Educational Pathways and their Role in Occupational and Class Attainment in Czech Society*

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Abstract: This article introduces a new approach to the study of the association between education and socio-economic outcomes in the Czech Republic: educational pathways, which are the primary channels of study involving at least two educational transitions with qualitatively different tracks. Based on Czech Household Panel Study data, I operationalise Czech educational pathways between secondary and tertiary education and examine the role of eight different educational paths on ESeC-derived social classes, contrasted by parental education, gender, and birth cohort. Based on the ordered logit model, I compute the predicted probability that specific educational pathways would lead to a specific class status. I find that the educational pathway approach yields distinct insights about the education-class link that would be masked had I studied only highest level of education attained. The educational pathway approach could, therefore, be a fruitful way to approach other areas of Czech social stratification research.

Keywords: educational pathways, educational attainment, social class, occupational status

The role of education in the intergenerational transmission of socio-economic status has been a cornerstone of sociological research in the last half century. In the social stratification research tradition, Blau and Duncan's [1967] structural model of status attainment conceived occupational status as determined primarily by educational attainment and indirectly by parental background (father's education and occupation), which impacts the social standing of their offspring primarily through its influence on education. The key role of educational institutions in stratifying modern society has led them to be seen as social sorting machines that create categorical differentiation among students and their credentials, thus 'intentionally sorting students into the social roles that they will ultimately play in a

complex and highly specialized adult society' [Domina, Penner and Penner 2017: 315; see also Kerckhoff 1976, 2001]. To better understand the mechanisms and mitigating factors in the effects of education on social outcomes, an entire generation of sociologists updated status attainment models to include educational and occupational aspirations, peer effects, cognitive ability, and many other factors. Despite sociologists' anxieties of not wanting to omit a decisive explanatory variable, this research has consistently affirmed the role of education as a 'universal' sorting machine across modern societies [Treiman and Ganzeboom 1990; Hout and DiPrete 2006], even if those machines differ in their degree of stratification, standardisation, and vocational specificity [Müller and Shavit 1998].

Despite the complexity and diversity of educational institutions, many studies of socio-economic status attainment continue to treat the education variable in simplistic ways. In the early years of stratification research, education was often operationalised in terms of years of completed schooling, which enabled scholars to take a blind eye to the institutional differentiation of educational systems and to universalise models of human capital formation, such as models of wage returns to years of education, still widely used today [Mincer 1974; Psacharopoulos and Patrinos 2004]. Recent studies of education as a 'positional good'—the concept that the value of education varies by its scarcity on the labour market—are also based on years of schooling, but transform it into a percentile position for the given cohort [Bol 2015; Katrňák and Doseděl 2019]. While such an approach is useful for taking into account the 'dilution' of the value of education brought about by the expansion of educational systems, it does not take into account important qualitative differences in types of schooling or the quality of educational credentials that take the same number of years to complete. For example, in the Czech context, individuals completing 4-year grammar schools or 4-year secondary professional schools would be considered to have the same number of years of education—and thus the same educational 'position'—even though there may be distinct labour market effects of their different educational credentials.

Mare [1980, 1981] was the first to break through the hegemony of years of education to conceptualise educational attainment as a sequence of binary transitions, which helped take into account institutional differentiation in educational systems. In the tradition of the Mare transition model, social stratification researchers conceive a given educational attainment as a dichotomous outcome (e.g. attaining a college degree or not), which is itself conditional on having transitioned through lower levels of educational attainment (a high school degree or not). One of the lasting contributions of educational transition models is the finding that parental background strongly shapes children's educational attainments early in life, but then declines across subsequent transitions within school and then from school to work.

One limitation of educational transition models is their reliance on binary outcomes: what if educational decisions are not binary, but involve the choice of multiple educational trajectories, each of which might have its own set of conse-

quences for future socio-economic attainment? The multinomial transition model [Breen and Jonsson 2000] directly addressed this in the case of educational stratification, i.e. with a set of educational qualifications or characteristics as the outcome variable. Multinomial models of educational attainment have been applied in the Czech context, particularly in terms of the role of family background on the transition to different secondary school tracks [Kreidl 2004, 2008]. However, the novel contribution of the Breen-Jonsson model is not the shift from binary to multinomial outcomes, but rather the conceptualisation of the primary explanatory variables, namely educational transitions as a set of *pathways* that combine both temporal sequence and qualitatively different educational tracks. In this path dependent approach, each educational pathway—defined as the combination of each relevant sequential transition and the strata of the school system at those points in time—rather than a particular educational credential has its own coefficient in determining subsequent educational or other socio-economic outcomes. Besides Kreidl's [2008] analysis of the role of delayed school entry on secondary school track, there are few other studies on the social consequences of educational pathways in the Czech Republic, and none using the novel approach presented here.

While Breen and Jonsson [2000] applied their pathway approach to multinomial educational outcomes, in this article I will apply an analogous approach to occupational and class outcomes. This approach requires a fundamental shift of theoretical perspective away from viewing education as the total accumulated human capital (summarised by years of education or highest degree attained) but rather as an *educational career* or *educational trajectory* in which earlier educational experiences shape subsequent educational decisions and may in fact retain relevance for the labour market outcomes. This understanding of the educational process was pioneered by Kerckhoff [1996, 2001], who was concerned with how educational systems 'allocate' labour market positions based upon the educational careers of pupils. Nonetheless, the operationalisation of educational careers as qualitatively distinct pathways has not been applied to research on Czech occupational and class stratification until now. The reason for this is that the logit models of this kind require detailed data on respondents' educational history, not simply the highest level of educational attainment, as is commonly asked in Czech social surveys. But by utilising data from the Czech Household Panel Study, we can finally examine the role of educational pathways on socio-economic status attainment in the Czech Republic.

This study hypothesises that occupational and class attainment is not simply determined by the highest level of education attained, but more specifically by the educational pathway respondents experienced between secondary and tertiary education. We hypothesise that these pathways may be important based on existing scientific knowledge of the importance of secondary school tracks on the transition to tertiary education and on subsequent social outcomes. If secondary school tracks are deeply important for Czech society, their relevance should

persist, even if Czechs later attain university education. If this hypothesis is correct, we would expect differences in occupational and class attainment by whether, for example, university graduates previously attended a secondary grammar school, a secondary professional school, or a secondary vocational school.

We would also expect gender differences in the role of educational pathways on occupational and class attainment, both due to gender differences in occupational structure and to gender differences in the importance of higher education on life chances. By contrast, a lack of differentiation in the effects of educational pathways within and between genders would indicate that our hypothesis on the key role of educational pathways, compared to highest education attained, should be rejected.

This article is structured as follows. The following section overviews key findings in the literature on Czech social stratification, particularly from the lens of how education is operationalised in that research. I then introduce my approach for conceptualising educational pathways and overview the data and methods used in the analysis, which involves ordinal regression of ESeC social classes by qualitatively distinct educational pathways, controlling for family background, gender, and age. I then report our results by computing the probability of attaining a particular social status by educational pathway, parental background, and gender. A discussion of the significance of the results follows.

Educational attainment vs educational stratification

In this article, I attempt to integrate two different bodies of literature on social stratification in the Czech Republic—i.e. occupational and class stratification, on the one hand, and educational stratification, on the other—which have modelled the role of education in quite different ways. First, research on class outcomes and other forms of socio-economic attainment in the Czech Republic has exclusively modelled education in terms of years of schooling or highest education attained. For example, in their comparisons of status attainment models by Šafař [1972] and more data from the post-communist period, Šafr et al. [2012] kept to existing practice and examined only years of education, but importantly found stability in the very strong effects of years of education on occupational status across Czech cohorts. One reason for the use of years of education in status attainment models of this kind is that it is easy to visual depict and substantively interpret the education variable in a structural equation path diagram.

Even more recent structural equation models of the determination of Czech occupational status have relied on the same operationalisation of education in terms of years of schooling as Šafr et al. [2012]. Incorporating data on cognitive ability collected in the PIAAC survey, Smith, Matějů and Anýžová [2018] found that respondent education remains the strongest determinant of occupational status (ISEI), with standardised coefficients roughly three times the size of the effect

of both cognitive ability and family background. Anýžová and Matějů [2018] supplemented that model by incorporating data on respondents' physical attractiveness—which impacts the income and occupational status of middle-aged Czech women, but not men—but also found that stability in the effect of education on occupational status across age, cohorts, and genders.

By contrast, Czech studies of class outcomes and class mobility often use variables on the highest level of education attained. In his study of the crystallisation of social class in the 1990s, Matějů [2000] focused on Czechs' subjective identification with the middle and upper classes as his dichotomous dependent variable, predicted by respondents' highest level of education. He found that the effect of education on social class actually declined between 1992 and 1996, leading to the conclusion that consistent linkages between dimensions of socioeconomic status, which would be expected in a crystallised system of social stratification, were still very much in flux in the period of economic transformation. In the subsequent decade, the association between educational attainment and the self-identified middle class would significantly increase [Večerník 2009].

Similarly, Katrňák and Fučík's [2010] research on intergenerational class mobility also used highest education attained as one of its explanatory variables, finding that completing the school-leaving exam (*maturita*) or attaining tertiary education contributed to upward class mobility by respondents compared to the class position of their fathers, as well as reduced the odds of downward class mobility between those generations. While they find that intergenerational upward mobility outpaced downward mobility in the two decades from 1988–2009, the effect of education on upward or downward mobility remains more or less constant during that period. Nonetheless, both downward class mobility and downward educational mobility are significant predictors of the transmission of poverty [Želinský, Mysíková and Večerník 2016].

While research on occupational status, class status, and class mobility has been content with operationalising education in terms of years or highest level attained, Czech research on educational stratification—carried out by many of the same community of authors—points to the danger of that approach. Above all, empirical analyses have shown that the high degree of institutional stratification of the Czech educational system—above all differentiation at the level of secondary education, which is one of the most extreme among OECD countries [Matějů et al. 2007]—has a decisive impact on future life chances. Attending a secondary grammar school doubles one's odds of aspiring for a managerial, professional occupation [Münich et al. 2018], while attending a vocational school is a leading risk factor for the long-term unemployment of young people [Trhlíková and Úlovcová 2010]. Surprisingly, Simonová and Soukup [2010] did not find that the type of secondary school attended had a significant effect on respondents' odds of attending tertiary education, but this is because the type of secondary school attended is itself highly sorted by family background [Kreidl 2004, 2008] and academic achievement [Matějů, Procházková and Burdová 2006]. Indeed, parents who are

themselves highly educated play a key role in ensuring their children attend a multi-year grammar school (beginning at approximately 11 years of age), as this is seen as a primary mechanism for ensuring their children also have a smooth path towards university studies [Straková and Greger 2013]. Given the importance of secondary school track, Czech sociologists have applied numerous educational transition models to estimate the size of inequalities in access to secondary and tertiary education, and whether those inequalities have changed over time as educational opportunities in tertiary education have expanded [Kreidl 2004, 2008; Simonová 2003, 2011; Katrňák, Simonová and Fónadová 2013; Smith et al. 2016].

This excursion into the core findings of Czech social stratification research has revealed a major tension between the relatively simple way education is operationalised in research on occupational and class attainment, compared to the key role of qualitatively distinct secondary school tracks on subsequent educational and occupational outcomes. The problem is that social surveys containing data on highest educational attainment do not contain information on the secondary school track attended in the case of respondents who have achieved some level of tertiary education. To overcome this impasse, I utilise new data from the Czech Household Panel Study, which contained a detailed battery of questions on respondents' educational history that was designed precisely to fill in this gap in sociological knowledge.

Data and methods

The Czech Household Panel Study (CHPS) is the first large-scale household panel survey conducted by sociologists in the Czech Republic, modelled on the British Household Panel Study and the German Socio-economic Panel. This paper utilises CHPS data from the first wave carried out in 2015, which is only wave that is publicly available as of writing. The first wave involved interviews with over 5000 households and 13000 respondents, including children. A unique aspect of the CHPS questionnaire is that it contains detailed information on the educational history of respondents, which forms the basis for this article.

The sample is truncated to adult respondents aged 25–64 at the time of the survey who have been economically active. The age 25 was selected because nearly all Czechs have completed their educational studies and entered the labour market by that time and it is a standard starting point in Czech social stratification research. The age of 64 is just before the current retirement age for both men and women (65). This also creates four 10-year birth cohorts, which is useful for contrasting education and class associations by cohort. In the end, 5047 respondents with complete data on the variables of interest were included in the main analytic sample.

Educational pathways are defined as the primary channels of study involving at least two educational transitions, which themselves have qualitatively different tracks. Our specification of these educational pathways is based on fea-

Table 1. Main educational pathways in the Czech Republic

Pathway	Description	N	% of sample
Path 1	Completed elementary education (or less), no college	382	5.3%
Path 2	Completed secondary vocational education; no college	1 892	26%
Path 3	Completed secondary professional education, but did not attain a maturita; no college	598	8.2%
Path 4	Completed secondary professional education, passed the maturita exam; no college	2 271	31.2%
Path 5	Attained secondary grammar school (gymnázium); no college	377	5.2%
Path 6	Completed secondary vocational education, follow-up studies for maturita; attained a college degree	56	0.8%
Path 7	Completed secondary professional education; attained a college degree	516	7.6%
Path 8	Completed grammar school education, attained a college degree	693	10.3%
Total		7 271	100%

tures of the Czech educational system, which have been thoroughly described elsewhere [e.g. Simonová 2011; Münich et al. 2018]. For our purposes, it is important to note the structure of upper secondary education, which has three main tracks. Only two tracks lead to a school-leaving examination *maturita* (ISCED 3A) that entitles pupils to apply for tertiary education: 4-, 6- and 8-year grammar schools (*gymnázia*), which are academically oriented, and secondary professional schools (also called secondary technical schools in the literature), providing a more skills-based education for a variety of professional occupations, such as in science and engineering, pedagogy, medical fields, and so on. The third track, vocational schools (also referred to as apprenticeship programmes), prepare pupils for lower level vocations (e.g. cooking, horticulture, hotel operations, carpentry, etc.), typically last three years and is concluded by an apprenticeship certificate (ISCED 3C), which does not qualify them for tertiary school entry. However, a small share of pupils in vocational schools later attend follow-up studies to pass the *maturita* exam, which entitles them to apply for tertiary education.

Keeping in mind these basic characteristics of Czech secondary education, I identify the following educational pathways in Table 1, each of which can be specified by a separate dummy variable.

The first five paths were identified on the basis of a detailed question on respondents' highest education attained. Path 1 groups together respondents who attended only elementary education, or dropped out of school before completion. Path 2 includes respondents to completed secondary vocational education, which ordinarily ends with a certificate and not the *maturita* school-leaving exam, and thus did not attend college. However, I also include here a few respondents who completed vocational education and ultimately also received the *maturita*, but did not attend college. Because there are so few of such individuals, they do not constitute a separate path. Path 3 and 4 characterise respondents who completed secondary professional education, the most common form of secondary education in the Czech Republic and former Czechoslovakia, but did not continue to tertiary education. Because of their sizable numbers, we can differentiate those who received the *maturita* (Path 4), a valued credential on the labour market, versus those who did not (Path 3). Technically, respondents in Path 4 but not in Path 3 have completed professional education. This distinction, which is often masked in other studies of the effects of Czech education, is highly important because many jobs on the Czech labour market require a *maturita* or higher. In that regard, our educational pathway approach does not only differentiate types of school attended, but also the credentials attained.

Path 5 includes respondents who completed secondary education at a 3-year, 4-year, 6-year, or 8-year grammar school, but who did not follow up with tertiary education. Because the possible lengths of grammar schools have changed over the age distribution, and because relatively few older respondents attained 6- or 8-year gymnázium education at the time of the survey, Path 5 includes all forms of grammar schools.

Paths 6, 7, and 8 include all respondents who attained tertiary education. We are able to differentiate their pathways on the basis of a separate question asking what kind of secondary school they attended. Path 6 codes for secondary vocational education, Path 7 for secondary professional education, and Path 8 for grammar schools. As is evident, very few respondents (0.8%) attended secondary vocational schools, passed the *maturita* exam, and subsequently attained a tertiary education degree. However, because this represents a very specific pathway to escape from a dead-end track, and because such individuals have not been studied before in the framework of a large-scale social survey, we find it meaningful to incorporate those respondents into a separate path. Even if the number of respondents in that path is too small to interpret their coefficients with any degree of confidence, that subgroup has great relevance for educational and social policy. Future studies on educational pathways with larger datasets are also being planned, and thus keeping Path 6 is important for future research.

The only respondents we had to drop from our analysis are 618 persons who attained tertiary education, but did not specify what kind of secondary education they received. Obviously, the educational pathway approach used here requires complete information on both secondary and tertiary education. While it is lamentable we had to drop those respondents, we also determined that their class struc-

ture and family background are nearly identical to the population of university graduates who provided information on secondary education. Therefore, we do not believe that dropping those respondents bias the results in any way.

Readers may wonder why we differentiate secondary school tracks in a detailed way, but not tertiary education degrees. The reason is because before Czech membership in the EU (and the implementation of the Bologna process), few Czechs received only a bachelor's degree (4% of the total sample), as it was—and still is—common to study primarily for a master's degree, attained in about 5 years (18.4% of the total sample). Differentiated by secondary school track, it would not be possible to constitute pathways to undergraduate education with a sufficient sample size. It would be possible, however, to differentiate university educated Czechs by their field of study, for example, but that analysis would require full treatment in a separate paper.

For the dependent variable, for preliminary analyses we use a standard measure of occupational status (ISEI), based on the ISCO-08 classification. We use ISEI because it is the most common measure of socio-economic status attainment used in the Czech social stratification literature. We thus use ISEI for benchmark comparisons when considering the role of the educational pathways above, compared to standard approaches of highest education attained.

Our primary dependent variable, however, is social class, based on the ESeC classification (European Socio-economic Classification). This classification was based on comparative analyses of class structures in European countries [Rose and Harrison 2010], has not yet been widely used by Czech sociologists, who overwhelmingly adopted the EGP class schema [Tuček 2003]. The EGP schema was developed primarily on the analysis of British social classes [Goldthorpe, Llewellyn and Payne 1980], then applied across Europe [Erikson and Goldthorpe 1992]. The ESeC schema, which is rooted in the EGP schema, was developed by a large consortium of research institutions in order to ensure that social class schema are based on the data of EU member states and can be used for comparing class structure across the EU.[1] A detailed comparison of the class schema and their empirical application on Czech data can be found in Katrňák and Fučík [2010], Šafr et al. [2012], and Katrňák [2012], who argue in favour of using the ESeC schema for studies of Czech social stratification. As that analysis played a key role in the construction of occupational, employment, and workplace questions in the Czech Household Panel Study analysed in this article, we use the ESeC schema here.

However, as with Katrňák and Fučík [2010], we drop long-term unemployed or never employed respondents as a social class, as it is not evident such persons (e.g. stay at home mothers, adult students, long-term unemployed, etc.) constitute a coherent social class. Trying to put such diverse persons into a single social

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[1] For details on the development of the ESeC, see https://www.iser.essex.ac.uk/archives/esec.

Table 2. Description of Czech social classes, based on the ESeC schema

Class name	ESeC Class	N	% of sample
Managerial class	Identical to ESeC class 1: large employers, higher grade professional, administrative and managerial occupations	1 063	20.3%
Technical class	Identical to ESeC class 2: lower grade professional, administrative, and managerial occupations and higher grade technician and supervisory occupations	1 115	21.3%
Lower service class	Comprises ESeC classes 3, 4, 5, and 7: self-employed and small employers, intermediate occupations, and lower services, sales, and clerical occupations	1 451	27.7%
Skilled manual class	ESeC classes 6 and 8: higher grade blue-collar workers and skilled blue-collar workers	870	16.6%
Unskilled manual class	Identical to ESeC class 9: routine occupations, i.e. semi- and non-skilled workers	740	14.1%
Total		5 239	100%

class, or trying to impute class position based on auxiliary data, would introduce other forms of bias, and thus I do not go down that road.

In addition, I reduce the 9-class ESeC scheme into five social classes, but in a way different from the standard approach used in Rose and Harrison [2010]. This is depicted in Table 2.

There are several reasons for this approach. First, the standard shortened versions of the ESeC classification call for the merging of ESeC classes 1 and 2, which would be 41.6% of our sample. Given the importance of Czechs' aspirations to join the managerial class [Münich et al. 2017], and given the size of these classes, I choose to keep them conceptually distinct.[2] Doing so also adds variation in the high end of the classification. Similarly, I maintain variation at the lower end of the classification by keeping ESeC classes 8 and 9 as intact as possible, with the small revision of including ESeC class 6 (higher grade blue-collar workers with mixed contracts; 332 respondents) with ESeC class 8 (skilled blue-collar workers on labour contracts; 538 respondents), given the similarity of their occupations and that both classes are relatively small. Lastly, I group the remaining ESeC classes into the lower service class, which is technically not a class at all but

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[2] Harry Ganzeboom, a foremost author on occupational and class structure, also recommends keeping these classes distinct (see http://www.harryganzeboom.nl/isco08/qa-isec-08.htm).

instead groups respondents who are primarily self-employed, run small businesses, or work in lower level administrative and sales positions. Together, they constitute lower level workers in the service economy, as commonly understood. This re-classification is also useful given that some of the ESeC classes are very small (e.g. only 19 self-employed respondents in agriculture, ESeC class 5). We use this 'lower service class' primarily as a point of reference for comparisons with the two white-collar and two blue-collar classes in our analysis.

As the main task here is to analyse the association between educational pathways and social class destinations, I keep the analysis straightforward in terms of contrast variables. I differentiate associations in the education-class link in terms of sex (women = 1, men = 0), age category dummies for ages 25–34, 35–44, 45–54, and 55–64, and the highest education of either parent (four dummy variables for basic education, vocational or professional education without a maturita, vocational or secondary education with a maturita, and university education). I group father's and mother's education in this way in order to reduce the number of cases with missing values. While it would be valuable to include a variable on father's or mother's occupation in the main analysis, there are too many missing values for those variables and preliminary analyses indicated that neither has a significant effect on class attainment, especially in comparison to parental education.

My statistical approach is also straightforward. Following Katrňák [2012], who views 6-class EGP and ESeC classifications as ordinal, I use ordered logit regression of the five social classes. The test of parallel lines indicated the slope coefficients across response categories are similar, validating the appropriateness of the ordinal regression approach compared to multinomial regression. All explanatory variables used in the main analysis are dichotomous, making coefficients easy to interpret. Given the importance of gender gaps in both education and the labour market [e.g. Mysíková 2012], I analyse both sexes together and introduce interaction terms between sex and all of the other explanatory variables in the model, so that the main effects can easily be interpreted as the logit coefficients for men. As it is difficult to interpret log-odds of educational pathways across values of contrast variables of interest, such as parental education, I compute the predicted probabilities of attaining a given social class for each respondent and then plot the means of those predicted probabilities across values of contrast variables.

Results

To better understand the role of educational pathways on socio-economic status attainment, compared to the role of highest education attained, I first run simple OLS regressions of those education variables on occupational status (ISEI), with standard controls (Table 3). All explanatory variables in the model are dichotomous.

Table 3. The role of highest level of education vs educational pathways on occupational status (ISEI). Unstandardised coefficients from OLS regressions with standard errors in parentheses—first part

Variable	Baseline model: highest level of education	New approach: educational pathways
Intercept	21.101 *** (1.274)	21.750 *** (1.273)
Elementary education (reference)		
Secondary education without maturita	5.144 *** (1.058)	
Secondary education with maturita	21.620 *** (1.057)	
Tertiary education	39.332 *** (1.126)	
Path 1 (reference)		
Path 2		5.419 *** (1.073)
Path 3		6.834 *** (1.230)
Path 4		22.056 *** (1.067)
Path 5		22.970 *** (1.401)
Path 6		34.137 *** (2.331)
Path 7		37.656 *** (1.240)
Path 8		41.205 *** (1.207)
Female	1.921 *** (0.444)	1.377 *** (0.447)
Age: 25–34 (reference)		
Age: 35–44	1.178 (0.659)	1.207 (0.658)
Age: 45–54	1.718 * (0.678)	1.685 * (0.677)
Age: 55–64	2.601 *** (0.678)	2.294 ** (0.676)

Table 3. The role of highest level of education vs educational pathways on occupational status (ISEI). Unstandardized coefficients from OLS regressions with standard errors in parentheses—second part

Variable	Baseline model: highest level of education	New approach: educational pathways
Parental education: Elementary (reference)		
Parental education: Secondary w/o maturita	0.058 (0.842)	−0.155 (0.841)
Parental education: Secondary with maturita	2.861 ** (0.886)	2.688 ** (0.886)
Parental education: Tertiary	4.673 *** (1.022)	4.045 *** (1.028)
R-square	0.455	0.457
AIC	27738.037	27687.534

*** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

A comparison of the baseline approach—involving typical dummy variables for highest education attained that can be generated from most Czech social surveys—and the new educational pathways approach reveals several important findings. Estimates for tertiary education in the baseline model overestimate the effect of having that educational credential for respondents who went to secondary vocational or professional schools and underestimate it for respondents who attended secondary grammar schools. Such differences may not seem to matter, but a difference of four points in ISEI can mean the difference between top professionals and the associates who work just under them. The difference in Paths 6 and 8 (university educated respondents, but who attended secondary vocational and follow-up studies, versus those who went to grammar schools) is particularly large. This suggests that the various unobserved characteristics of vocational education, or of the students sorted into them, persist on the labour market, even after attaining a university diploma.

My detailed approach to classifying educational pathways also reveals the importance of differentiating respondents without a *maturita* into those who went to secondary vocational or professional schools. On the other hand, occupational status depending on whether respondents attained secondary professional education (Path 4) and grammar school education (Path 5) are basically the same, as both groups of respondents have passed the *maturita* exam. Also note the decline in the role of gender from the baseline to the pathways model, suggesting the possibility that some educational pathways might be sufficiently gendered to account for some of the variation in the direct gender effect.

Table 4. Log-odds from ordinal regression, with two-way interactions of all variables with sex. Standard errors in parentheses

	Main effects	Interaction effects (by female)
Path 1: Basic education, no college (reference)	--	--
Path 2: Secondary vocational school, no college	0.459 * (0.184)	0.473 * (0.204)
Path 3: Secondary professional education, no maturita, no college	0.633 ** (0.215)	0.307 (0.249)
Path 4: Secondary professional education, maturita, no college	2.310 *** (0.189)	0.327 (0.205)
Path 5: Gymnázium, no college	2.428 *** (0.272)	0.342 (0.312)
Path 6: Secondary vocational school, college	3.411 *** (0.346)	0.202 (0.572)
Path 7: Secondary professional education, maturita, college	3.850 *** (0.218)	−0.285 (0.254)
Path 8: Gymnázium, college	4.022 *** (0.225)	−0.355 (0.250)
Parents' highest education: basic (reference)	--	--
Parents' highest education: secondary without maturita	0.050 (0.144)	−0.026 (0.178)
Parents' highest education: secondary with maturita	0.274 (0.151)	0.025 (0.190)
Parents' highest education: university	0.479 * (0.177)	−0.025 (0.226)
Age: 25–34 (reference)	--	--
Age: 35–44	0.071 (0.114)	0.018 (0.149)
Age: 45–54	0.104 (0.118)	0.071 (0.153)
Age: 55–64	0.097 (0.115)	0.238 (0.149)
Observations	5.047	
Nagelkerke R-square	0.374	

*** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

Lastly, the educational pathways model has a marginally higher explained variance and scores better on other model selection criteria, such as AIC, as well as all other criteria of significance. The fact that nearly half of the explained variance in occupational status is accounted for by just a few factors clearly demonstrates that the Czech labour market is highly stratified by educational background, regardless of how education is operationalised. Nonetheless, we should not make too much of the very minor differences in explained variance and model fit between the two approaches. Both the baseline approach and the educational pathways approach provide similarly robust depictions of the association between education and occupational status. The additive contribution of the educational pathways approach is not an increase in explanatory power or statistical significance, but rather an increased nuance in how we substantively understand the allocation of occupational positions by educational careers. Following the work of Soukup [2019] and Soukup and Rabušic [2007], I also caution against interpreting the results only in terms of statistical significance, instead focusing on the differences in substantive understanding brought about the two different approaches to the effect of education.

Based on these results, I ran an ordered logit model of the five social classes with the same variables as the educational pathways model in Table 3. The only difference is that I now interact the female dummy variable with all other explanatory variables in the model. The results are reported in Table 4. The logits should be interpreted as the log-odds of being in higher social classes (managerial class at the top) for each unit change in the predictors, which in this case are all [0,1]. Gender is a substantively important intervening variable in the association between educational pathways and social class, particularly for respondents with vocational education without a maturita (Path 2), which is dominated by men. While the interactions are generally not significant, university educated men having attended secondary professional or grammar schools do have higher odds of attaining higher class status than women who have traversed the same educational pathways.

Because these logits are difficult to interpret, particularly across intervals of social class and relevant values of the predictors, I plot the results in Table 4 in terms of predicted probabilities of attaining a particular social class, by educational pathway, gender, and parental background. I do not plot predicted probabilities by age cohort—though this is certainly possible—because the effect of age groups were small and insignificant, leading the graphs to look like parallel lines. The weak effect of age *may* suggest stability in the association of educational pathways and social classes across time and levels of experience in the labour market. Stability in effects would be significant given that our respondents entered the labour market under vastly different conditions: from the normalisation period after the Prague Spring, the 'wild' economic transition to the market economy in the 1990s, and the more recent periods of economic growth since membership in the EU. Other studies have also found stability in cohort and pe-

riod effects in the role of education on the labour market [Šafr et al. 2012] and my results are generally in line with those. Nonetheless, further cohort-based studies of class and occupational status using different social surveys are needed to reach definitive conclusions about whether there is in fact stability in these cohort effects.

The predicted probabilities are reported in Figures 1–5, each with two panels, one for men and one for women. In terms of the probabilities in attaining the managerial class (Figure 1), there is a substantial difference between men and women: differences in secondary school background among college educated men have a substantial impact on class attainment, but this does not appear to be the case for women. For college educated men with a college educated parent, their predicted probability of becoming managers stands at 42% for those who attended vocational schools, 54% for those who attended professional schools, and 58% for those who attended grammar schools. Another feature of these probabilities are the large differences in pathways by educational credential: there are no differences between Paths 1, 2 and 3 for both genders, and a large gap is present between those paths and Paths 4 and 5 (respondents with a *maturita*, but no college education) and other gap between them and the college educated. In both panels, the trend-line is upward sloping, reflecting a modest effect of parental education on their children's class outcome, especially for respondents with university educated parents.

The link between educational pathways and social class is quite different in the case of the technical class (ESeC class 2, depicted in Figure 2) compared to the managerial class. These differences would have been entirely masked had we followed conventional wisdom in merging ESeC class categories 1 and 2. While educational credentials (and the higher educational pathways among men) seem to be decisive predictors of managerial status, such factors play a much smaller role for the technical class. Surprisingly, university educated respondents do not sort by educational pathway, and they have the same probability of attaining this professional class status as respondents who only passed the *maturita* exam. By contrast, this class status is out of reach for Czech men and women without *maturita*.

I will not comment much on Figure 3, which depicts the probability of attaining a multitude of lower service class jobs (or self-employment in the service sector), rather than one coherent social class. My recoding of the 'lower service class' probably explains the flux in the effect of educational pathways, as well as by parental education. We can clearly see, however, that tertiary educated parents seem to try to prevent their children from entering these social classes, orienting them towards technical and managerial classes instead. In other words, there is a resorting in the association between educational pathways and the lower service class by the level of parental education.

Moving to the more coherent class of skilled manual workers, both employed and self-employed (e.g. skilled craftsmen), the most likely group of Czechs
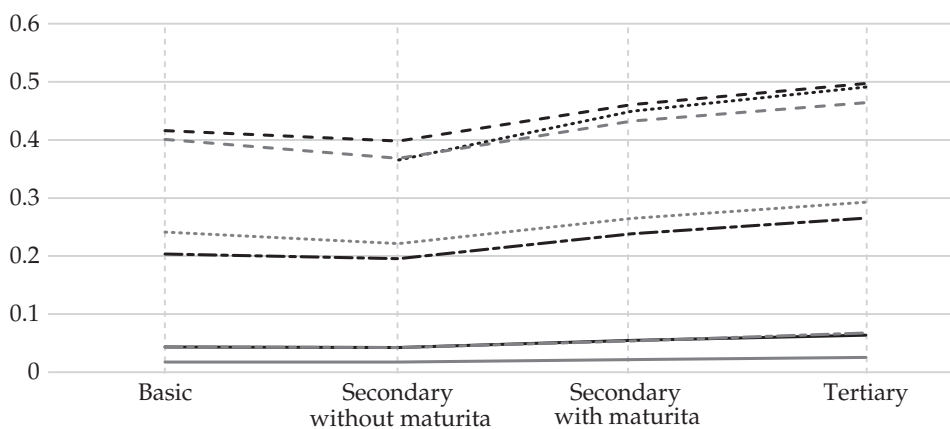
Figure 1. Predicted probability of managerial class by parental education (x-axis) and respondent educational pathway
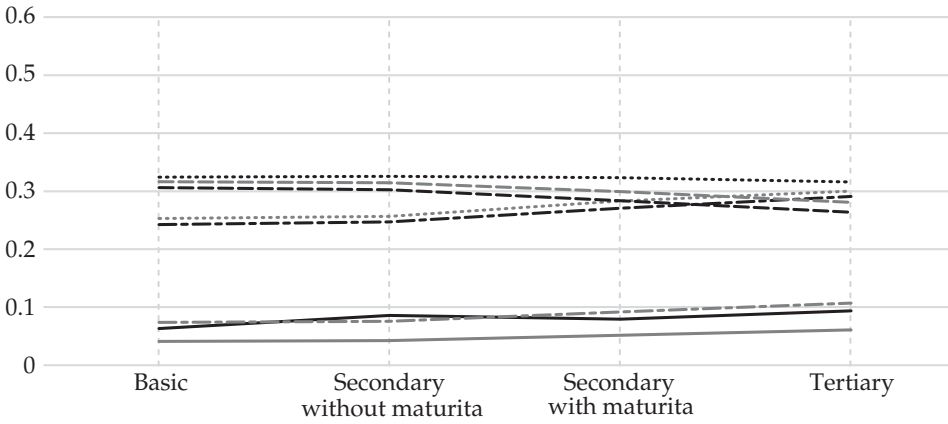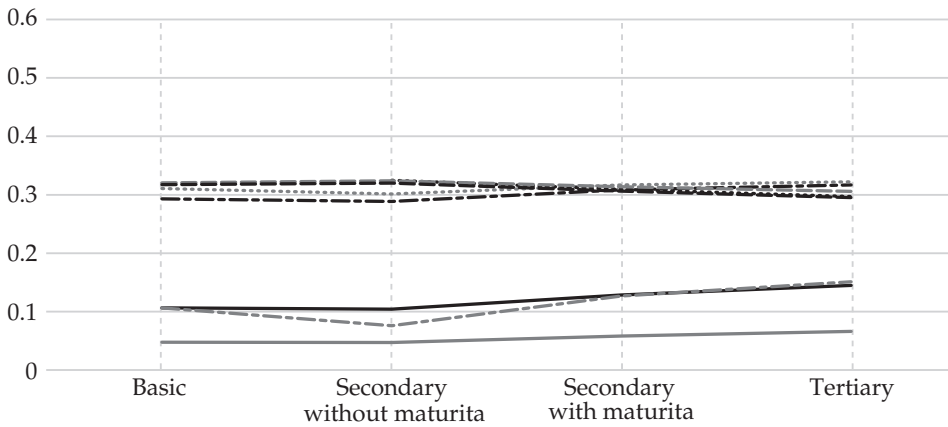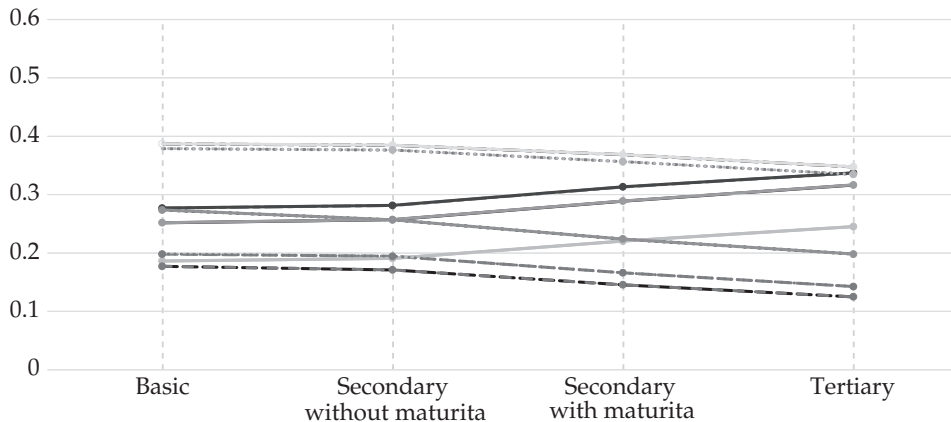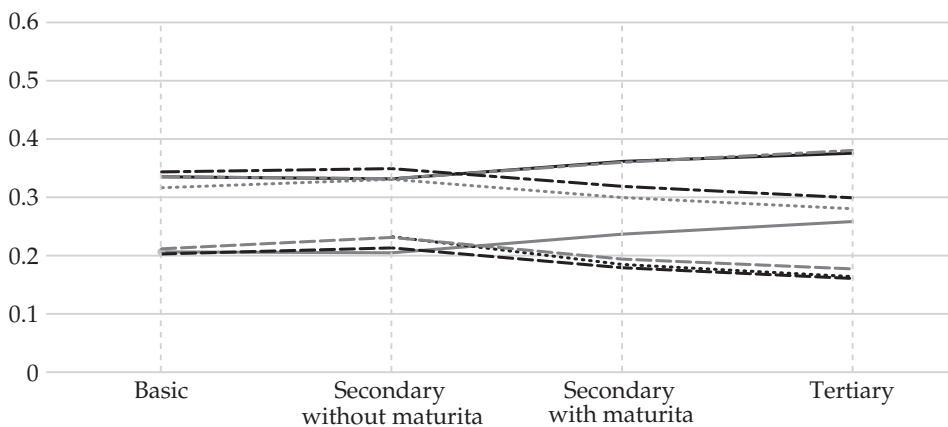
Panel A: Men
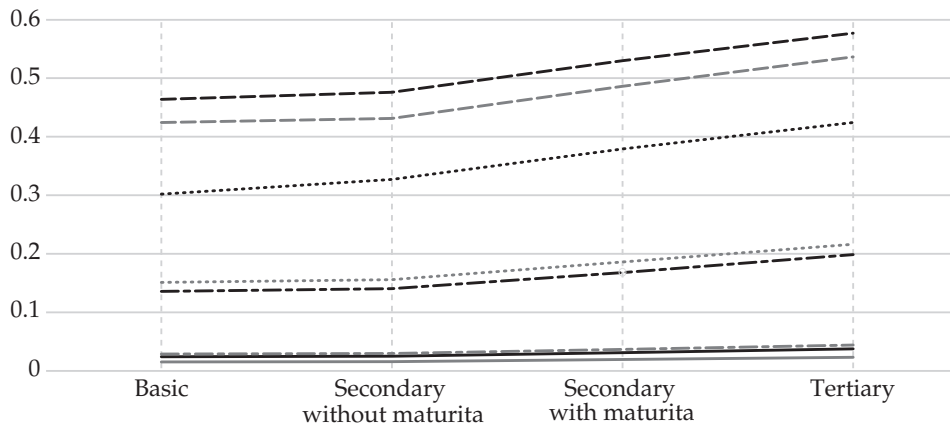
Panel B: Women

— Elementary education

— Vocational, no college

--- Professional without maturita, no college

---- Professional with maturita, no college

······· Grammar school, no college

········ Vocational, college

--- Professional with maturita, college

--- Grammar school, college

Figure 2. Predicted probability of technical class by parental education (x-axis) and respondent educational pathway

Panel A: Men

Panel B: Women

Legend:
- Elementary education
- Professional without maturita, no college
- Grammar school, no college
- Professional with maturita, college
- Vocational, no college
- Professional with maturita, no college
- Vocational, college
- Grammar school, college

Figure 3. Predicted probability of lower service class by parental education (x-axis) and respondent educational pathway
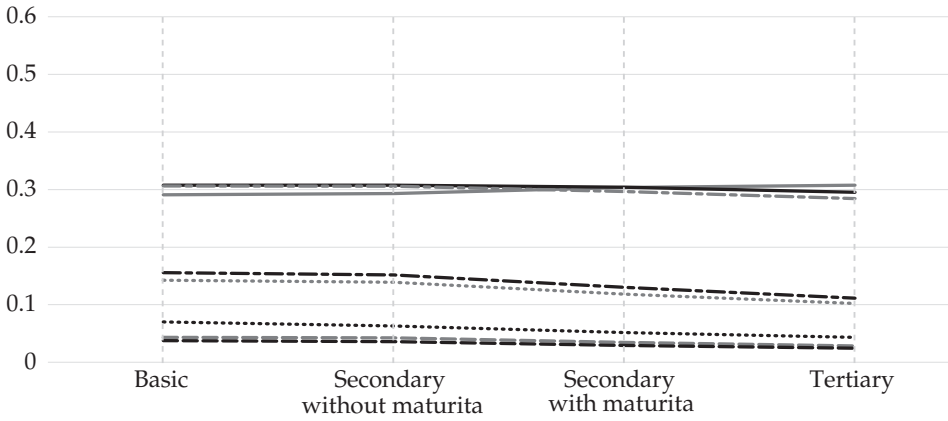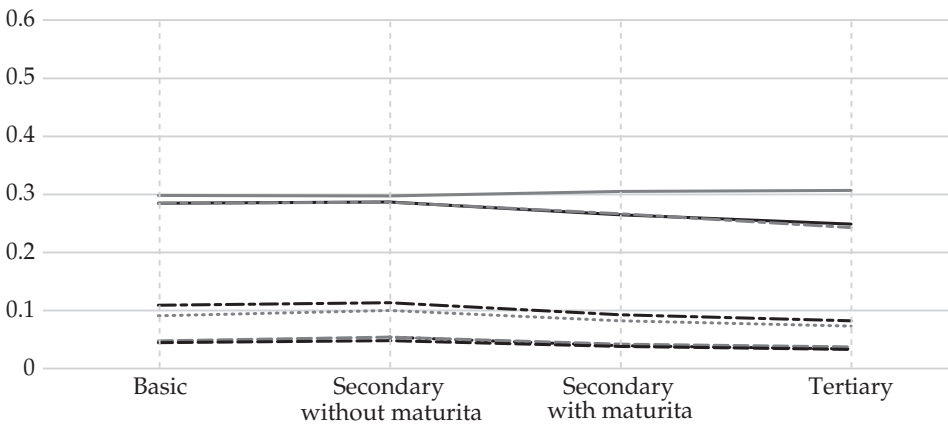
Panel A: Men

Panel B: Women

Legend	
—— Elementary education	—— Vocational, no college
— - — Professional without maturita, no college	— ∙ — Professional with maturita, no college
⋯⋯ Grammar school, no college	⋯⋯ Vocational, college
— — Professional with maturita, college	— — Grammar school, college

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Figure 4. Predicted probability of skilled manual class by parental education (x-axis) and respondent educational pathway
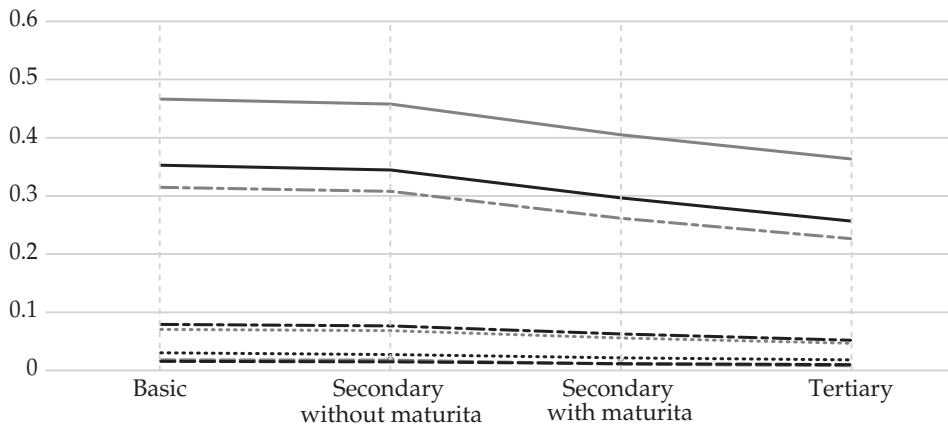
Panel A: Men

Panel B: Women

Figure 5. Predicted probability of unskilled manual class by parental education (x-axis) and respondent educational pathway

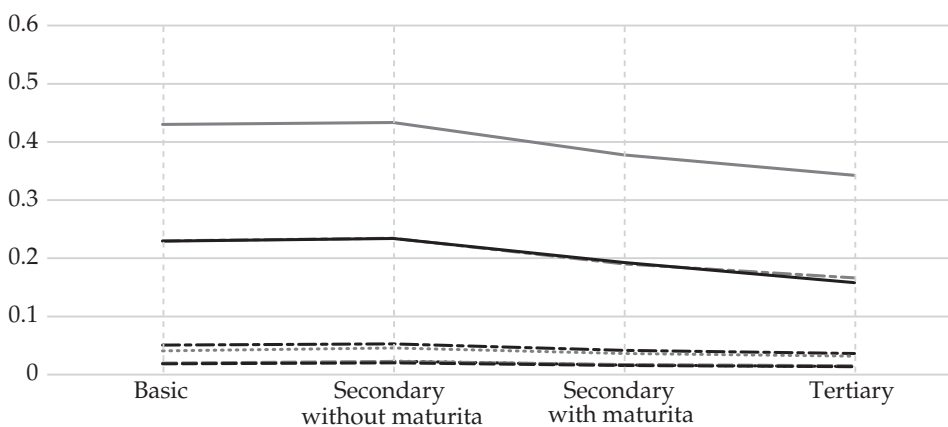Panel A: Men

Panel B: Women

Legend:
- —— Elementary education
- —— Vocational, no college
- —·—· Professional without maturita, no college
- —··— Professional with maturita, no college
- ········ Grammar school, no college
- ········ Vocational, college
- — — Professional with maturita, college
- — — Grammar school, college

to attain this class are respondents without a maturita—i.e. without any major educational credential—with negligible differences between Paths 1, 2, and 3, for both men and women. In fact, there are no apparent differences in the probabilities of attaining this class status between men and women, betraying the popular conception that this is a male dominated class.

Similar to our comparison of the managerial and technical classes, we can also observe remarkable differences between the skilled manual class and the unskilled manual class. Once again, this reminds us of the importance of not blindly reclassifying the ESeC schema to the recommended five-class version, which would violently merge these two distinct classes, something that the analogous EGP 5-class schema does not do [Erikson and Goldthorpe 1992]. While great efforts were required to establish both (and other) social class schemas, their reclassification for the purposes of empirical analysis should take into account facts on the ground, which may vary in country-specific ways.

Roughly 40% of Czech men and women with only elementary education end up in the unskilled manual class, though well-educated parents do seem to play a role in limiting the likelihood of that outcome. The difference in the predicted probability of respondents in Path 1 between those with parents with elementary education versus university educated parents is about 10%. While there were no differences in predicted probabilities for Paths 1, 2, and 3 in attaining skilled manual status, there are in fact large differences in these pathways in the case of the unskilled manual class. This suggests that some degree of incomplete upper secondary education, whether at a vocational or professional school (the difference does seem to matter for Czech men, but not for women) can potentially shift Czechs from unskilled into skilled class status.

Discussion

We can draw a number of important lessons from this analysis. First and foremost, we have established that there are substantive differences in the association between educational pathways and social class attainment that are typically masked if we were to use variables for highest education attained or for years of education. These differences in paths—such as in differences in secondary school track among college educated Czechs, or differences among Czechs who succeeded or failed the *maturita* exam at different types of school—have a substantive impact on their future trajectories on the labour market, and most likely on other socioeconomic outcomes not examined here. It is therefore a reminder of the need for Czech sociologists to offer detailed response categories to the standard question of highest educational attainment, as well as to have a follow-up question on the type of secondary school attended in the case of Czechs who have attained some degree of college education. Such a follow-up question would be inexpensive to implement in the context of major Czech social and omnibus surveys, but would add great value to the analysis of the role of education on life outcomes.

Second, the strength of the association between educational paths and social class—and the large explained variance of these parsimonious models—once again confirms that Czech class structure remains highly stratified by educational background. This is consistent with other studies [e.g. Smith, Anýžová and Matějů 2018] that have compared the role of both education and skills on socioeconomic attainment, concluding that Czech society is very much credentialist [Collins 1979] due to the much stronger effect of education.

The differences in probabilities for college educated men in the managerial class by secondary school type suggest that such details of educational background are important on the labour market, but we do not yet have a clear explanation. One possibility is that this is a selection effect: pupils sorted into secondary grammar versus secondary professional schools may vary by unobserved characteristics, such as ability, which contribute to attaining different class outcomes. Another possibility is the role of signalling: applicants to managerial positions reveal their educational histories, and perhaps different educational credentials at the secondary level may influence class destinations. The mechanisms at work in these processes require further research to uncover.

Third, the analysis presented here was intentionally made simple, so it can serve as a stepping stone for subsequent research on educational pathways. One direction of future research would be to analyse in more detail the role of educational pathways at the elementary and secondary levels on tertiary educational attainment, tertiary degrees or fields of study, building on the work of Keller and Tvrdý [2012]. Educational pathways can also serve as a basis for the re-analysis of educational mobility tables, or cohort analyses of change in inequality of educational attainment over time. There is also great potential in examining educational pathways by fields of study, which is now possible using administrative data.

In fact, in this special issue Katrňák and Doseděl [2019] found that the value of education (viewed as a positional good), on occupational status varies by the respondent's field of study. Economic returns by field of study is in fact one of the most promising areas for future Czech social stratification research, including research on educational pathways. It should be noted, however, that the field of study is integral to education itself. In fact, the coefficients for specific educational pathways can be seen as the weighted average for all fields of study available in that pathway. When properly modelled, the inclusion of fields of study as mediating variables would reduce the direct effect (and correspondingly increase the indirect effect) of educational pathways on social class, but the total effect of educational pathways would be largely the same as provided in this article.

Lastly, the results presented here demonstrate the value of graphically representing non-linear associations. This is not a matter of style, but that the findings I reported from Figures 1–5 are substantively richer than what one can glean from the same results presented in Table 4. Instead of reporting only regression tables, a graphic approach may help in communicating the nature of social inequality, mobility, and stratification in the Czech Republic.

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