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Systems of Educational Specialization and Labor Market Outcomes in Norway, Australia, and The Netherlands

Herman G. van de Werfhorst*

ABSTRACT

To account for differences between systems of education in highly educated societies, I argue that the impact of academic discipline (field of study) on labor market outcomes should be central. Three modifications of earlier typologies are needed to account for cross-national differences in the transparency of skills provided by educational specialization. We should observe: (1) the system of tertiary vocational programs; (2) whether a system has a bachelor's-master's structure; and (3) whether students choose minor and major subjects in college. Our analysis of Norway, Australia, and the Netherlands shows that these modifications seem useful. In the Netherlands, the impact of fields of study on wages and occupational status is much higher than in the other countries. The relatively high value of Australian qualifications compared to the Norwegian may be explained by the welfare state regulations of both countries, but this explanation is a tentative one. In Australia, eligibility to social benefits depends much more on previous work experience than in Norway, making fields of study a better indicator of labor market commitment.

Keywords: Australia, cross-national comparison, education, field of study, labor market, Norway, the Netherlands, wages

Introduction

This article compares the impact of education on labor market outcomes (wages and occupational status) in three countries: Norway, the Netherlands, and Australia. The aim of the present article is partly descriptive: what are the effects of educational level and fields of study on indicators of labor market success in these three countries? Such a description is valuable, as my review of the literature did not reveal any published sociological research on cross-national variation in the effects of field of study on labor market outcomes (with the exception of the recent working paper of Kim and Kim, 2003).

However, the aim of this article is not solely descriptive; it offers some explanations for potential differences as well. Thus far, comparative research on the institutional impact of education on labor market outcomes has mainly focused on the extent and system of vocational training, and the degree of

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standardization of educational programs within a country (Allmendinger, 1989; Brauns et al., 1999; Shavit and Müller, 1998). These characteristics are particularly useful to classify systems of *secondary* education. As an increasing proportion of the population of western societies enter higher education (Shavit and Blossfeld, 1993), this means that available classifications of educational systems become less meaningful for a considerable number of people. The increase in participation has made research on labor market differences across fields of study of central interest (e.g. Daymont and Andrisani, 1984; Hansen, 2001; Kalmijn and Van der Lippe, 1997; Van de Werfhorst, 2002; Van de Werfhorst and Kraaykamp, 2001). By extending the framework of stratification and vocational specificity of educational systems, we argue that countries differ in the *transparency of competencies* that fields of study provide to students. In educational systems where the obtained competencies are highly transparent, employers use education as a signal of skills and trainability more than in systems where competencies are less transparent.

Two outcomes of interest are hourly wages and occupational status. By focusing on two different measures of job success, we get a more comprehensive picture of the benefits of education on the labor market. As sometimes people may trade off higher incomes against lower occupational status and vice versa, analysing both outcomes simultaneously gives us further insight into the investment decision that people make in a particular field of study.

The research questions to be answered are: to what extent do educational qualifications lead to labor market success differentially in Norway, the Netherlands, and Australia, and how can we explain these differences? These three countries are interesting to compare as the most crucial aspects of educational systems, including higher education, differ strongly. At the same time, all three countries have important similarities relating to economic factors affecting the demand for qualifications. Economic growth was at or above the average OECD figures during 1992 to 2002 (OECD, 2003). The expenditures and employment in research and development, another indicator affecting the demand for qualifications, are very similar as well (OECD, 2002).

Theoretical Background

Educational Systems and Transparency of Competencies

Earlier comparative work on the relation between education and the labor market has argued that countries vary between a 'qualificational space' and an 'organizational space' (Maurice et al., 1986). In a qualificational space (Germany in their study), skills are learnt in a vocationally oriented schooling system and employers select employees based on these assets. In an organizational space (France in their study), work skills are mainly acquired on the job and education functions merely as a screening device. Another influential approach classifies

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educational systems in terms of the level of standardization: the extent to which the education system meets the same standards nationwide, such as in terms of budgets, examinations, or teachers' training; and stratification: the proportion that attains the maximum number of school years combined with the extent and system of tracking in secondary education (Allmendinger, 1989; Kerckhoff, 2001; Shavit and Müller, 1998). Vocational specificity is often put on a third dimension, although it is closely related to the stratification dimension. Furthermore, a dual (work/school based) vocational system seems to be the most important characteristic to account for valuable signals (Breen, 2002). In countries with highly stratified, vocationally specific, and standardized educational systems, such as the Netherlands, education-work linkages are stronger than in other countries; high levels of stratification and vocational specificity make it possible for employers to select employees with detailed vocational qualifications; and higher levels of standardization makes the signals provided by education more reliable. Similarly, in countries with clear vocational training systems, job tasks are organized through the 'qualification rule' (Marsden, 1999). This rule bases the classification of job tasks on the skills of workers, thereby 'moulding' jobs to workers (cf. Maurice et al., 1986). It functions as an 'outward visible sign of management's recognition of worker competencies' (Marsden, 1999: 54), and minimizes on-the-job training. The wages that an employer is willing to pay would thus reflect the skills the employee obtained in education.

These approaches capture all kinds of important differences in systems of secondary education, which, on the aggregate level, lead to sound explanations for differences across countries in the association between education and work. However, on a micro-level these kinds of explanations hold for a decreasing part of the population of western countries. More and more people attain tertiary educational qualifications, for which the above-mentioned classifications are less accurate. In particular, the vocational specificity dimension seems of limited value to classify systems of university education; countries do not differ substantially in the extent that their academic university programs are vocationally specific. Also, the standardization dimension is less valuable in tertiary education, since educational policy on higher education is more often than not made at the national level, implying that most countries are highly standardized in this respect. Indeed, given the tremendous educational expansion in all western countries, we should observe cross-national convergence in the impact of education on work if educational institutions only differ at the secondary level.

To analyse cross-national differences in systems of higher education, however, I argue that a 'modified' stratification dimension exists. This modification implies that stratification of tertiary educational systems should not, for example, refer to 'the extent and system of tracking in secondary education' but encompass the signals that the fields of study in higher education provide to the labor market. More specifically, three types of modifications are needed. First, some countries have a highly vocationally oriented tertiary education system in

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the 'vocational colleges' (e.g. institutions of Hoger Beroeps Onderwijs in the Netherlands), which do not exist in the same magnitude in countries like Norway and Australia.[1] These vocational colleges are designed to develop job-oriented skills in specific subjects, with or without a bachelor's degree equivalent. People with such a qualification provide a clear signal for the labor market; their field of study is highly indicative of their productivity and trainability. The Dutch system of vocational colleges is also highly standardized compared to the Norwegian, with basically one type of institution offering all non-academic tertiary education.

Second, the signals provided by fields of study differ across countries not only in the vocationally oriented institutions, but also in 'regular' universities. In countries with a bachelor's-master's structure (i.e. a combination of undergraduate and graduate pre-doctoral education), like Australia, it is more common to do two different subjects for each degree than in countries where no undergraduate-graduate distinction is made. Similarly, in Norway many different types of degrees can be obtained in universities, even before entering the doctoral phase, which does not improve the transparency of the skills obtained. In the Netherlands, all students enrolled in a program (e.g. sociology) will obtain the same degree eventually. Third, in some countries, educational institutions offer courses in 'minor' and 'major' subjects, making it even more difficult for employers to judge the educational qualifications of job applicants. These three dimensions of stratification are positively related to the *transparency* of educational qualifications in higher education, and thus to the signal that is provided by the educational system. If workers possess one of these clear signals, their 'control over the job' is higher (Sørensen and Kalleberg, 1981), making employers willing to pay higher wages to avoid employees from looking for another job. As regards the transparency of competencies, therefore, the Dutch education system offers clearer signals than the Norwegian or Australian system.[2]

One of the scarce papers on cross-national differentiation in the effect of field of study on occupational outcomes hypothesizes quite the opposite conclusion from the above, namely that in countries with a *weak* signaling function of educational level (in their case, the United Kingdom), additional selection criteria are sought, for example, in fields of study (Kim and Kim, 2003). Indeed, looking at the probability of entering the 'service class' in terms of class schema described by Erikson and Goldthorpe (1992), they found more variation across fields of study within educational levels in the UK than in Germany.

The Welfare State and Labor Market Regulations

In addition to the education-related design of the welfare state, other aspects of the welfare state seem to be important. Esping-Andersen's (1990) classification of types of welfare states fits neatly into this discussion. He distinguishes

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between social-democratic (e.g. Norway), corporatist (e.g. the Netherlands), and liberal welfare states (e.g. Australia). Social-democratic welfare states have a large public sector and usually a strong labor unionization level. Although both characteristics affect average wage levels positively (Moulton, 1990), this does not mean that education has a larger impact in such countries. First, since the public sector wage premium seems to be largest for lower-qualified occupations (Gornick and Jacobs, 1998), a 'redistribution' of public-sector incomes between educational levels seems to take place. Second, traditionally, members of labor unions are often found in the working classes, who have low average education levels. If labor unions serve their interests in particular, again incomes are redistributed among educational levels within the public sector.

The liberal welfare state, of which Australia is an example, is characterized by a low level of 'decommodification', that is, the extent to which social benefits are separated from the market. In Australia, eligibility for social benefits is based on previous work experience more strongly than in the other countries. In countries with a high level of decommodification (social-democratic welfare states), people who choose fields of study of poor labor market value are still eligible for various social benefits even if they can not find a job after leaving school. Thus, from a rational point of view, labor market commitment might be a more important criterion for selecting a field of study in a commodified welfare state than in a decommodified welfare state. This probably causes larger homogeneity within fields of study with respect to labor market commitment in liberal welfare states. This makes, *ceteris paribus*, the signal of labor market commitment provided by education clearer in liberal welfare states. As this type of welfare state normally has only limited vocational specificity of the educational system, it is doubtful whether this homogeneity, with respect to labor market commitment, offsets the negative impact of the educational institutions. Furthermore, the limited amount of (un)employment protection in liberal welfare states stimulates individual investments in general rather than specific skills (Estevez-Abe et al., 2001). This, too, suggests that the educational signals that people acquire in liberal welfare states are relatively strong. In corporatist welfare states, such as the Netherlands, the links between the education system and the labor market are strongest. The welfare state in such countries is aimed at maintaining status differentiation 'for the sake of social integration' (Esping-Andersen, 1990: 58). This type of welfare state has 'paternalistic' features, implying that traditionally elites determine what is best for the public. One way to maintain (and legitimize) status differentiation is to organize educational systems in such a way that clear labor market signals are provided. Such a system may more clearly direct people into vocational choices that prepare for detailed occupational destinations. Marshall (1950), one of the founders of welfare state sociology, argued that a 'divided' education system (into several tracks), by promoting intra-class similarity and inter-class difference, emphasized social distance. Additionally, the level of (un)employment

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protection makes people more likely to 'take the risk' of acquiring non-portable, industry-specific or firm-specific skills (Estevez-Abe et al., 2001), even insofar as unemployment protection is dependent on previous work experience.

Education and the Public Sector

It is argued above that the public sector does not necessarily impose a stronger impact of educational level on labor market outcomes (e.g. wages) than the private sector. On the one hand, as selection into jobs is regulated in more detail in the public sector, educational level may have a stronger impact on wages and occupational status than in the private sector. On the other hand, as the public sector is a 'better' employer for jobs in the lower end of the hierarchy in particular, educational-level effects may be smaller in the public sector than in the private sector. This latter pattern is the most prominent in empirical research (Gornick and Jacobs, 1998; Katz and Krueger, 1991).

With regard to the impact of fields of study, there is a clearer relationship between labor market success and the public sector. In particular, fields of study where students generate 'non-market skills' (Marini and Fan, 1997) may result in advantageous positions in the public sector, whereas no positive returns can be expected in the private sector. So, people who are educated in the humanities, the arts, and social studies, have relatively high wages and occupational status in the public sector, but not in the private sector.

Research Design

Data

The datasets used were collected in 1990 and 1991. We selected individuals who were older than 24 and younger than 66 at the time of the survey. The Norwegian data used came from the Life course survey 1991 (Levekårsundersøkelsen, 1991: SSB, 1991). This survey was carried out at the Central Statistical Office among a representative sample of the adult Norwegian population. Restricting ourselves to individuals who were employed (not self-employed), our analytical sample consisted of $N = 1211$ respondents. The Australian data come from the National Social Science Survey 1990 (Kelley et al., 1990). Interviews were taken from a representative sample of the adult Australian population ($N = 2271$). The data of the Netherlands come from the Supplementary Use of Services Research 1991 (Aanvullend Voorzieningengebruik Onderzoek 1991: SCP, 1991). This household survey is carried out every four years among a representative sample of the Dutch population. Because this was the only household sample design among our datasets, we randomly selected one adult member of each household ($N = 1582$).[3]

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Variables

I used the following variables. *Gender* is operationalized with a dummy variable representing women (women = 1, men = 0). *Age* in years is measured with value 0 for 25-year-olds, and divided by 10 for ease of interpretation of the effects. Also, the *quadratic term of age* is included to account for the curvilinear relation between age and labor market outcomes. Furthermore, *public sector* is included.

As regards educational variables, *years of education* is included in our models. We had to construct years of education out of different educational classifications in the three datasets. As the ISCED classifications of the Norwegian data were most detailed (UNESCO, 1976), we were able to distinguish postgraduate from graduate programs in university. In Norway, the number of years of education ranges from 0 to 17, and 0 to 16 in Australia and the Netherlands.[4] Other, more standardized, operationalizations that were less representative of the actual years it takes to complete a certain level of schooling in the countries, made no difference to our findings.

Field of study is measured in eight categories. First, 'General education' classifies all non-vocational programs in secondary education, and forms the reference category in our analyses. 'Teacher education' covers all programs preparing for the teaching professions. The 'arts and humanities' are characterized by the strong focus on skills and knowledge that enhance cultural capital (Van de Werfhorst and Kraaykamp, 2001). The 'social-behavioral' field is separated from 'Economics/business/law' because of difference in marketability of the skills obtained. Schooling in the 'technical/nature' field comprises all kinds of technical and mathematical skills. 'Healthcare' includes study programs focusing on all kinds of therapy, nursing, and medical care. 'Agriculture' includes all types of education focusing on the primary sector, such as fishing, forestry, and agriculture.

The dependent variables in our models are *logged hourly wages* and *occupational status*. Hourly wages are transformed into 1991 US Dollars. For the 1990 dataset of Australia, this means that we accounted for inflation in the year to 1991. Occupational status is measured with the International Socioeconomic Index of occupations (ISEI), developed by Ganzeboom et al. (1992). This measure assigns status scores to occupational titles based on a weighted sum of the educational level and income level of persons employed within occupations and is treated as a variable of interval measurement level. Occupational status measured this way is widely used in stratification and labor market research, as well as in other fields like housing studies and epidemiological research. Descriptive statistics of all used variables can be found in Table 1.

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Table 1.
Descriptive statistics

	Norway (*N* = 1211)		Australia (*N* = 2271)		Netherlands (*N* = 1582)	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Gender (Female = 1)	.47	.50	.43	.50	.34	.47
Age (/10, 25 = 0)	1.68	1.06	1.50	.97	1.33	.91
Age squared	3.94	4.14	3.19	3.49	2.59	3.03
Public sector	.47	.50	.48	.50	.43	.50
Years of education	12.75	1.74	11.80	2.74	12.10	2.92
Field of study						
General	.30	.46	.46	.50	.46	.50
Teacher training	.08	.28	.08	.27	.08	.27
Arts and humanities	.04	.19	.02	.15	.04	.19
Social-behavioral	.05	.23	.03	.17	.07	.25
Economic/business/law	.18	.38	.09	.28	.15	.36
Technical/nature	.25	.43	.22	.41	.12	.33
Health care	.09	.28	.09	.29	.07	.25
Agriculture	.02	.13	.01	.10	.02	.13
Natural Log Wage (in 1991 US$)	2.76	.40	2.43	.56	2.69	.39
Occupational status (ISEI)	52.50	16.76	48.31	15.51	48.97	15.80

Results

A first step in comparing education effects across the three countries is to estimate a regression model on wages and ISEI, with only educational independent variables. The fit statistics of these models tell us to what extent the variance in wages and occupational status is explained with education variables. Table 2 shows these fit statistics for models with only field of study, only years of education, and both years of education and field of study. Furthermore, fit statistics are shown for an interaction model that interacts fields of study with years of education, and another interaction model that interacts college (i.e. non-university tertiary schooling) and regular university with fields of study (adjusted R^2).

A very consistent pattern emerges from Table 2. First, years of education is slightly more important in explaining the variance in wages, and considerably more important as regards status than is field of study (but with only 1 degree of freedom).[5] Second, education is, as expected, most important in the Netherlands, and least important in Australia. This cross-national difference is most apparent with regard to wages, but less so with regard to status. Regarding the interaction models, we see that it is more important to let field of study effects differ across educational levels with regard to occupational status than with regard to wages.

A second step in analysing the impact of education on wages and status is to estimate the regression coefficients of a multivariate model. For each

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Table 2.
Fit statistics of models with educational variables only (adjusted R^2)

	Norway		Australia		Netherlands	
	Wage	**ISEI**	**Wage**	**ISEI**	**Wage**	**ISEI**
A. Field of study	.037	.106	.036	.205	.129	.231
B. Years of education	.075	.278	.046	.268	.150	.284
C. Field of study and years of education	.092	.324	.054	.312	.169	.306
D. C + interactions field of study × years of education	.100	.326	.054	.323	.184	.330
E. C + interactions field of study × college and university (employed in Figure 1)	.100	.347	.057[a]	.347[a]	.186	.342

[a] For Australia only models with interactions with university are included because of the absence of vocational college in the Australian educational system.

dependent variable, three models are estimated for each country. First, a 'baseline' model includes gender, age, age squared, public sector, and years of education. Second, the dummy variables for fields of study are added to the baseline model. Third, the impact of educational variables is allowed to vary between the public and the private sector with an interaction model. Tables 3 to 5 show these models for Norway, Australia, and the Netherlands, respectively. Fourth, we analyse to what extent the impact of field of study varies between educational levels. Specifically, differences between academic university programs and vocationally oriented tertiary programs are examined. Figure 1 shows these empirical results.

Norway

In Table 3 we see that women have on average lower wages than men of equal age, educational level, and sector. As the coefficients on logged wages are interpretable as percentage differences, women earn almost 17 percent less than men. In Model 2 this gender difference has hardly changed, implying that the gender wage gap is not explained by differential choices of fields of study. The impact of age is, as expected, curvilinear. The wage returns to years of schooling are about 6.1 percent in Norway, slightly higher than the 1991 rate of 5.4 found by Barth and Røed (2001).[6]

Field of study has a very limited impact on wages once we control for the other characteristics. Only people trained in the agricultural field have lower incomes than people without educational specialization (i.e. general education). Splitting the effects by sector, however, shows that in the private sector the social-behavioral field and the arts and humanities pay less well than general education. People educated in these fields do far better in the public sector than in the private sector. Apparently, non-marketable skills pay off in the public sector, but are penalized in the private sector. Years of education have a stronger

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Table 3.
Regression of wages and occupational status on selected independent variables, *Norway*
(standard errors in brackets)

	Wages (logged)			ISEI		
Model	**1**	**2**	**3**	**1**	**2**	**3**
Constant	1.975***	1.983***	1.885***	–12.4***	–18.53***	–12.96**
	(.083)	(.095)	(.126)	(3.257)	(3.581)	(4.754)
Gender (Female = 1)	–.168***	–.167***	–.171***	–1.101	–.409	–.130
	(.022)	(.024)	(.024)	(.864)	(.920)	(.921)
Age (/10, 25 = 0)	.136***	.135***	.129***	.820	.676	.511
	(.035)	(.035)	(.035)	(1.364)	(1.329)	(1.328)
Age squared	–.028**	–.028**	–.026**	–.098	–.121	–.067
	(.009)	(.009)	(.009)	(.348)	(.338)	(.338)
Public sector	–.087***	–.088***	.182	–.738	.658	–10.254
	(.023)	(.024)	(.180)	(.880)	(.891)	(6.832)
Years of education	.061***	.060***	.069***	5.082***	5.707***	5.367***
	(.006)	(.008)	(.011)	(.241)	(.296)	(.405)
Field of study						
General		Ref	Ref		Ref	Ref
Teacher training		.006	–.027		–.685	–5.453
		(.050)	(.100)		(1.882)	(3.802)
Arts and humanities		–.044	–.152~		–5.227*	–8.493*
		(.064)	(.087)		(2.419)	(3.299)
Social-behavioral		–.009	–.136~		–6.615**	–8.611**
		(.051)	(.126)		(1.935)	(2.632)
Economic/business/law		.021	.049		.878	–.762
		(.034)	(.043)		(1.280)	(1.617)
Technical/nature		.029	.036		–3.366**	–5.355***
		(.033)	(.042)		(1.254)	(1.578)
Health care		.037	.069		–13.28***	–10.918*
		(.047)	(.127)		(1.776)	(4.807)
Agriculture		–.161~	–.218*		–2.051	–6.521
		(.085)	(.105)		(3.219)	(3.960)
Public sector × Years of education			–.022			.575
			(.016)			(.589)
Public sector × Field of study						
General			Ref			Ref
Teacher training			.074			7.275
			(.118)			(4.483)
Arts and humanities			.242~			7.128
			(.128)			(4.839)
Social-behavioral			.270**			4.986
			(.102)			(3.847)
Economic/business/law			–.085			4.496~
			(.069)			(2.624)
Technical/nature			–.024			5.964*
			(.065)			(2.480)
Health care			–.010			–.764
			(.138)			(5.229)
Agriculture			.186			12.153~
			(.178)			(6.737)
Adjusted R^2	.155	.156	.163	.278	.322	.328

~ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (two-tailed).

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effect in the private sector than in the public sector, which confirms earlier findings for Norway (Barth and Røed, 2001).

With regard to occupational status, the results are somewhat different. First, there is no gender difference in status once we hold constant for educational level, age, and sector. This can be explained by the fact that men and women with similar characteristics have access to the same occupations, but seem to be paid differently within the same occupations. Age has no impact on occupational status at all.

Field of study has a stronger impact on status than on wages in Norway. The overall picture is that, among people with comparable years of schooling, general education gives access to jobs of relatively high status. Fields of study that lead to lower status than general education are the arts and humanities, technical/nature, and health care. The relatively low occupational status of people within technical fields has been explained by the fact that the direct applicability of technical skills makes it unlikely for these people to obtain status-enhancing job attributes such as supervisory and management tasks (Van de Werfhorst and Kraaykamp, 2001). In the public sector, teacher training and technical training give higher status than in the private sector (Model 3), but further differences across sectors are negligible.

Australia

Table 4 shows the effects of regression of wages and occupational status in Australia and we can see the points of similarity and difference between Australia and Norway. The gender wage gap is approximately the same size. However, the impact of age is not as substantial as is usually found in economic models on wage returns to human capital. The returns to schooling are 4.9 percent. In Model 2, we see that field of study has a stronger impact on wages in Australia than in Norway. Fields of study that pay off particularly well are teacher training, economically oriented fields, and health care. Plausibly, the argument put forward above – that field of study is more indicative of labor market commitment in liberal welfare states than in social-democratic welfare states – explains the difference between Australia and Norway. Educational systems in Norway and Australia both have a vocational component, though not in a dual apprenticeship system as in the Netherlands. One important way in which Australia differs from Norway is that social benefits depend much more on previous work experience, making the choice for an educational field a crucial decision. This may result in larger homogeneity in labor market commitment within fields of study, providing employers with useful screening information on applicants.

Differences between sectors show that the arts and humanities lead to lower wages in the private sector, and that health care programs do particularly well in the private sector. This is again typical for a liberal welfare state, where a substantial part of health care is organized in the private sector.

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Table 4.
Regression of wages and occupational status on selected independent variables, *Australia* (standard errors in brackets)

	Wages (logged)			ISEI		
Model	**1**	**2**	**3**	**1**	**2**	**3**
Constant	1.808***	1.879***	1.852***	10.306***	16.528***	16.47***
	(.062)	(.069)	(.093)	(1.530)	(1.638)	(2.220)
Gender (Female = 1)	–.160***	–.178***	–.176***	2.311***	–3.066***	–3.131***
	(.023)	(.026)	(.026)	(.559)	(.619)	(.618)
Age (/10, 25 = 0)	.072~	.070~	.067	2.568**	1.751~	1.666~
	(.039)	(.039)	(.040)	(.964)	(.939)	(.941)
Age squared	–.005	–.006	–.005	–.384	–.220	–.194
	(.011)	(.011)	(.011)	(.269)	(.262)	(.262)
Public sector	.026	.016	.074	2.008***	1.503**	1.884
	(.023)	(.023)	(.111)	(.561)	(.553)	(2.637)
Years of education	.049***	.042***	.044***	3.001***	2.433***	2.516***
	(.004)	(.005)	(.008)	(.106)	(.127)	(.189)
Field of study						
General		Ref	Ref		Ref	Ref
Teacher training		.105*	.028		11.69***	6.468**
		(.052)	(.102)		(1.236)	(2.415)
Arts and humanities		–.097	–.246*		6.462***	4.737~
		(.080)	(.119)		(1.917)	(2.826)
Social-behavioral		.041	.015		.651	–4.207~
		(.067)	(.097)		(1.601)	(2.313)
Economic/business/law		.112*	.098		7.095***	7.778***
		(.045)	(.062)		(1.062)	(1.486)
Technical/nature		.037	.046		.824	–1.228
		(.033)	(.044)		(.793)	(1.052)
Health care		.152***	.259***		–.452	–1.974
		(.044)	(.069)		(1.048)	(1.651)
Agriculture		–.050	.030		–6.773*	–5.808
		(.117)	(.205)		(2.803)	(4.882)
Public sector × Years of education			–.005			–.211
			(.010)			(.246)
Public sector × Field of study						
General			Ref			Ref
Teacher training			.098			7.973**
			(.118)			(2.813)
Arts and humanities			.271~			3.910
			(.161)			(3.839)
Social-behavioral			.051			9.760**
			(.135)			(3.204)
Economic/business/law			.027			–1.051
			(.089)			(2.119)
Technical/nature			–.019			4.706**
			(.063)			(1.500)
Health care			–.171~			3.268
			(.088)			(2.102)
Agriculture			–.117			–.387
			(.249)			(5.929)
Adjusted R^2	.076	.082	.082	.284	.326	.331

~ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (two-tailed).

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As regards occupational status, specialization in teacher training, the arts and humanities, and the social and economic sciences leads to advantageous positions. The status benefits of the teaching field are larger in the public sector than in the private sector (Model 3). The economically oriented field leads to status benefits in both the private and the public sector. As we also saw for Norway, the technically oriented field leads to higher status in the public sector than in the private sector. Agricultural training generally leads to low occupational status, plausibly through the strong link with the farming occupations which generally have low occupational status (Ganzeboom et al., 1992).

If we compare the effects of field of study on wages and on status, we see that there might be a trade-off between wages and status. In particular, the choice for the arts and humanities, which is related to social backgrounds rich in cultural capital (Van de Werfhorst et al., 2001), seems to lead to higher status but to lower incomes. Indirectly this seems to be in line with the hypothesis proposed by De Graaf (1988), who argues that people who strive for post-materialist goals, like self-actualization and democratic rights, prefer higher occupational prestige to higher incomes. Materialists, on the other hand, prefer higher incomes to higher prestige.

The Netherlands

Table 5 shows the parameter estimates for the Netherlands. The gender gap in wages is somewhat higher in the Netherlands than it is in the other two countries (25 percent). Age has the usual curvilinear impact on wages. The rate of return to years of schooling is 5.9 percent, which is similar to the 1992 rate of 5.6 percent estimated by Smits et al. (2001).

Model 2 shows that there is a substantial impact of field of study, independent of years of schooling, on wages in the Netherlands. This confirms the hypothesis that the skills that employees learned in the Dutch educational system are highly transparent to employers. Most fields of study lead to higher incomes than general education, with the exception of health care and agriculture. Separating the education effects by sector leaves few significant parameters. However, the economically oriented field of study pays well in the private sector in particular (cf. Van de Werfhorst, 2002), and the teaching field pays off in the public sector.

With regard to occupational status, teacher education leads to higher status, as do the arts and humanities, economics, and technical fields. Status benefits of economically oriented fields of study are restricted to the private sector. There is no support for the trade-off hypothesis posed above; where a lower income might be acceptable if the job has a higher status.

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Table 5.
Regression of wages and occupational status on selected independent variables, *the Netherlands* (standard errors in brackets)

	Wages (logged)			ISEI		
Model	**1**	**2**	**3**	**1**	**2**	**3**
Constant	1.835***	1.929***	1.939***	10.184***	13.620***	18.46***
	(.042)	(.051)	(.063)	(1.742)	(2.079)	(2.549)
Gender (Female = 1)	–.251***	–.245***	–.243***	–.846	–.250	–.063
	(.018)	(.018)	(.018)	(.725)	(.751)	(.750)
Age (/10, 25 = 0)	.279***	.290***	.290***	4.002***	4.422***	4.215**
	(.030)	(.030)	(.030)	(1.236)	(1.228)	(1.223)
Age squared	–.054***	–.058***	–.057***	–.811*	–.956**	–.919*
	(.009)	(.009)	(.009)	(.369)	(.365)	(.363)
Public sector	.014	.015	–.023	1.576*	1.435~	–10.837**
	(.017)	(.018)	(.092)	(.715)	(.745)	(3.734)
Years of education	.059***	.046***	.046***	2.906***	2.452***	2.004***
	(.003)	(.005)	(.006)	(.120)	(.184)	(.237)
Field of study						
General		Ref	Ref		Ref	Ref
Teacher training		.096*	–.044		8.133***	.728
		(.040)	(.087)		(1.641)	(3.535)
Arts and humanities		.170**	.100		3.874~	2.134
		(.051)	(.076)		(2.092)	(3.102)
Social-behavioral		.050	.011		–1.494	2.116
		(.041)	(.068)		(1.658)	(2.747)
Economic/business/law		.117***	.099*		4.657***	5.754***
		(.030)	(.038)		(1.240)	(1.554)
Technical/nature		.102**	.078*		3.449*	4.888**
		(.033)	(.040)		(1.337)	(1.616)
Health care		.034	–.080		–.882	1.662
		(.040)	(.076)		(1.639)	(3.078)
Agriculture		–.035	–.021		–1.750	2.572
		(.065)	(.089)		(2.658)	(3.612)
Public sector × Years of education			–.001			1.147**
			(.009)			(.372)
Public sector × Field of study						
General			Ref			Ref
Teacher training			.195~			6.018
			(.102)			(4.131)
Arts and humanities			.141			.733
			(.105)			(4.257)
Social-behavioral			.083			–7.058*
			(.087)			(3.532)
Economic/business/law			.057			–2.623
			(.063)			(2.546)
Technical/nature			.084			–3.160
			(.070)			(2.848)
Health care			.174~			–5.079
			(.091)			(3.717)
Agriculture			–.009			–9.679~
			(.131)			(5.309)
Adjusted R^2	.327	.335	.336	.294	.315	.324

~ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (two-tailed).

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Differences in Effects of Fields of Study between Educational Levels

We now turn to the question of whether the observed differences in earnings and occupational status between fields of study are similar across educational levels, or whether some fields offer advantages at academic university level whereas other fields lead to advantageous positions if they are taken at lower levels of schooling. This question is answered by including interaction effects between field of study and educational level. The results of this analysis are displayed in Figure 1.

Among Norwegians with regular university degrees people educated in commercial and economically oriented study programs have by far the highest wages, but not the highest occupational status. In terms of status, people educated in less market-oriented programs (in particular the social/behavioral and technical/nature oriented programs) do better than commercially qualified people. This is in line with the trade-off hypothesis that people in these fields opt for higher status relative to earnings, whereas the economically oriented individuals prefer high incomes to high status. As it was possible to distinguish postgraduate degrees with the Norwegian data, it is furthermore evident that most postgraduate courses lead to very high incomes (approximately three times the standard deviation in predicted logged wage), but there is not much variation among them. With regard to occupational status, the health-oriented programs reach the highest occupational status (medical doctors).

In Australia, less divergence is observed between fields of study within educational levels. All university degrees pay well in the labor market, and lead to positions of higher status. Some of this lack of variation is related to the fact that postgraduate degrees could not be distinguished from first degrees. This means, for example, that medical doctors could not be separated from other health-oriented programs at first-degree level, which are sometimes below degree level in the other countries (e.g. physiotherapy).

In the Netherlands there is much more variation within levels, but the between-field differences are similar across educational levels. This confirms earlier suggestions that between-field variation is similar across educational levels (Van de Werfhorst, 2001, 2002). One exception is the medical field, which leads to very high occupational status at university level (medical doctors) but not at non-university tertiary education (all kinds of therapy programs at vocational college level). It is important to see that the art/humanities field has similar wages and status levels for both tertiary levels. It should also be stressed that, at the secondary level, general education is the best option to reach high status, but to reach high incomes it is as profitable to enter economically and technically oriented programs.

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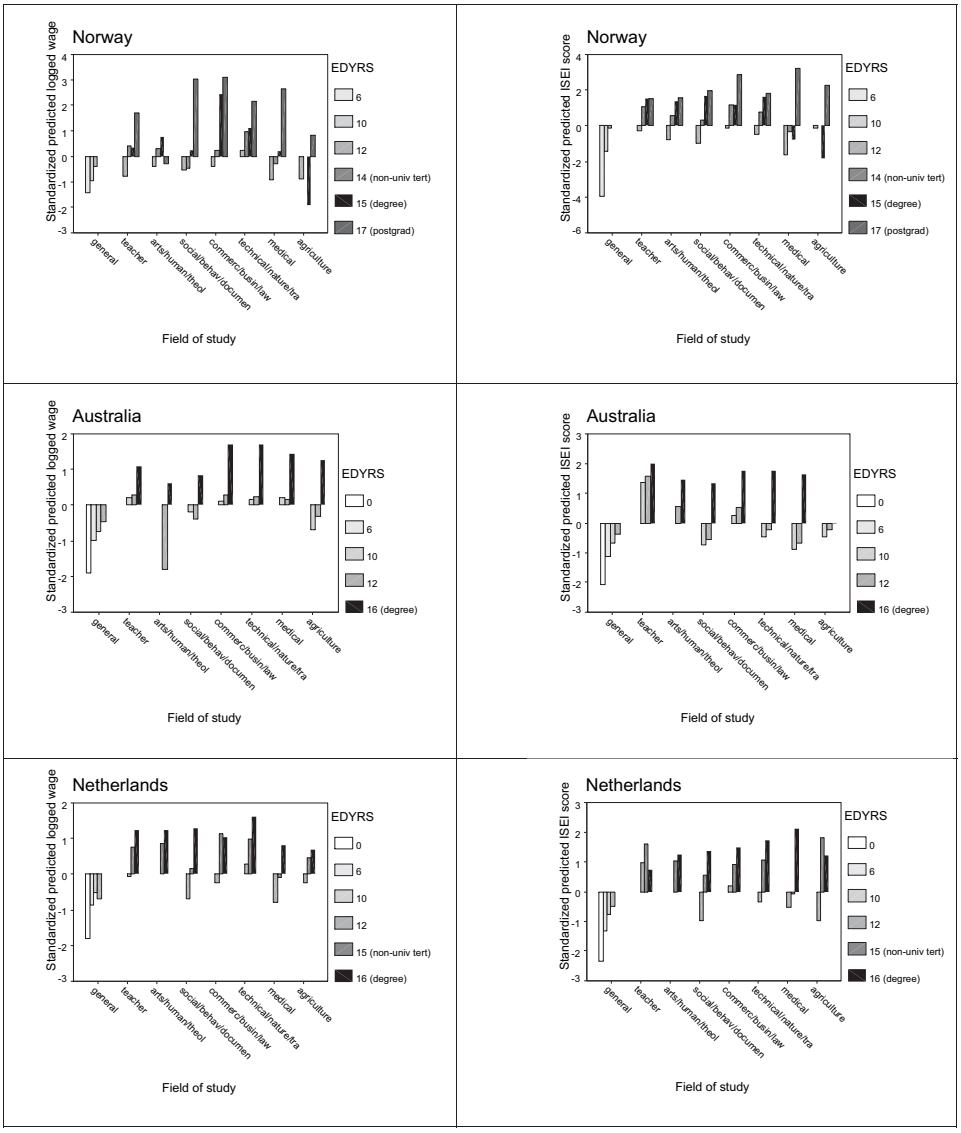
Figure 1.
Standardized predicted logged wages and ISEI scores for combinations of educational level and field of study, by country[a]



[a] Interactions are included for non-university tertiary education by fields of study (Norway and Netherlands) and university by field of study (all three countries). Other independent variables of Tables 3–5 are also included.

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Summary and Conclusions

This article has analysed the way 'systems of educational specialization' affect the impact of educational qualifications on labor market success (wages and occupational status). The argument put forward is that existing typologies of educational systems need to be updated to include the signals that *fields of study* provide to employers. In doing so, more attention is paid to international differences in the design of higher education, which is relevant given the tremendous rise in post-secondary education. Tertiary education is mostly standardized at a national level, making the 'standardization dimension' of educational systems (Allmendinger, 1989) of limited value for higher levels of schooling. The 'stratification dimension', focusing on systems of tracking in education systems, also has its main distinctive feature in secondary levels of schooling. Also, another commonly used stratification characteristic, the percentage of students entering tertiary education, does not do complete justice to crucial differences among educational systems.

The stratification dimension needs three modifications to capture most crucial differences among tertiary educational institutions in the *transparency of competencies* they offer to students. First, attention should be paid to the extent of vocationally oriented tertiary schooling. Such schooling is a very common transition in educational systems where such a school type is well-developed. A clear signal is provided by such types of education in these countries, providing, for example, better chances than universities for entering employment and avoiding unemployment in the Netherlands (Wolbers, 2000). Second, we should concentrate on whether a university system is organized in a bachelor's-master's structure. If so, it may be argued that signals obtained by workers are more diffuse as often different subjects are taken in the two degrees. Indeed, the recent EU treaty of Bologna, which standardizes educational systems across Europe in the bachelor's-master's structure from 2002 onwards, should lead to convergence of (tertiary) education effects on work across European countries in the future. A third feature of tertiary education systems that deserves attention is whether, within a degree course, students choose minor and major subjects. If this is so, then again the signals that educational qualifications send out seem to be more diffuse, as a smaller amount of time is spent on learning a specific subject.

Our results suggest that these modifications are useful to account for cross-national differences in the impact of education on work. The strongest effects of education were found in the Netherlands, a country with a highly developed secondary *and* tertiary vocational schooling system, without a bachelor's-master's structure, and no major-minor courses. The fields of study in the Netherlands provide clear signals of specialization, leading to advantageous positions compared to general schooling. In Norway and Australia the impact of education was much weaker, particularly educational subject specialization.

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Although our classification of educational systems would suggest that the impact in Norway would be larger than in Australia (Australia has a bachelor's-master's structure), we found, if anything, the opposite to be true. The reason for this may be found in other institutional features of these societies, in particular welfare state arrangements. In addition to education-related institutions, other welfare state arrangements have an impact on the transparency of competencies as well. As the eligibility for social benefits in Norway is separated from the (labor) market and strongly dependent on previous work experience in Australia (Esping-Andersen, 1990), it is important to get access to jobs immediately after leaving school in Australia. Thus, it may be argued that people choose a field of study more strongly on the basis of the labor market prospects in Australia than in Norway. This makes field of study a better signal for labor market commitment in Australia, suggesting that it makes more sense for Australian employers to reward the field of study of workers than for Norwegian employers.

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NOTES

1. It has to be acknowledged that the Australian education system has changed since 1988, in order to increase the number of people educated in non-university institutions of tertiary education (OECD, 1992). Most of the people in our cross-sectional data from 1990 were educated before that change. Although vocational colleges do exist in Norway, their labour market orientation is weaker than of the Dutch vocational colleges, with, for example, less emphasis on apprenticeships.

2. A currently undertaken international research project coordinated by Yossi Shavit looks in detail at cross-national differences in systems of higher education (www.tau.ac.il/~yshavit2/text.html). Their work too, will focus on the differences between countries in stratification between vocational colleges and academic institutions. However, their work is more centrally focused on the impact on social inequality of educational opportunities. No emphasis is put on the differential impact of fields of study on occupational outcomes between

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countries, which is, I try to show here, another important consequence of cross-national differences in systems of higher education.

3. The analyses reported below were also conducted with all adult members (with valid data) instead of one per household. These analyses showed almost identical results to the ones shown here.

4. In Norway the assigned years are six for primary education (ISCED 1); 10 to first stage of secondary level (ISCED 2); 12 for second stage of secondary level (ISCED 3); 14 for third-level non-university (ISCED 5); 15 for third-level first university degree (ISCED 6) and 17 for postgraduate degree (ISCED 7). In Australia, no education is assigned 0 years of education, primary level is coded six years, incomplete secondary level is coded 10 years, completed secondary level is coded 12 years, and university degree is coded 16 years. In the Netherlands, no education is coded 0 years of education, primary education is coded six years, lower secondary level is coded 10 years; upper secondary level is coded 12 years; non-university tertiary education (vocational college) is coded 15 years, and university degrees are assigned 16 years of education.

5. Obviously the strong impact of years of education on status stems from the fact that the ISEI status measure is based on average education levels (and income) of occupations.

6. Barth and Røed (2001) did not include the public sector in their analysis on year-by-year returns to schooling. They also used a different dataset.

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