlds of Welfare Capitalism*. Cambridge: Policy Press.

ESS Round 5: European Social Survey 2016. ESS-5 2010 Documentation Report. Edition 4.1. Bergen, European Social Survey Data Archive, NSD - Norwegian Centre for Research Data for ESS ERIC.

Eurofound 2014. *Mapping Youth Transitions in Europe*. Publications Office of the European Union, Luxembourg.

European Intergenerational Fairness Index: A Crisis for the Young. 2016. London: Intergenerational Foundation.

Eurostat 2012. LFS Ad Hoc Module 2009. Entry of young people into the labour market. Luxembourg. Accessed January 14, 2018.

Hall, P. A., and S. Soskice. 2001. An Introduction to Varieties of Capitalism. In *Varieties of Capitalism. The Institutional Foundations of Comparative Advantage*, edited by P. A. Hall, and D. Soskice, 1–68. Oxford: Oxford University Press.

Ištoňová, L., and D. Fedáková. 2015. "Predictors and Consequences of Job Insecurity: Comparison of Slovakia and Estonia." *Studies of Transition States and Societies* 7 (3): 21-37.

Jaeger, M. M. 2007. "Economic and Social Returns to Educational Choices: Extending the Utility Function." *Rationality and Society* 19 (4): 451–483.

Kerckhoff, A. C. 2001. "Education and Social Stratification Processes in Comparative Perspective." *Sociology of Education* 74: 3–18.

Kogan, I., C. Noelke, and M. Gebel. (Eds.) 2011. *Making the Transition: Education and Labour Market Entry in Central and Eastern Europe*. California: Stanford University Press.

Karamessini, M., M. Symeonaki, G. Stamatopoulou, and A. Papazachariou. 2016. *The Careers of Young People in Europe during the Economic Crisis: Identifying Risk Factors* Accessed January 14, 2018. https://negotiate-research.eu/files/2015/04/NEGOTIATE-working-paper-no-D3.2-The-careers-of-young-people-in-Eurpa-during-the-economic-crisis.pdf

Levels, M., R. van der Velden, and V. Di Stasio. 2014. "From School to Fitting work: How Education-to-job Matching of European School Leavers is Related to Educational System Characteristics." *Acta Sociologica* 57 (4): 341–361.

Müller W., and M. Gangl. (Eds.) 2003. *Transitions from Education to Work in Europe: The Integration of Youth into EU Labor Markets*. Oxford: Oxford University Press.

Müller, W., and Y. Shavit. 1998. “The Institutional Embeddedness of the Stratification Process.” In *From School to Work: A Comparative Study of Educational Qualifications and Occupational Destinations*, edited by Y. Shavit and W. Müller, 1–48. Oxford: Clarendon Press.

Rabe-Hesketh, S., and A. Skrondal. 2012. *Multilevel and Longitudinal Modeling Using Stata* (3rd ed.). College Station, TX: Stata Press.

Reimer, D., C. Noelke, and A. Kucel. 2008. “Labor Market Effects of Field of Study in Comparative Perspective: An Analysis of 22 European Countries.” *International Journal of Comparative Sociology* 49(4/5): 233–56.

Saar, E., and O.B. Ure. 2013. “Lifelong Learning Systems: Overview and Extension of Different Typologies” In *Building European Lifelong Learning Society: The Enduring Role of National Characteristics*, edited by E. Saar, O.B. Ure, and J. Holford, 46–81. London: Edward Elgar Publishing Ltd.

Schofer, E., and J. W. Meyer. 2005. “The Worldwide Expansion of Higher Education in the Twentieth Century.” *American Sociological Review* 70 (6): 898–920.

Shavit, Y., and W. Müller. (Eds.) 1998. *From School to Work: A Comparative Study of Educational Qualifications and Occupational Destinations.* Oxford: Clarendon Press.

Shavit, Y., and W. Müller. 2000. “Vocational Education: When Diversion and When Safety Net?” *European Societies* 2 (1): 29–50.

Silla, I., N. Cuyper, F.Gracia, R. Peiró, and H. De Witte. 2009. „Job Insecurity and Well-Being: Moderation by Employability.” *Journal of Happiness Studies* 10 (6): 739–51.

Spence, M. 1973. “Job Market Signaling.” *The Quarterly Journal of Economics* 87 (3): 355–374.

Standing, G. 2011. *The Precariat: The New Dangerous Class*. London and New York: Bloomsbury.

Symeonaki, M., G. Stamatopoulou, and M. Karamessini. 2017. *On the Measurement of Early Job Insecurity in Europe*. ASMDA, London, 6-9, June, 2017. Accessed January 14, 2018. https://negotiate-research.eu/files/2017/06/On-the-measurement-of-early-job-insecurity.pdf

Van der Velden, R., and M. Wolbers. 2003. "The Integration of Young People into the Labor Market: The Role of Training Systems and Labor Market Regulation." In *Transition from Education to Work in Europe: The Integration of Youth into EU Labor Market*s. W. Muller, and M. Gangl, 186–211. Oxford: Oxford University Press.

Verhaest, D., and E. Omey. 2010. "The Determinants of Overeducation: Different Measures, Different Outcomes?" *International Journal of Manpower* 31: 608–625.

Walther, A. 2006. "Regimes of Youth Transitions. Choice, Flexibility and Security in Young People's Experiences Across Different European Contexts." *Young* 14 (1): 119–141.

West, A., and R. Nikolai. 2013. "Welfare Regimes and Education Regimes: Equality of Opportunity and Expenditure in the EU (and US)." *Journal of Social Policy* 42 (3): 469–493.

Wolbers, M. H. J. 2007. "Patterns of Labour Market Entry: A Comparative Perspective on School-to-Work Transitions in 11 European countries." *Acta Sociologica* 50 (3): 189–210.

Table 1. Results of two-level random intercept logistic regression models concerning whether a person is unemployed vs. employed

Fixed parameters	Model 0 e(b)	Model 1 e(b)	Model 2 e(b)
Gender: Ref. Male			
Female		1.079**	1.079**
Parents' educational level: Ref. None of the parents with a tertiary degree			
At least one of the parents with a tertiary degree		0.984	0.987
Educational level: Ref. Low education			
Medium		0.579**	0.579**
Vocational orientation: Ref. General			
School-VET		0.962	0.964
Work-VET		0.943+	0.943+
Participation in education and training (4 weeks): Ref. No			
Yes		0.897**	0.898**
Country-level features			
Stratification		0.947	0.830+
Vocational prevalence		0.568**	0.683**
Standardisation of input		0.944	0.890
Standardisation of output		0.768	0.710+
Expenditure on education		0.925	0.994
Educational expansion		1.013	1.007
Regimes, Ref. Liberal			
Social-democratic			0.556*
Conservative			0.837
Mediterranean			0.915
Post-Socialist			1.269
Constant	0.163**	0.243*	0.276+
Random parameters			
Intercept	0.513**	0.383**	0.310**
Country-level variance	0.263**	0.146**	0.096**
Explained variance at level 2		44.38%	63.55%
Intraclass correlation	0.074	0.043	0.028
Log likelihood	-27369.1	-27127.1	-27122.2

Source: LFS (2009), own calculations.

Note: e(b) = Exponentiated coefficients; N (individual level) = 66542; N (country level) = 24.

Significance: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 2. Results of two-level random intercept logistic regression models concerning whether a person has temporary job/work on a limited-duration contract vs. has a permanent job/ work on an unlimited contract

Fixed parameters	Model 0 e(b)	Model 1 e(b)	Model 2 e(b)
Gender: Ref. Male			
Female		1.206**	1.206**
Parents' educational level: Ref. None of the parents with a tertiary degree			
At least one of the parents with a tertiary degree		1.190**	1.191**
Educational level: Ref. Low education			
Medium		0.855**	0.856**
Vocational orientation: Ref. General			
School-VET		0.834**	0.834**
Work-VET		0.737**	0.737**
Participation in education and training (4 weeks): Ref. No			
Yes		2.681**	2.682**
Country-level features			
Stratification		1.175	1.199
Vocational prevalence		0.732	0.728
Standardisation of input		0.821	0.769
Standardisation of output		0.955	1.315
Expenditure on education		1.043	1.214
Educational expansion		0.998	1.012
Regimes, Ref. Liberal			
Social democratic			2.266
Conservative			2.625
Mediterranean			6.198**
Post-Socialist			1.725
Constant	0.266**	0.269	0.019**
Random parameters			
Intercept	0.822	0.787	0.639**
Country-level variance	0.676	0.620	0.409**
Explained variance at level 2		8.34%	39.58%
Intraclass correlation	0.171	0.159	0.110
Log likelihood	-26800.4	-25718.3	-25713.4

Source: LFS (2009) own calculations.

Note: e(b) = Exponentiated coefficients; N (individual level) = 51266; N (country level) = 24.

Significance: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 3. Results for two-level random intercept logistic regression models concerning whether a person has a part-time job vs. a full-time job.

Fixed parameters	Model 0 e(b)	Model 1 e(b)	Model 2 e(b)
Gender: Ref. Male			
Female		3.667**	3.666**
Parents' educational level: Ref. None of the parents with a tertiary degree			
At least one of the parents with a tertiary degree		1.433**	1.431**
Educational level: Ref. Low education			
Medium		1.361**	1.363**
Vocational orientation: Ref. General			
School-VET		0.608**	0.608**
Work-VET		0.531**	0.531**
Participation in education and training (4 weeks): Ref. No			
Yes		3.331**	3.331**
Country-level features			
Stratification		0.874	1.119
Vocational prevalence		1.698*	1.201
Standardisation of input		0.844	0.992
Standardisation of output		0.994	1.219
Expenditure on education		1.327	1.168
Educational expansion		0.974*	0.992
Regimes, Ref. Liberal			
Social democratic			1.720
Conservative			1.051
Mediterranean			0.744
Post-Socialist			0.319**
Constant	0.196**	0.095*	0.062**
Random parameters			
Intercept	0.928	0.613**	0.409**
Country-level variance	0.860	0.376**	0.167**
Explained variance at level 2		56.30%	80.56%
Intraclass correlation	0.207	0.103	0.048
Log likelihood	-25858.3	-22385.3	-22375.6

Source: LFS (2009) own calculations.

Note: e(b) = Exponentiated coefficients; N (individual level) = 56405; N (country level) = 24.

Significance: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 4. Results for two-level random intercept logistic regression models concerning subjective feelings of job insecurity.

Fixed parameters	Model 0 e(b)	Model 1 e(b)	Model 2 e(b)
Gender: Ref. Male			
Female		1.130	1.138
Parents' educational level: Ref. None of the parents with a tertiary degree			
At least one of the parents with a tertiary degree		0.809	0.822
Educational level: Ref. Low education			
Medium		0.924	0.956
Participation in work related training (12 months): Ref. No			
Yes		0.582**	0.580**
Country-level features			
Stratification		1.162	1.120
Vocational prevalence		0.570*	0.714+
Standardisation of input		1.245	1.107
Standardisation of output		0.888	0.846
Expenditure on education		0.711+	0.786
Educational expansion		1.003	0.993
Regimes, Ref. Liberal			
Social democratic			1.097
Conservative			0.797
Mediterranean			2.234+
Post-socialist			2.241
Constant	0.744	4.534	3.772
Random parameters			
Intercept	0.824	0.482**	0.268**
Country-level variance	0.679	0.232**	0.072**
Explained variance at level 2		65.82%	89.43%
Intraclass correlation	0.171	0.066	0.021
Log likelihood	-919.8	-900.8	-894.58

Source: ESS (2010/2011), own calculations.

Note: e(b) = Exponentiated coefficients; N (individual level) = 1450; N (country level) = 20.

Significance: $^{+}p < 0.10$, * $p < 0.05$, ** $p < 0.01$.