

## RESEARCH ARTICLE

### The Social Space of Educational Strategies: Exploring Patterns of Enrolment, Efficiency and Completion among Swedish Students in Undergraduate Programmes with Professional Qualifications

Carina Carlhed

Department of Education, Uppsala University, Sweden

#### Abstract

The aim of the study was to analyse enrolment patterns, and study efficiency and completion among students in programmes with professional qualifications, using microdata from Statistics Sweden. The programmes were Architecture, Medicine, Nursing, Law, Social work, Psychology and Engineering (year 2001–2002, n=15,918). Using the concepts from Bourdieu's sociology, data was analysed with Specific Multiple Correspondence Analysis. Different patterns emerged and were constructed as different dimensions of the social space of educational strategies in higher education, patterns of enrolment, efficiency and completion. The students' relative positions in the social structure were analysed by the type and amount of their cultural capital. The most important factors for differences between coherent intensive and scattered extensive enrolment patterns were programmes, gender, mother's socioeconomic index, parents' education, and type of university. Regarding efficiency, the most important factors were programme and type of university. The factors most important for graduation were gender and type of university.

**Keywords:** higher education, enrolment patterns, dropouts, educational capital, multiple correspondence analysis, professional education, university

Box 2136, 750 02 Uppsala  
Sweden  
+46 18 471 1672  
+46 708 701256  
Email: carina.carlhed@edu.uu.se

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## **The Social Space of Educational Strategies: Exploring Patterns of Enrolment, Efficiency and Completion among Swedish Students in Undergraduate Programmes with Professional Qualifications**

### **Student enrolment, efficiency and completion**

A growing political interest in access and the study success of diverse student populations in higher education has been witnessed in many countries in Western Europe lately. Higher education has also been reformulated as a main vehicle for sustainable growth in society, which has led to new political priorities, which connect educational policy and the notion of workforce competitiveness and employability in an increasingly globalized world (Europe 2020).<sup>1</sup> Member states in the European Commission have been encouraged to invest in their higher education systems ensuring increased access to higher education and student success guided by buzzwords like widening or broadening participation, student retention and employability (European Commission/EACEA/Eurydice, 2014; Gaebel, Hauschildt, Mülleck & Smidt, 2012).

At the same time, students are expected to be mobile, at least in neoliberal and modernist discourses (Mitchell, 2003), which transcend national educational policies. Nonetheless, being mobile can mean different things, for example, in terms of using higher education for climbing upwards socially (Bathmaker et al, 2013; Ingram & Waller, 2013; David, 2013; Trow, 2005) or geographically within the Bologna framework ([www.ehea.info](http://www.ehea.info)). But it could also include moving in and out of financial systems (labour market, student finance) as well as managing time, deadlines, keeping up, and the timing of important events during one's educational career.

In relation to the ideal visions of successful student trajectories, which can be derived from educational policy and debates, it can be questioned whether the opportunities to access higher education, to be mobile, efficient and successful are the same for all students. This connects to research problems that have been attended to in many countries, i.e. in the Nordic region such as in Finland (Mäkinen, Olinkura & Lonka, 2004), in Denmark (Madsen, Ulriksen, & Holmegaard, 2010) in Norway (Hovdhaugen & Aamodt, 2005, Mastekaasa & Smeby, 2006, Hovdhaugen, 2009, 2011, 2012) and in several European countries within comparative research (RANLHE, 2009) or in nation case studies i.e. in the UK (Cannell & Thomson, 2010; Jackson & Jamieson, 2009; Leathwood, 2005; Reay, Crozier & Clayton, 2009; Rose-Adams, 2013; Quinn, Thomas, Slack, Casey, Thexton & Noble, 2005; Yorke & Longden, 2004, 2008) in the Netherlands (Meeuwisse, Severiens, & Born, 2010) in France (Shankland, Genolini, Riou França, Guelfi, & Ionescu, 2009; Van Bragt, Bakx, Bergen, & Croon, 2010). Student enrolment, efficiency and completion are however not solely European issues. Dropout and non-completion of higher education have been prioritised issues in the US for a considerable time (Lutta, 2011; Meyer & Marx, 2014; Wells, 2008) and are widespread internationally (Archer, Chetty, & Prinsloo, 2014; Brook, 2011; Letseka, Cosser, Breier & Visser, 2010; Maria Graffigna et al., 2014; McInnis & James, 2004; Tumen, Shulruf & Hattie, 2008; Townsend, 2010; Wheeler, 2012).

Consequently, there has been an increased political focus on student enrolment, efficiency and completion in higher education at the national level as well. In Sweden, these have traditionally been important issues for individual higher education institutions (HEIs), which have an interest in recruitment and student persistence due to various funding schemes. However, it is evident that agents on the national policy level have begun to approach these issues in a more persistent way than before. In the present Swedish policy debate on higher education, the words 'efficiency', 'utility', and 'employability' are frequently heard and efficiency in the higher education system has been questioned (Bladh 2013; Fölster, Kreicbergs & Sahlén, 2011; SOU 2008:69), which could be seen as echoes of European policy debates. Some brief examples of activities in line with the increased interest of efficiency among state authorities are mentioned below. To increase student completion a government bill in 2009 proposed a reduction in the maximum number of study semesters with student finance from 12 to 9 semesters (SOU 2009:28). The proposal was however never implemented. While in 2013, the appropriation directions for the Swedish Higher Education Authority was enlarged with special attention to: follow up and develop new methods for monitoring inactive students and analyse the balance of educational supply and labour market demand and needs (U2013/7791/UH, U2013/7484/SAM). Furthermore, the high age of Swedish graduate students was problematized in an official report in 2011 (Uusitalo, 2011). At the end of 2012, we also learned from the Swedish government's own (but independent) think tank 'Expertgruppen för studier i offentlig ekonomi' (ESO),<sup>2</sup> that the higher education system has serious efficiency problems (ESO, 2012) due to the financial costs of falling productivity while a person is enrolled in higher education and not employed. In addition, Swedish students spend a longer time than necessary within HE, while studying subjects and topics that are not well-suited to the demands of the labour market (ESO, 2012; Fölster, Kreicbergs & Sahlén, 2011). From this dominant discourse a vision of ideal students emerges: they should be young, efficient

<sup>1</sup> [http://ec.europa.eu/europe2020/index\\_en.htm](http://ec.europa.eu/europe2020/index_en.htm)

<sup>2</sup> Public finance studies expert group (Author's translation)

and determined in their choice of educational investments, preferably in utilised areas of labour and should not spend unnecessary time at the university. They should graduate in the expected normal time<sup>3</sup>, be employed and contribute to the economic production of society.

But then, how do Swedish students use higher education and how are their trajectories related to social and cultural resources and structures? When turning to previous research regarding patterns of student enrolment, efficiency and completion in Swedish higher education there is very little published research, especially with a national scope. However there are studies which focus on particular issues, such as educational choice and student enrolment (Berggren, 2008; Börjesson & Bertilsson, 2012; Holzer, 2009; Hällsten, 2010), transition to labour market (Berggren, 2013) or completion in online education (Westerberg & Mårald, 2006) or in single universities or programmes (Appel, 2007; Carlhed, 2015; Petersen & Lundin, 2007; Lind, 2008; Forsman, Linder, Moll, Fraser, & Andersson, 2014; Jungert, Alm & Thornberg, 2014). Still, the national evaluation activities conducted by the Swedish Higher Education Authority and Statistics Sweden produce a large number of annual reports and special follow up studies on these subjects (HSV, 2002, 2010; SCB, 2011, 2013; UKÄ, 2013a, 2013b).

Participation in higher education in Sweden, as in Europe, has increased significantly over the past decade (Orr, Schnitzer & Frackmann, 2008). The contemporary norm is to progress to higher education as a logical step after graduation from secondary school. However, access continues to be biased according to socio-economic background with lower social classes poorly represented not only in particular disciplines but across tertiary level institutions in general (Börjesson & Bertilsson, 2012; Berggren 2013; HSV, 2002). Completion rates are about 40 % in general (Holzer, 2009) and it seems that a high level of parental education is the most important factor for completion (Berggren, 2013). Concerning access to higher education, Sweden has a relatively high number of students with non-traditional access (36 %) compared to other European countries (Orr et al., 2008).

In total Sweden has 47 higher education institutions (HEIs): 14 public-sector universities, 17 public-sector university colleges and 3 independent HEIs. These are entitled to award third cycle qualifications. The universities have full rights but the university colleges have to apply for this entitlement within specific domains. There are also 13 independent HEIs which have entitlement to first-cycle qualifications and for some also second-cycle qualifications or qualifications in psychotherapy (UKÄ, 2014).

The Swedish HE system is relatively uniform since it comprises all types of post-secondary education including a range of programmes with professional qualifications such as, for example, nursing and teaching programmes. It is legally seen as a uniform system under the Higher Education Act 1993:100. Yet, the idea that the HE system is uniform has been questioned by a number of scholars who suggest that it is a binary system (Kyvik, 2004; Ljungberg, Johansson & McKelvey, 2009) or that the stratification structure is even more complex (Hällsten & Holmberg, 2013). Nonetheless, the proportion of the total student body in relation to different programmes and forms of study is shown in Figure 1.

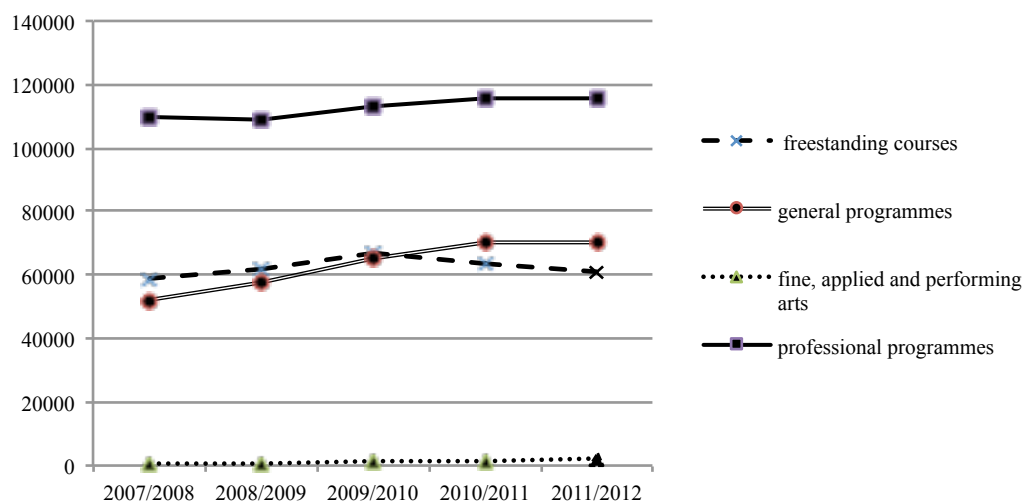


Figure 1. The changes in forms of study within the student population in Swedish higher education.

As a result, students can choose to study programmes or single freestanding courses. Students can also assemble and combine the freestanding courses for a bachelor degree or a master's degree in relation to certain criteria in the Higher Education Act 1993:100. The difference between Universities and University colleges is not unambiguous. University colleges have to apply to The Swedish Higher Education Authority

<sup>3</sup> A normal timeframe would be within one year of the last registration in the programme

(Universitetskanslersämbetet) for the entitlement to award two-year Masters' degrees and third cycle qualifications in specific domain/s.<sup>4</sup>

### ***Objectives and design of the study***

The overall aim of this study is to analyse enrolment patterns, and to study efficiency and completion among students in programmes with professional qualifications. More specifically, to study how Swedish students use higher education and how their trajectories relate to social and cultural resources and structures. The theoretical underpinning in the design is constructed through concepts developed and used by Pierre Bourdieu such as social space and cultural capital (Bourdieu, 1986, 1989). Social space is understood as a social structure. Like a geographical space, regions could be identified within a social space, but here it is constructed by social distances. That is, the closer the individuals are in the social space under study, the more common properties they share and the reverse, the more distant they are, the fewer properties they have in common (Bourdieu, 1989). The properties, i.e. the students' social and cultural resources are operationalised according to the notion of cultural capital, which are embodied and accumulated through the individuals' socialisation within the family, the social class and society (Bourdieu, 1986). The students' relative positions and positioning in the social structure, here in terms of a specific social space of higher education, are analysed by the type and amount of cultural capital that the students possess. Educational capital is a sub-form of cultural capital, which can be inherited from the level of the parents' education or earned by students' own achievements in school, such as grades. The embodiment of cultural capital lies more or less implicitly in the educational strategies that students show when they make choices to enrol in an educational path at a specific university at a given period of time in their lives. The educational strategies are then matched with the variables in the data emanating from official statistics covering national enrolment data and population data.

### ***Population characteristics***

The analyses are built on data retrievals from Statistics Sweden, specifically on one total cohort from 2001–2002 (n=15,918), which is about 20 % of all first-year students in higher education at the same time. The dataset covers individual student enrolment data such as registries of freestanding courses and programmes, earned HE credits, age, sex, income (work and/or student finance), parenthood, parents' highest level of education, birth nation (student, mother, father), socioeconomic index (mother, father), migration (in/out), grades from upper secondary school, number of universities that the student has enrolled with during the programme, number of times the national university aptitude test was taken, and earned graduation certificate/diploma.

The student cohort includes students with at least one student registration on one of the seven selected undergraduate programmes with professional qualifications: Master of Architecture, Master of Science in Medicine, Bachelor of Science in Nursing, Bachelor of Science in Social Work, Master of Science in Psychology, Master of Law, and Master of Science in Engineering. The programme lengths vary between 3 and 5 ½ years (see Table 1).

*Table 1. Programmes and programme lengths.*

Programme	Medicine	Architecture	Psychology	Engineering	Law	Social work	Nursing
Semesters	11*	10	10	9	9	7	6

\* excl. pre-registration training (AT) 1.5 years

In the cohort 2001–2002 there are 59 % women and 41 % men, which is in line with the proportion in higher education generally at the time (HSV, 2002). When considering age, the cohort reflects a somewhat younger student population than in higher education in general. In the cohort, 34 % were older than 25 years, compared to the general distribution of the same age group, which was 50 %. The non-completion rates among women and men were 17 % and 38 % respectively, compared to an average of 26 % in general. The largest dropout rate is observed on the Architecture and Engineering programmes, 46 % and 43 % respectively. Graduation within 1 year after the expected graduation point was the most common trajectory. There were only small numbers of students who graduated within 2–5 years after the expected graduation point, which adds up to the overall completion rate of 74 % (Table 2).

<sup>4</sup> <http://english.uk-ambetet.se/highereducation/highereducationinstitutions>

Table 2. Frequencies and percentages of students in the programmes and their completions rates.

	Architecture	Engineering	Law	Medicine	Psychology	Nursing	Social work	Total
<b>No diploma</b>								
Count	112	2349	461	129	70	498	323	3942
% within program	46%	41%	33%	13%	17%	11%	19%	26%
<b>Diploma within 1 year after expected graduation</b>								
Count	114	3024	832	902	320	4080	1336	10608
% within program	47%	53%	60%	87%	79%	87%	78%	70%
<b>Diploma within 2-5 years after expected graduation</b>								
Count	16	384	86	2	14	111	55	668
% within program	7%	7%	6%	0%	4%	2%	3%	4%
<b>Total count</b>	242	5757	1379	1033	404	4689	1714	15218
% within program	100%	100%	100%	100%	100%	100%	100%	100%

Differences between men and women were apparent. 38 % of the male students did not gain a diploma within 5 years from expected graduation point, compared to 17 % of the female students. However, this could signify differences in two large gender-biased study programmes such as Nursing, Engineering and Architecture, which are known to have different kinds of dropout patterns. Students in Engineering Architecture tend to drop out late due to employment offers, in spite of the absence of a diploma, while the few Nursing students who drop out, do so early. To get employed they need both a diploma and an authorisation certificate.

### Operationalisation Procedures

The empirical material is originally administrative data reported from universities to the national statistical authority Statistics Sweden. The data is supplemented with other population data, produced by the same authority. In order to use the data retrievals for research purposes considerable work has been done in transforming, recoding and adapting administrative data into useful research tools. One of the more radical transformations which were done was to create variables of time i.e. different kinds of pauses and different lengths of pauses. Thus, new time variables were constructed by sequence analysis in Mathematica software and were then imported back into the SPSS software. Other transformations were made, such as combination 2–3 variables i.e. family situation wherein information about parenthood, children's age and the student's marital status (partner/family or single) were combined into one variable. (PAR/FAM\_no\_child, PAR/FAM\_children\_<18, Single\_children<18, Single and No info children).

The students' educational strategies were operationalised and matched with existing or constructed variables derived from the data in terms of:

- preferences in the choice of the different study programmes and different universities at different periods in life. Thus, the age and family situation when they entered the study programme were central in the analysis.
- mobility and time lapses of study; for example, no time-outs/pauses during their studies or single/multiple pauses or different lengths of pauses. Mobility was operationalised in terms of staying at one university or transferring, staying within one discipline domain/scientific branch or moving between different scientific domains, taking extra courses besides the specific programme.
- preparing themselves/compensating for poor qualifications from upper secondary school by taking an aptitude test (SWESAT-test).
- choosing to work while taking courses, and/or using study finance.
- formal ideal performance goals were also accounted for, such as achieving their goals in terms of earning credits in relation to the amount they had registered for, achieving a diploma/degree within the normal timeframe<sup>5</sup>, or dropping out.

From the analysis of the educational strategies different patterns emerged and were constructed as different dimensions of the social space of educational strategies in higher education that is, patterns of enrolment, efficiency and completion.

<sup>5</sup> A normal timeframe would be within one year of the last registration in the programme.

These patterns were then studied in relation to a set of student lifestyle characteristics, matching existing or constructed variables derived from the data; student's and parents' socioeconomic class, parents' educational level, student's grades from upper secondary school, supplementary studies at municipal adult education, type of professional programme, type of HEI, age, gender, family situation (single, parent, etc.), migration, and nation of birth (student, mother, father).

This two-step analysis is described in detail below, but to put it in brief it aims to capture explanatory factors of the student's educational strategies (enrolment, efficiency and completion) following Bourdieu's methodology to analyse "relative positions and of the objective relations between them" (Bourdieu, 1989, p 16). Thus, the educational strategies are to be analysed by the type and amount of the cultural capital, as manifested by the student's lifestyles.

### ***Geometric data analysis and Specific multiple correspondence analysis***

Traditional multivariate analysis has a basic interest in studying principal variables as linear combinations of initial variables, which have the largest variances under specified constraints. Using Geometric Data Analysis (GDA) implies an interest in individuals as well as variables. A GDA analysis produces a 'space of individuals' and a 'space of variables', which are easy to relate to the sociological thinking on two complementary facets of social space, namely the space of properties and the space of individuals (Le Roux & Rouanet, 2009).

Specific Multiple Correspondence Analysis (MCA) is a statistical method that manages data on nominal and ordinal scale levels. Within the GDA procedures, of which MCA is one, individuals and variables are visualised as clouds of points in multidimensional geometric spaces with more than three dimensions. Analyses of the structure of these clouds are done on the basis of sociological properties and their interrelations. It gives a picture of the social structure within which individuals are positioned, or more specifically, a social space (also known as Bourdieu's statistical method). MCA provides a geometric model of data in which distances between points (which could be variables or individuals) is the main concern of analysis (Ibid.).

Hence, in this study, the social space is operationalised in terms of constructing a space of educational strategies (enrolment, efficiency and completion patterns) and student lifestyle characteristics (the social and cultural resources). There is an interest in investigating whether student lifestyle characteristics have any impact on their enrolment patterns. In GDA procedures, there is a specific way to handle explanatory purposes. Analytically, one has to separate variables that construct the space of educational strategies. Those variables are considered active variables that determine the geometric space in the MCA. Other variables that characterise individuals like gender, socioeconomic class, parents' educational level, or grades—that is, variables that may have an impact on which position individuals may occupy in the social space and which can influence student educational strategies—are assigned as supplementary variables. One could say that the active variables construct the space or the cloud of categories and the supplementary variables are projected onto the graph and thereby visualise homologies. These two separate analytical layers are visualised simultaneously, which makes it possible to study the homologies between the positions of the active variables and the supplementary variables. MCA, conducted this Bourdieuan way, is a powerful method for capturing explanatory factors (see Bourdieu, 1984).

### ***Statistical procedures***

In this specific MCA, 18 eigenvalues exceeded the average. The first three axes (axes 1–3) were chosen for interpretation due to the decrease and levelling of the eigenvalues. As shown in Table 3, axis 3 adds up to 87 % of the total variance.

*Table 3. Eigenvalues, raw variance rates, and the modified rates for the first five axes.*

<b>Axes</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Eigenvalues <math>\lambda</math></b>	0.2584	0.1613	0.1344	0.1230	0.1189
<b>Raw variance rates (%)</b>	10.30	6.43	5.36	4.91	4.74
<b>Modified rates (%)</b>	68	13	6	3	3

In Table 4, the active variables and their modalities are specified. The active variables are 10 and they have 41 associated modalities. After exclusion of 6 passive modalities, which were not included in the analysis, there were 35 active modalities.



Table 4. Active variables and modalities in the Specific MCA, absolute and relative distributions, cohort 2001-2002, n=15 918.

Headings	Variables (10)	Modalities (42)	n=	%
General interest in university studies	Number of profiles (discipline domains/scientific profiles) at university in total	1Profile	6111	39
		2Profiles	3829	24
		3Profiles	2697	17
		>4Profiles	3112	20
	Number of courses at university in total	2-9 courses	5863	37
		10-11 courses	3088	20
		12-14 courses	3199	20
		>15-20 courses	3537	22
		nr.courses.missing*	62	--
	Number who had taken a national university aptitude tests SWESAT before the start of the study programme	0 SweSAT.test	3712	24
		1 SweSAT.test	4443	28
		2 SweSAT.test	3324	21
		3 SweSAT.test	2006	13
		>4 SweSAT.test	2264	14
Preferences of university type	Studies at university or university colleges	most.university	12321	78
		university.colleges	2995	19
		most.uni.missing*	433	--
Persistence in current programme	Length of pauses (1 pause = 1 semester)	0 programme.pause	10108	64
		1programme.pause	2305	15
		>2programme.pauses	3336	21
		Pause.missing*	0	--
	Registered for a second study programme	No.secondary programme	12600	80
Achievement	Time to earning a degree within one year or 2-5 years from the last registration or not earn a degree	Secondary programme	3149	20
		Dipl.within.1year	10607	67
		No.diploma	3780	24
		Dipl.within.2-5years	668	4
	Share of achieved credits of those registered	Dipl.missing*	694	--
		0-50% PPprod	2150	14
		51-75% PPprod	4679	30
		76-90% PPprod	5353	34
Circumstances of age and parenthood at the start of the programme	Age at the start of study programme	91-100% PPprod	3517	22
		Pprod.missing*	50	--
		<=19.year.Pstart	2045	13
		20-24.year.Pstart	8446	54
	Family situation at the start of the study programme	25-30.year.Pstart	2565	16
		>=31.year.Pstart	2693	17
		PAR/FAM no child	2057	13
		PAR/FAM children <18	3178	20
		Single children<18	791	5
		Single	9697	62
		No info children*	26	--

Note: \* These modalities are coded as passive categories and are not included in the construction of the space.

The next step in the MCA was to calculate the contributions of the active variables and modalities to axes 1–3 and then analysing and interpreting the principal contributions to each axis of the cloud of variables. This included evaluating the positions of barycenters of the active categories located on either the left or the right side on the axis. The further the barycenters are positioned from the middle of the axis, the more they contribute to the axis.

There were 16 supplementary variables, namely: gender, income, study programme, grades, supplementary municipal adult education, university, migration, mother's and father's highest level of education, mother's and father's socioeconomic status, their work sector and student's, mother's and father's birth nation (Table 7, 8, 9, in Appendix). Graphs were created in order to visualise the three axes and the space of enrolment patterns they represented in terms of axis poles. The supplementary variables were then projected into the space of educational strategies (enrolment, efficiency and completion patterns), which clarified structured factors in terms of 'explanatory' factors.



## The social space of educational strategies – enrolment, efficiency and completion

### Analysis of active variables

The results of the specific MCA of the active variables are summarised below in two tables (Table 5 and 6).

Table 5 presents the active variables and the modalities that contributed the most to the axes. Only modalities that exceeded the average contribution of 100/35 or 2.86 were interpreted, which were 22 of the 35 active modalities initially included in the analysis. The same modality can contribute to more than one axis. From interpretation of the modalities and their distances from each other, poles of educational strategies emerged. The first axis, axis 1, shows the most important difference within the student population and therefore contributes most of all the axes to the structure of the space. Axis 2 is consequently the second most important, and the third axis the next, etc.

Thus, the largest difference is between educational strategies in terms of enrolment patterns that are *coherent intensive* and on the other side of the axis *scattered extensive* (axis 1). The axis opposes horizontally the *quantity* and *density* of student registrations on educational programmes. On the left side, we find modalities that point out use of HE intensively (few registrations, one scientific profile only i.e. Caring Sciences, and no pauses) and on the right side those who use HE extensively (many registrations, multiple scientific profiles Social Sciences and Technology, and multiple pauses). There are also oppositions between modalities that characterise younger students who study at universities (U) (right side) and modalities that characterise older students with children who study at university colleges (UC) (left side).

Table 5. Interpretations of the three axes. Relative contribution (%) of each modality of the active variables to axes, written either in column 'left' or 'right', 'bottom' or 'top' according to its positions on the graph. Study pattern in *italics*, representing the poles of axes and eigenvalues of each axis ( $\lambda$ ).

Axis 1 $\lambda=0.25$		Study patterns		Left	Right
		<i>coherent intensive</i>	<i>scattered extensive</i>		
Active variables		10 modalities			
Number of profiles	1Profile		>4Profiles	9.3	7.3
Number of courses in total	2-9 courses		>15 courses	10.9	7.8
University type	university colleges			9.9	
No.of pauses during programme	0 programme pauses		>2programme.pauses	3.8	4.2
Age at start of programme	>31years		20-24years	3.0	10.0
Marital status at the start of programme	Partner in a family with children		dren <18yrs	5.5	
Axis 2 $\lambda=0.1613$		Study patterns		Bottom	Top
		<i>high efficiency</i>	<i>low efficiency</i>		
Active variables		10 modalities			
Number of profiles			>4Profiles		12.2
Number of courses in total	10-11 courses		>15-20 courses	5.7	15.7
SWESAT-test			>4 SWESAT-tests		6.2
Second programme			Second programme		9.2
Age at start of programme	<19 years		25-30 years	6.1	5.5
Credit production			>31years		3.3
	76-90 % PProd		0-50 % PProd	3.8	7.6
Axis 3 $\lambda=0.1344$		Study patterns		Bottom	Top
		<i>non-graduation</i>	<i>graduation pursuing</i>		
Active variables		13 modalities			
Number of profiles	>4Profiles		2Profiles	4.1	12.2
Number of pauses during programme	>2programme.pauses			5.3	
SWESAT-test			>4 SWESAT-tests		4.0
Second programme			Second programme		3.2
Time to diploma	No.diploma		Dipl. within1 year	11.0	3.8
Age at start of programme	<19 years		25-30 years	15.6	4.1
Marital status at the start of programme	>31years		20-24 years	4.8	4.4
	Partner/family with children <18yrs		Single	6.3	5.1

Regarding the efficiency pattern, axis 2 vertically opposes students' *efficiency* in earning credits, here called credit production. At the top, it attracts modalities that depict a moderate/low production *and* high quantity of registrations, which implies low efficiency. At the bottom, we find modalities that show a moderate/high

production of credits *and* a lower number of registrations, which implies high efficiency. Axis 3 opposes the extent of *graduation pursuing* or not, which visualises the completion pattern.

Thus, there were three dimensions of the social space of educational strategies (enrolment, efficiency and completion) that emerged in analyses based on the active variables.

In order to further visualise the structure of the social space of educational strategies, an overview of the combination of patterns and their polarisation was created illustrating regions (Figure 2). Different modalities are positioned in different regions thereby illustrating phenomena under study in more detail. For instance if certain modalities are positioned in the upper right corner of the graph in Figure 3 it is interpreted as a characteristics of the Coherent-intensive-Low efficiency pattern, due to the homologous right corner in Figure 2.

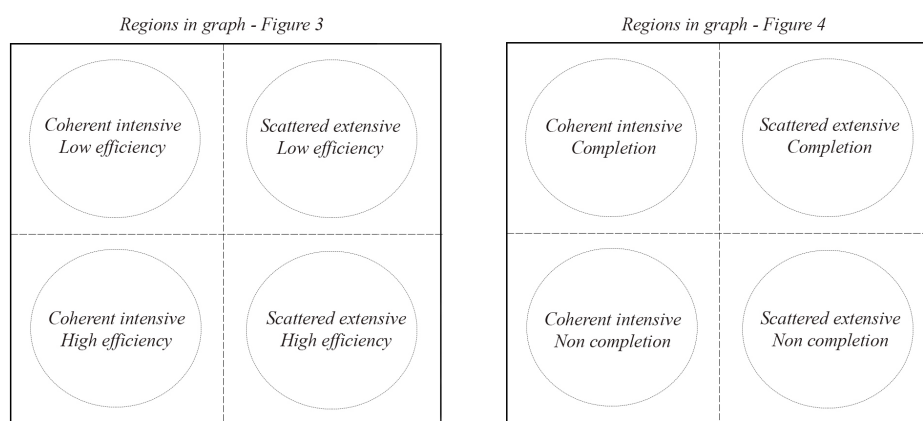


Figure 2. Combinations of poles into regions in the graphs in Figure 3 and 4.

The first graph (Figure 3) is schematically illustrated in Figure 2 showing enrolment and efficiency patterns with 4 regions; 1. Coherent intensive-Low efficiency, 2. Scattered extensive-Low efficiency, 3. Coherent intensive-High efficiency and 4. Scattered extensive-High efficiency. The second graph (Figure 4) and its regions, is in the same schematically way described in Figure 2: Here the regions show combinations of enrolment and completion patterns; 1. Coherent intensive-Completion, 2. Scattered extensive-Completion, 3. Coherent intensive-Non completion and 4. Scattered extensive-Non completion.

In the next step, an explanatory step in the analysis was carried out by using the *supplementary* variables.

### ***Analysis including Supplementary Variables***

The results of the specific MCA based on the analysis of the *supplementary* variables (Table 7–9 in Appendix) are visualised in two graphs (Figure 3 and 4). The clouds of supplementary variables were projected into the graphs, onto the structure of the social space of educational strategies, which was created from the analysis of the *active* variables. The projection of the supplementary variables illustrates explanatory factors regarding the educational strategies or their objective relations as Bourdieu would have put it. In measuring the impact of the 16 supplementary variables, deviations between the coordinates to each pole of the axes were calculated ( $>1.0$  = large,  $>0.5$  = notable). In simple words, a large deviation means a large impact and high explanatory power (Le Roux & Rouanet 2009, p. 59).

Table 6. Summary of results of calculations of deviation between coordinates of the poles of axes.

Study pattern	Size of deviation	
	Large > 1.0	Notable > 0.5
<i>Coherent intensive vs. Scattered extensive</i>	study programmes	gender
	mother's socioeconomic index	grades
	parents' educational level	student's nation of birth
	type of university	parents' nations of birth
		father's socioeconomic index
		parents' work sector
		prep. studies at municipal adult education
<i>High efficiency vs. Low efficiency</i>	study programme	gender
	type of university	grades
		study programmes
		student's nation of birth
		mother's nation of birth
		prep. studies at municipal adult education
		income
		parents' work sectors
<i>Graduation pursuing vs. Non-graduation pursuing</i>	gender	study programme
	type of university	grades
		student's nation of birth
		parents' nations of birth
		income
		parents' work sectors

A more contextualised presentation of the results follows below and is illustrated through two graphs (Figures 3 and 4). A basic rule of thumb of interpreting the graphs is that modalities in the peripheral parts of the graphs show more distance to each other, than those in the middle. Larger distances between supplementary variables mean larger impact on explaining the positions of the active variables, as was mentioned earlier. Small distances in the graph show strong interrelations. Thus, the more remote positions of the supplementary variables in the graph, the more explanatory impact they have.

### ***The first and second dimensions of the social space of educational strategies***

#### ***The coherent intensive enrolment pattern***

The pole of the *coherent intensive enrolment pattern*, which is located on the horizontal middle left in Figure 3 is strongly connected to Nursing and Social Work programmes. Their locations are mainly regional at university colleges (UCs), in which large proportions of somewhat older students with parental obligations are found (approx. 36–40 %) compared to the other programmes (approx. 11–20 %). The pattern is also closely related to low socioeconomic status and low educational levels of parents, low grades, student's nation of birth (other Europe or Nordic<sup>6</sup>, or missing information), parents' nations of birth (other Nordic, which is all Nordic countries besides Sweden, South America, Caribbean or Central America, or missing information), parents' socioeconomic index (SEI) as workers, parents' work sector, gender, and participation in preparatory studies at municipal adult education.

<sup>6</sup> 'Other Europe' refers to countries in Europe besides Sweden and the other Nordic countries and besides East-Europe. The standardised classification comes from Statistics Sweden.

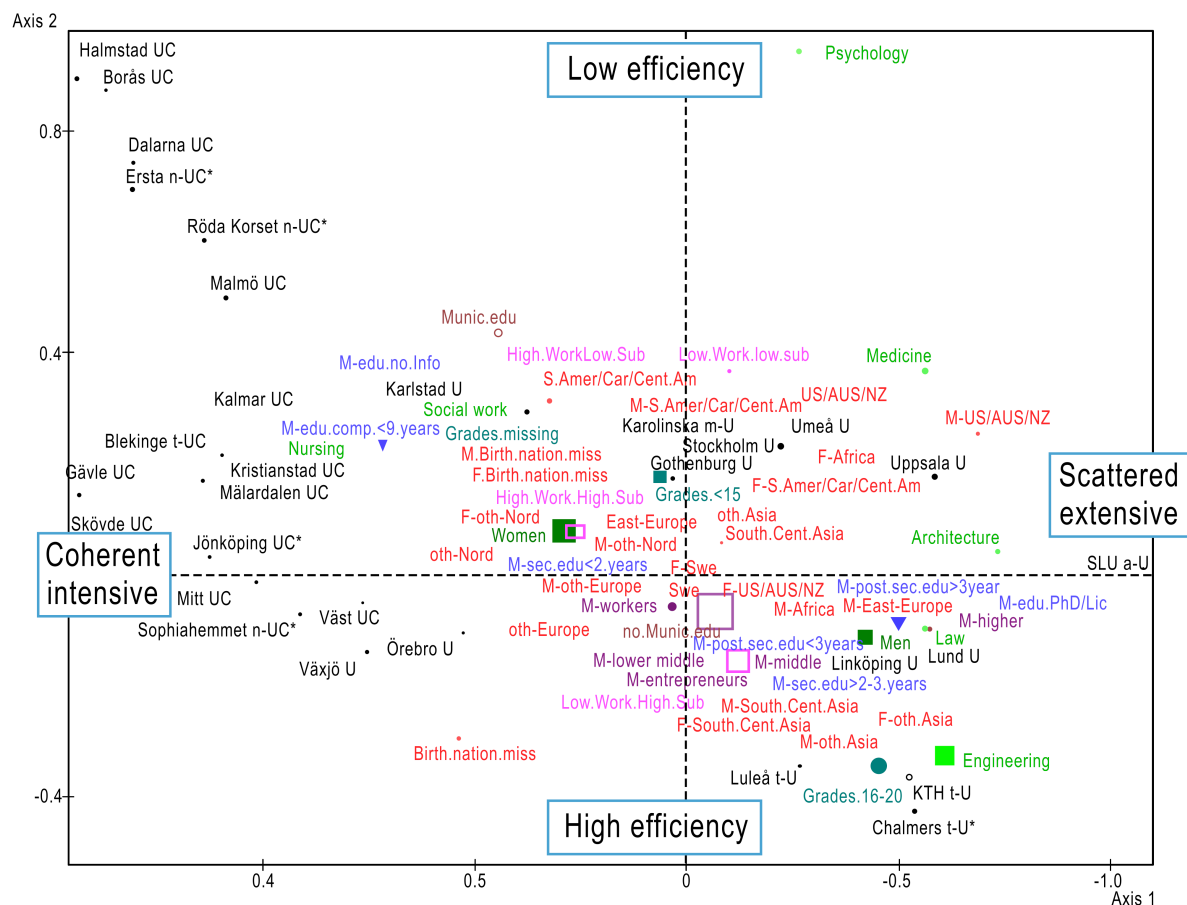


Figure 3. Plane 1-2, poles of axes 1 and 2 and supplementary variables.

Interestingly, on the left side of the graph (Figure 3) there are in general many ‘missing’ modalities such as: grades, parents’ education, and birth nation of parents, compared to the right side of the graph. The ‘missing’ modalities could be explained by students being immigrants themselves or being second generation immigrants with no information available about their parents’ SEI or birth nations in the official registers. In addition, the label ‘M-others’ in the socioeconomic classification is also evident regarding mothers’ SEI (meaning unemployed, housewives, pensioners, etc.).

The results imply that students with low amounts of inherited and earned educational and cultural capital are unlikely to leave their home towns for university studies but rather choose a university college nearby (Christie, 2007; Pugsley, 2004). The predominance of regional university colleges (UCs) is also understandable in relation to the high share of mature students entering HE. From the literature, we know that family obligations and cultural expectations about working-class women’s relatively limited opportunities to work on a self-fulfilling educational project at a university a long way from home are also hindering factors. It is a careful calculation of risks and costs of launching such a selfish project, which are balanced with study obligations, child care, and domestic responsibilities (Reay, 2003). Being a single parent does not make things easier (Archer, Hutchings & Ross, 2002). The situation of working class women stands in contrast to middle-class women’s neutral approach to participate in higher education and to allowing them to work on themselves such as workout and engage in extracurricular activities (Bathmaker, Ingram & Waller, 2013; Redmond, 2010),

Belonging is also important. Moving away from one’s hometown, family, and peers is a giant step for many non-traditional students. The big university campuses have been reported to be hostile and alien by student with working-class backgrounds. The cultural environment on traditional universities is based upon an elitist structure; where extra support to learn how to study is not always present (Reay, David & Ball, 2005).

#### *The scattered extensive enrolment pattern*

Meanwhile, at the right horizontal axis of the graph (Figure 3) an opposite position of pattern is found, which is *the scattered extensive enrolment pattern*. This pattern is related to Engineering, Law, Medicine, Architecture, and Psychology, and is placed near the higher ranked universities (U) in which younger freshmen enter their

education (single with no children, 65-74 %). Likewise, this enrolment pattern is connected to high and middle socioeconomic status and high educational level of parents, according to positions of modalities on the right side in the graph. Other notable deviations were related to high grades, gender, student's nation of birth (US/AUS/NZ, other Asia besides South Central Asia<sup>7</sup>), parents' nations of birth (Africa, East Europe, US/AUS/NZ, other Asia besides South Central Asia, South America, Caribbean or Central America), mother's socioeconomic index (higher, middle, entrepreneurs, and lower middle), and parents' work sector (parents working in health care, education, county councils, public administration, or misc. organisations)<sup>8</sup>.

The results are in line with earlier research: students in the middle class or upper middle class are more likely to enter university (Berggren, 2008) and move to another city for educational reasons; it is a part of the 'natural order' (Pugsley, 2004). Several studies also show that middle-class social reproduction includes learning strategies in Higher Education such as saliency and how to play the game in order to enhance their future competitive positions (Bathmaker, Ingram & Waller, 2013; Bourdieu, 1996; Lareau, 2003).

#### *Low efficiency pattern*

Still considering Figure 3, but now turning to the supplementary modalities connected to the second *vertical* axis. The axis are related to the degree of students' *efficiency* in earning credits and show the largest deviations between the study programmes Psychology and Medicine on the low efficiency region (in the top of the graph), which is somewhat puzzling. However, this could simply mean that these students had taken a set of extra courses, which they never needed to finish. Low efficiency in earning credits is related to regional university colleges (UCs), and to students who had taken municipal adult education before the start of the programme, and to having either high income from work and a low proportion of study finance or both income sources at low levels.

Connected to this pattern there are modalities of low grades or missing information of grades. Parents' educational levels are low, the socioeconomic index modality is 'M-others' and missing information about parents' birth nation, students born in South America, Caribbean or US/AUS/NZ, Other Asia besides South Central Asia, or the father born in Africa, South/Central America or US/AUS/NZ. Regarding age, there are the mature students, which are older than 31 years when entering the programme who are positioned on the low efficiency side and those who have registered for a second programme either as an activity in a lifelong learning logic or transferred to another programme.

#### *High efficiency pattern*

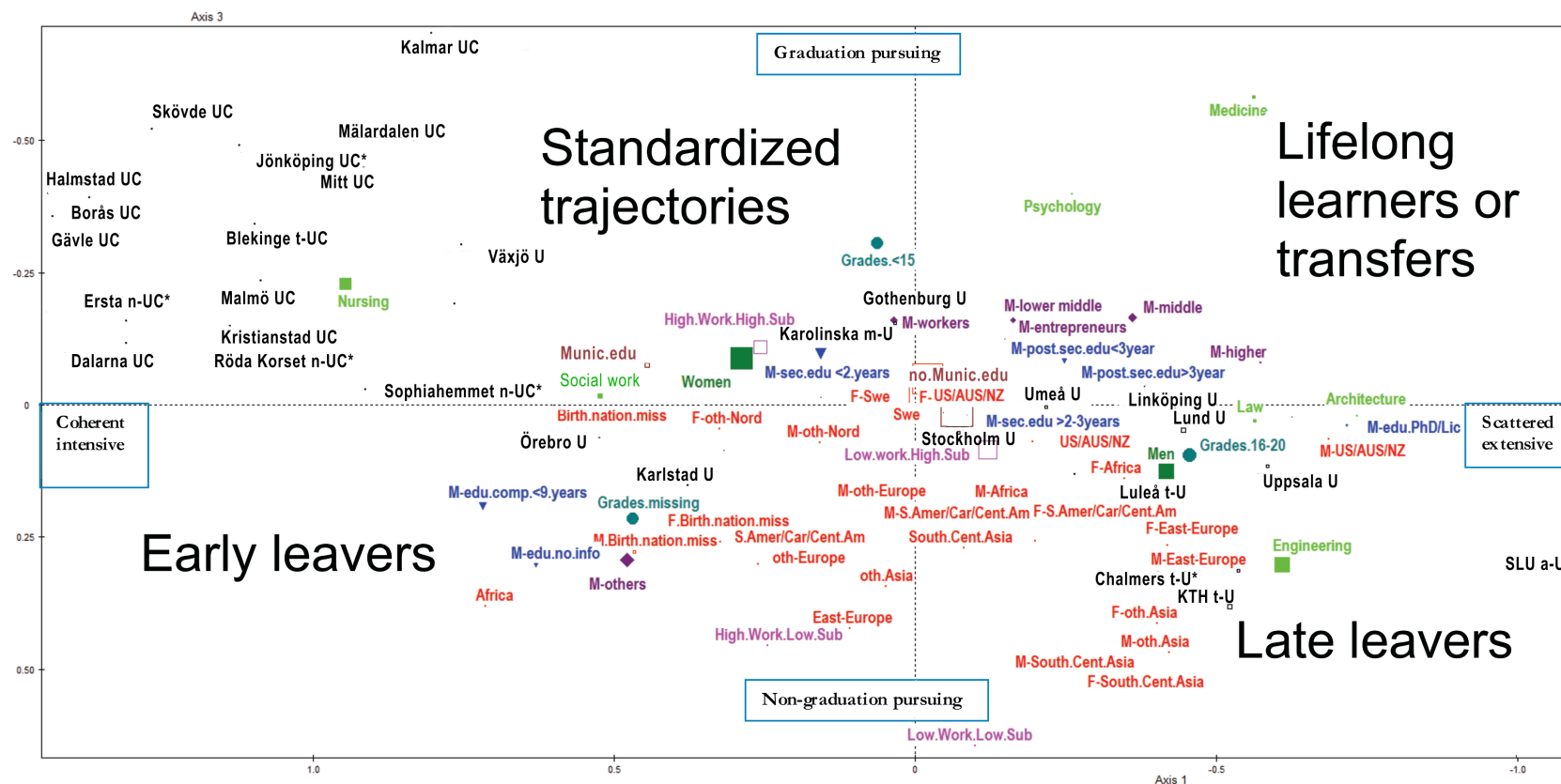
Moving to the bottom of graph (Figure 3), the set of modalities that shows a moderate/high credit production *and* a lower number of course registrations is interpreted as a *high efficiency* pattern. Here, supplementary modalities like higher grades, no municipal adult education prior to the start of the programme, higher socioeconomic classes like 'middle' and 'higher' are present. Three of the high status universities in regards to Technology are also found here, close to the study programme Engineering, which seems highly reasonable.

The modality 'Birth.nation.missing' tells us that there is no information about the student's birth nation, but it stands out as important for a coherent intensive enrolment pattern with high efficiency. Students with unknown birth nations are either temporary international students or students who have migrated to Sweden. Having parents born in Asia is connected to high efficiency and to high income proportion from study finance and low proportion from work income, which is the most common income arrangement for students in Sweden.

In brief, in the region Coherent intensive-Low efficiency the most striking positions found in the upper left corner belong to a set of small regional university colleges (UCs) or specialized nursing university colleges (n-UCs). Only one university is found here. As mentioned before there are many missing information modalities on the left side in the graph and modalities of parental education <9 years or missing information about it. It is also apparent that students having supplemented the grades from upper secondary school in municipal adult education. The income variables tell that these are students who work a lot, with income coming mainly from work or that they have either high shares of student finance aid as income or low shares of student finance aid. In the bottom left side in the graph we find the combination Coherent intensive-High efficiency pattern. Here are a small number of regional university colleges (UCs) and two new universities (U) and a solitary position of students with unknown birth nation

<sup>7</sup> The standardised classification comes from Statistics Sweden.

<sup>8</sup> Labels of parents' work sector modalities and Father's socioeconomic status are omitted in the graphs due to readability



### *The first and third dimensions of the social space of educational strategies*

#### *Graduation pursuing*

The next graph (Figure 4) presents a new angle of the space of educational strategies from the dimensions 1 and 3. The first horizontal axis we know from the previous figure, *the coherent intensive enrolment pattern* vs. *the scattered extensive enrolment pattern*. The third axis opposes vertically the extent of *pursuing*, either graduation within the expected timeframe or in terms of transferring from one programme to another or studying a supplementary programme, but still earning a degree/diploma vs. *dropping out*.

The results shown in Figure 4 are interpreted in terms of different student strategies. In the upper left corner, *standardised trajectories* are found. On the other upper side, the *transfer trajectories* are found, in addition also in terms of being *lifelong learners* with more than one study programme registration. At the bottom of the graph, we find *early leavers* and at the right the *late leavers*.

*Figure 4 about here*

*Standardised trajectories.* At the upper left corner in the region Coherent intensive-Completion, with the coherent intensive enrolment pattern combined with earning a degree, where modalities depict a 'standardised' student trajectory of female students entering a professional study programme at a university college (UC) or at specialised nursing colleges (n-UCs), University of Gothenburg (U) or Institute of Technology (KI (m-U)). They are in their mid-twenties when entering the programme and have transferred from a secondary programme. It includes earning a diploma within 1 year after the latest course registration. They often gained their merits (low grades) with preparatory studies at municipal adult education. This is related to a low level of parents' educational capital, which also matches the socioeconomic index as workers. Their income to a large extent comes from work and high proportions of study finance.

*Transfer trajectories and Lifelong learning trajectories.* In the right upper corner in the region Scattered extensive-Completion, in which the enrolment pattern of scattered extensive combines with earning a degree, modalities show signs of determination in trying to qualify for an alternative admission track (performing well on the SWESAT admission test more than 4 times), students were 20–24 years old and single when entering the programme and they had taken a few extra courses, extending their studies over 2 scientific profiles (Sciences and Humanities). Here, we find Medicine and Psychology and having higher amounts of educational capital. The socioeconomic indexes of the parents are the lower classes, the middle class, and entrepreneurs. Umeå University and Linköping University are examples of university sites (U) for these trajectories.

*Early leavers.* At the lower left corner, in the region Coherent intensive-Non completion, there are modalities that point out somewhat older students with family obligations. The student's inherited educational capital is small. Information about their grades is missing to a large extent. The early leavers' trajectories are connected to the socioeconomic class 'Others' and the working sectors 'Non.specified' or 'Misc.'. It is evident that there is an assembling of 'junk' categories especially in the lower left corner. It may have to do with students whose parents have migrated to Sweden, simply because there is no information about their parents in our official statistics. Some birth nations of the students are however mapped such as Africa, Europe, and Other Asia on the coherent intensive non-degree side. Regarding income, it seems that they are employed or have sources of income other than work, beside their low level of study finance.

*Late leavers.* At the lower right side, in the region Scattered extensive-Non completion there are enrolment patterns that are characterised as scattered extensive but still in the non-graduation area. Here we find the youngest students (19 years old), predominantly males who have not taken the SWESAT admission test. They have taken more than 2 pauses of 2 semesters (an academic year) and their course registration is in 4 branches of sciences (i.e. Medical sciences, Humanities, Caring sciences and Social sciences). On the scattered extensive non-degree side, the parents are born in East Europe, South America, Caribbean or Central America, US/AUS/NZ, Africa, Other Asia, and South Central Asia, and the students are born in the USA, Africa, New Zealand. The inherited educational capital is considerably higher (parents with PhD level qualifications, secondary education longer than 3 years) and the parents' working sectors are quite varied. The largest number of the oldest universities are present (Us)—Stockholm, Lund, and Uppsala—along with the study fields of Architecture, Law, and especially Engineering. Regarding income, we can find full-time students with amounts of work income and high amounts of study finance but also with the implication that they have sources of income other than work or study finance (student scholarships).

<sup>9</sup> Labels of parents' work sector modalities are omitted in the graphs due to readability



## Conclusion

Given the nature of the empirical material, i.e. transformed administrative register data, the analysis has shown clear relations between educational strategies and student characteristics. However, such analysis does not allow the students' own views on their strategies, which are of course a very valuable source in understanding their reasons for their trajectories (see Hovdhaugen, 2009; Mäkinen, Olinkura & Lonka, 2004). But on the other hand, using this kind of data gives a solid ground for a comprehensive picture of how HE is used by the students. The results are not only of considerable value to a Swedish audience but to other countries as well. As we shall see, there are several international studies that support the results and which can further deepen our understanding of the use of HE, by students from different backgrounds (e.g. Arnold, 2013; Brinbaum & Guégnard, 2013). The results show that the most important factors in determining distance between coherent intensive and scattered extensive enrolment patterns were study programmes, gender, mother's socioeconomic index, parents' educational level, and type of university. Regarding efficiency in earning credits, the most important factors with large deviations were study programme and type of university. The factors most important for graduation pursuing were gender and type of university.

In summary, female students pursue their degrees to completion to a greater extent. In percentages the completion rates among women were 83 % and 62 % among men, compared to an average of 74 % in general.<sup>10</sup> Graduation within 1 year after the expected graduation point was the most common trajectory, especially within Medicine and Nursing (87 %) Psychology (79 %) and Social work (78 %). These are the programmes, which are overrepresented by female students (87 % in Nursing and Social work, 72 % in Psychology and 62 % in Medicine). The lowest completion rates were observed in the programmes of Architecture and Engineering, (47 % and 52 % respectively) and in Law (60 %). Consequently, these programmes have higher shares of male students than females, besides Law students (Law 62 % women), compared to 55 % in Architecture (55 %) and Engineering (27 %). In general the university colleges turn out to have a higher completion rate (UCs 88 %) than the universities (Us 70 %), which is in line with Holzer's study on university choice, equality and performance in Swedish HE (2009).

One important thing to discuss is the polarisation of gender-biased educational programmes. The results of this study reflect the gender structure of Swedish higher education. We know from previous studies that the field of higher education is partially divided into gender subspaces where on the one hand Nursing, Caring, and Educational professional programmes to a large extent recruit working-class daughters and on the other hand the technical programmes recruit the working class sons (Börjesson & Bertilsson, 2012; Petersen & Lundin, 2007). In the empirical material, the two large educational programmes Nursing and Engineering are included, which divide the social space of educational strategies into two strong poles of gendered education structure. However, it is not just a matter of gender but this apparent structure reflects more precisely a specific configuration of gender-class intersections such as working-class women (positions close to the coherent intensive enrolment pattern) vs. middle-class men (positioned closely to the scattered extensive enrolment pattern).

Students who are in university colleges (UCs) and from more humble backgrounds seem to be more 'goal-oriented' than students from the middle classes, who study at universities and may be able to 'afford' to take multiple pauses, such as a sabbatical year. This goal-orientedness could be understood in terms of taking time for a careful decision to enter HE, studying for a future job, or giving something back to society (Christie, 2007). The persistence also embraces struggles with academic achievement and a sense of belonging, which are nonetheless bearable compared to the risk of failure when having 'invested so much already' (Byrom & Lightfoot 2013, p. 817; Thunborg, Bron & Edström, 2012).

The persistence to graduate in spite of several pauses or transfers is also a difficult path and may involve financial constraints when re-entering HE and skills requirements in terms of time management/planning with respect to getting behind in one's studies and needing to catch up (Arias Ortiz & Dehon, 2013; Arnold, 2013; Byrom & Lightfoot, 2013; Carlhed, 2015). The middle-class students have an advantage through their parents with higher levels of cultural, economic, and educational capital, and who know how to survey and micro-manage their children's educational trajectory (Weis & Cipollone, 2013). Choosing the "right" university is dependent on the cultural capital the students and their parents possess. If the university is remote from home this requires the student to be able to move to another town. But it also means that family and peer ties need to be loosened and that the student's skills in constructing a new identity in a new place need to be sufficient (Christie, 2007). This skill sufficiency could arise from peers doing the same things or from having siblings or parents who have undergone the same transformation earlier. Holzer (2009) has shown that nearby, easy-access to HEIs encourages more people to attend higher education, and there has been a large growth in enrolment among students whose parents had upper secondary school as their highest education. The present study shows that university colleges (UCs) attract a larger share of students who have a lower level of educational capital and older students who have family obligations.

Successful trajectories also imply skills of transfer between different systems like secondary school, HE, the labour market, and related financial systems like study finance, health insurance systems, or unemployment

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<sup>10</sup> earn a diploma within 5 years from expected graduation point

systems. This demands good skills and cultural and economic resources at the individual or the parental/family level to handle the shifts, the gaps, and financial consequences in order for the financial machinery of the different systems to work smoothly. We know that these resources are socially distributed unequally. Living conditions also create temporal constraints. We have seen that some students take time and make careful decisions about whether to enter HE at all; they may have to compensate for their lower grades with municipal adult education to obtain qualifications, they tend to have children. All in all, they are older freshmen at a greater extent as we could see in the analysis (older than 31 years when entering the programme) and their educational capital level is low. Another important aspect of the path to graduation is the pace at which students have to follow the study programme, where falling out of the normal pace means financial troubles with the study finance system due to certain performance minimums, and then some effort for re-enrolment and study recovery (e.g., Arias Ortiz & Dehon, 2013; Carlhed, 2015).

Furthermore, there are several studies that can help illuminate the relation between social class and dropping out either permanently or temporarily (Hovdhaugen, 2012; Thunborg, Bron, & Edström, 2012; Quinn, 2013). Obstacles to academic achievement in terms of family and domestic obligations that collide with study obligations have already been discussed above regarding working-class women (Reay 2003). The results of interrupted academic trajectories in this study reveal a clear connection between dropouts and low amounts of cultural and educational capital, which is in line with several previous studies (Arias Oriz and Dehon, 2013; Berggren, 2013; Hovdhaugen, 2009).

Considering the accumulation of the statistical ‘junk’ categories (‘missing’, ‘misc’ or ‘other’) among the early leavers, this denotes students who are not recognisable to the official statistics in terms of missing data for grades from upper secondary school, birth nation, parents’ educational level, and socioeconomic status, and are not really part of any recognisable social category in the society, in one way or another. It implies that these students are either immigrants themselves or their parents are. Nevertheless, among the early leavers, there are birth nation categories that stand out, such as East Europe, Other Asia (not South Central Asia), South America, Central America or Caribbean, and Africa. This would be in line with the results from several studies i.e. a Swedish study (Berggren, 2013), and with a French study on second generation immigrants and their higher risk of dropping out compared to students of French origin (Brinbaum & Guégnard, 2013), and with those from a Dutch study (Arnold, 2013). However, results from a Norwegian study show no support for minority students’ higher risk of dropping out, but do support the notion of advantage in academia through high amounts of cultural capital and the relatively small minority student group in Norway as already selected and in tune with educational demands (Reisel & Brekke, 2010). The late leavers are found at positions near the Engineering programme, which can be understood as dropping out as a consequence of either an increase in educational demands at the end of the study programme or of other pull-out factors like being offered a job before graduation, which is quite common for engineering students (HSV, 2010). Other studies also point out that early withdrawal is much lower among science students than non-science students (Arnold, 2013).

Finally, the analysis has contributed by putting forward a range of classifications of educational strategies that could be useful as starting points in further research on the use of HE and student trajectories. In terms of rather distinct educational strategies and recruitment related to specific HEIs (university colleges and universities), the results also illuminate divisions in practice within the uniform Swedish higher education system, which could support views of the need for change within the system toward a complex stratification (see Hallonsten & Holmberg, 2013). The utility of results varies of course with the views of different stakeholders. From a financial perspective, the standardised trajectories could be seen as fairly ‘unproblematic’ since they reinforce prejudices about ‘the ideal student’, which relieves HE administrators from worrying about budget deficit risks. From an institutional point of view, the enrolment patterns in the non-degree space are however more ‘problematic’, since completion is connected to reimbursement for the HEI by production of both students’ earned credits and diplomas/degrees. The relatively recent increased financial interest in student completion and attrition in higher education on the national and international levels also connects to discourses of efficiency in higher education systems and employability (Eurydice, 2000; Fölster, Kreicbergs & Sahlén, 2011; OECD, 2013; SOU 2008:69).

However, this policy track collides with other ideological ideas of HE and its role in society. Following the “efficiency policy track” there is an obvious risk of focusing on and acclaiming the standardised trajectories while criticising and condemning the non-standardised ways of using HE. Other existing policies and views of HE such as an opportunity for lifelong learning or for levelling out living conditions would need a pluralistic and flexible system which would offer recurring opportunities for education throughout an individual’s lifespan embracing and addressing the wider socio-cultural and socio-economic circumstances of student life.

Hence, the analysis of the social space of educational strategies and its objective relations reflects consequences of paradoxical policy processes and a relatively open and flexible system at the time (see Government bill 2001/02:15). The reactions the results of the study will provoke will probably have another educational policy context, but will require nevertheless caution when judging which kind of educational strategies are either “good” or “bad”.

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## Bio

Carina Carlhed has a PhD in Education, and is associate professor of Sociology of Education at Uppsala University, Sweden. She currently runs a four-year post doc project: 'Gravelled Expectations or Successful Reorientations? Switchers and Dropouts in Higher Education 1977-2007', funded by the Swedish Research Council. She also works in a project on professions: 'Agents of Knowledge: The Emergence and Contemporary Significance of Professions in Sweden', funded by the Swedish Research Council, in which her specialty is professions within the medical field.

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## Figures

Figure 1. The changes in forms of study within the student population in Swedish higher education.

Figure 2. Combinations of poles into regions of the graphs in Figure 3 and 4.

Figure 3. Plane 1–2, poles of axes 1 and 2 and clouds of supplementary variables.

Figure 4. Plane 1–3, poles of axes 1 and 3 and clouds of supplementary variables.

## Tables

Table 1. Programmes and programme lengths.

Table 2. Frequencies and percentages of students in the programmes and their completions rates.

Table 3. Eigenvalues, raw variance rates, and the modified rates for the first five axes.

Table 4. Active variables and modalities in the Specific MCA, absolute and relative distributions, cohort 2001–2002, n=15,918.

Table 5. Interpretations of the three axes. Relative contribution (%) of each modality of the active variables to axes, written either in column ‘left’ or ‘right’, ‘bottom’ or ‘top’ according to its positions on the graph. Study pattern in *italics*, representing the poles of axes and eigenvalues of each axis ( $\lambda$ ).

Table 6. Summary of results of calculations of deviation between coordinates of the poles of axes.

## In Appendix

Table 7. Supplementary variables; gender, programme, grades, migration, birth nation (student, mother, father), Socioeconomic status (mother, father), in counts and percentages.

Table 8. Supplementary variables; income, municipal adult education, highest level of education (mother, father, work sector (mother, father) in counts and percentages.

Table 9. Supplementary variable: university in counts and percentages.



## Appendix

Table 7. Supplementary variables; gender, programme, grades, migration, birth nation (student, mother, father), Socioeconomic status (mother, father), in counts and percentages.

Supplementary variable		Frequency	Percent
Gender	<i>Men</i>	6452	40,7
	<i>Women</i>	9376	59,3
	<i>Total</i>	15828	100
Program	<i>Architecture</i>	257	1,6
	<i>Engineering</i>	6144	38,6
	<i>Law</i>	1458	9,2
	<i>Medicine</i>	1067	6,7
	<i>Psychology</i>	423	2,7
	<i>Nursing</i>	4789	30,1
	<i>Social work</i>	1780	11,2
	<i>Total</i>	15918	100
Grades	<i>Grades. &lt;15</i>	5206	47,6
	<i>Grades. 16-20</i>	5721	52,3
	<i>Total</i>	10927	100
Migration	<i>Mig.in</i>	1361	68,9
	<i>Mig.out</i>	614	31,1
	<i>Total</i>	1975	100
Birth Nation (student)	<i>Swe</i>	14224	89,4
	<i>oth-Nord</i>	196	1,2
	<i>oth-Europe</i>	270	1,7
	<i>East-Europe</i>	210	1,3
	<i>US/AUS/NZ</i>	27	0,2
	<i>S.Amer/Car/Cent.Am</i>	148	0,9
	<i>Africa</i>	84	0,5
	<i>South.Cent.Asia</i>	295	1,9
	<i>oth.Asia</i>	370	2,3
	<i>Birth.nation.missing</i>	94	0,6
	<i>Total</i>	15918	100
Birth Nation (mother)	<i>M-Swe</i>	12990	81,6
	<i>M-oth-Nord</i>	738	4,6
	<i>M-oth-Europe</i>	365	2,3
	<i>M-East-Europe</i>	291	1,8
	<i>M-US/AUS/NZ</i>	19	0,1
	<i>M-S.Amer/Car/Cent.Am</i>	112	0,7
	<i>M-Africa</i>	41	0,3
	<i>M-South.Cent.Asia</i>	242	1,5
	<i>M-oth.Asia</i>	216	1,4
	<i>M.Birth.nation.missing</i>	904	5,7
	<i>Total</i>	15918	100
Birth Nation (father)	<i>F-Swe</i>	12977	81,5
	<i>F-oth-Nord</i>	483	3
	<i>F-oth-Europe</i>	466	2,9
	<i>F-East-Europe</i>	200	1,3
	<i>F-US/AUS/NZ</i>	17	0,1
	<i>F-S.Amer/Car/Cent.Am</i>	94	0,6
	<i>F-Africa</i>	73	0,5
	<i>F-South.Cent.Asia</i>	239	1,5
	<i>F-oth.Asia</i>	223	1,4
	<i>F.Birth.nation.missing</i>	1146	7,2
	<i>Total</i>	15918	100
Socioeconomic status (mother)	<i>M-workers</i>	2898	18,2
	<i>M-lower middle</i>	2075	13
	<i>M-middle</i>	3322	20,9
	<i>M-higher</i>	1763	11,1
	<i>M-entrepreneurs</i>	451	2,8
	<i>M-others</i>	5409	34
	<i>Total</i>	15918	100
Socioeconomic status (father)	<i>F-workers</i>	2660	16,7
	<i>F-lower middle</i>	875	5,5
	<i>F-middle</i>	2469	15,5
	<i>F-higher</i>	2811	17,7
	<i>F-entrepreneurs</i>	872	5,5
	<i>F-others</i>	6231	39,1
	<i>Total</i>	15918	100

Table 8. Supplementary variables; income, municipal adult education, highest level of education (mother, father, work sector (mother, father) in counts and percentages.

Supplementary variable		Frequency	Percent
Income	<i>Low.work.High.Sub</i>	8122	51
	<i>High.Work.Low.Sub</i>	268	1,7
	<i>High.Work.High.Sub</i>	5270	33,1
	<i>Low.Work.Low.Sub</i>	243	1,5
	<i>Total</i>	13903	87,3
Municipal adult education	<i>no.Munic.edu</i>	13764	86,5
	<i>Munic.edu</i>	2154	13,5
	<i>Total</i>	15918	100
Highest level of education (mother)	<i>M-edu.no.info</i>	1188	7,5
	<i>M-edu.comp.&lt;9.years</i>	2592	16,3
	<i>M-edu.sec.edu &lt;2.years</i>	3929	24,7
	<i>M-edu.sec.edu &gt;2.years-3.years</i>	1372	8,6
	<i>M-edu.post.sec &lt;3.years (4.years.sec)</i>	2587	16,3
	<i>M-edu.post.sec &gt;3.years</i>	4076	25,6
	<i>M-edu.PhD/Lic</i>	174	1,1
	<i>Total</i>	15918	100
Highest level of education (father)	<i>F-edu.no.info</i>	2296	14,4
	<i>F-edu.comp.&lt;9.years</i>	2826	17,8
	<i>F-edu.sec.edu &lt;2.years</i>	2703	17
	<i>F-edu.sec.edu &gt;2.years-3.years</i>	2068	13
	<i>F-edu.post.sec &lt;3.years (4.years.sec)</i>	1792	11,3
	<i>F-edu.post.sec &gt;3.years</i>	3687	23,2
	<i>F-edu.PhD/Lic</i>	546	3,4
	<i>Total</i>	15918	100
Work sector (mother)	<i>M-sector.Bld.miss</i>	3619	22,7
	<i>M-Public administration</i>	766	4,8
	<i>M-Public business</i>	18	0,1
	<i>M-Municipal administration</i>	4739	29,8
	<i>M-County councils</i>	1875	11,8
	<i>M-Misc.Public adm</i>	124	0,8
	<i>M-Private limited company</i>	2846	17,9
	<i>M-Companies_non_public</i>	594	3,7
	<i>M-State_organizations</i>	448	2,8
	<i>M-Municipal:organizations</i>	207	1,3
	<i>M-Misc. org.</i>	682	4,3
	<i>Total</i>	15918	100
Work sector (father)	<i>F-sector.Bld.miss</i>	4340	27,3
	<i>F-Public administration</i>	1015	6,4
	<i>F-Public business</i>	46	0,3
	<i>F-Municipal administration</i>	1240	7,8
	<i>F-County councils</i>	631	4
	<i>F-Misc.Public adm</i>	29	0,2
	<i>F-Private limited company</i>	6078	38,2
	<i>F-Companies_non_public</i>	1111	7
	<i>F-State_organizations</i>	521	3,3
	<i>F-Municipal:organizations</i>	282	1,8
	<i>F-Misc. org.</i>	625	3,9
	<i>Total</i>	15918	100

Table 9. Supplementary variable university in counts and percentages.

Supplementary variable	Frequency	Percent
University		
<i>Blekinge t-UC</i>	137	0,9
<i>Chalmers t-U*</i>	1266	8
<i>Ersta n-UC*</i>	169	1,1
<i>Gothenburg U</i>	923	5,8
<i>Dalarna UC</i>	151	0,9
<i>Borås UC</i>	202	1,3
<i>Gävle UC</i>	146	0,9
<i>Halmstad UC</i>	125	0,8
<i>Jönköping UC*</i>	279	1,8
<i>Kalmar UC</i>	117	0,7
<i>Skövde UC</i>	221	1,4
<i>Kristianstad UC</i>	159	1
<i>Väst UC</i>	224	1,4
<i>Karlstad U</i>	151	0,9
<i>Karolinska m-U</i>	668	4,2
<i>KTH - t-U</i>	1734	10,9
<i>Linköping U</i>	1466	9,2
<i>Luleå t-U</i>	637	4
<i>Lund U</i>	2022	12,7
<i>Malmö UC</i>	380	2,4
<i>Mitt UC</i>	449	2,8
<i>Mälardalen UC</i>	353	2,2
<i>Röda Korset n-UC*</i>	133	0,8
<i>Sophiahemmet n-UC*</i>	107	0,7
<i>Stockholm U</i>	940	5,9
<i>SLU a-U</i>	8	0,1
<i>Umeå U</i>	1065	6,7
<i>Uppsala U</i>	1213	7,6
<i>Växjö U</i>	115	0,7
<i>Örebro U</i>	358	2,2
<i>Total</i>	15918	100

Note: UC - University college, U- Universities, t-UC - Technology University college, t-U - Technology University, m-U - Medical University, n-UC - Nursing University college, a-U - Agricultural University, \*independent and operate on the basis of an agreement with the Government.