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Gendered transition structures: life course patterns after completion of gender-segregated vocational education in Norway

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ABSTRACT

In this article, we present the results from a sequence analysis of two cohorts of young people skilled in gender-segregated vocational education in Norway. By using administrative data on monthly statuses in education, employment and welfare, we map life course trajectories during the 11 years after completion. The results suggest that men skilled in male-dominated trades experience the most favourable trajectories in terms of labour market inclusion and income progression, whilst women skilled in female-dominated tracks have the least favourable trajectories. More surprisingly, the two gender minorities appear to ‘meet in the middle’, displaying strikingly similar life course pattern. We interpret these results as indicating *gendered transition structures* which confront vocationally inclined youth. Though we cannot draw conclusions concerning underlying selection processes, our findings may inform discussions on why young men overall have remained more reluctant towards taking gender-untraditional paths through education and employment over recent decades.

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Introduction

Over recent decades women have changed their preferences and behaviour with respect to employment and work to a greater degree than men. This has been described as the ‘unequal gender revolution’ (England 2011). More women have entered areas of higher education and professional segments of the labour market traditionally dominated by men. Declines in gender segregation have been strongest among professional and managerial occupations, with little change at lower points of the occupational scale (Moskos 2020). Vocational tracks of upper-secondary education have remained the most segregated part of the education system, reflecting the situation in low skill segments of the labour market (Steinmetz 2012; Reisel, Hegna, and Imdorf 2015). The concept of the ‘the glass ceiling’ (Reskin and Roos 1990) has been used to conceptualise the hindrances confronted by women entering male-dominated occupations, and the concept of ‘the glass escalator’ (Williams 1992) has been used about advantages awarded (some) men entering female-dominated occupations.

In this article, we ask two research questions. First, does the minority gender completing gender segregated education follow similar work and welfare trajectories as the majority gender, or are there gender-specific patterns within male – vs. female dominated educational tracks? Second, have these patterns changed over recent decades? We scrutinise the education, employment and welfare trajectories of two cohorts of men and women who have completed gender segregated vocational

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education in Norway. We use multifactor discrepancy analysis of status sequences based on administrative data from two whole educational cohorts of individuals skilled in gender-segregated vocational tracks in Norway 1994 and 2004, and analyse their trajectories over the 11 years following completion.

We find that the trait most clearly differentiating the sequences under study is the individual's gender. The second most determining feature is the direction of the gender-segregation in the track completed. The third and final 'split' relates to cohort and reveals some minor fluctuations relating to shifts in employment demand in different historical periods. Overall, those skilled in male-dominated areas appear to experience the most favourable trajectories (in terms of income and labour market integration), whereas women who completed female-dominated tracks, have the least favourable trajectories, and the gender minorities appear to 'meet in the middle'. The question of which groups have the most favourable trajectories thus depends on the reference group with which comparison is made.

Based on these empirical insights from Norway, we develop the theoretical concept of *gendered transition structures*. This is inspired by the concept of opportunity structures that has long been established in the field of youth studies (Roberts 1968, 2009), and studies of gender in organisations (Kanter 1977). But whereas opportunity structures refer to individual's conditions for action in specific institutional contexts, the concept of gendered transition structures denotes the gendered nature of aggregate patterns of life course transitions. We propose that using sequence analysis, it is possible to create a proximate 'map' of what gendered transition structures look like in specific areas of education and employment, and in specific contexts of time and place.

Previous research and theory

Research on what fuels persistent patterns of labour market gender segregation has noted a number of challenges confronting women who enter male-dominated low-skilled occupations. Within construction, for instance, informal institutions have been found to obstruct not only recruitment of women but also their retention and progression (Galea et al. 2020). Recent research on female pilots and automotive workers in Australia has documented widespread gender harassment in the form of belittling jokes and demeaning comments from colleagues, managers and customers (Foley et al. 2020). These and other invisible barriers to career progression encountered by women in male-dominated occupations have been conceptualised as constituting a 'glass ceiling' (Reskin and Roos 1990).

Research on men entering female-dominated occupations, on the other hand, suggests that they face a very different situation as a gender minority. They enjoy privileged access to a 'glass escalator', partly from being perceived as more suitable for leadership positions (Williams 1992, 2013; Simpson 2005). A key question in this literature over the last decade, has been whether such glass escalators are in fact open to *all* men. Inspired by theories of intersectionality, scholars have noted that ethnic minority men, for instance, may not enjoy similar privileges as gender-untraditional men from the ethnic majority population (Wingfield 2009; Williams 2013; Hussein and Christensen 2017).

As noted by Torre (2018, 3) much prior research has examined gender segregation 'as a rather static phenomenon'. That said, several important conceptual contributions to this literature have focused specifically on the temporal aspects of gender segregation. The image of 'revolving doors' (Jacobs 1989) is meant to conceptualise the ways in which pressure on gender minorities may continue after the initial untraditional choices are made, and thus increasing the chance of premature exit from minority positions. A more recent contribution to the conceptualisation of the temporal aspects of gender segregation is the term 'stopgappers' (Torre 2018), which refers specifically to a pattern among men entering female-dominated occupations. US data suggest that, unless they come to enjoy upward mobility (the glass escalator), these men tend to return to more gender-traditional positions over time.

In addition to these conceptual discussions concerning life course dynamics, a number of contributions have investigated relations between gender segregation and temporality at the level of everyday processes. This has been conceptualised as ‘gliding’ or ‘sliding’ gender segregation. These concepts refer to the everyday workplace processes by which women and men may, despite starting with the same level of education and seniority, are delegated different work tasks and enjoy varying working conditions and opportunities for development and promotion/wages (Holt and Lewis 2011). For instance, in the Australian construction industry, informal gendered institutions obstruct not only women’s recruitment but also their retention and progression (Galea et al. 2020).

Most of the research into the nature and causes of gender segregation has focused empirically on the gender minorities. Studies that have included both gender majorities and gender minorities have mostly been in-depth case studies focused on how processes of inclusion and exclusion operate in specific gendered organisations (e.g. Corcoran-Nantes and Roberts 1995). Another notable feature of research on gender-segregation is that male-dominated and female-dominated areas of education and employment tend to be researched separately. Few studies have provided an integrated analysis of gender minorities and gender majorities in multiple sectors. For this reason, there is little empirical knowledge on how gender majorities and minorities fare as compared to each other within the most gender-segregated areas of education and employment.

As noted by Blossfeld et al (Blossfeld et al. 2015, 348) there is limited research on gender disparities specifically among young workers. A comparison of two cohorts in the UK (Bukodi and Dex 2010) suggests that young women may be facing increasing hindrances to career advancement from low-level entry jobs. However, the predominance of cross-sectional research designs, and a general lack of cohort-comparisons in this research area, means that there is limited knowledge on how opportunities and constraints for young skilled workers have changed over recent decades. Against this backdrop, the current study examines the life course patterns of two cohorts of gender minorities and gender majorities in the most gender-segregated fields of education and work in Norway.

The study is based on a life course perspective. The life course perspective is a theoretical orientation which has its origins in the biographical approach developed in Chicago at the beginning of the 20th century (Elder, Johnson, and Crosnoe 2003). What sets it apart from other perspectives is the link between human agency, time, and structure in specific historical periods, and the relation between specific institutional arrangements and life course patterns (Mayer 2004; Mills 1959). Previous research has demonstrated that transitions through youth to adulthood vary considerably according to social origin and gender, and that transitions from school to work are often non-linear and long-lasting (Billari and Liefbroer 2007; Schoon 2015), especially in low-skilled segments of the youth population (Maguire and Ball 2011; Bradley and Devadason 2008; Shildrick and Robert 2007). Building on these insights, we study transitions from education to work as contextualised processes, using long observation periods and comparisons of two recent birth cohorts. Cohort-comparative research designs are common within life course research and have long been considered useful for investigating the interlinkages of social change and individual lives (Ryder 1965; Nilsen 2014; Elder, Johnson, and Crosnoe 2003).

The context of Norway

As its Nordic neighbours, Norway is characterised by a high female employment rate, and extensive provision of free or affordable public services, including education (Kvist et al. 2011). Though the Nordic countries boast some of the world’s highest female employment rates, it is worth noting that a large proportion (37%) of these employed women work part time (Statistics-Norway 2018, 12). Labour market gender segregation can be characterised as stable and strong (Teigen and Skjeie 2017). The level of gender segregation in Norwegian higher education is moderately high, but starker in the vocational programmes of upper-secondary (Seehuus and Reisel 2017). Indeed, vocational upper secondary has long been the most gender-segregated part of the Norwegian education system (Mjelde 2004; Støren and Arnesen 2003).

After 10 years of compulsory education, 98% of young people in Norway enter upper-secondary education at 15/16 years of age. Since a major reform in 1994, approximately half enter 4-year vocational tracks, consisting (predominantly) of two years of school-based learning followed by two years of apprenticeship. The other half of pupils enter 3-year academic tracks, which qualify for entry into higher education. Around 30% of each cohort do not complete upper secondary within the normative timeframe (within five years, i.e. before the age of 21). Among these early school leavers, around one-third experience significant labour market exclusion, and women earn markedly less than men (Vogt, Lorentzen and Hansen 2020).

Data

For this study, we use population-based administrative registers, collected by Statistics Norway. We analyse data on education, work/income, social welfare benefits, and socio-demography for the period from 1993 throughout 2014. Two educational cohorts have been defined: all individuals completing gender segregated vocational in 1993 and 2004. Each entire educational cohort is followed by monthly statuses from which they complete upper secondary school and for eleven consecutive years. For the sensitivity analyses, described in more detail below, we follow the 2007 cohort for eight consecutive years.

In order to identify gender-segregated education-types, we rely on annual records using the Norwegian NUS2000 educational coding standard. This is a slightly more detailed standard than the international ISCED2011. We have used the three-digit level of 'subject group' for education at the upper secondary level. By limiting the types of education to upper secondary level, we aim to avoid bias caused by within-group heterogeneity with regard to educational level and formal competence. For this same reason, we exclude persons who took further education during the three years after completing upper secondary. This provides us with a population who entered the labour market at the start of each cohort-specific observation periods. The demarcation line for severely gender segregated upper-secondary education is set at a representation of at least 70% from one gender receiving the final skill certificate (fagbrev). On this basis, education has been grouped into two broad categories consisting of education with female dominance and male dominance, respectively. Most types of qualifications exist for both cohorts. In [Tables 1 and 2](#), we present the detailed list of qualifications included into each of the two-broad gender-based groups of education. [Table 1](#) shows that the female-dominated qualifications are predominantly within caregiving and health. Nurses are, however, not included here since this is an education at tertiary level in Norway.

[Table 2](#) shows that in total, there were more people completing male-dominated than female dominated vocational tracks in both cohorts. There was a sharp increase in the number of persons gaining female-dominated vocational qualifications from 1993 to 2004, while there was a small drop

Table 1. Gender segregated education 70% women or more, frequency.

NUS code (3 digits)	Education	Cohort 1993	Cohort 2004
461	Caregiving	62	996
469	Health	202	227
462	Social work	25	463
483	Service	380	515
416	Handicraft	213	409
443	Office and secretary	-	96
465	Occupational therapy	60	65
466	Pharmacist	38	95
464	Dental health	33	58
444	Hotel and tourism	320	55
449	Economy and administration	418	-
Total		1755	2979

Table 2. Gender segregated education, 70% men or more, frequency.

NUS code (3 digits)	Education	Cohort 1993	Cohort 2004
455	Electro, mechanic, and machine	2566	2121
457	Building and construction	1600	1520
481	Transport	415	183
468	Sports and physical education	118	184
452	Physics and chemistry	209	67
454	Information – and computer tech.	-	212
471	Fishing and aquaculture	51	64
473	Nursery	-	32
474	Forestry and horticulture	34	14
Total		4 993	4408

in the male-dominated trades. These changes can be explained by the comparatively late institutionalisation of the ‘skilled care worker’ as an educational track (hjelppeleier/helsefagarbeider), following the Reform 94 (Høst and Larsen 2018).

Methods

Multifactor discrepancy analysis of status sequences

In order to explain the characteristic features of Multifactor discrepancy analysis, it is useful to first describe the basic features of more traditional approaches to sequence analysis. The traditional approach to sequence analysis usually follows a three-step procedure, where the first step is to calculate pairwise distances between sequences. The second step involves the grouping of sequence typologies based on how similar the sequences are. This is usually performed by hierarchical clustering or other clustering approaches (see Studer 2018, for a recent contribution). In the third step, descriptive analyses of covariate-cluster associations or regression-based analyses on cluster membership are carried out. This last step results in an analysis where potential sequence-covariate associations are uncovered post-matching. In consequence, potential sequence-covariate relationships do not influence on the identification of the actual sequence types. This is unfortunate if the primary interest of the researcher lies in uncovering how covariate associations structure individual sequences, as is the case here.

Instead of following the traditional approach to sequence analysis, we therefore follow the example of Studer et al. (2011), and use multifactor discrepancy analysis of status sequences. Multifactor discrepancy analysis combines the principles of ANOVA to the dissimilarity matrix and regression trees, thus allowing the computation of the share of sequence-discrepancy explained by a covariate (Studer et al. 2011). This approach is appealing since it retains the holistic qualities of traditional sequence analysis, as well providing a direct way of scrutinising how individual sequences are influenced by different contextual factors. Furthermore, its inductive character is well suited to explorative analyses of phenomena where there exist few conceptions of covariate associations and their interactions.

A regression tree starts with one node where all individuals are grouped initially. This original node is then partitioned using the values of the predictor that results in ‘child nodes’ that differ as much as possible from one another. Subsequent splits are done following the same principle. This results in a tree-like plot where each covariate’s effect nuances the effects of previous covariates. For these analyses, the stopping criteria for growing new branches to the tree is set at a p value of 1% and a minimum node size of 50 persons. The covariates entered in the discrepancy analysis was gender, gender segregated education (female or male dominated, vocational), country background, and cohort.

The first step of our analysis corresponds with the first step in traditional sequence analysis; the calculation of pairwise distances between sequences. This is the number of steps that is required to make two sequences similar (Brzinsky-Fay 2007). There exist several cost setting approaches, some of which emphasise the order of events, while others emphasize the timing of events (Lesnard 2010). Since we have no strong preferences towards either timing or order, we have applied optimal matching with transition-rate-based substitution costs and indels set to 1.

Table 3. Status alphabet, monthly statuses.

Disability	Registered with disability pension current month
Health related	Registered with either sickness benefit, temporary disability benefit, vocational or medical rehabilitation, or work assessment benefit current month
No work	Registered as unemployed or/and social assistance current month
Education	Registered under education current month if month is in a year with a valid educational record and none of the above apply
Work, income 1 st quintile	Monthly status is based on annual income in the 1 st income quintile (age 16–66) and none of the above monthly statuses apply
Work, income 2 nd quintile	Monthly status is based on annual income in the 2 nd income quintile (age 16–66) and none of the above monthly statuses apply
Work, income 3 rd quintile	Monthly status is based on annual income in the 3 rd income quintile (age 16–66) and none of the above monthly statuses apply
Work, income 4 th quintile	Monthly status is based on annual income in the 4 th income quintile (age 16–66) and none of the above monthly statuses apply
Work, income 5 th quintile	Monthly status is based on annual income in the 5 th income quintile (age 16–66) and none of the above monthly statuses apply
Other	Registered if none of the other statuses apply current month

For the optimal matching and following sequence-tree regression, we have defined 10 mutually exclusive monthly states. These states reflect positions within the educational system, labour market and welfare system. The status alphabet has been defined in such a way that if two or more states occur at the same time, the topmost state in Table 3 is given preference.

Sensitivity analyses: multifactor discrepancy analysis of status sequences on paired samples

The analytical approach described above does not take into account any potential gender-based selection effects into different educational tracks. Thus, there is a possibility that gender differences between minority and majority groups might be caused by compositional differences between men and women. Women who choose male dominated education might be systematically different from the men who choose male education and vice versa.

In order to take compositional differences into account, we have run a sensitivity analysis on paired samples before repeating the multifactor discrepancy analysis. For the matching of paired samples, we have used coarsened exact matching (CEM) (Iacus, King, and Porro 2009), matching each of the gender minority groups with identical persons of the opposite sex from the corresponding majority group. Matching was based on country background, parental education, age when finishing education, and school-leaving grades from upper secondary school. Among these variables, finishing grades from upper secondary school is considered a key variable for the identification of academic/intellectual ability. Unfortunately, this information was only available for a restricted part of the observation period. Analyses have therefore been run only for the 2007 cohort for a duration of eight years using the same status alphabet as in the main analyses. In total, 259 men within female dominated education were matched with 259 female ‘twins’, and 177 women within male dominated education were matched with 177 male ‘twins’. All in all, the matching quality was good, and we found exact matches in the majority populations for all persons in the gender minority groups. For the multifactor discrepancy analysis, we entered the same variables as in the main analysis with the exception of cohort.

Results

Descriptive statistics

Table 4 contains descriptive statistics for the two cohorts under study in the main analysis. While all qualifications with more than 70% of one gender were included in the sample, the average degree of gender segregation was in most cases higher. Gender segregation in the qualification groups where

women were in the majority increased from close to 87% for the 1993-cohort to 92% for the 2004-cohort. The gender distribution within the male-dominated trades was stable at 95–96% for both cohorts. [Table 4](#) also shows us that the average age of attaining these qualifications, is between 21 and 22 years of age.

Reliable information on work hours is only available from the year 2000, and thus only available for the 2004-cohort. There is a pronounced difference in working hours between those who pursue male-dominated education versus female-dominated education. For the first year of observation in 2004, more than 88% of those who completed a male-dominated track worked full time, while only 42% of those who followed a female-dominated education worked full time. This marked difference persisted throughout the observation period and is likely a reflection of the predominance of part-time positions in social care work in Norway (Vabø, Drange, and Amble 2019). It is also worth noting that the share who had become parents decreased between the cohorts for those who completed a male-dominated track, while it increased for those who completed a female-dominated track. This may in part reflect an overall trend of decreasing fertility rates in the Nordic countries, especially prevalent among low-skilled men, over recent decades (Jalovaara et al. 2019). Notably, however, measured at the last year of observation, in 2003 or 2014, these cohort differences have evened out. Even so, the share of parents is still higher among those who completed female-dominated tracks. Country background did not add any explanatory power to the tree-based analysis or the hazard rate model but has been included in [Table 4](#) for descriptive purposes. Here, it is worth noticing that the share of non-western immigrants is highest and has increased over time, among those who completed female-dominated tracks.

Results from the main analysis

The results from the multifactor discrepancy analysis are presented in [Figure 1](#), which shows chronograms for each node.¹ The interpretation of the tree-based discrepancy analysis is fairly straightforward. Initially, all individuals are placed in one node. Then, each node is recursively partitioned by the values of the predictor that provides the lowest within-group discrepancy in the ‘child’ nodes (Studer et al. 2011). Country background did not improve the model fit and is therefore not included in [Figure 1](#).

Table 4. Variable distribution within cohorts and education, in percent.

Variables	Cohort 1993		Cohort 2004	
	Edu men >70%	Edu women >70%	Edu men >70%	Edu women >70%
Gender				
Women	4,6	86,8	4,2	91,8
Men	95,4	13,2	95,8	8,2
Age finishing edu. (mean)	22,6	21,4	21,5	21,7
Work hours (first year)				
Full-time work	N/A	N/A	88,4	42,2
Part-time work	N/A	N/A	11,7	57,8
Work hours (last year)				
Full-time work	N/A	N/A	94,6	61,5
Part-time work	N/A	N/A	5,4	38,5
Children (first year)				
No children	82,2	86,4	92,8	79,5
One or more children	17,8	13,6	7,2	20,5
Children (last year)				
No children	34,8	26,4	43,8	26,9
One or more children	65,4	73,6	65,2	73,2
Country background				
Norwegian or western	97,7	92,2	94,9	88,0
Non-western	2,3	3,8	5,1	12,0
Total N	4 993	1 755	4 408	2 979

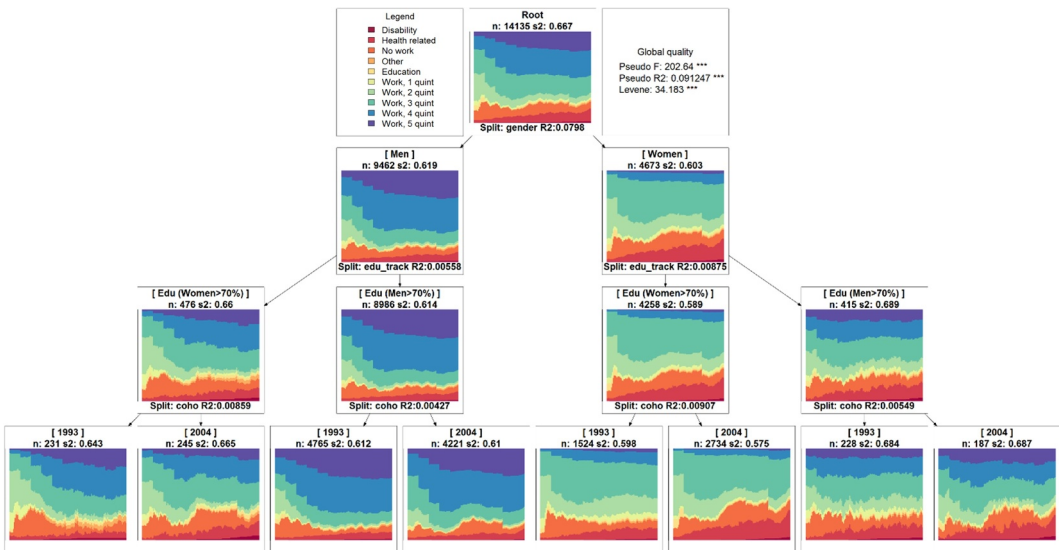


Figure 1. Sequence tree regression of gender segregated education in Norway, state distribution.

Starting at the top node in Figure 1, we see the overall state distribution of the full population of those who finished a gender-segregated education in 1993 or 2004. Employment income in the upper three quintiles dominate the overall state distribution, but there also seems to be some noticeable fluctuations in the unemployment rate over time. Not surprisingly, gender is the covariate that causes the first split. Consequently, gender provides the lowest within-group discrepancy and the strongest contribution to the pseudo-R².

The second split – which is symmetrical for both men and women – signals that the type of gender-segregated education completed is the second most important factor structuring individual life courses. Thus, starting at the left-hand side, men completing vocational education where they are the minority gender have less beneficial employment and welfare careers than men who completed male-dominated tracks. Hence, stable and well-paid work seems to be less common for men completing female-dominated tracks. Unemployment spells and health-related benefits are also more common for these untraditional men. Towards the end of the 11 year sequences, stable work within the top 4th and 5th income quintile are the two most common statuses among men who have completed a gender-traditional education, and more seldom, though not rare, among gender-untraditional men.

Moving to the right-hand side of the tree, we see that women with male-dominated qualifications are better off when it comes to employment and income than their more traditional female peers. Both educational groups have frequent spells of unemployment throughout the period. However, women with male-dominated qualifications have higher income profiles than women who completed female-dominated tracks. Some of this variation may be explained by mothers taking out more unpaid parental leave in connection with childbirth.² However, in our data, all paid parental leave is registered as income. Women’s lower income profiles (see Table 4) are likely more related to the fact that women in Norway for various reasons on average earn less than men (see Petersen, Penner, and Høgsnes 2014), and to the high rate of part-time employment which, especially among young low-skilled workers in health care, is mostly involuntary (Vabø, Drange, and Amble 2019).

Comparing the trajectories of men and women with education dominated by women (first and third nodes. from the left after the second split) reveals that women have a substantially higher aggregate number of spells involving health-related benefits. The men with female-dominated qualifications on the other hand have more spells in the fourth – and fifth-income quintile than women skilled in these same occupations.

Moving on to compare men and women having completed male-dominated vocational tracks (second and fourth nodes from the left after the second split) reveals that these nodes are rather similar when it comes to income profiles. Here, although not as often as for men with similar qualifications, there are quite a few women who climb to the two upper income quintiles, but they also experience more health-related labour market exclusion than their male peers.

The last split divides the sample into sub-nodes based on cohort membership. For all four nodes, the most conspicuous difference between the 1993 and 2004 cohort is the historical timing of unemployment spells. For the 1993 cohort, [Figure 1](#) shows a concentration of unemployment spells around the first third of the observation period. This corresponds well with the financial downturn to the Norwegian economy, with (relatively) high rates of youth unemployment in the mid 1990s. The nodes identifying the 2004 cohort, show a concentration of unemployment spells towards the middle of the period, during the years following the financial crisis in 2008. Apart from these differences reflecting short-term period-specific labour market fluctuations, the cohort contrasts reveal few signs of any major structural change in the life course patterns of men and women skilled in gender-segregated occupations over recent decades.

Results from the sensitivity analyses

Previous research using sequence analysis has noted challenges in untangling gender effects from gender compositional effects (Malin and Wise 2018). In order to remedy this, we have conducted sensitivity analyses where we aim to minimise selection bias by matching on ability as well as socioeconomic background. [Figure 2](#) contains the results from the sensitivity analyses of the paired samples. After taking compositional differences into account, the type of education is now the covariate that causes the first split. Thus, gender is no longer the factor that provides the lowest within-group discrepancy and the strongest contribution to the pseudo- R^2 . This suggests some kind of gender-based selection effect into gender segregated educational tracks. Even so, gender still has a very clear and pronounced effect on employment and welfare trajectories. Thus, the results from the last split produce a very similar picture as the second split in the main analysis.

Hence, despite having the same objective characteristics as their majority-group peers, men with female-dominated qualifications have substantially better income trajectories and a lower level of labour market exclusion than the female majority group. Likewise, women with male-dominated qualifications have less favourable income trajectories, more unemployment, and a higher level of labour market exclusion than the male 'twins' they completed vocational education alongside. In conclusion, the sensitivity analysis therefore strengthens the impression from the main analysis that young women skilled in gender-segregated vocational tracks have more adverse work and welfare trajectories than men, which men who complete female-dominated tracks fare better than the women in majority, and that the two gender minorities meet in the middle.

Discussion

In this study, we have investigated if the minority gender completing gender segregated vocational education in Norway follow similar work and welfare trajectories as the majority gender, and if this has changed over recent decades. The findings shed light on the complex interplay between gender, education and employment in the life course trajectories of those who complete gender-segregated vocational education. Even in the comparatively gender-equal country of Norway, gender still appears to play a pivotal role in structuring vocational life course trajectories. Our study provides a rare overview of the life course trajectories of both gender minorities and gender majorities in different vocational qualification groups. Our analysis of administrative registry data provides a descriptive and aggregate overview – a 'birds eye view' – of what ends up happening over the life course during the years after men and women complete gender segregated vocational education in Norway.

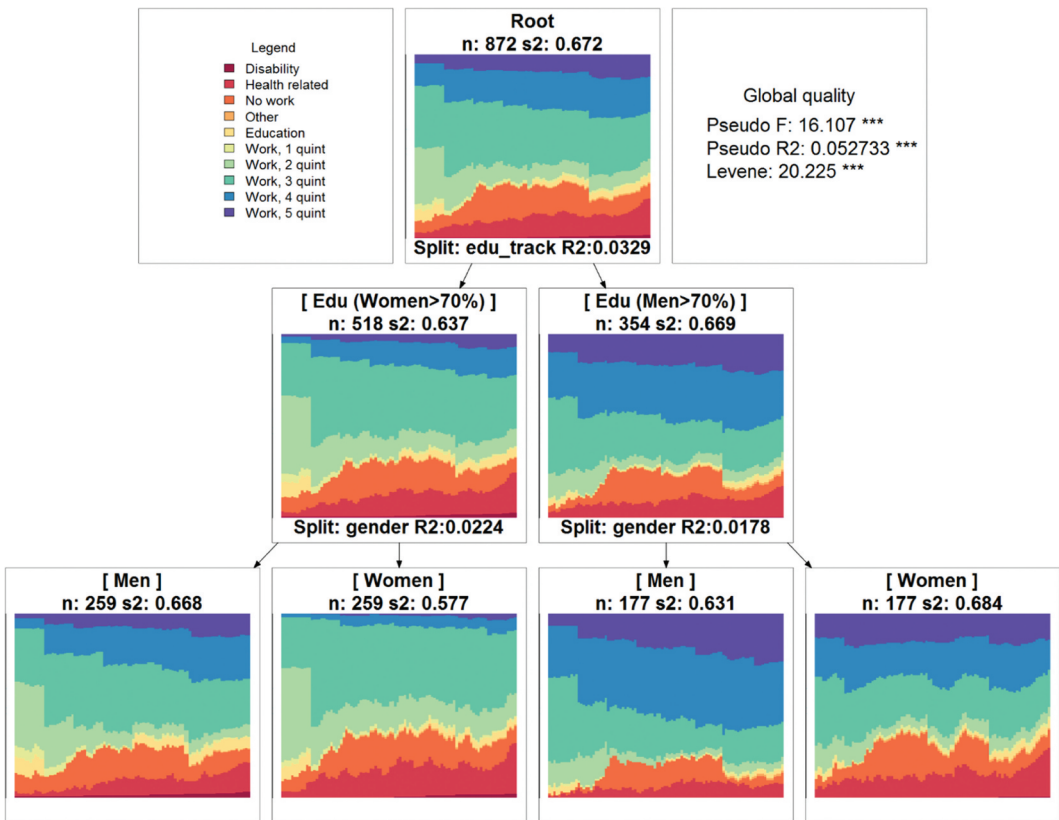


Figure 2. Sequence tree regression of gender segregated education in Norway, paired samples.

Several aspects of our findings are noteworthy in the context of ongoing theoretical debates. The fact that we find the greatest disparities in life course patterns between the two gender majorities reflect broad labour market disparities relating to gender, such as the fact that men work more often in the private sector and women work more part-time (Petersen, Penner, and Høgsnes 2014). A perhaps more surprising finding is that the gender minorities from vocational education have strikingly similar trajectories after completion. The gender pioneers appear to meet in the middle in terms of both levels of income and degree of labour market integration.

The article thus adds a novel perspective to the question of which group (gender minority or gender majority) has the most favourable prospects in terms of income and employment. Our findings illustrate that the question of favourability depends on the chosen reference group. Overall, men tend to do better in the sense that they earn more and experience lower levels of labour market exclusion. However, as compared with their more traditional gender peers, untraditional men do worse. Conversely, women skilled in a male-dominated trades do worse compared with men with the same qualifications, but compared with their more traditional gender peers, these untraditional women do significantly better.

We are not able to determine and untangle the various biographical and organisational selection processes, which may be fuelling these aggregate patterns. Indeed, we have not aimed to identify determining mechanisms or explanatory factors (such as preferences, incentives, discrimination or favouritism). It is worth noting, however, that our descriptive analysis reveals an aggregate pattern,

which appears largely congruent with what one would expect based on the research literature on «glass escalators» carrying untraditional men upwards, and 'glass ceilings' impeding the progression of untraditional women (Williams 2013; Reskin and Roos 1990).

In a wider societal and historical context, this rare comparison of minority trajectories with majority trajectories provides a novel perspective on the question of the 'uneven and stalled' gender revolution (England 2011). Our findings provide an aggregate view of the type of context in which un-traditional educational have remained concentrated among women who enter previously male-dominated, high-skilled areas of education and employment. For instance, a recent study from Denmark showed that women with high-grade point averages tend to avoid female-dominated occupations (Humlum, Nandrup, and Smith 2019, 467). Our results shed new light on some basic features of the social context from which such patterns of behaviour are shaped.

Transition processes from gender-segregated vocational education into employment appear to depend on complex interactions between each individual's gender and the direction of gender segregation in specific vocational tracks. Notwithstanding some minor fluctuations relating to shifts in employment demand and welfare policy over recent decades, these overall patterns are consistent across both cohorts. This is as would be expected based on previous observations about stability concerning gender segregation in vocational education (Reisel, Hegna, and Imdorf 2015). The cohort stability uncovered here thus not only illustrates but may contribute to a contextual explanation of, the glacial pace at which gender desegregation has hitherto been taking place in vocational education and skilled segments of the labour market.

Finally, our analysis is relevant for ongoing discussions concerning the cross-fertilisation of life course theory and sequence analysis. A number of scholars have noted that methodological advances within sequence analysis may benefit the development of life course theory (Aisenbrey and Fasang 2010; Ritschard and Studer 2018). In this context the results from our multifactor discrepancy analysis can be seen as depicting what may be termed *gendered transition structures*. This term combines elements from several theoretical traditions. The conceptualisation of life course transitions as contextualised processes is at the heart of the life course perspective (Elder, Johnson, and Crosnoe 2003; Elder 1985; Hareven and Masaoka 1988). The term 'opportunity structures' has long been established both in youth studies (Roberts 2009, 1968) and in research on gender in organisations (Kanter 1977), and refers to individual's conditions for action in specific institutional contexts. Combining key features of these previous contributions, the concept of gendered transition structures refers to aggregate gender patterns of life course transition processes. While the term opportunity structures directs attention to concrete *options* at different point in the life course, the term transition structures is more descriptive and processual, and denotes aggregate gender regularities in the way transition processes unfold over time. The empirical analysis presented here illustrates one way in which sequence analysis can be used to provide a proximate map of gendered transition structures in specific areas of education and employment, and in specific contexts of time and place.

Notes

1. In addition to chronograms, sequence index plots depicting the most representative sequences have been used for the descriptions of the nodes.
2. Between 65 and 75% of our two cohorts had become parents at the end of the observation period(s). Parents in Norway have over the period in question been eligible for fully compensated parental leave for 42 weeks, or alternatively 52 weeks with 80% compensation. Since 1993, between 4 and 14 weeks of the paid parental leave have been reserved for fathers (Kvande and Brandth 2019).

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