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Predicting stable employment trajectories among young people with disabilities

Jannike Gottschalk Ballo [a] and Andreea Ioana Alecu [b]

[a]Work Research Institute, Oslo Metropolitan University (OsloMet), Norway; [b]Consumption Research Norway, Oslo Metropolitan University (OsloMet) Norway

ABSTRACT

Research aiming to explain disabled people's inequalities in the labour market has primarily focused on transitional factors between school and work, wage gaps, or socioeconomic background characteristics as explanations for (no-)entry in the labour market. There is a lack of longitudinal studies that map how disabled people fare in the labour market over time. Therefore, the objective of this paper is to identify, describe and predict stable employment paths of long-term disabled people. Our study employs detailed longitudinal data with total coverage of the Norwegian population – we focus on 11 birth cohorts (1973–83) of disabled individuals and we follow their employment trajectories between the ages 20 and 34. To describe employment trajectories and create a typology of longitudinal labour market attachments, we employ sequence analysis and subsequently linear probability models to analyse the association between the disability's severity, gender, educational enrolment, early-work experience and employment trajectories. We identify four main types of trajectories: permanently work-disabled, stable employment, early marginalisation, and unstable employment. Our findings indicate that men are more likely than women to have stable employment trajectories. Starting higher education, as well as parental higher education, is linked with the likelihood of stable employment.

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Social sequence analysis; disability; employment trajectories; labour market attachment; gender segmentation

Introduction

Living with a disability is associated with an increased risk of living in poverty (Batavia and Beaulaurier 2001). Studies investigating the consequences of disability show that disabled people have lower educational attainment (Esch et al. 2014), are discriminated in employment processes (Ameri et al. 2018; Bjørnshagen 2021; Bjørnshagen and Ugreninov 2021; Østerud 2022), and report lower levels of social inclusion (Gannon and Nolan 2007).

Research aiming to explain disabled people's inequalities in the labour market has focused primarily on transitional factors between school and work, and individual-level background characteristics as explanations for entry (or no-entry) into the labour market or for income disadvantages (Ballo 2020; Maroto and Pettinicchio 2014; Pettinicchio and Maroto 2017; Wehman et al. 2015).

Although longitudinal studies of disabled people's work outcomes exist (Jones 2021), we note a lack of longitudinal studies of work trajectories that map how disabled people fare in the

CONTACT Jannike Gottschalk Ballo jannike.gottschalk.ballo@nifu.no Work Research Institute, Oslo Metropolitan University (OsloMet), Norway

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labour market over time and over the life course. This is partly because the disabled population is a heterogeneous and hard-to-reach minority and data spanning both time and variations in impairments are scarce. The lack of attention on long-term employment outcome is unfortunate because an entry into the labour market is by no means a safe ticket to long-term stability. It is vital that the consequences of early life processes and conditions are examined in a life course perspective for people with disabilities. Gauffin et al. (2021), who study precariousness in working life, emphasise that important facets of labour market attachment will be insufficiently analysed if longitudinal aspects are disregarded. Short-term exclusion or temporary low-income is not necessarily worrying, it is the *duration* of precarious arrangements that has the most negative consequences, both for individuals and society as a whole (Gauffin, Heggebø, and Elstad 2021, 382). Health-related and financial vulnerability can intensify in a downward spiral towards permanent labour market exclusion. Work is also a form of social inclusion with several positive repercussions for the individual, such as sense of mastery and meaning, in addition to financial security (Schur 2002).

In the present study, we aim to address the lack of longitudinal research on disabled people's labour market attachment by applying a holistic perspective on working histories by means of social sequence analysis. We focus on the employment trajectories of disabled individuals and aim to identify, describe, and discuss predictors of *stable employment trajectories among young people with disabilities*. To achieve this, we draw upon the unique strength of sequence analysis – namely 'the identification of patterns of social processes over time' (Aisenbrey and Fasang 2010, 432), combined with high-quality Norwegian longitudinal registry data spanning 24 years. Disabled individuals are defined by means of welfare benefits intended for citizens with chronic illnesses and long-term disabilities. By doing so, we offer some new insights on what characterises successful employment trajectories in this group. Regressions predicting employment trajectory membership also include the nondisabled population for comparison.

Our focus is on Norway, which makes an intriguing case for studying labour market trajectories for disabled young people for several reasons. First, Norway has a large social welfare state with both generous compensation for people remaining outside the labour market disincentivising work participation (Esping-Andersen 1990), *and at the same time* comprehensive active labour market policies incentivising work participation (Dahl and Lorentzen 2017). Second, the educational system is free of charge, but at the same time the labour market is highly regulated and dominated by formal qualification requirements. This entails that it is (relatively) easy to acquire an education, but (relatively) hard to find work without formal qualifications. Finally, the Nordic labour market is highly gender segregated both horizontally and vertically, entailing deep-rooted gender-structured inequalities (Albæk, Larsen, and Thomsen 2017; Reisel, Østbakken, and Attewell 2019).

It remains unclear how the educational attainment and gendered structure of the labour market intersect with disability. The extant literature on labour market participation has shown that gender (Brown and Moloney 2019; Kim, Parish, and Skinner 2019; Kim, Skinner, and Parish 2020; Pettinicchio and Maroto 2017), and education are important determinants of labour market participation (Ballo 2020; Maroto and Pettinicchio 2014). Nevertheless, for disabled persons, the impact of gender is less clear. Several studies suggest that the male privilege is less pronounced among disabled people in terms of labour market outcomes, and that disabled women therefore have similar opportunities and outcomes as men with disabilities (Ballo 2020; Mik-Meyer 2015). However, a recent study of early school leavers by Vogt et al (2020) claim that the gender-segregated labour market (in Norway) consistently provides men with more economically rewarding life course trajectories, than women. Given the lack of longitudinal research on disabled people's life courses, it is important to study the long-term consequences of gender on work trajectories of disabled people.

Theory and expectations

In the present study, our main theoretical focus lies with the impact of gender and educational attainment on work trajectories of disabled people.

Intersectionality and the gendered labour market: added strain on women?

The intersectional perspective was developed to better understand the interplay between race and gender (Crenshaw 1989). Its core implications are also relevant for understanding the interplay between gender and disability, as demonstrated by several recent studies (Ballo 2020; Brown and Moloney 2019; Pettinicchio and Maroto 2017). According to the intersectional perspective, the effects of gender and disability status should be understood as simultaneous and linked, rather than separate processes. In this perspective, disabled women face a double minority status, which may further harm their inclusion in the labour market.

Following the insights from Ridgeway and Kricheli-Katz (2013) in developing the intersectional perspective, overlapping social identities may result in both binds and freedoms. For example, they note that the Asian man is stereotyped as a non-prototypical male person, and thus not able to reap the fruit of the typical male privilege. A similar phenomenon is discussed by Mik-Meyer (2015) who suggests that Danish disabled men are feminised by their nondisabled co-workers, as characteristics associated with disability such as 'dependent' and 'weak' are more in line with female identity. Hence, disability status may obscure gender status jeopardising common expectations to gender in the context of employment.

However, our expectations to intersectional processes in the work setting are also influenced by the highly gendered structures of the labour market (Charles and Grusky 2005). Gender is one of the most important determinants of employment outcome and income levels (Blau and Kahn 2017). The occupational gender segregation literature conceptualises inequalities experienced by women in terms of horizontal and vertical segregation. Horizontal segregation means that women work in different occupations or sectors than men. Vertical segregation, on the other hand, entails that women have poorer opportunities for career progression than men within the same occupations (Charles 2003). Additionally, horizontal, and vertical segregation may overlap: typical male-dominated occupations have higher wage levels, more favourable employment arrangements, and better opportunities for progression, than typical female-dominated occupations.

Despite the intersectionality perspective proposing ambivalence on the impact of gender and disability, the structures of the labour market are likely to favour men in the long run. *We therefore expect that disabled men are more likely to have stable employment trajectories than disabled women.*

The impact of education for disabled young people

Disabled people have on average lower educational attainment than nondisabled (Ballo 2020), and they are underrepresented in higher education (Langørgen, Kermit, and Magnus 2020; McDonnall 2010; Taneja-Johansson 2021). At the same time, the extant literature provides evidence that higher education is particularly important for disabled people's labour market success (Bliksvær and Hanssen 2006; Loprest and Maag 2007; Vedeler and Mossige 2010). It has been shown that the lack of higher education among disabled people explains a proportion of their wage differentials (Pettinicchio and Maroto 2017), and that disabled people often experience a delay in typical life course transitions, such as the transition from school to work (Reims and Schels 2021). In the following, we discuss theoretical expectations regarding the impact of ongoing education at age 20 on consecutive employment trajectory.

Studies examining the barriers students with disabilities face in higher education highlight the importance of both socio-economic factors (economic security, parental support), individual factors

(such as ease of learning), and the presence of hinders within the university environment (lack of knowledge on behalf of the staff, or support infrastructure) (Fuller, Bradley, and Healey 2004; Taneja-Johansson 2021). Individuals in higher education at the age of 20 have most likely completed upper secondary education in standard time and may have individual resources conducive for a stable employment trajectory.

For employers, educational credentials serve as an important signal of productivity. Hypotheses such as these are rooted in signalling theory, discussed in the seminal works of Spence (1973) and Stiglitz and Weiss (1990). Furthermore, the theory of human capital postulates that education augments productivity, as individuals acquire more knowledge and skills (Becker 1976). While differentiating between these mechanisms is notoriously hard, both theoretical perspectives offer similar implications – that (more) education is linked with better employment outcomes. We can therefore expect that *disabled persons registered in higher education at the age of 20 are more likely to have stable employment paths, compared with individuals in upper secondary education or individuals not registered in education.*

As comparatively fewer disabled individuals enrol and complete higher education, it is interesting to study the impact of the upper secondary level on employment trajectories. Students at the age of 20 who are still registered in upper secondary education are experiencing a slower educational progress than those who followed the normal progression and moved on to higher education, or employment. Among the 20-year-olds who are still in upper secondary education, we differentiate between academic and vocational educational tracks. The standard model in vocational programs is 2 years of school-based education, followed by 2 years of apprenticeship training. Upon completing a vocational track students trade or journeyman's certificates, or licences, depending on specialisation. Nevertheless, vocational education is sometimes seen as a second chance (Tønder and Aspøy 2017), and they have a distinct role in supporting disadvantaged youth (Björk-Åman et al. 2021). Furthermore, the need for vocationally trained personnel has been high in Norway and is likely to remain high in coming years (Statistics Norway, 2020).

Vocational tracks give students hands on practical work experience during the trainee phase. This gives the students both opportunities to connect with potential employers and allows the students to show future employers that they were both skilled and capable of working in their respective fields. Furthermore, upon completing many of the vocational tracks in Norway, students often receive a certificate attesting their competence and skills, which can often pave the way towards entering closed occupations (Drange and Helland 2018). Entry in closed occupations is conditioned upon having a formal documentation of the necessary skill set, rather than on qualitative assessments of employability. Theories of occupational closure are often used to explain why wage discrimination is lower in closed occupations (Drange and Helland 2018; Weeden 2002). Alike ethnic minorities, disabled people are vulnerable to employer discrimination; thus, we argue that occupational closure can be a mechanism of labour market integration for this group. For instance, Drange and Helland (2018) argue that occupations requiring formal educational credentials, and specifically licenced occupations are likely to be characterised by limited wage differentiation. As vocational tracks both put students in contact with potential employers and may additionally be a way of entering closed occupations right after completing upper secondary school: w*e expect that individuals in vocational tracks at the age of 20 are more likely to experience stable employment trajectories than individuals in academic tracks.*

The acquisition of human capital through a link between education and work is contended by Staff and Mortimer (2007). Although the debate on implications of early work experience also proposes that work may displace education (Greenberger and Steinberg 1986; Marsh and Kleitman 2005; Mortimer, Staff, and Oesterle 2003), Staff and Mortimer (2007) suggest that behavioural patterns established in high school persist during the transition to adulthood, and that the combination of (moderate) work and education has important advantages,

weighing heavier than the risk of displacing secondary educational attainment. Similarly, Herrygers and Wieland (2017) have emphasised the positive formative impact of part-time work for young people. Early work experience may be especially advantageous for disabled young people, as demonstrated by Connors et al (2014) and Ballo et al. (2022). *We, therefore, expect that individuals who combine education, whether upper-secondary or higher education, with moderate part-time work, in their early 20s, are more likely to have stable employment trajectories.*

The interplay between gender and education

The highlighted importance of the gendered structures (both vertical and horizontal segregation) of the labour market for long-term attachments and rewards, may also have implications for the choice of education (Seehuus 2021). Specifically, we are interested in the differences between men and women who are not registered in education at the age of 20 (male privilege), whether there are differences between men and women in vocational tracks (horizontal segregation), and whether higher education contributes to diminishing, as opposed to increasing gender differences (vertical segregation), in terms of likelihood for stable employment trajectories. We therefore expect the interplay between gender and education to be of importance for the likelihood of experiencing stable employment trajectories. *More specifically, we expect that being enrolled in higher education at the age of 20 is associated with smaller gender gaps in probabilities of stable employment trajectories.*

Data

We employ administrative data from national registries merged into one single panel dataset covering the period 1993 to 2017. Our dataset consists of the total population born 1973–1983 registered as residing in Norway between the ages 20–34 ($N \approx 530\ 000$). Individuals who either die or emigrate before 2017 are excluded. The dataset includes a disabled subset of 3243 individual trajectories, amounting to 0.61% of the total number of trajectories in the dataset.

Individuals who need long-term private care and supervision because of a medical condition are entitled to *attendance benefits* from the Norwegian Labour and Welfare Administration (NAV). *Basic benefits* cover necessary additional expenses incurred due to permanent illness, disabilities, or congenital malformations. Persons living with a disability may be entitled to one of these benefits or both, and both benefits are adjusted to the severity of increased needs. Hence, in this study individuals are defined as disabled if they become first-time recipients of either benefit before the age of 20 and continue to receive at least one of the benefits every year between ages 20–34. Both attendance and basic benefits are granted contingent on *documented additional expenses and/or care needs* and are not intended to cover ordinary living expenses. Thus, receiving these benefits is not likely to disincentivise employment.

While the sequence analyses focus on the holistic trajectories of individuals, the regression analyses employed to describe the resulting clusters adjust for a series of factors. We construct a variable that differentiates between the type(s) of benefits received (attendance benefits, basic benefits, or both). Our models include controls for gender (men (baseline), women), and immigration background (i) majority, native born with two native-born parents (baseline); (ii) persons who immigrated from, or persons born to immigrant parents from a European Economic Area (EEA) country, Canada, North America, Australia or New Zealand; and (iii) persons who immigrated from, or are born to immigrant parents from non-EEA countries (the Balkans and Russia), Asia (including Turkey), Africa, Latin America or the remainder of Oceania.

We measure ongoing education at age 20 and differentiate between individuals who are not in education (baseline), first two years upper secondary, upper secondary academic or vocational track, and higher education.

We additionally proxy the parents' socio-economic position, by accounting for the parents' highest level of education when the individual was 16, where we differentiate between those with parents having only compulsory education (baseline), completed upper secondary, completed bachelor's level education, or completed master's level education and a missing/unknown category.

To account for the expansion of the education system and inter-generational changes we include dummies for birth cohorts (3 years). Individuals with missing values on these key variables are excluded from the dataset. As registry data usually are of very high quality, missing values are almost exclusively due to either emigration or death.

Methods

To capture the holistic trajectories of disabled young people, we employ sequence analysis (SA). A sequence consists of a series of states (i.e. in employment, in education, on benefits) for each individual over time (15 years). The 'alphabet' of states is a list of mutually exclusive and exhaustive categories that make up the building blocks of the sequences (Table 1). Each state is the dominant annual activity of the individual, determined by the predefined priority rule of the alphabet.

By mapping all the states for each individual SA informs of the individual's employment trajectories. The usage of SA has increased in recent years, and it has previously been employed to explain the transition from education to work (Blanchard 2011; Lorentzen and Dahl 2021; Vogt, Lorentzen, and Hansen 2020; Wehman et al. 2015; Wel et al. 2021). A strength of this method is that it considers the entire series of states (i.e. trajectories) and its patterns: timing, ordering and duration of states (Aisenbrey and Fasang 2010). This is an advantage to other longitudinal methods such as event history analysis, which is mainly focused on counting down towards a specific event, without fully accounting for the heterogenous nature of the trajectories leading up to the event studied (Studer and Ritschard 2016).

Individuals living with a disability are of primary focus in this study, hence we employ a two-stage method to define the clusters. Firstly, we preform SA and cluster analysis only for the disabled subpopulation. Secondly, we reconstruct the cluster membership variable for the nondisabled subpopulation. Estimating the SA on both the disabled and nondisabled subpopulations leads to the disabled population being clustered in one, or two clusters (permanently work-disabled and marginalised). The two-step procedure enables us to explore the heterogeneity within the disabled subpopulation.

We estimate linear probability models (LPM) to assess what characteristics are linked with cluster membership for both the disabled and nondisabled groups. The reconstructed cluster variable was coded based on the distinct distribution of states in the four sequence clusters. The reconstructed variable obtained a correlation of 0.87 to the one generated by means of cluster analysis of the sequences. The reconstruction is detailed in the supplementary material.

Alphabet

The alphabet of states is a list of mutually exclusive and exhaustive categories that represent the building blocks of the sequences. We construct annual states building on the status alphabet constructed by van der Wel et al. (2021), although with some adjustments. We define seven states (Table 1) in the following order of priority: Work-disabled, normal income, education with part-time work, education without part-time work, low income, social welfare, and marginalisation (rest category).

Table 1. Status alphabet.

States	Operationalisation	Priority
Work-disabled	Recipients of more than 50% work-disability benefit	Above everything below
Normal income	Income above 3.5 PBA, parental leave benefits and compensation for sick leave included	Above everything below
Education with part-time work	Registered in education, with income between .5–3.5 PBA	Above everything below
Education without part-time work	Registered in education, income below .5 PBA	Above everything below
Low income	Income above .5 PBA but below 3.5 PBA, parental benefits and compensation for sick leave included	Above everything below
Social welfare	Social assistance, work assessment allowance, unemployment benefits	Above everything below
Marginalized	Income below .5 PBA and not belonging to any of the above states	Rest category

To adjust for growth and inflation during the 24-year observation period, income cut-offs are measured in price-based amounts (PBA) which is a fixed annual amount used to calculate applicability and level of welfare benefits, pensions, and student allowances in Norway. In 2022 1 PBA was equivalent to 10 600 EUR.

We parallel former Nordic studies of labour market attachments (Bäckman and Nilsson 2011; Elstad and Heggebø 2019; Gauffin, Heggebø, and Elstad 2021; Widding-Havneraas 2016) and use 3.5 PBA as a threshold for normal income. According to Gauffin et al. (2021, 386), 3.5 PBA approximates the annual pay of a full-time worker in the lowest income brackets, equivalent to two-thirds of the median work income. Parental benefits and compensation for sick-leave are included in the income measure, as these benefits usually imply a full wage compensation and seldom signify a termination of the preceding employment arrangement. We set the threshold for economic marginalisation to 0.5 PBA, in correspondence with former studies (Bäckman and Nilsson 2016).

Dissimilarity algorithm and partitioning

In SA, the similarity of the trajectories can be calculated by the number of operations required to transform one sequence into another (Aisenbrey and Fasang 2010). As our main interest is to identify stable labour market attachments, we are more concerned with order and duration of states, than the exact timing of states. Therefore, we employ data-driven substitution costs calculated with the aid of the *longest common subsequence* (LCS) algorithm (Studer and Ritschard 2016). By pairing together sequences based on the length of common subsequences we are for example able to group sequences of education followed by normal income and distinguish these from sequences of alternating social welfare and low income.

Studer and Ritschard (2016) recommend to let both theoretical knowledge and empirical evidence weigh in on the choice of dissimilarity matrix. Therefore, we evaluated partitioning quality measures for a range of different dissimilarity algorithms. We note that *reversed longest common prefix* (RLCP) gave very similar clusters and very similar quality scores. RLCP and LCS are similar algorithms: RLCP looks for the common elements at the end of the sequence, while LCS is concerned with the overall length of common subsequences (Gabadinho et al. 2011, 25). Given our theoretical interest in *long-term* labour market attachment, we employ LCS (descriptive overview of sequences presented in supplementary material).

The aim of the partitioning (or clustering) is to create groups of sequences that are as homogeneous as possible and as different from another as possible (Studer 2013). We employ Ward hierarchical clustering in combination with the Partitioning Around Medoids (PAM) algorithm to group similar sequences (Studer (2013)). We arrive at a four-cluster solution, presented in the next section (further detailed in the supplementary material).

Results

Clusters of labour market trajectories

Figure 1 shows the silhouette sorting of the sequences in each cluster. Silhouette sorting implies that the top sequence of each cluster is the most typical sequence and the most distinct from other clusters. The bottom sequence is the least typical and with the smallest distance to one or several other clusters. These plots were used to label the clusters.

The first cluster is 'permanently work-disabled' (cluster 1, $N = 1406$) encompassing people that have been granted a permanent work incapacity benefit at a young age. The second cluster is dubbed 'stable employment' (cluster 2, $N = 1026$). Here, we find those individuals that have a period of education, either with or without part-time work followed by long periods of normal income. We dubbed the third cluster 'unstable employment' (cluster 3, $N = 334$) because it shows frequent changes in states shifting back and forth between low income, social welfare, and education without work. The fourth cluster can be described as 'early marginalisation' (cluster 4, $N = 477$) from education, work, and social welfare, mixed with unstable periods of social welfare and a high degree of permanent work-disability towards the end of the observation period.

In Table 2, we display descriptive individual-level background characteristics of the four clusters using the reconstructed cluster variable for both the disabled and nondisabled subpopulations. All variables are measured at age 20.

Disabled men and women are almost equally represented in 'stable employment', but women are overrepresented in 'unstable employment', with a share of 65%. In the nondisabled subset, men are overrepresented in the 'stable employment' cluster (54%) and underrepresented in the 'unstable

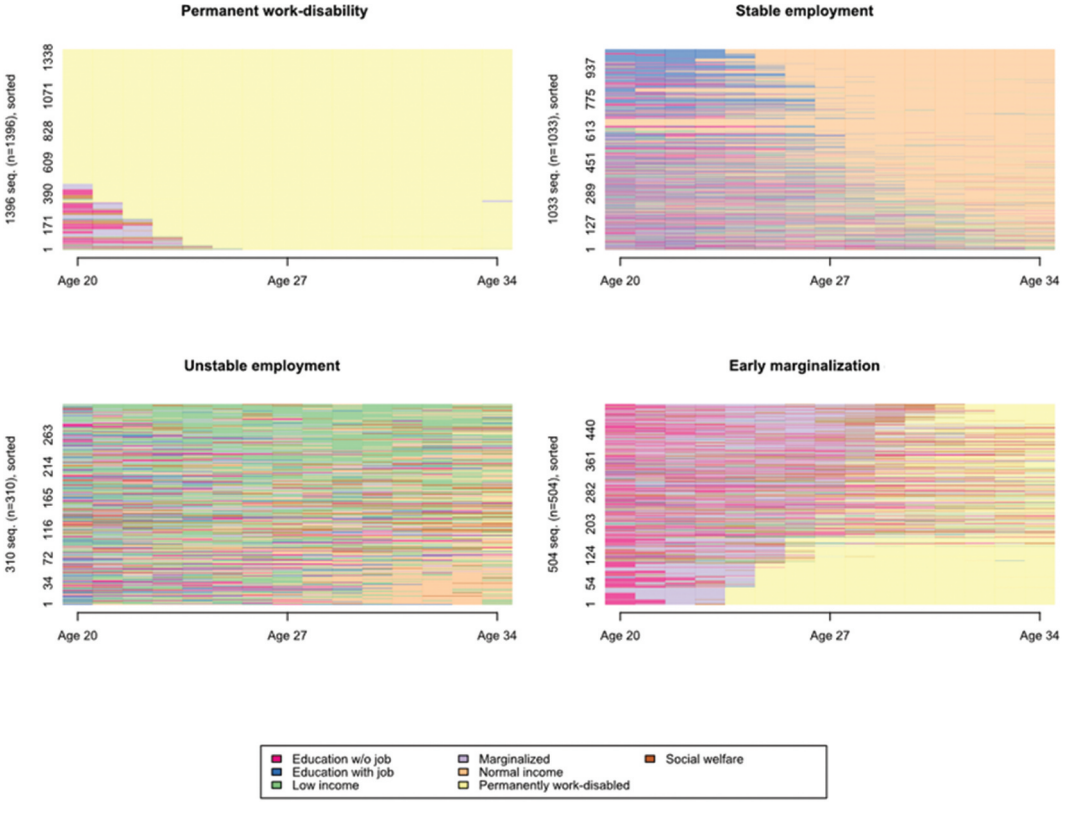

Figure 1. Four cluster solution with silhouette sorting using the LCS algorithm.

Table 2. Descriptive statistics of clusters for disabled and non-disabled.

	Disabled				Nondisabled			
	Cluster 1 Permanently work-disabled	Cluster 2 Stable employment	Cluster 3 Unstable employment	Cluster 4 Early marginalisation	Cluster 1 Permanently work-disabled	Cluster 2 Stable employment	Cluster 3 Unstable employment	Cluster 4 Early marginalisation
N	1406	1026	334	477	5211	405629	89616	13124
%	43%	32%	10%	15%	1%	79%	17%	3%
Male	54%	48%	35%	44%	55%	54%	35%	43%
Female	46%	52%	65%	56%	45%	46%	65%	57%
Ongoing education								
Not in education	44%	38%	66%	47%	58%	48%	70%	70%
Not completed upper sec	51%	8%	14%	28%	37%	5%	10%	16%
Upper sec., academic	3%	6%	6%	10%	2%	3%	4%	4%
Upper sec., vocational	2%	8%	7%	6%	2%	9%	7%	3%
BA or higher	1%	41%	7%	9%	0%	35%	9%	8%
	100%	100%	100%	100%	100%	100%	100%	100%

employment' cluster (35%). The variation in education across clusters shows that most disabled individuals are either not in education the year they turn 20, or still in the first 2 years of upper secondary education. Disabled individuals in the 'stable employment' cluster, stand out with a share of 41% in higher education.

The 'unstable employment' cluster has the largest proportion of disabled individuals not in education (66%). The variable measuring parents' educational level shows that individuals in 'stable employment' have parents with higher levels of education than individuals belonging to other clusters, applying to both the disabled and nondisabled subset.

Predicting cluster-membership

To examine how individual background characteristics are related to cluster type, we estimate linear probability models predicting individual cluster memberships for all, stratified by disabled/nondisabled. The first model estimates the probability of belonging to either the stable or unstable employment clusters (value 1) versus permanent work-disability and early marginalisation (value 0). We first present results for the disabled subpopulation and contrast these to the nondisabled subpopulation results below.

Figure 2 shows that benefit type, ongoing education at age 20 and the parents' education level are important predictors for belonging to either stable or unstable employment for the disabled subset. Individuals who are about to finalise upper secondary vocational track education or have started higher education are more likely to belong to either stable or unstable employment clusters, than individuals who are either not in education, still in their first 2 years of upper secondary or in academic track upper secondary.

We do not find statistically significant associations between birth cohort, or immigration background and the employment trajectory cluster. However, people with immigration background are likely to be underrepresented in our data because of the data selection procedure which excludes anyone migrating to Norway after the year they turn 20.

The second model excludes all individuals in the permanently work-disabled cluster and the early marginalisation cluster, hence estimating the probability of being in stable employment as opposed to unstable employment. Results for the disabled subpopulation show that women

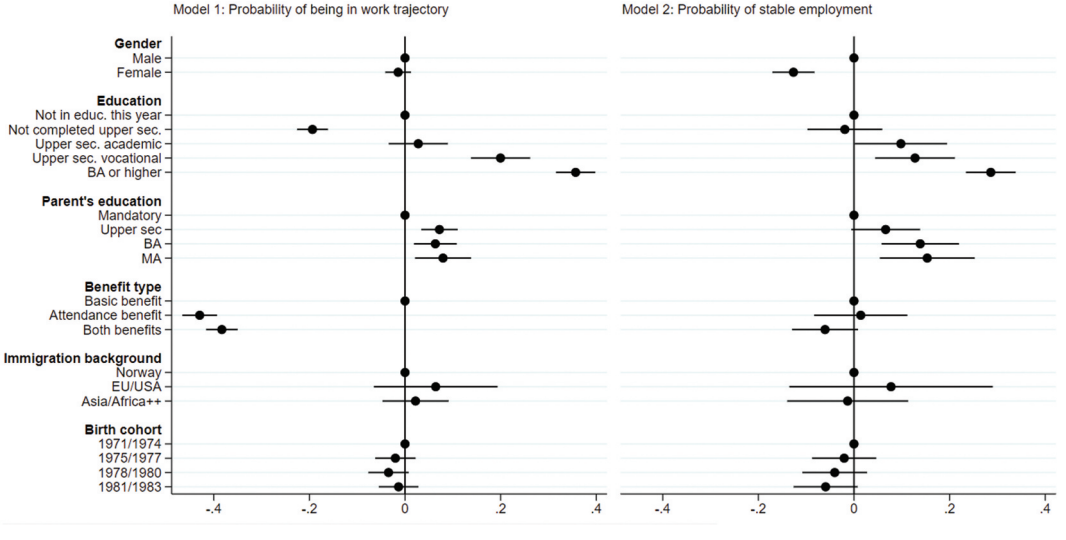

Figure 2. Linear probability models on disabled population, coefficients with 95% confidence intervals.

are less likely to have stable employment trajectories. Ongoing education at the first year of the observation period is positively related to the probability of being in stable employment, however being enrolled in an academic upper secondary track is not statistically significantly different from not being in education or being in the first 2 years of upper secondary. Being enrolled in a vocational track, or higher education are each related to higher probabilities of stable employment. Individuals who are enrolled in higher education have completed upper secondary education at age 20, which means that the estimate for those enrolled in academic track upper secondary reflects those who did not complete within standard time.

We find no statistically significant relationship between immigration background and stable employment, which may be a result of having excluded everyone migrating to Norway after the age of 20 from the disabled population. Birth cohort is not statistically significant, indicating that results are stable over time.

Figure 3 displays regression results for the nondisabled subpopulation. Results of both models show roughly the same patterns as for the disabled population, apart from immigration background which is negatively related to membership in a work trajectory (Model 1) and in stable employment (Model 2).

Gender, education, and stable employment

To further explore the relationship between gender, education, and stable employment, we estimate Model 2 again with an interaction between gender and education. This is done separately for disabled and nondisabled subpopulations. Predicted probabilities for men and women by education, with control variables at means, are plotted in Figure 4 (disabled) and 5 (nondisabled). Full models in Table A4 (Supplementary material).

Figure 4 shows that disabled men who are not in education at age 20 have higher probabilities of stable employment than disabled women who are not in education. Women who are enrolled in academic track upper secondary have higher chances of stable employment trajectories, than men. However, for vocational track, the pattern is reversed. Although gender differences in neither academic nor vocational upper secondary are statistically significant, they indicate a tendency that education, and especially higher education may contribute to reducing – albeit not eliminating – gender gaps in opportunities of stable employment. Nevertheless, we cannot fully exclude that the

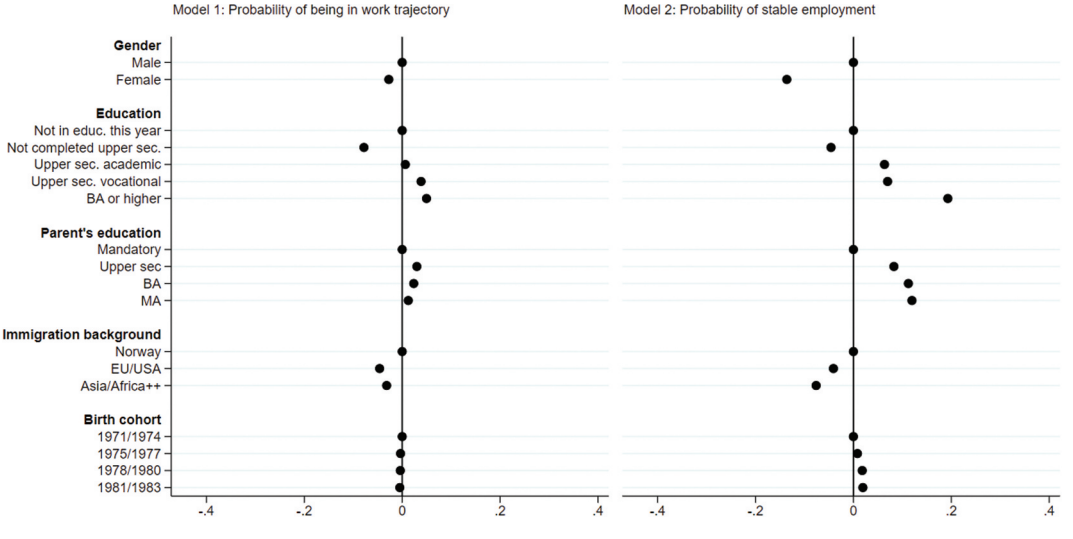

Figure 3. Linear probability models on nondisabled population, coefficients with 95% confidence intervals.

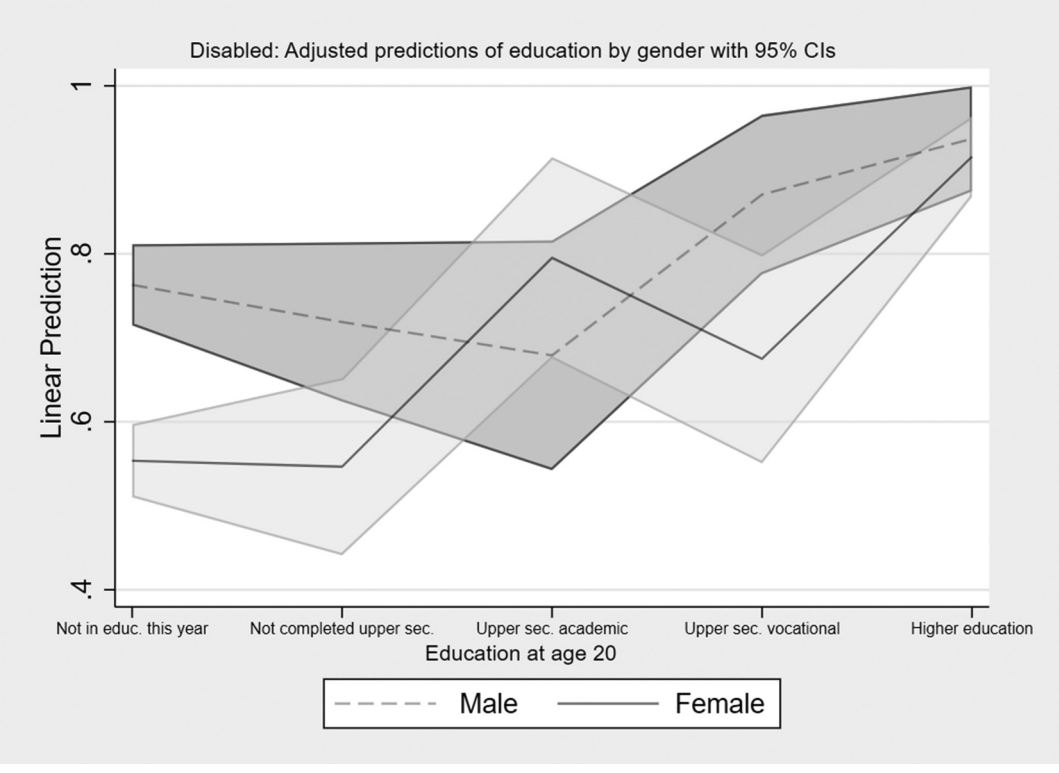

Figure 4. Predicted probabilities for disabled population of stable employment for men and women by education.

patterns we observe are due to the small sample size of disabled persons. Figure 5 shows the same patterns for the nondisabled population, although the gender differences here are statistically significant in favour of men, irrespective of ongoing education at age 20.

Concluding discussion

This paper was motivated by the lack of empirical research on disabled peoples' labour market trajectories. The objective of the present study was to identify, describe, and predict stable employment trajectories of disabled people. We used administrative register data of 3243 disabled and 520 000 nondisabled people between the ages 20 and 34 from birth cohorts 1973 to 1983. Social sequence analysis and cluster analysis were used to arrive at typical employment trajectory clusters for the subpopulation of disabled young people.

We find four clusters for the disabled subpopulation. Two showing a work trajectory with a 'stable' and 'unstable employment' cluster, and two showing labour market exclusion through 'permanent work-disability' and 'early marginalisation'. The analyses highlight the need to study heterogeneity within the disability population.

Our main findings indicate that although the same overall factors are linked with stable employment for both the disabled and nondisabled subpopulations, disabled people are overall less likely to have stable trajectories of labour market attachment. Explanations may be both health-related inability to work and discrimination in the labour market (see for example Bjørnshagen and Ugreninov 2021), but the current method is not suited to distinguish between the various explanations for lower shares of stable employment trajectories among the disabled. In line with our theoretical expectation on the role of gendered segregated labour markets, both disabled and nondisabled women are less likely to experience stable

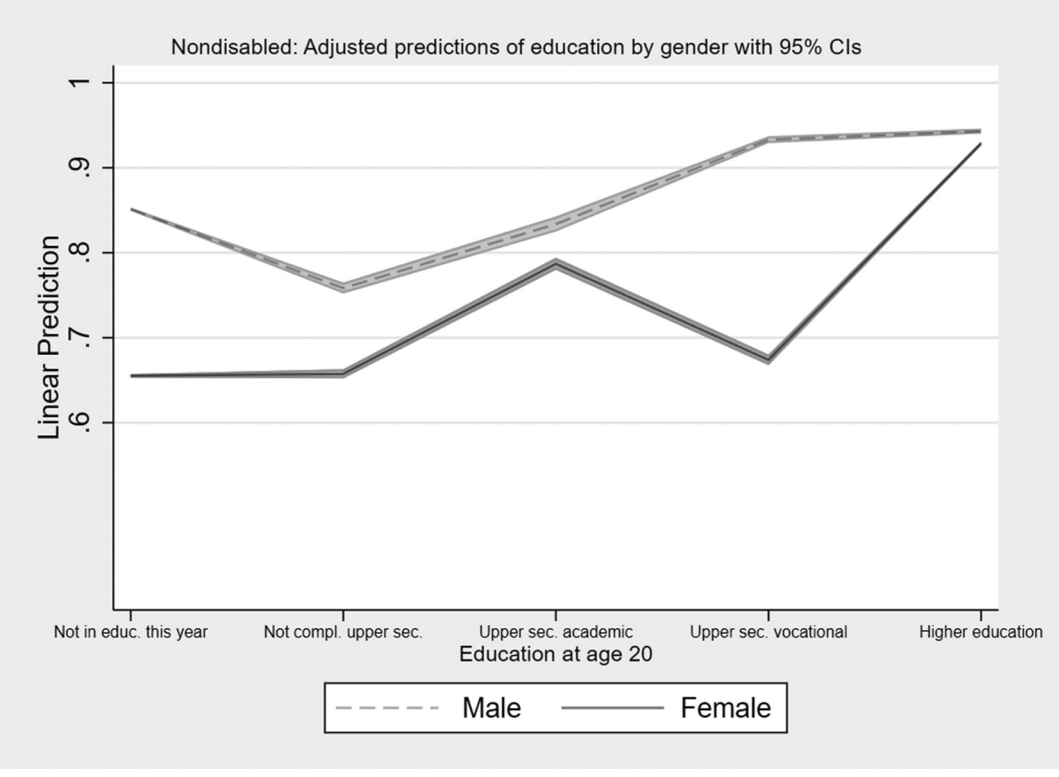

Figure 5. Predicted probabilities for nondisabled population of stable employment for men and women by education.

employment trajectories. However, male privilege is less pronounced in the disabled subpopulation, and higher education seems to reduce gender differences in chances of stable employment.

Education and early work experience

Enrolment in higher education was associated with a higher probability of stable employment, compared with not being in education at age 20. Thus, our expectations regarding higher education as conducive to stable employment were confirmed. The finding may reflect that education has either a positive signalling effect towards employers (Spence 1973; Stiglitz and Weiss 1990), serves as accumulation of human capital which may augment productivity (Becker 1976), or both. Higher education was significantly related to stable employment in the nondisabled subpopulation as well yet given that the overall chances of stable employment among the disabled are lower, higher education is especially important for young disabled people.

Our findings also indicate that vocational track – but not academic track – upper secondary education was related to higher likelihood of stable employment for disabled youth, compared to not being in education at age 20. This finding confirmed our theoretical expectation related to occupational closure (Drange and Helland 2018). Regulated occupations that rely on formal qualifications in recruitment processes have less room for discriminatory practices concerning marginalised groups. The finding could additionally be linked to skill specificity – that starting vocational education gives a clearer match to jobs – especially compared to the academic track and to reduced employer bias. Persons with disabilities who have completed vocational education signal to employers that they are able to fulfil workplace tasks as a part of their

vocational education, which in turn may alleviate employer bias and reduce the employer's risks in hiring them. However, the data at hand do not allow us to disentangle these mechanisms further. The positive relationship between vocational track and likelihood of stable employment also gives support to our hypothesis regarding early work experience as positive for employment trajectories.

We find, in correspondence with Staff and Mortimer (2007) and Herrygers and Wieland (2017) that early work experience understood as part-time work in combination with education is advantageous for stable employment. Our findings support earlier research by Connors et al (2014) and Ballo et al. (2022) in that early work experience is especially important for disabled young people. Although we do not compare trajectories of disabled to those of non-disabled, we note that states of education with part-time work are almost exclusively located in the stable employment trajectory cluster, which indicates that it in most cases leads to stable employment for young disabled people.

The interplay between gender and education

The analyses also revealed statistically significant gender differences at age 20 among disabled men and women not enrolled in education. Disabled men were more likely to experience stable employment paths than women not enrolled in education. However, we found no gender differences in the likelihood of stable employment among disabled people enrolled in higher education at age 20. We cannot exclude that this finding could be related to the small number of observations in sample of persons living with disabilities. Nevertheless, enrolment in higher education at age 20 showed the smallest gender gaps also for nondisabled individuals, indicating higher education's role in reducing – not necessarily eliminating – gender differences in the labour market.

The models on the nondisabled subpopulation find gender differences in favour of men in all categories of ongoing education at age 20. Thus, gender differences by education seem larger among the nondisabled subpopulation. However, due to the difference in sample size between the disabled and nondisabled populations, it remains unclear whether insignificant gender gaps are simply a result of the low number of observations, or that results are suggestive of no added intersectional strain on disabled women in terms of stable employment. If interpreted in the latter way, our findings indicate that disability may be associated with a reduction of male privilege, but further research is needed on this topic.

Limitations and suggestions for further research

Our study has some limitations. First, as we evaluate the importance of several factors at the early age of 20, we do not account for personal and family-related aspects which develop later over the life course and may impact labour market attachment (such as independent leaving, marriage, having children). These factors should be subject to further scrutiny. To exemplify, it is possible that the child penalty is one important explanatory factor, as suggested by Lorentzen and Dahl (2021). However, although well-documented on the population level across countries, the consequences for disabled women of bearing children have not yet been examined. Our findings emphasise the need for future research to determine the implications of having children for disabled women (and men) and their successive careers.

Second, we use an administrative definition of disability, and condition on receipt before the age of 20. As previous research has shown, disability operationalisation may have implications for results (Molden and Tossebrø 2010). For example, attendance benefits have lower uptake among immigrants, and may have higher uptake among people with low earnings (Brekke, Evensen, and Brekke, Evensen, and Kaldager Hart 2020; Finnvold 2021), and conditioning on early receipt may exclude those with a late diagnostic processes. However, the analyses

presented in this paper contribute with a comprehensive visual display of the large heterogeneity of trajectories found among disabled people, emphasising the intrinsic challenge of delineating the disabled experience.

Despite these limitations, our findings related to gender make an important contribution to the intersectionality perspective in disability studies, by confirming the multiplicative effects of the disability and female status with quantitative population data. We argue that the mechanism proposed by Ridgeway and Kricheli-Katz (2013) that one social identity may obscure the other when they intersect, may very well be true in *individual* situations, but the current study shows that being female and disabled remains a disadvantaged position on the societal level and over the life course.

We conclude by stressing two main practical implications of our findings: 1) facilitation of education for disabled youth should be strengthened, and especially so for disabled women; and 2) alternative paths to employment for individuals who are unable to complete education should be considered by policymakers, social workers, and employers.

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Notes on contributors

Jannike Gottschalk Ballo is a senior researcher at the Nordic institute for studies in innovation research and education (NIFU). Her research interests are focused on but not limited to social inequalities in education and employment, including school-to-work transitions. See: https://www.nifu.no/en/ansatte/jannike-gottschalk-ballo/

Andreea Ioana Alecu is a senior researcher at Consumption Research Norway (SIFO) at Oslo Metropolitan University. Her research interests include: trust ethnicity, gender, disability, social stratification and mobility. See: https://www.oslomet.no/om/ansatt/alecu/

ORCID

Jannike Gottschalk Ballo http://orcid.org/0000-0001-5258-1052
Andreea Ioana Alecu http://orcid.org/0000-0003-0074-4782

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