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Education and occupational status in 14 countries: the role of educational institutions and labour market coordination[1]

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Abstract

This article explores the role of national institutional factors – more specifically, the level of skill transparency of the education system and labour market coordination – in accounting for cross-national differences in the relationship between education and occupational status. Consistent with previous research, our findings suggest that skill transparency is the primary moderator. Countries with a highly transparent educational system (i.e., extensive tracking, strong vocational orientation, limited tertiary enrolment) tend to be characterized by a strong relationship between education and occupational status. These findings hold even after controlling for the level of labour market coordination. Nevertheless, we also find that labour market coordination plays an independent role by dampening the effect of education on occupational status. Taken together, these results suggest two quite different policy implications: (1) strengthening the skill transparency of the education system by increasing secondary and tertiary-level differentiation may strengthen the relationship between education and occupation, regardless of the level of coordination, and (2) increasing labour market coordination could lead to improved social inclusion and a reduction in inequalities related to educational attainment.

Keywords: Education; occupational status; educational institutions; labour market coordination; comparative

Introduction

It is well-established that there is substantial cross-national variation in the impact of education on labour market outcomes. It is also widely accepted that this variation largely reflects differences in educational systems, especially with respect to the level of institutionalized vocational specificity (e.g. Shavit and Müller 1998; Brauns, Steinmann, Keiffer and Marry 1999; Korpi et al. 2003;

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Breen 2005). Stronger education effects on work outcomes – measured by occupational status, occupational prestige, or social class – are consistently found in countries with substantial vocational components to their education systems (e.g., Germany, the Netherlands and Switzerland) than in countries with limited vocational components (e.g., the USA and UK). Nevertheless, research on the impact of education systems – as measured by the size of the vocational sector, percentage in dual work/education training programmes, percentage in tertiary education, or the level of standardization of educational programmes – typically ignores the impact of labour market characteristics. Although labour market coordination is usually examined from the perspective of wage bargaining and unemployment, it is also highly relevant for the role of schooling in the labour market (see, for example, Culpepper and Finegold 1999; Estevez-Abe, Iversen and Soskice 2001). Moreover, research in this area almost exclusively explores Western European countries only, so little is known about whether these findings persist if countries from Central and Eastern Europe (CEE countries) are also considered. In other words, the moderating role of education systems on the relationship between individual-level education and occupational outcomes could be subjected to closer scrutiny.

The present paper combines individual-level survey data from the *European Social Survey* with national-level contextual variables to explore the impact of education on occupational status in 14 European countries. Guided by the standard approach in the area, we begin by exploring the role of education systems. We concentrate specifically on the level of skill transparency caused by differentiation due to tracking, the amount of vocational orientation, and the level of tertiary enrolment. We then extend research in the area by drawing on the varieties of capitalism literature (see, for example, Estevez-Abe, Iversen and Soskice 2001; Hall and Soskice 2001; Hall and Gingerich 2004; Huber and Stephens 2001; Pontusson 2005; Mares 2001) to assess if cross-national differences in the match between education and occupation also reflect the level of coordination of employment relations between employers and employees (Soskice 1994; Kenworthy 2002; Traxler and Kittel 2000). Just as important, we also seek to determine whether accounting for the level of coordination in the labour market reduces the observed effects of the education system. Finally, our analysis is also unique compared with previous research in that we explore a much larger number of countries, including some from Central and Eastern Europe (CEE).

Theoretical background

Education and labour outcomes

It is well known that education systems differ in terms of levels of standardization, stratification and vocational specificity (Shavit and Müller 1998;

Kerckhoff 2001). Standardization refers to the extent to which schools meet common national standards for budgets, examinations, and/or teacher training. Stratification refers to the level of tracking in secondary education, and more generally, to the proportion of the population that attains tertiary educational qualifications. The two aspects of stratification are negatively associated: A secondary-level tracking system ensures both that fewer people are eligible to access tertiary education and that fewer people require its qualifications to obtain desirable positions in the labour market. Vocational specificity, on the other hand, indicates the extent to which particular educational tracks prepare students for occupational specific skills. Vocational specificity is typically described by the amount of institutionalized apprenticeship training that 'combines work experience in regular firms with schooling that is designed to improve students' occupation-specific skills' (Kerckhoff 2001: 5). An education system is considered a 'dual system' if it provides a significant level of institutionalized education that is both work and school based (see Müller, Steinmann, and Ell 1998).

Although research in this area has tended to explore individual countries (for exceptions, see the cross-national studies of Allmendinger 1989; Brauns, Steinmann, Kieffer and Marry 1999; Bernardi, Gangl and Van de Werfhorst 2004; Maurice, Sellier, and Silvestre 1986; Scherer 2005; Iannelli and Raffe 2007), when combined these studies provide substantial evidence that the effect of education on occupation outcomes differs according to characteristics of educational systems. Countries characterized by highly stratified education systems with strong vocational components, extensive tracking, and early selection into tracks tend to show a stronger relationship between education and occupation when compared to countries with less vocational training and stratification (Allmendinger 1989; Brauns, Steinmann, Kieffer and Marry 1999; Kerckhoff 2001; Shavit and Müller 1998; Scherer 2005). The theoretical rationale for this finding is straightforward: the more stratified and vocationally-specific the educational system, the more transparent potential employees' qualifications are to employers, and thus the stronger the match between education and occupation.

A few studies have systematically explored the relationship between the education system and occupational outcomes in many countries simultaneously. Shavit and Müller (1998) examined 12 countries, regressing the coefficients representing the education effect from individual country models predicting occupational prestige (obtained from micro-data) on a set of macro variables representing characteristics of the education system (i.e., level of standardization, stratification, and vocational specificity). They concluded that vocational specificity has a significant effect on the relationship between education and occupation. Using a similar framework to explain cross-national variation in youth unemployment rates in OECD countries, Breen (2005) argues that strong educational signaling was most evident in countries

characterized by extensive dual educational systems – i.e., those with a significant level of work-school based training apprenticeships. This strong signaling apparently led to lower levels of youth unemployment.

Using a multi-level framework that included micro-level labour force survey data and country-level indicators, Van der Velden and Wolbers (2003) examined the school-to-work transition in several European countries. Similar to Breen's findings, their results indicate that the transition is quickest in countries with extensive vocational educational systems and dual tracks. Van der Velden and Wolbers' models contained no information on the position of individuals within school tracks (i.e., whether they were in a vocational or general track), however, and thus it is impossible to know whether this finding indicates a smooth transition only for individuals educated in vocational tracks, or if a vocationally-oriented schooling system benefits everyone because it results in generally better signaling of education qualifications for employers. In fact, most studies that simultaneously test for micro-level and macro-level effects of vocational schooling sometimes fail to show micro-level effects (Wolbers 2007; Iannelli and Raffe 2007). Scherer (2005), however, found stronger effects of tertiary and upper secondary vocational education on the school-to-work transition in Germany relative to Italy and Britain, suggesting that vocationally oriented systems may smooth the transition to work for all, but particularly for those who have vocational qualifications.

It is also possible that the education system may not affect the relationship between education and occupation on its own accord. In fact, a large vocational component could be important under some economic conditions but there are also conditions under which it may hinder the match between education and work outcomes. For example, in some post-industrial or service-based economies, general knowledge may be more important than technical or vocational training and thus a large vocational training component may not be necessary. On the other hand, a large vocational component may be very important in an economy characterized by a high degree of technical specialization. What is important to the match between education and occupation, then, is not necessarily a *high* level of stratification but rather that the *right* training is provided. In this respect, it is important to assess whether or not labour market characteristics – in particular, the coordination of employment relations – play an important causal role (Soskice 1994; Culpepper and Finegold 1999; Hall and Soskice 2001; Visser and Hemerijck 1997; Breen 2005). At the very least, focusing exclusively on the impact of characteristics of the education system may not tell the whole story.

Labour market coordination is primarily linked to wage bargaining and unemployment but it could also affect the nature of vocational education (e.g. Iversen and Soskice 2001; Culpepper and Finegold 1998; Estevez-Abe, Iversen and Soskice 2001). Highly coordinated market economies are characterized by

extensive collective negotiation on employment relations among employers' organizations, trade unions, and the government (Soskice 1994). In other words, employers actively influence the design of vocational training in the educational system. This coordination often takes place at the industry-level, where the demand for occupation-specific skills can be expressed clearly by industrial employers' organizations. It is sensible to suggest that societies with a high degree of coordination are more likely than societies with a low degree of coordination to ensure that the training needs of employers are met.

Despite that coordination affects a broad spectrum of labour relations, including the size of the vocational system (cf. Thelen 2004; Culpepper and Finegold 1999), it has seldom been considered in research on the relationship between education and work outcomes. An exception is Van der Velden and Wolbers's (2003) study, which considers the role of both the education system and labour market regulation. Still, their statistical models did not distinguish between centralization and coordination. Although related, these are two distinct domains of collective bargaining. Wage centralization 'refers to the level(s) at which wages are bargained or set' (Kenworthy 2001:59). For example, bargaining can take place within a single plant, a whole company, or even an industry or sector as a whole. Coordination, on the other hand, refers to the extent to which labour relations are negotiated in a tri-partite system of employees' organizations, employers' representatives, and the government. Research has shown that it is through coordination – not centralization – that employers contribute to the design of vocational education and negotiate with unions about employment protection 'in return for' a strong vocational educational sector (Iversen and Soskice, 2001; Estevez-Abe, Iversen and Soskice 2001).

By coordinating the employment relationship, coordination institutions function to ensure inclusion of workers and thus reduce inequalities among them (cf. Hall and Soskice 2001). We argue that the resulting 'package deals' between employers' and employees' organizations will improve the match between education and occupational outcomes. More specifically, we might expect that vocational training will have greater occupational rewards, and a university education less rewards, in highly coordinated societies. This dampening effect of education in highly coordinated societies is likely to result from two factors: (1) fewer people enrol in post-secondary education, and hence the signal of qualifications to employers is enhanced, and (2) less often do people with different qualifications compete for the same jobs. A counter argument could also be posited, however. In this regard, one might expect post-secondary education to have higher returns in highly coordinated societies for two reasons: (1) fewer post-secondary educated people will be under-employed because of the coordinated effort to ensure the market's needs are met, and (2) the specific jobs pertaining to the post-secondary labour market have greater value because less qualified workers seldom compete for them.

In summary, the 'education perspective' assumes that educational institutions make a difference, independent of the institutional context in terms of labour market coordination. The standard policy implication from this research is that strengthening the vocational system will improve the transition of youth from school to work (Hansen and Vignoles 2005). On the other hand, some argue that we must look at the broader institutional context in which labour market coordination plays an important role (Breen 2005; Culpepper and Finegold 1999; Ryan 2001; Thelen 2004). This 'coordination perspective' suggests that changing an educational system does *not necessarily* lead to the desired outcome of a better match between education and occupation. Instead, we should place emphasis on the level of coordination in the labour market on the grounds that policy makers in coordinated economies are more likely to know the required level of vocational training. In other words, coordination – not the level of differentiation in the education system *per se* – affects the strength of the impact of schooling in labour markets. Given that negotiations resulting from labour market coordination are likely to affect the level of differentiation offered by the education system, it is important to consider both factors when analysing the relationship between education and labour market outcomes. Until now comparative quantitative research on the school-work relationship has typically ignored the role of coordination.

Research questions

We explore three research questions derived from the discussion above. Firstly, following the educational institutional approach we test if education has its strongest effect on occupational status when the skills obtained in the educational system are most transparent. In other words, we test for an interaction effect between individual education and the level of skill transparency in the educational system. Secondly, we explore the impact of labour market coordination on the match between education and occupational status. If coordination is the causal factor leading to strongly transparent educational systems, the interaction between education and the level of skill transparency will diminish when the interaction between education and labour market coordination is also considered. The leverage for this hypothesis stems from the fact that some coordinated market economies, such as Sweden and Norway, do *not* have a strongly transparent skill structure in the education system. We also consider whether coordination has its own effect – i.e., independent of the level of skill transparency. In this regard, we test whether coordination reduces, rather than enhances, the relationship between education and occupational status, resulting in less inequality due to educational attainment.

Data and measurement

Individual-level data

The individual-level data for our analysis are from the 2004 wave of the *European Social Survey (ESS)*. The ESS contains survey data on respondents from more than 30 countries over four waves from 2001 to 2007. We restrict our analysis to the 14 countries for which relevant data are available for the 2004 survey (wave 2 of the ESS). All of the data are from random samples representative of the national populations of adults (18 years and older). We concentrate on the following countries (sample sizes after removing missing cases are parentheses): Belgium (1,446), Czech Republic (2,351), Denmark (1,400), France (1,533), Germany (2,421), Hungary (1,271), Ireland (1,931), the Netherlands (1,653), Norway (1,672), Poland (1,429), Slovakia (1,115), Spain (1,123), Sweden (1,781), and Switzerland (1,974). The total analytical sample size we employ is 23,100.

The dependent variable in our analyses is *Occupational Status*. More specifically, we employ the International Socio-Economic Index (ISEI) of occupational status developed by Ganzeboom and Treiman (1996). This measure is commonly utilized in social stratification and mobility research (Breen and Jonsson 2005; Hout and DiPrete 2006). In contrast to occupational prestige scores, which score occupations according to public evaluations, socio-economic indices of occupational status are based on objective criteria. The ISEI index uses the International Labour Organization's 1988 International Standard Classification of Occupations (ISCO-88) four-digit representation of occupations to compute 'weighted averages of standardized measures of the income and education of incumbents of each occupation' (Ganzeboom and Treiman 1996). Deriving these scores for the ESS respondents was facilitated by the fact that the ISCO-88 codes are included in the dataset. For more information on the specific occupations that constitute the ISCO-88 four-digit categories, see ILO (1990); extensive details on the construction of the ISEI measure are shown in Ganzeboom and Treiman (1996).[2]

Our main individual-level predictor is *Education*, which we divide into four categories: (1) less than a secondary school diploma, (2) vocation or technical training at the upper secondary level, (3) general upper secondary school, and (4) tertiary degree. For all but four countries, the source code for the education measure comes from Schneider's (2008) project on the measurement of education in international surveys, including the ESS. We supplement this coding with our own similar coding for the four countries (France, Ireland, Norway and Sweden) for which no pre-existing codes were available.

Our statistical models also control for *age* and *gender*. Gender is measured as a dummy variable coded 1 for men and 0 for women. Age is entered in the

statistical models as a quadratic polynomial in order to control for a curvilinear relationship with occupational status.

Country-level variables

Skill transparency of the education system

The argument for stronger education effects in strongly diversified educational systems is based on the premise that the link between skills and educational qualifications is more transparent in such systems. We thus develop a new measure of the skill transparency of the education system that taps the extent to which the system stratifies students into different tracks and levels. Using various OECD indicators (OECD 1999, 2002), we construct a scale based on a factor analysis of five related indicators: (1) the percentage of the population enrolled in a vocational track at the upper secondary level, (2) enrolment in the dual (work/school based) track as a percentage of students, (3) the number of tracks available to students within lower secondary education, (4) the age of first selection into an education track, and (5) the percentage of students enrolled in tertiary education.

Our measure of the level of skill transparency is similar to most commonly used classifications (Shavit and Müller 1998), with the main exception that we give less weight to *tertiary-level* vocational education. In our view, the vocational content at the (upper) secondary level is both more relevant than at the tertiary level and more strongly discriminant across countries (cf. Estevez-Abe, Iversen and Soskice 2001). Our approach also differs from that of Shavit and Müller (1998) in that they include separate measures for tracking and vocational orientation. Testing for independent effects of all the five items that constitute our composite measure is a worthwhile endeavour but impossible for the present analysis because we have data from only 14 countries, meaning it would exhaust the degrees of freedom at the country level in the statistical models. Nevertheless, the factor analyses indicated fairly high communalities for the individual items (between 0.33 and 0.72), and only one underlying factor with an eigenvalue greater than one. We are confident, then, that these measures tend to tap the same underlying concept.

Labour market coordination

There are only two measures of labour market coordination readily available for CEE countries. The first was developed by Knell and Srholec (2007). This measure is not suitable for our analysis, however, because it places a heavy emphasis on employment regulation instead of directly tapping the level of negotiation between employers, employee groups and government, which is our primary concern. We thus employ the second alternative, which simply

Table I: *Correlations between country-level variables (country as unit of analysis)*

	Bivariate correlations between the country-level variables		
	Skill transparency of education system	Labour market coordination	Eastern Europe
All countries			
Stratification in the education system	1		
Labour market coordination	–0.41	1	
Eastern Europe	0.70	–0.65	1
N (Countries)	14		

classifies countries into a two-category variable coded 1 for coordinated economies and 0 for liberal market economies that is often employed for Western countries (e.g. Soskice 1994). Our coding of CEE countries is influenced by Visser's (2009) recent research from the varieties of capitalism perspective. In this regard, we classify the Czech Republic, Poland, and Slovakia as liberal market economies, and Hungary as a coordinated market economy. This measure specifically taps the level of co-operation among workers, employers and government, rather than the nature of employment regulation.

Central/Eastern Europe

We also include a dummy variable indicating Central and Eastern European countries, and its interaction with education.

Table I displays the bivariate correlations between each combination of the three context variables. All three variables are moderately correlated with each other but none of them is adequately explained by the other variables. Most importantly, much of the differences in education systems cannot be explained by the level of coordination, so it is possible that the two institutional variables have independent effects on the relationship between education and occupational status. The large correlations between the CEE dummy regressor and both the level of skill transparency and the level of labour coordination accentuates the importance of controlling for its effects.

Statistical models

Our main analysis employs hierarchical linear models to predict occupational status. More specifically, we fitted variance component models which account for the clustering of individual respondents (level 1) within countries (level 2) by specifying a random component for the intercept. This results in the models having two desirable properties relative to those fitted by ordinary least

squares regression: 1) they parsimoniously control for country differences in the overall average level of ISEI, and 2) they account for the fact that individuals within countries are not entirely independent (i.e., they are clustered within countries), thus ensuring that the standard errors for the estimates are more accurately (and conservatively) estimated (see Snijders and Bosker 1999: Chapter 2; see also Pinheiro and Bates 2002).[3]

Model 1 provides a test of the standard hypothesis that the occupational returns to education are positively related to the level of skill transparency of the education system. In other words, it includes terms representing the interaction between individual-level education and the level of skill transparency of the education system at the country-level. This model does not include information about the level of labour market coordination. Model 2 extends Model 1 by adding the dummy regressor to capture the differences in average ISEI between CEE and Western European countries. Model 3 further extends the model to include the cross-level interaction between education and the dummy regressor representing CEE countries. Model 4 builds on the previous model by controlling for the level of labour market coordination in the country. Our final model explores the possibility that labour market coordination has a moderating role on the relationship between education and ISEI. To do so, terms representing the interaction between individual-level education and labour market coordination are added. This final model allows us to assess the relative importance of the type of education system and the level of labour market coordination.

Results

Table II provides some country-specific descriptive statistics for the important variables for important variables in our analysis. The first four columns show the mean scores for occupational status according to education category. We can clearly see a large education effect, with post-secondary qualifications tending to give the highest occupational status, and low education resulting in the lowest status, in all 14 countries. Still, there is considerable variation in this effect, with average occupational status for tertiary degree qualifications reaching a high of 66.3 in the Czech Republic and a low of 56.2 in Norway. We see even greater variability in the returns to general secondary education, which ranges from a low of 36.5 in Sweden to a high of 53.2 in Switzerland. Occupational status returns for technical/vocational qualifications are less variable, ranging from a high of 47.9 in Spain to a low of 35.1 in Slovakia. The last three columns of Table II provide the values of the three national-level variables for each of the 14 countries.[4] From this point onwards, our goal is to determine whether or not these institutional differences are, at least in part, responsible for the differences in the match between education and occupational status.

Table II: *Various descriptive statistics for important predictors and dependent variables in the analysis for each country separately*

Country (sample size in parentheses)	Mean occupational status by education				Country-level variables		
	Less than secondary	Vocational/ technical	General secondary	Tertiary degree	Skill transparency of the education system	Labour market coordination	East Europe
Belgium (1,446)	36.6	39.9	45.1	61.6	–0.23	1	0
Czech Republic (2,351)	30.8	36.9	47.9	66.3	1.49	0	1
Denmark (1,400)	33.7	42.9	41.6	60.0	–0.29	1	0
France (1,533)	35.7	42.7	50.3	57.9	–0.67	1	0
Germany (2,421)	33.2	43.6	46.0	64.3	0.81	1	0
Hungary (1,271)	31.8	37.4	47.6	63.3	0.80	1	1
Ireland (1,931)	34.0	42.8	49.2	60.4	–0.96	0	0
Netherlands (1,653)	40.0	45.8	51.3	60.5	0.37	1	0
Norway (1,672)	35.0	39.7	40.3	56.2	–1.24	1	0
Poland (1,429)	30.5	36.0	45.0	60.8	0.73	0	1
Slovakia (1,115)	29.6	35.1	45.7	63.7	1.06	0	1
Spain (1,123)	34.5	47.9	44.8	58.3	–1.20	1	0
Sweden (1,781)	36.6	40.4	36.5	57.6	–1.64	1	0
Switzerland (1,974)	34.9	46.4	53.2	67.7	0.47	1	0
Total number of respondents = 23,100							

Table III: *Multilevel models predicting occupational status (ISEI score). Standard errors are in parentheses*

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
Individual-level					
(Intercept)	25.10***	27.06***	26.77***	26.29***	24.79***
	(0.96)	(0.81)	(0.82)	(1.30)	(1.37)
Education					
Tertiary degree	27.58***	27.56***	26.60***	26.60***	29.49***
	(0.28)	(0.28)	(0.34)	(0.34)	(0.78)
General secondary	13.21***	13.20***	12.92***	12.93***	15.79***
	(0.29)	(0.29)	(0.41)	(0.41)	(0.75)
Vocational/technical	8.23***	8.21***	9.17***	9.17***	10.39***
	(0.24)	(0.24)	(0.30)	(0.30)	(0.65)
Less than secondary	0	0	0	0	0
Country-level					
Skill transparency of education system	–1.38	0.80	0.54	0.51	0.37
	(0.75)	(0.55)	(0.57)	(0.59)	(0.60)
Eastern Europe	–	–6.56***	–5.65***	–5.27***	–4.14**
		(1.11)	(1.23)	(1.49)	(1.53)
Labour market coordination	–	–	–	0.52	2.18
				(1.09)	(1.17)
Education X skill transparency of education system					
Tertiary degree	3.43***	3.44***	2.47***	2.47***	2.66***
	(0.43)	(0.27)	(0.35)	(0.35)	(0.35)
General secondary	2.90***	2.92***	2.53***	2.53***	2.80***
	(0.30)	(0.29)	(0.45)	(0.45)	(0.45)
Vocational/technical	–0.11	–0.11	1.08***	1.08***	1.22***
	(0.24)	(0.24)	(0.32)	(0.32)	(0.32)
Education X Eastern Europe (East = 1)					
Tertiary degree	–	–	4.46***	4.45***	2.29*
			(0.87)	(0.87)	(1.01)
General secondary	–	–	0.48	0.48	–1.88
			(0.91)	(0.90)	(1.04)
Vocational/technical	–	–	–4.08***	–4.08***	–4.97***
			(0.72)	(0.72)	(0.87)
Education X labour market coordination					
Tertiary degree	–	–	–	–	–3.17***
					(0.77)
General secondary	–	–	–	–	–3.27***
					(0.72)
Vocational/technical	–	–	–	–	–1.38*
					(0.65)
Random intercept (variance)	6.74***	1.67***	1.73***	1.87***	1.94***
Deviance	183,944	183,925	183,789	183,787	183,756
Individual-level N	23,100	23,100	23,100	23,100	23,100
Number of countries	14	14	14	14	14

Note: All models control for gender and a quadratic trend for age.
* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

We now turn to the hierarchical linear models, which provide tests of the impact of national context on the relationship between education and occupational status. The coefficients for these models are reported in Table III. Model 1 tests the standard hypothesis from the stratification literature that the occupational status rewards to education increase with the level of skill transparency

in the education system. This model *does not* consider the role of labour market coordination or differences between Western European and CEE countries. Consistent with previous research, we indeed find support for the expected interaction between education and the education system. Those with tertiary education generally have higher occupational status, but this is even more so in countries with a high level of differentiation in the education system. Nevertheless, those with vocational education tend to have lower occupational status in more strongly transparent educational systems than in education systems with a low level of differentiation. Of course, this latter result is not consistent with standard findings in this area. This discrepant finding results from the inclusion of CEE countries, which are generally characterized by a significantly different relationship between education and occupational status. More specifically, obtaining a university degree typically results in a much higher occupational status in CEE countries than in non-CEE countries. We will discuss this finding in more detail when exploring the results of Model 3.

The results are substantively similar for Model 2, which adds a control for Eastern and Central European countries. This model demonstrates that Western countries tend to have much higher average levels of occupational status than the countries of Central and Eastern Europe, but none of the other effects in the model differ substantively from the effects in Model 2. In other words, the atypical finding that the occupational returns to vocational/technical education and less than a secondary school education are similar persists. As we shall see below with respect to the results of Model 3, however, extending the model to include the cross-level interaction between the dummy regressor for CEE countries and level of educational attainment does correct the effects pertaining to skill transparency.

Turning to Model 3, we start by noting the differences in occupational returns to education between CEE countries and non-CEE countries. These differences are quite large, with education tending to have a much stronger effect in the CEE countries. More specifically, the advantage of vocational qualifications relative to incomplete secondary education is less than half the size in CEE countries to that in Western countries. On the other hand, a tertiary degree leads to even further advantage in CEE countries (a further two points greater on the ISEI scale) than it does in the countries of Western Europe. More importantly, unlike the previous models, Model 3 consistently supports the standard finding of previous research with respect to the interaction between individual-level education and the level of skill transparency of the education system. That is, education now has a positive effect across the board, including a comparative advantage for vocational education relative to incomplete secondary-level education. It is clear, then, that there are differences in the general pay-off to a university degree between CEE countries and other countries. Failing to control for these differences leads to the erroneous conclusion that the occupational returns to vocational/technical training are

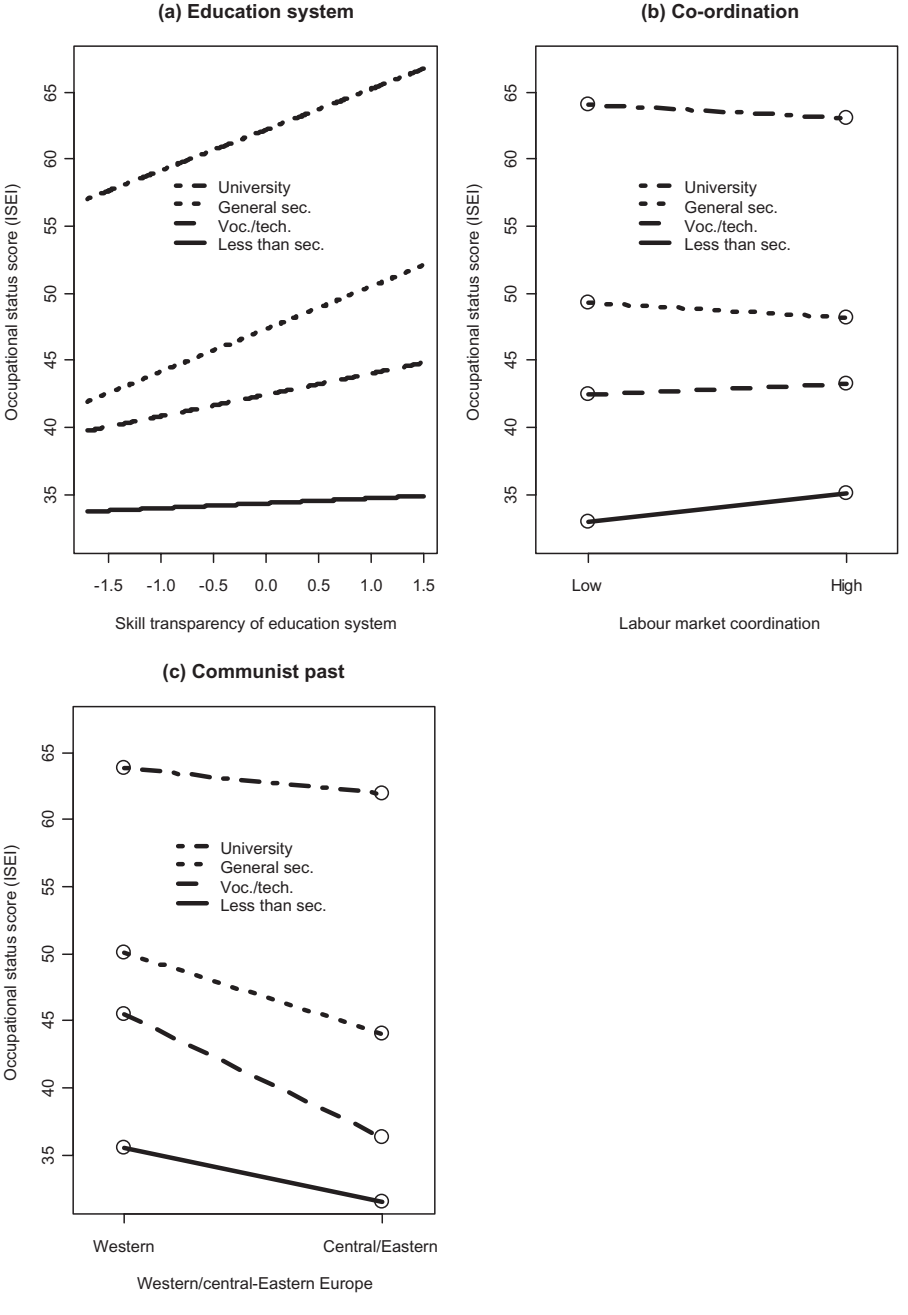
no different from the occupational returns to less than secondary school qualifications.

We now turn our attention to the role of labour market coordination. Aside from the statistically insignificant positive effect of the newly added labour market coordination variable, the results of Model 4 are nearly identical to those of Model 3, which did not control for labour market coordination. There are noteworthy findings in Model 5, however, which includes the cross-level interaction between individual-level education and coordination. Firstly, relative to having no qualifications, all other levels of education tend to result in occupations with less status in coordinated economies than in liberal market economies. This 'levelling effect' is even more pronounced for the more general levels of education (tertiary degree and general secondary) than for vocational or technical qualifications. Secondly, including the cross-level interaction between individual-level education and coordination has no significant impact on the estimated effects of skill transparecy in the education system for any of the four education-levels. This suggests, then, that the effects of the education system are independent from the effects of coordination. In other words, our results corroborate previous research demonstrating that educational institutions moderate the education effect. Controlling for the direct effects of the level of labour market coordination does not change the story.

To better understand the cross-level interactions between individual-level education and the three context variables in their effects on occupational status, we turn to Figure I. The lines in this figure represent the fitted values of occupational status from Model 5 for each of the education categories through the range of the three context variables. These fitted values were calculated with all predictors not associated with the effects of interest set to typical values (i.e., means for quantitative variables and proportions for dummy regressors).

Figure I(a) clearly demonstrates the strong moderating role of skill transparency of the educational system. All levels of education, except less than secondary, tend to be more highly rewarded in terms of occupational status as differentiation increases. Figure I(b) suggests that the effect of coordination is much smaller but important none the less. We also see how the dampening effect of coordination on education operates: in highly coordinated economies there are slightly smaller rewards in terms of occupation status for tertiary degree and general secondary qualifications, but slightly better rewards for vocational/technical training and failing to obtain a secondary school qualification. Figure I(c) clearly displays the differences in average occupational status between Western and CEE countries. Relative to Western countries, in CEE countries all education levels tend to have lower occupational status, but the difference is most marked for vocational and technical qualifications.[5]

Figure I: *Fitted occupational status showing the interaction between individual-level education and (a) skill transparency of the education system, (b) labour market coordination, and (c) Communist past (from model 5)*



Conclusions and discussion

This paper advances comparative research on the link between schooling and labour market outcomes. Rather than examine countries individually, as is the usual practice, we systematically explored this relationship across 14 European countries using hierarchical linear models. This study is innovative in its incorporation of both the level of skill transparency of the education system *and* the level of labour market coordination as contextual influences on the relationship between education and occupational status. Our study is also unique in its consideration of both Western European and Central and Eastern European countries. Our results confirm, but also extend, earlier findings regarding national institutional influences on the relationship between education and occupational outcomes.

Consistent with previous research, we found that the impact of a secondary vocational or technical training relative to incomplete secondary education is strongest in countries with clear transparency in terms of the skills obtained in the schooling system (Breen 2005; Ianelli and Raffe 2007; Scherer 2005; Van der Velden and Wolbers 2003). Our results add to our understanding of the link between education and occupation by demonstrating that the effects of the school system hold even after controlling for the level of labour market coordination. Independent of coordination, the relative returns to all education levels except less than secondary are highest in educational systems where educational qualifications (in the form of strong tracking, strong vocational orientation, and limited enrolment in tertiary schooling) are highly transparent. Thus although some studies have argued that educational systems must be seen in the broader context of coordination institutions (Culpepper and Finegold 1999; Thelen 2004), our empirical findings justify the primary focus on educational institutions. Simply put, our understanding of the role of educational institutions on the relationship between educational qualifications and labour market position is not harmed by ignoring the role of labour market coordination.

Nevertheless, our findings also suggest that ignoring the role of labour market coordination does not give a complete story of how national context affects the match between education and occupation. We found that extensive coordination will reduce the effect of education on occupational status. Although there is still a positive relationship between level of education and occupational returns in highly co-ordinated economies, the relationship is much weaker than in liberal market economies. This finding holds despite controlling for the level of skill transparency of the education system. These findings are consistent with the idea that coordination strongly influences inclusion processes and reduces inequalities resulting from educational attainment (Finegold and Soskice 1988; cf. Hall and Soskice 2001).

This study also underscores the importance of controlling for a Communist past if CEE countries are included in an analysis of the moderating role of educational institutions on the relationship between education and occupation. Only after including the cross-level interaction between education and the dummy variable representing CEE countries did we obtain results consistent with previous research. The differences reflect the relative position of vocational and technical training in CEE and Western Europe. In this respect, the interaction between education and CEE is also interesting on its own accord. We found clear evidence that relative position in terms of the occupational status returns to vocational and technical qualifications is much worse in CEE countries. This issue is worthy of further investigation in future research.

Like most studies, our findings are not without limitations. In this regard, it is interesting that all of our models had substantial (and statistically significant) country-level variation in the intercept, suggesting that other factors not included in our models – either at the individual-level or country level – are important to occupational status. As appropriate data from more countries become available, future research could explore the effects of other possibly important contextual variables. An even more accurate picture of how national context influences the relationship between education and occupational outcomes might further consider other characteristics of the national political economy. Three possible contextual factors to consider are the level of social spending, the level of income inequality, and the type of economy (e.g., whether the service industry or manufacturing dominates). Unfortunately, there are too few countries with appropriate information in the ESS for us to pursue these ideas in the present analysis. We are also unaware of any other existing datasets that have all the necessary information at the individual level for as many countries as we explored in the present analysis.

As a final note, it is interesting to ponder the policy implications of our results. The fact that the effects of the education system withstood the inclusion of labour market coordination in the model suggests that there is no need to put educational policy regarding tracking or vocational orientation in the context of broader coordination institutions. If policy makers aim to optimize the signalling function of education by strengthening the vocational orientation of the system, there is no evidence in our study to suggest that such policy would be more effective in coordinated market economies than in liberal market economies. Nevertheless, our results also suggest that if the goal is to reduce inequalities resulting from educational attainment, policy focused on increasing labour market coordination may help produce the desired outcome.

(Date accepted: February 2010)

Notes

1. An earlier version of this paper was presented at the International Sociological Association's RC 28 Conference in Brno, Czech Republic, May 23–25, 2007. We thank participants at the conference, and in particular Mike Hout, and three anonymous reviewers for their comments. Research for this paper was funded by an International Research Linkage Grant from the International Council for Canadian Studies. Herman Van de Werfhorst is also supported by a personal VIDI grant of the Netherlands' Organization for Scientific Research (NWO), grant 452.07.002.

2. The codes to convert the ISCO-88 four-digit categories to ISEI scores were obtained from Harry Ganzeboom's (Department of Social Research Methodology, Free University Amsterdam) website: http://home.fsw.vu.nl/hbg.ganzeboom/isko88/index.htm.

3. We fitted these models using the restricted maximum likelihood algorithm implemented in the lme4 package for R (R Development Core Team, 2009). For more information see Bates (2008) and Pinheiro and Bates (2002). Given that our models include cross-level interactions between education and the country-level contextual variables, it would be desirable to further specify education as a random variable. The small number of countries prohibits this, however. In any event, to ensure the robustness of our results, we also fitted regular linear models with heteroskedasticity consistent robust errors to account for the clustering within countries and robust regression models fitted by MM-estimation (see Andersen 2008). The substantive findings from these models were identical to those of the hierarchical linear models.

4. Some argue that the classification of southern European countries, including France, as coordinated market economies may be arbitrary (Hall and Soskice 2001: 21). In order to ensure that our models were not sensitive to the coding of France, we further assessed two preliminary models: 1) a model that excluded France, and 2) a model for which France was coded '0' for the labour market coordination variable. Both of these models gave substantively similar results to the final model. In fact, excluding France yielded nearly identical results. The coefficients representing the education and coordination interaction in the latter model were somewhat muted but followed the same pattern.

5. Although there are some differences in the coefficients and the size of their standard errors, the final model fitted without the CEE dummy and the terms representing its interaction with individual-level education provides a very similar story: occupational status differences increase with the level of skill transparency and decrease with the level of labour market coordination. We also fitted the final model using ordinary least squares with robust standard errors and excluding the CEE countries altogether. Again the results for the moderating effects of the education system and coordination were substantively similar.

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