

# Employability of employees on the labour market.

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## **Abstract**

This research focuses on the relationship between perceived employability and career paths. Perceived employability covers how people estimate their own chances in finding a new job. Career path refers to the kind of transitions an individual can make during their career. Can perceived employability be used as a predictor for the career path of an individual? In line with the Lifespan Theory of Control, a moderating effect of age on the relationship between perceived employability and job search behavior is expected. Job search behavior (e.g. search intensity, salary flexibility) is influenced by one's perceived employability and influences one's career path. Sequence and cluster analyses are used to create a typology from the objective career paths. This typology was then used as the dependent variable in multinomial logistic regression analyses, with perceived internal or external employability as the independent variable and several control variables. In the search for an answer, six hypotheses were investigated. The results support the Lifespan Theory of Control.

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## Introduction

During the last decade research indicates that, within the European Union, about three quarters of the civilians think that life-time jobs with the same employer are a thing of the past (Eurobarometer, 2006; 2009; 2011). One has to be prepared to switch from one to another employer frequently when aiming for a good job. This emphasizes the change in state of mind about work, which has been designated as a shift from employment to employability. The traditional model of making a career (life-time employment) aimed at climbing the corporate ladder within one organization, is more and more shifting towards life-time employability. Van der Heijde & Van der Heijden (2006) define employability as the ability to continuously have, obtain or create work by optimally using one's competences. This implies a permanent acquisition and realization of work within and outside the current organization, for current as well as potential new customers and concerning future expectations (Van der Heijden, 2010). Lifetime employability means one has to be making a career not only by being mobile within one's organization, but also between organizations.

This research will focus on the relationship between perceived employability and career paths. Perceived employability, covers how people estimate their own chances in finding a new job. Perceived employability might be different for internal as for external transitions (Groot & Maasen van den Brink, 2000). Internal employability refers to one's ability and willingness to remain employed within the current employer, while external employability reflects the ability and willingness to switch to another job in another company (Juhdi, Pa'Wan, Othman, & Moxsin, 2010). Career path refers to the kind of transitions an individual can make during their career. For example, one might start one's career as an employee and remain being an employee, for one or more employers. This would indicate a high level of employability and is thus considered a positive career path. Another person might start as an employee and become a receiver of unemployment benefits (negative career path) or become self-employed (neutral career path). So the question of this study runs as follows:

Q: Can perceived employability be used as a predictor for the career path of an individual?

If it is possible to use perceived employability as a predictor for the career path of an individual, then this knowledge can be used to create an intervention for people who seem to be in a risk group of a negative career path (e.g. starting as an employee and becoming a receiver of unemployment benefits).

## Reading guide

In the theoretical background the differences between two forms of the concept employability will be discussed. Also a conceptual model of possible factors that could predict the career path of an individual is displayed and elaborated on. Subsequently three contradicting psychological theories (i.e. Social Cognitive Theory, Expectancy Value Theory and Control Theory) on the role of perceived employability in job searching behavior are explained. Then, the Lifespan Theory of Control is used to explain that the prior discussed theories might be contradicting each other due to a moderating role of age (Heckhausen & Shulz, 1995). The distinction between internal and external employability will be explained.

The data sources chapter presents information on how the data used in this study was collected by Statistics Netherlands. In the methods section, the descriptive statistics of the sample are presented. Also the variables used in this research and the sequence analysis method are discussed.

Multinomial logistic regression analysis is also explained. In the results section, an overview of the clusters will be discussed first. Afterwards the multinomial regression analyses will be presented.

In the discussion the results that are relevant for accepting or rejecting the hypotheses will be discussed. The main conclusions of this study will be presented and a few limitations will be illustrated. Finally ideas for a follow-up study are specified.

## Theoretical background

### Perceived and objective employability

In the literature about employability researchers differentiate between perceived and objective employability (Berntson, Sverke & Marklund, 2006). Objective employability describes to what extent individuals are actually capable of making transitions in their career (for example changing jobs or changing from being an employee to a receiver of unemployment income). Perceived employability however, covers how people estimate their own chances in finding a new job. Both perceived and objective employability can be considered as different forms of the same concept, i.e. employability is measurable in two different ways.

A drawback of objective employability is that it can only be determined for individuals who actually make a transition in their career. This does not mean that the employability of individuals who do not make a transition is just low. Someone who has only one perfectly fitting job during his whole career might be highly employable. Furthermore, it is not clear whether someone who is changing jobs (more often) should be interpreted as an individual having a higher level of employability. Job mobility could imply one is seeing more chances at the labour market, but it could also mean that an individual is fired more often. Higher job mobility is not always a good sign and the causes and effects of job mobility are diverse.

Perceived employability is related to different individual and contextual factors (Berglund & Wallinder, 2015). Younger individuals, higher educated individuals and healthier individuals tend to estimate their chances on the labour market higher (Wittekind, Raeder & Grote, 2010; Berglund & Wallinder, 2015). Moreover, perceived employability is higher during periods of economic prosperity and good performance of one's industry (Blatter, Dorenbosch & Keijzer, 2014; Berglund & Wallinder, 2015).

Another factor that might influence someone's perceived employability is having multiple jobs at the same time. Recent labour market statistics show the growth in the share of workers with two or more jobs. Research of both The Netherlands Institute for Social Research (SCP) (Vlasblom, Van Echtelt & De Voogd - Hamelink, 2015; Van Echtelt, Croezen, Vlasblom & De Voogd-Hamelink, 2016) as well as Statistics Netherlands (CBS) (2013, 2014) show an increase in the portion of workers in the Dutch labour market who have a second job in addition to their primary job (combination) or who are self-employed alongside their primary job (hybrid). In the period of 1986 through 2014 this increased from 3% to 9% of the total Dutch workforce. Most of this increase is due to workers who deploy the hybrid variant (van Echtelt et al, 2016).

But as there are different factors influencing perceived employability, is it even possible for individuals to estimate their perceived employability correctly? Results from previous research indicate, that some groups are structurally being over- or underestimated, or are structurally over- or underestimating themselves (Blatter et al., 2014; Porter, 2014). A group that structurally overestimates their own employability are the recent graduates (Porter, 2014), while the elderly form a group whose employability is structurally underestimated by potential employers (Blatter et al., 2014; De Coen, Forrier, De Cuyper & Sels, 2012).

As mentioned before objective employability can only be measured for individuals who actually make a transition in their career. Which means that objective employability cannot be used to describe the situation of the people who are continuously employed (Berntson, Sverke & Marklund, 2006). For people who already have a job, employability mainly concerns the ability to stay employed.

### **The relationship between perceived employability and career paths**

This is why this research will focus on the relationship between perceived employability and career paths. Career path refers to the kind of transitions an individual can make during their career. For example, one might start one's career as an employee and remain being an employee, for one or more employers. Another person might start as an employee and become a receiver of unemployment benefits or become self-employed. Can perceived employability predict the career path of an individual, and which other factors might be involved? In figure 1 possible factors that could predict the career path of an individual are visualized. Those factors that have not been described in the earlier paragraphs will be discussed below the figure.

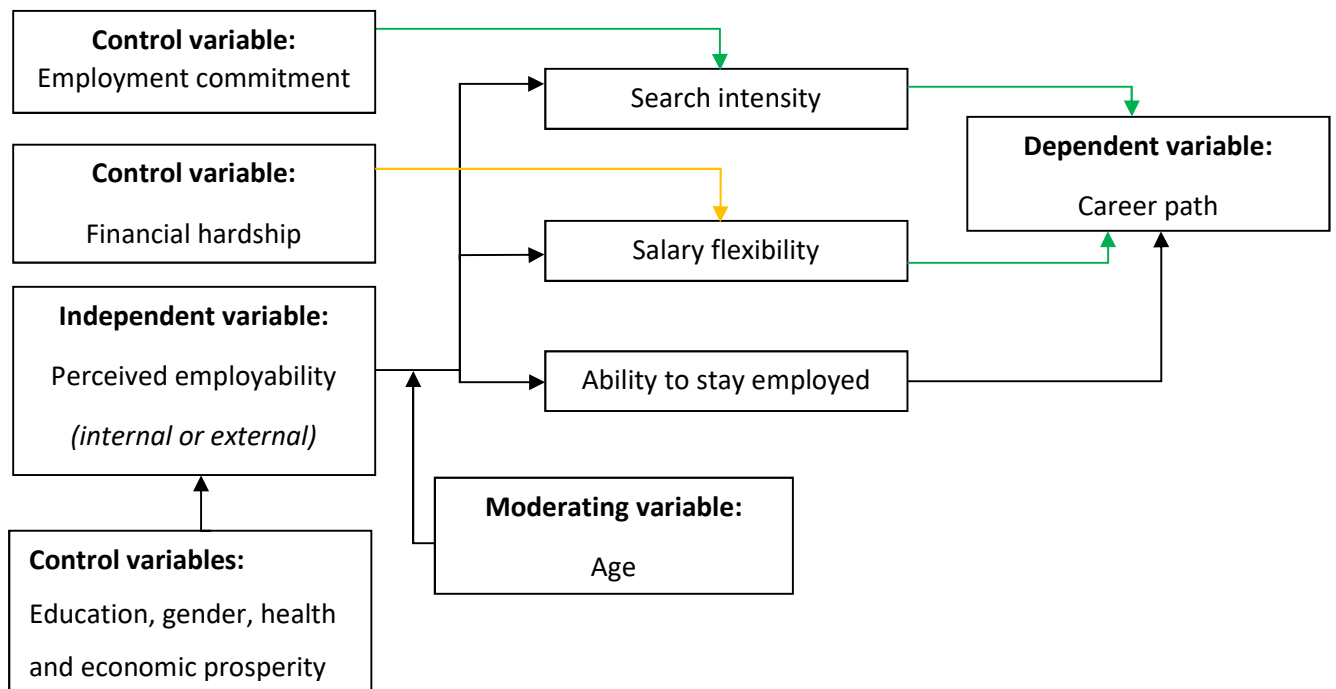


Figure 1: a conceptual model of relationships between the different factors and indicators that are relevant to the ability of getting a job.

## Internal and external employability

As shown in figure 1, perceived employability might be different for internal as for external transitions (Groot & Maasen van den Brink, 2000). Internal employability refers to one's ability and willingness to remain employed within the current employer, while external employability reflects the ability and willingness to switch to another job in another company (Juhdi, Pa'Wan, Othman, & Moxin, 2010).

Internal and external employability are expected to be influenced by career management practices (Noe, 2008; Sturges, Guest & Davey, 2000; Bagshaw, 1997), training (Bassanini 2006; Groot & Maasen van den Brink, 2000; Sanders & de Grip, 2004), job experience (Van der Heijden, 2002), education and tenure (Mincer, 1991; Tome, 2007). Though the influence of these career management practices might differ for internal and external employability. Job specific training for example, has an influence on an individual's internal employability but not on the individual's external employability. Moreover the type of organization is an important factor for someone's internal employability. If an individual works for a small business there might be very few opportunities to change jobs internally, while in a big organization there might be lots of possibilities.



## Other factors related to career paths

According to previous research, perceived employability is not the only factor related to one's career path. Three factors are described as motives for job searching behavior; perceived employability (Van Dam & Menting, 2012), employment commitment and financial hardship (Figure 1).

Employment commitment describes how important work is in someone's life, the intrinsic motive one has for having a job (Kanfer, Wanberg & Kantrowitz, 2001). Financial hardship is about the economic problems one foresees when one is unable to provide for one's own needs and the needs of their family (Wanberg, Zhang & Diehn, 2010a). As mentioned before, people who already have a job, employability mainly concerns the ability to stay employed. But when it is not possible to keep one's current job, for example due to organizational changes, job search behavior is important to describe the relation between perceived employability and career path.

There are two indicators of job searching behavior: search intensity and salary flexibility (De Coen et al, 2012). Search intensity is the extent to which job seekers perform job search activities in a certain amount of time, like reading vacancies (Kanfer et al, 2001). Salary flexibility describes the gap between the salary from the previous job (or the current job, if someone actually has a job but wishes to switch to another job) and the lowest amount in salary that someone is willing to accept (Wanberg et al, 2010a). Both search intensity and salary flexibility are positively correlated with the ability to get a job (Wanberg et al, 2010a).

When someone needs or wishes to get a new job, there is a positive relationship between employment commitment and search intensity (Kanfer et al, 2001; De Coen et al, 2012). De Coen and colleagues (2012) determined that employment commitment does not influence salary flexibility. Moreover research indicates there is also a positive relationship between financial hardship and search intensity (Kanfer et al, 2001; Van Hooft & Crossley, 2008). Alternatively according to more recent research financial hardship causes less salary flexibility (De Coen et al, 2012). De Coen and colleagues explained it as follows: individuals who are faced with financial hardship have higher salary demands for future jobs. Their research did not confirm that financial hardship would encourage people to increase their search intensity.

## Conflicting theories

Different conflicting theories are applicable to the relationship between perceived employability and search intensity. On the one hand the *Social Cognitive Theory* (Bandura, 1994) as well as the *Expectancy Value Theory* (Vroom, 1964) predict that a higher perceived employability has a positive influence on the state of mind and motivation of job seekers in the search process. A higher perceived employability would lead to a higher search intensity. A lower perceived employability would be discouraging and demotivating. On the other hand the *Control Theory* (Powers, 1991) assumes that behavior is guided by the gap between the desired state (i.e. work) and the current state. A lower perceived employability would lead to extra effort to decrease the distance to the desired state, for instance by increasing the search intensity. Individuals with a high perceived employability though, would think the desired state is within reach, which is why their search intensity will be lower (Carver, 2006).

## Lifespan Theory of Control: on the moderating effect of age

These contradicting theories on the role of perceived employability in job searching behavior could possibly be explained by the moderating role of age. The *Lifespan Theory of Control* (Heckhausen & Schulz, 1995) suggests that the strategies people use to keep their situation under control, differ with age. Younger individuals mostly use *external oriented control strategies*. These active problem-oriented strategies *change the environment* in such a way that it is fitting to one's personal needs and desires. As one grows older, one starts to choose *internal oriented control strategies*. Passive cognitive strategies can *fit the internal thought process* to the external environment, for example by re-evaluating one's own desires and priorities when a preset goal does hardly seem to be achievable.

This theory implicates that younger job seekers with a low perceived employability would take action to change their labour market condition (i.e. their environment), for instance by increasing their search intensity or their salary flexibility. Furthermore, the theory predicts that job seekers will employ more cognitive strategies as they grow older, they will fit their ideas to their environment. In this case, low perceived employability would lead to avoidance behavior and setting other goals. High perceived employability would lead to extra effort in finding a new job, for example by increasing the search behavior or salary flexibility.

However, according to Wanberg, Zhu and Van Hooft (2010b), who studied job search behavior of unemployed individuals, there is no relationship between perceived employability and search intensity. Other research on job search behavior, among employed and unemployed individuals, indicates there is a negative effect between perceived employability on search intensity (Van Hooft, Born, Taris, Flier & Blonk, 2004; Vansteenkiste, Lens, De Witte & Feather, 2005). So as those different studies provided contradicting findings, the relationship between perceived employability and search intensity remains unclear. This might be due to the effect of age as the mean age of the respondents is different for these studies.

More recent research on job search behavior of people in an outplacement trajectory indicates that elderly with a low perceived employability search less than elderly with a high perceived employability (De Coen et al, 2012). This might indicate that as the preset goal (of getting a job) does hardly seem to be achievable, the older individual might re-evaluate his priorities, which would confirm the internal oriented control strategies used by the elderly, according to the Lifespan Theory of Control. Young people with a low perceived employability on the contrary search more than youngsters with a high perceived employability (De Coen et al, 2012), which is in line with the external oriented control strategies that are used by young people according to the Lifespan Theory of Control. So there seems to be a moderating effect of age on the relationship between perceived employability and search intensity for a new job (Figure 1). Moreover, young people are less prepared to give up on part of their salary when they estimate themselves as more employable, while by contrast, the elderly become more and more flexible when it comes to the amount of salary when they estimate themselves as more employable (De Coen et al, 2012).

*H1: For young people, perceived external employability relates negatively to their career paths*

*H2: For young people, perceived internal employability relates negatively to their career paths*

*H3: For older people, perceived internal employability is positively related to their career paths*

*H4: For older people, perceived external employability is positively related to their career paths*

In general, the external labour market is bigger than the internal labour market; that is there are more job openings outside of the current company compared to within the current company. Because of this, it is expected that young people have the idea that they have a higher chance to get a new job outside than within their current employer. It is therefore expected that the perceived external employability is a better predictor for the career path of young people.

*H5: For young people, perceived external employability is a better predictor for career paths than perceived internal employability.*

Though because of long job tenures and lower levels of participation in education and job skills training, older individuals are at a higher risk for skill obsolescence than young individuals (Hamilton & Uhlenberg, 2002). These longer tenures also result in a tendency for older job seekers to possess more firm-specific knowledge than young job seekers. This type of knowledge is logically valued more highly by the focal organization than by the external market (Maestas & Li, 2006). Because of this, it is expected that older people have the idea that they have a higher chance to get a new job within than outside their current employer. It is therefore expected that the perceived internal employability is a better predictor for the career path of older people.

*H6: For older people, perceived internal employability is a better predictor for career paths than perceived external employability*

## Data sources

### Netherlands Working Conditions Survey

The Netherlands Working Conditions Survey (NWCS) is a large scale periodical survey into the working conditions of Dutch employees (Hooftman et al, 2011; Koppes et al, 2012a). The NWCS is conducted by the Netherlands Organization of applied scientific research (TNO), Statistics Netherlands (CBS) and financially supported by the Dutch Ministry of Social Affairs and Employment (SZW). The target population of the NWCS are employees who work and live in the Netherlands and are between 15 and 65 years old (2003-2013) or between 15 and 75 years old (from 2014). The gathered data is made representative for the whole population through weighting, which is a method that emphasizes the contribution of different aspects. Because of the weighting it is possible to use the NWCS to make valid statements about the Dutch workforce.

The aim of the NWCS is to investigate the quality of work and employment in the Netherlands (Hooftman et al, 2011; Koppes et al, 2012a). The NWCS tracks trends in work risks, the effects of those risks and the measures taken by employers. It is a source for policy and scientific knowledge development with the scope of working conditions. It provides employers, trade unions and the government with national reference data for the purpose of occupational health and safety regulations. So these organizations can use the results to improve the quality of the working conditions in the Netherlands.

### Data from the Netherlands Working Conditions Survey

For the current research, data of the NWCS of October 2010 and October 2011 is used.

#### *Target population*

The target population of the NWCS are working people excluding self-employed people (Koppes, De Vroome, Mol, Janssen & Van den Bossche, 2011; Koppes et al, 2012b). This includes everyone from 15 through 64 years old who, during the period of conduction, are having a paid job.

### *Sampling*

The sampling frame for the NWCS is based on the Municipal Personal Records Database (BRP). By combining the BRP to the Policy administration of the Employee Insurance Agency (UWV), a selection of paid employees can be made from the BRP (Koppes et al, 2011; Koppes et al, 2012b). The Policy administration comprises data on all jobs of employees who have an employee insurance and for whom income taxes are obliged. For both the NWCS of 2010 and 2011 the Policy administration of the previous year is used, with December 31<sup>st</sup> as the reference date. A drawback of using a file with a reference date before the actual fieldwork, is the fact that people who started working after this reference date are absent. This influx to the labour market yearly amounts to about 10 percent and mainly comprises young people who just finished their education. Youngsters who had a job on the side or a summer job next to their study are however represented in the Policy administration. The Policy administration also contains people who flew out after the reference date, because this part of the sample is not employed any longer when the survey is conducted. About 6 percent of the total workforce flows out of the labour market each year. These are older people who reached (early) retirement age and people who have lost their job or became unfit for work. This also applies to people who switched from employee to self-employment. In spite of these limitations, the data is still considered a good estimation of the total workforce. In the current study 1112 respondents were excluded from the analyses because they did not have a job as an employee at the moment the NWCS was held.

Only people who are between 15 and 64 years old are selected from the file. Paid employees who are self-employed as well only end up in the sampling frame when they earn more as an employee than from their self-employment. The sampling frame consisted of 7.094.207 people in 2010 and 7.132.758 people in 2011.

### *Data collection procedure*

Data collection started in October as according to CBS the response rate is usually highest in this period (Koppes et al, 2011; Koppes et al, 2012b). In both 2010 and 2011 a gross random sample of 80000 was used (Koppes et al, 2011; Koppes et al, 2012b). As not everyone responds (by returning a filled out survey), the net sample was 23788 in 2010 and 22989 in 2011.

### *Enrichment with register data*

At the moment of sampling, every possible respondent obtains a unique numerical code. Because of this it is possible to fuse data from other registrations with the NWCS-file (Koppes et al, 2011; Koppes et al, 2012b).

### **System of Social Statistical Datasets**

The System of Social Statistical Datasets (SSD) comprises a huge amount of micro-data on individuals and their activities (Bakker, van Rooijen & van Toor, 2014). This data can be combined, so to every person in the SSD information can be attached about country of birth, job, income, children and so on. Based on this, lots of interesting publications can be put together.

### **Data from the System of Social Statistical Datasets**

For the current research, data on the social economic category of individuals is obtained from the SSD. The data comprises the monthly registered social economic category per individual starting October 2010 through December 2014. To determine the monthly score on this variable, all earnings from the various sources of revenue a respondent has, are compared to one another. The highest amount is basically determining the social economic category. Though in the current research, it was modified so that if a respondent had a job as an employee among other sources of income, the monthly social economic category of that respondent will be set as employee, regardless of possible higher earnings from another income source.

## Methods

### Descriptive statistics of the respondents

In table 1 the descriptive statistics of the respondents are shown. Almost 80 percent of the respondents has a medium or high level of education. Both genders are nearly equally represented in the sample.

Table 1: *Descriptive statistics of the respondents*

	<b>Min.</b>	<b>Max.</b>	<b>Mean</b>	<b>SD</b>	<b>Percentage</b>
<b>Gender</b>	1	2			
Male					48.2%
Female					51.8%
<b>Age</b>	15	64	42	12	
<b>Education</b>					
≤VBO <sup>1</sup>					20.7%
Havo-MBO <sup>2</sup>					41.4%
HBO-WO <sup>3</sup>					37.8%
<b>Number of months employee</b>	1	39	36	8	

**n = 46777**

<sup>1</sup>Low levels of education; <sup>2</sup>Medium levels of education; <sup>3</sup>High levels of education

### Variables

Two items from the NWCS (used in both 2010 and 2011) as presented below are used as the independent variables for the current research. The answer given on these items describe the perceived internal and perceived external employability of a respondent respectively.

- “I would easily be able to get a new position at my current employer.”
  - Fully agree / Agree > High perceived internal employability
  - Disagree / Fully disagree > Low perceived internal employability
- “I would easily be able to get a job at another employer.”
  - Fully agree / Agree > High perceived external employability
  - Disagree / Fully disagree > Low perceived external employability



Career path measured by social economic category per month is the dependent variable. This variable indicates the most important source of income of an individual for each month. When the monthly statuses of a respondent are put together as a series of statuses over time, a career path of this respondent can be described. The following list describes the possible different statuses.

- Employee
- Self-employed
- Receiver of unemployment benefits
- Receiver of pension income
- Receiver of illness or work disabled income
- Not yet going to school / school child / student, with or without income
- Other without income

Age category is included as a moderating variable between internal or external perceived employability and career path. Young is defined as 15 through 44 years and old is defined as 45 through 64 years, as this is also used in other research from Statistics Netherlands (Chkalova, van Genabeek, Sanders & Smits, 2017). Gender and education level (low, middle and high) are included as control variables. Financial hardship and employment commitment were measured with NWCS items and added as binary control variables (low / high).

Employment commitment was measured with two items. Answer categories were scored per item, as indicated below.

- “Do you skip or neglect your family activities due to work responsibilities?”
  - No, never                      1
  - Yes, sometimes                2
  - Yes, often                        3
  - Yes, very often                4
  
- “Do you skip or neglect your work activities due to family responsibilities?”
  - No, never                        4
  - Yes, sometimes                3
  - Yes, often                        2
  - Yes, very often                1

For each respondent the average score was calculated. Respondents with a score of 3 or higher were classified in the category high employment commitment. Respondents with a score lower than 3 were classified in the category low employment commitment.

Financial hardship was measured with a single item, as presented below.

- “How would you describe the financial situation of your household at this moment?”
  - Very low on money / a little low on money / just able to make ends meet > high financial hardship
  - A little money left over / much money left over > low financial hardship

### Research period

The data on social economic category per month is retrieved from the SSD and describes the different monthly states per NWCS respondent. For the respondents of NWCS 2010 this is measured from October 2010 through December 2013. For the respondents of NWCS 2011 this is measured from October 2011 through December 2014.

### Software and procedure

In the current study career paths are constructed and analysed using sequence analysis. With the sequence analysis, the monthly states of social economic status are put together in a “sequence” which is a series of states over time, per individual. Within the social sciences, sequence analysis is used to analyse the life path of individuals, e.g. concerning the social economic status of an individual. In the current study sequences are used to describe the social economic status of the respondents of the NWCS on a monthly basis. Thus, a sequence can be seen as a visualization of the career path of a respondent. To achieve this, the computer program R is used. R is a language and environment for statistical computing and graphics (R Core Team, 2017). Using data about the social economic category from the SSD, career paths can be constructed using sequence analysis in R (Gabadinho, Ritschard, Mueller & Studer, 2011a).

### Sequencing the data using TraMineR

By using the TraMineR package for R, sequences of states or events can be described and visualized (Gabadinho, Ritschard, Mueller & Studer, 2011a; Gabadinho, Ritschard, Studer & Müller, 2011b). For each respondent, the monthly recorded social economic category is put in a sequence, so a pattern over time can be established, i.e. the career path for that respondent.

### **Clustering the sequences using WeightedCluster**

By comparing sequences describing the social economic category of a big sample of respondents over time, using the R package WeightedCluster, it is possible to categorize (cluster) the different sequences to a limited number of groups of sequence patterns, so a typology is created from the objective career paths (Studer, 2013). Each respondent will thus belong to a certain category, also known as a cluster.

For clustering sequences, the number of mutations necessary to transform one sequence into another sequence has to be determined (Cornwell, 2015). One of the most common mutations are insertions and deletions (also often referred to as “indels”). With indels a value is inserted to or removed from a sequence. When the sequences [employee - self-employed] and [employee - student - self-employed] have to be aligned, [student] can be inserted to the first sequence or deleted from the second sequence. Substitutions are also common, when aligning the sequences [employee - student - self-employed] and [employee - employee - self-employed], the [student] from the first sequence could be changed to an [employee], or the second [employee] from the second sequence could be changed to a [student].

There are several methods available for clustering sequences (Cornwell, 2015). In this research Dynamic Hamming Distance (DHD) clustering is used. This clustering method is only using substitutions as form of mutation and can thus only be used for sequences that are of an equal length.

### **Comparing the perceived employability with the objective career paths**

The relationship between perceived employability and career path is estimated with multinomial logistic regression analysis (using SPSS Statistics 22; IBM Corp., 2013). The dependent variable in a multinomial logistic regression is a variable with more than two categories, in this case the possible clusters. The multinomial logistic regression model describes the effects of the independent and control variables on the ratio of the chance (odds ratio) to belong to a certain cluster relative to the chance to belong to the reference cluster. The effect of the reference cluster is set on 1. The effect for the other clusters is the factor for which the chance will increase or decrease for those clusters. These effects are odds: for each cluster this is the chance for the cluster divided by the chance for the reference cluster.

## Preparation of the data

The maximum number of sequences that can be sequenced and clustered in R is seriously limited by the RAM memory of the computer system that is being used. As stated before, the number of sequences is equal to the number of respondents ( $n = 46777$ ). So it was necessary to make choices about which respondents could be kept out of the sequence and cluster analyses for theoretical reasons.

Firstly, the results of the respondents who were employees for all of the 39 months are considered one group. For them, no transitions in their career path could be observed, so those people are in fact the most employable respondents. They were manually put into the first cluster ( $n = 35703$ ). In the multinomial regression analyses, this cluster will be the reference group, so the results of the other clusters will be compared to the results of this cluster. Furthermore, the results of the respondents who did not have a job as an employee at the moment the NWCS was held are not used in the analyses ( $n = 1112$ ).

For information on how the original SPSS dataset is converted to a format in which R handles the sequence and cluster analyses, please take a look at appendix 1.

## Results

### A 9-cluster typology

For the cluster analysis in this study a typology with a total of 9 clusters was deemed to be the best. Figure 2a shows the proportion of social economic states per month (since responding to the Netherlands Working Conditions Survey (NWCS), so the month in which the survey was returned is recorded as month 0) for each cluster in the typology. While figure 2b shows the individual sequences of social economic states per month (since the NWCS survey) for each cluster in the typology. Each cluster is a visualization of a possible career path. When using a smaller number of clusters, one or more clusters are less optimal as they still include respondents of more than one social economic category. If more than 9 clusters were used, some clusters in the optimal typology of 9 clusters would split into two clusters while the difference between these two would be nothing more than for example an early or late transition from being an employee to being a receiver of pension income. Distinguishing between early or late transitions was not deemed relevant for this study as the focus is on the relationship between perceived employability and the type of career paths. See appendix 3 for the typologies with less than 9 and up to 14 clusters.

Each cluster will be described below, and labeled for reflecting a positive, neutral or negative type of career path. Gringhuis and Pavlopoulos also used this type of labeling clusters in their study about flexible employment contracts of graduates (Chkalova, van Genabeek, Sanders & Smits, 2017). In the current study, only the career path in which respondents continuously have an earned income (which indicates a high level of employability) is marked as positive. Career paths in which respondents are long-term unemployed (without having reached the retirement age) will be labelled as negative. All other career paths will be labelled as neutral. This categorization makes it possible to distinguish between career paths with long-term unemployment and other suboptimal career paths like career paths with short-term unemployment. Furthermore it could be difficult to categorize some career paths as positive or negative (e.g. a career path in which someone makes a transition from employee to being self-employed).

As discussed before in the methods section, the cluster of respondents who remain employees during the entire period, were manually put in the first cluster, which will be called cluster 0. As respondents continuously have an earned income, this cluster reflects a positive career path. Of all the respondents, 35703 people (78.2%), belong to this cluster. It will be the reference cluster for the multinomial logistic regression analyses. As this cluster was not part of the outcome of the actual cluster analysis, it is unfortunately not shown in the figures depicted below.

Cluster 1 includes respondents who are employees for the most part of the examined 39 months (figure 2a). As shown in figure 2b, long periods of being an employee are being alternated with relatively short periods of for example being a student or a receiver of unemployment income. This cluster also includes some respondents who are retiring just near the end of the examined period. Of all the respondents, 5077 people (11.1%) belong to this cluster. As respondents do not continuously have an earned income, this cluster reflects a neutral career path.

Cluster 2 includes respondents who make a transition from employee to receiver of unemployment benefits (figure 2a). As shown in figure 2b, after a period of being an employee, respondents in this cluster make a transition to being receivers of unemployment income. Of all the respondents, 1473 people (3.2%) belong to this cluster. As respondents make a transition from having an earned income to receiving unemployment benefits, this cluster reflects a negative career path.

Cluster 3 includes respondents who make a transition from employee to being self-employed (figure 2a). As shown in figure 2b, after a period of being an employee, respondents in this cluster make a transition to being self-employed. Of all the respondents, 395 people (0.9%) belong to this cluster. As respondents do not continuously have an earned income, this cluster reflects a neutral career path.

Cluster 4 includes respondents who make a transition from employee to receiver of illness or work-disabled income (figure 2a). As shown in figure 2b, after a period of being an employee, respondents in this cluster make a transition to being receivers of illness or work-disabled income. Of all the respondents, 477 people (1.0%) belong to this cluster. As respondents make a transition from having an earned income to receiving illness or work-disabled income, this cluster reflects a negative career path.

Cluster 5 includes respondents who make a transition from employee to receiver of pension income (figure 2a). As shown in figure 2b, after a period of being an employee, respondents in this cluster make a transition to being receivers of pension income. Of all the respondents, 1245 people (2.7%) belong to this cluster. As respondents do not continuously have an earned income, this cluster reflects a neutral career path.

Cluster 6 is a varied cluster, it mostly includes respondents who make a transition from employee to being a student or being-self-employed (figure 2a). As shown in figure 2b, after a period of being an employee, respondents in this cluster make the transition. Of all the respondents, 891 people (2.0%) belong to this cluster. As respondents do not continuously have an earned income, this cluster reflects a neutral career path.

Cluster 7 includes respondents who make a transition from employee to “other without income” (figure 2a). When the monthly status of a respondent does not belong to any of the categories mentioned above, this status is used. As shown in figure 2b, after a period of being an employee, respondents in this cluster make a transition to “other without income”. Of all the respondents, only 231 people (0.5%) belong to this cluster. As respondents do not continuously have an earned income, this cluster reflects a neutral career path.

Cluster 8 includes respondents who make a transition from employee to “unknown” (figure 2a). When the monthly status of a respondent is unknown, this status is used. This might be a consequence of emigration or passing away of a respondent. As shown in figure 2b, after a period of being an employee, respondents in this cluster make a transition to “unknown”. Of all the respondents, 1245 people (0.4%) belong to this cluster. As respondents do not continuously have an earned income, this cluster reflects a neutral career path.

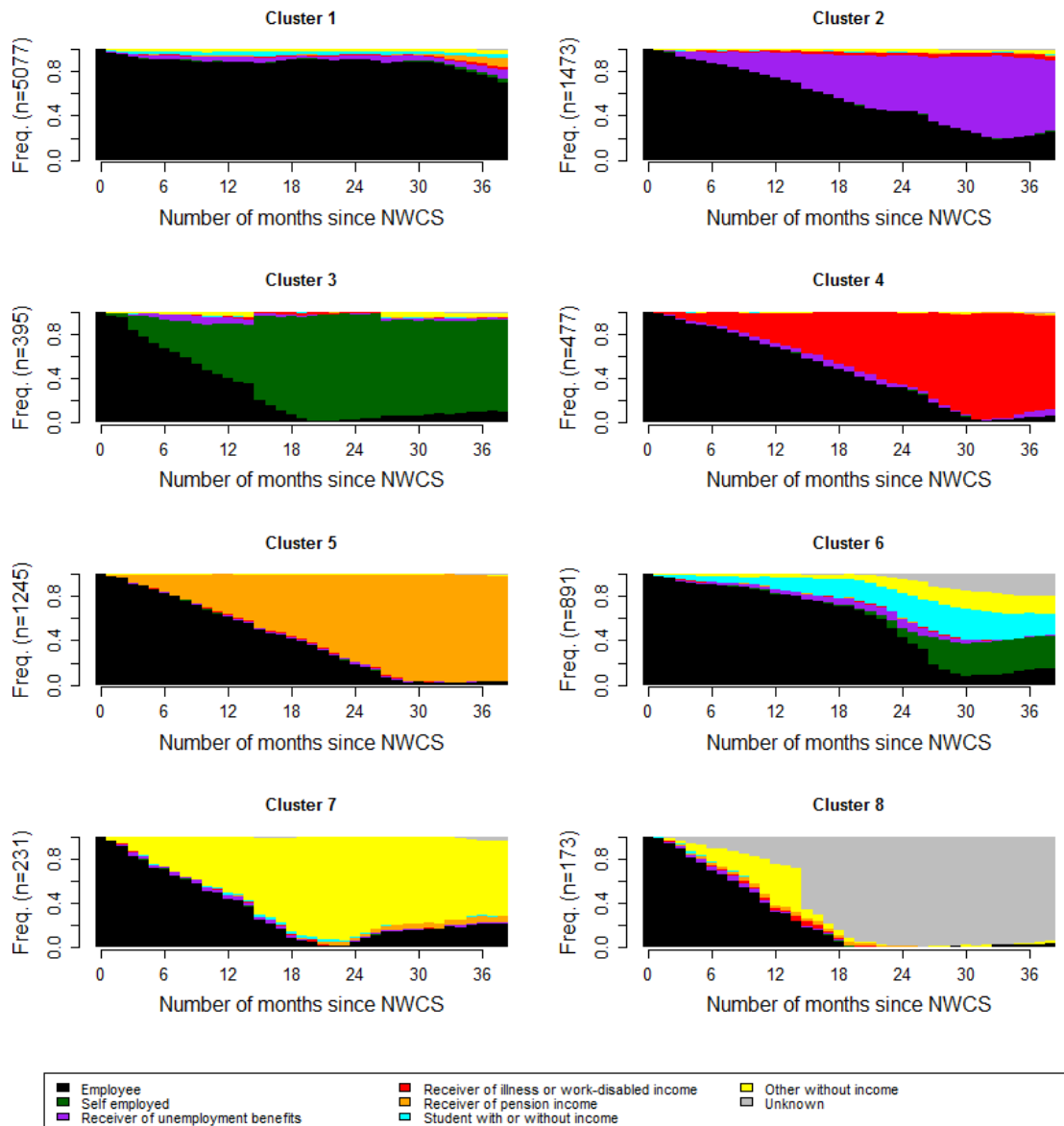


Figure 2a: A 9-cluster typology showing the proportion of social economic states per month for each cluster.



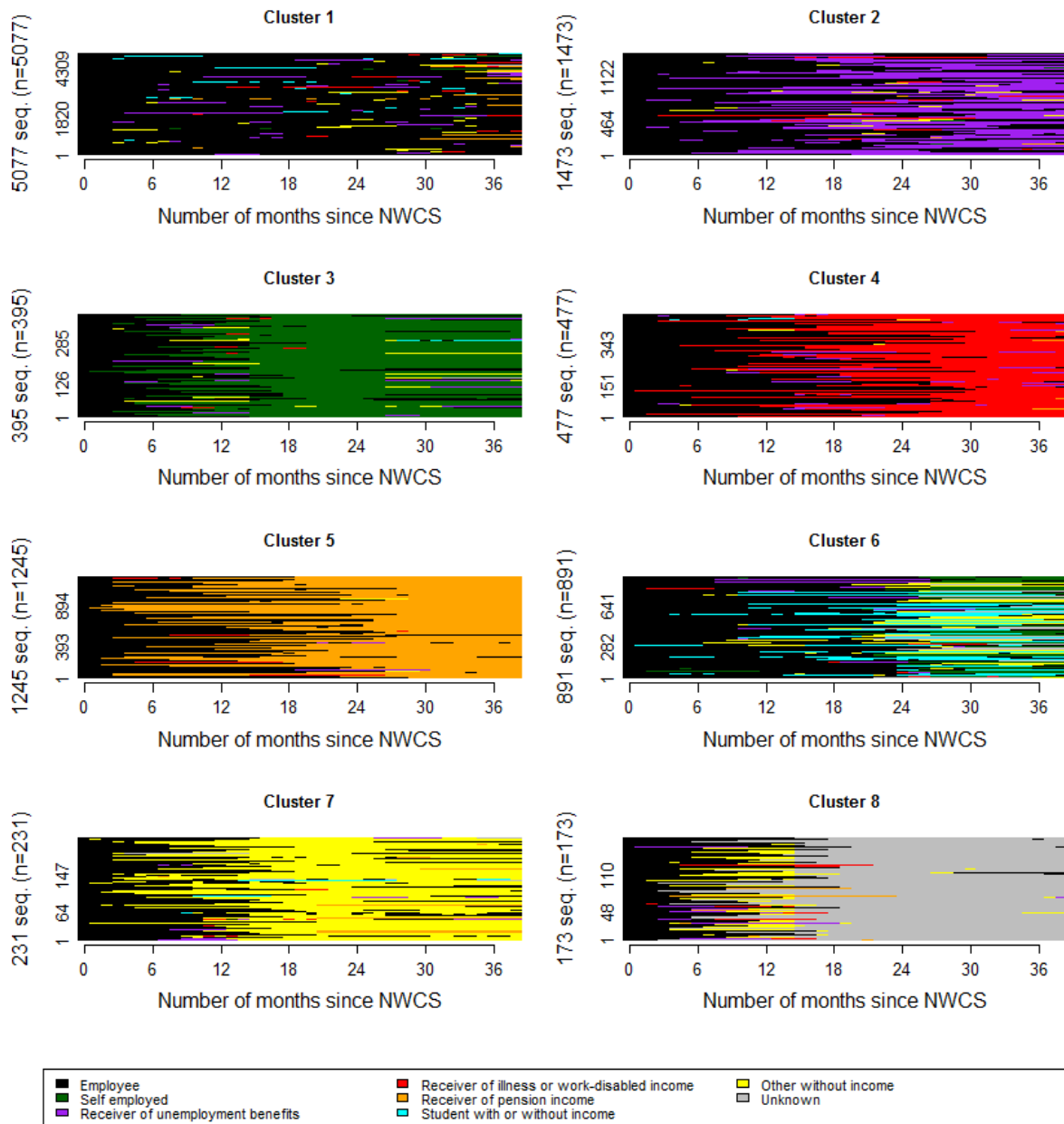


Figure 2b: A 9-cluster typology showing the individual sequences of social economic states per month for each cluster.

## The multinomial logistic regression analyses

For each multinomial logistic regression analysis, 3 models will be evaluated. In the first model only the effect of the independent variable, perceived internal or external employability, will be taken into account. For the second model, the effects the moderator variable, age as well as the interaction of the independent variable and the moderator variable will be added. In the final model, the control variables are added too.

As shown in table 2, model 1, people with a low perceived external employability have a 0,840 times as big chance as people with a high perceived external employability to belong to cluster 1 instead of cluster 0. To increase readability the odds will be converted to percentages. So people with a low perceived external employability have a chance of 45.7 % [ $0.84 / (0.84+1) * 100$ ] to belong to cluster 1 instead of cluster 0. While people with a high perceived external employability have a chance of 54.3% [ $1 / (0.84+1) * 100$ ] to belong to cluster 1 instead of cluster 0. Thus people with a low perceived external employability have an [54.3 - 45.7] 8.7 percentage points lower chance than people with a high perceived external employability to belong to cluster 1 instead of cluster 0.

Young respondents with a low perceived external employability have a 9.3 percentage points lower chance than young respondents with a high perceived external employability to belong to cluster 1 instead of cluster 0 (table 2, model 2). When accounting for the control variables, young respondents with a low perceived external employability have a 10.4 percentage points lower chance than young respondents with a high perceived external employability to belong to cluster 1 instead of cluster 0 (table 2). So young respondents with a low perceived external employability are significantly less likely than young respondents with a high perceived external employability to be an employee for most of the time instead of being an employee continuously. This is in line with hypothesis 1: *For young people, perceived external employability relates negatively to their career paths.*

As calculated from the odds ratio shown in table 3, model 1, people with a low perceived internal employability have a 9.1 percentage points higher chance than people with a high perceived internal employability to belong to cluster 1 instead of cluster 0. The interaction effect of perceived internal employability and age is not significant in the second and third model.

Table 2: Three different models describing chance (odds ratio) of being in cluster 1 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 1	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	,840***	1,110*	1,064
High (ref)	.	.	.
<b>Age category</b>			
Young		1,828***	1,847***
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		,829**	,812**
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,681***
Middle			1,383***
High (ref)			.
<b>Gender</b>			
Male			,916**
Female (ref)			.
<b>Financial Hardship</b>			
Low			,832***
High (ref)			.
<b>Employment commitment</b>			
Low			1,121**
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 3: Three different models describing chance (odds ratio) of being in cluster 1 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 1	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,200***	1,356***	1,322***
High (ref)	.	.	.
<b>Age category</b>			
Young		1,833***	1,863***
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		,909	,904
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,639***
Middle			1,368***
High (ref)			.
<b>Gender</b>			
Male			,927*
Female (ref)			.
<b>Financial Hardship</b>			
Low			,843***
High (ref)			.
<b>Employment commitment</b>			
Low			1,129**
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

As calculated from the odds ratio shown in table 4, model 1, people with a low perceived external employability have a 25.7 percentage points higher chance than people with a high perceived external employability to belong to cluster 2 instead of cluster 0. The interaction effect of perceived internal employability and age is not significant in the second and third model.

As calculated from the odds ratio shown in table 5, model 1, people with a low perceived internal employability have a 30.9 percentage points higher chance than people with a high perceived internal employability to belong to cluster 2 instead of cluster 0. Young respondents with a low perceived internal employability have a 14.2 percentage points lower chance than young respondents with a high perceived internal employability to belong to cluster 2 instead of cluster 0 (table 5, model 2). When accounting for the control variables, young respondents with a low perceived internal employability have a 14.1 percentage points lower chance than young respondents with a high perceived internal employability to belong to cluster 2 instead of cluster 0 (table 5). So young respondents with a low perceived internal employability are significantly less likely than young respondents with a high perceived internal employability to be a receiver of unemployment benefits instead of being an employee continuously. This is in line with hypothesis 2: *For young people, perceived internal employability relates negatively to their career paths.*

Table 4: Three different models describing chance (odds ratio) of being in cluster 2 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 2	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	1,692***	1,434***	1,384***
High (ref)	.	.	.
<b>Age category</b>			
Young		,694***	,709***
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		1,186	1,161
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,367***
Middle			1,144*
High (ref)			.
<b>Gender</b>			
Male			1,099
Female (ref)			.
<b>Financial Hardship</b>			
Low			,698***
High (ref)			.
<b>Employment commitment</b>			
Low			1,109
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 5: Three different models describing chance (odds ratio) of being in cluster 2 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 2	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,895***	2,071***	2,013***
High (ref)	.	.	.
<b>Age category</b>			
Young		,824*	,841
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		,751*	,753*
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,366***
Middle			1,125
High (ref)			.
<b>Gender</b>			
Male			1,092
Female (ref)			.
<b>Financial Hardship</b>			
Low			,707***
High (ref)			.
<b>Employment commitment</b>			
Low			1,136*
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

As calculated from the odds ratio shown in table 6, model 1, people with a low perceived external employability have an 8.7 percentage points lower chance than people with a high perceived external employability to belong to cluster 1 instead of cluster 0. Old respondents with a low perceived external employability have a 9.3 percentage points higher chance than old respondents with a high perceived external employability to belong to cluster 1 instead of cluster 0 (table 6, model 2). When accounting for the control variables, old respondents with a low perceived external employability have a 10.4 percentage points higher chance than old respondents with a high perceived external employability to belong to cluster 1 instead of cluster 0 (table 6). So old respondents with a low perceived external employability are significantly more likely than old respondents with a high perceived external employability to be an employee for most of the time instead of being an employee continuously. This is in line with hypothesis 4: *For older people, perceived external employability is positively related to their career paths.*

As calculated from the odds ratio shown in table 7, model 1, people with a low perceived internal employability have a 9.1 percentage points higher chance than people with a high perceived internal employability to belong to cluster 1 instead of cluster 0. The interaction effect of perceived internal employability and age is not significant in the second and third model.



Table 6: Three different models describing chance (odds ratio) of being in cluster 1 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 1	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	,840***	,921	,864**
High (ref)	.	.	.
<b>Age category</b>			
Old		,547***	,541***
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		1,206**	1,232**
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,681***
Middle			1,383***
High (ref)			.
<b>Gender</b>			
Male			,916**
Female (ref)			.
<b>Financial Hardship</b>			
Low			,832***
High (ref)			.
<b>Employment commitment</b>			
Low			1,121**
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 7: Three different models describing chance (odds ratio) of being in cluster 1 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 1	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,200***	1,232***	1,195***
High (ref)	.	.	.
<b>Age category</b>			
Old		,545***	,537***
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		1,100	1,106
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,639***
Middle			1,368***
High (ref)			.
<b>Gender</b>			
Male			,927*
Female (ref)			.
<b>Financial Hardship</b>			
Low			,843***
High (ref)			.
<b>Employment commitment</b>			
Low			1,129**
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

As calculated from the odds ratio shown in table 8, model 1, people with a low perceived external employability have a 25.7 percentage points higher chance than people with a high perceived external employability to belong to cluster 2 instead of cluster 0. The interaction effect of perceived internal employability and age is not significant in the second and third model.

As calculated from the odds ratio shown in table 9, model 1, people with a low perceived internal employability have a 30.9 percentage points higher chance than people with a high perceived internal employability to belong to cluster 2 instead of cluster 0. Old respondents with a low perceived internal employability have a 14.2 percentage points higher chance than old respondents with a high perceived internal employability to belong to cluster 1 instead of cluster 0 (table 9, model 2). When taking the control variables into account, old respondents with a low perceived internal employability have a 14.1 percentage points higher chance than old respondents with a high perceived internal employability to belong to cluster 2 instead of cluster 0 (table 9). So old respondents with a low perceived internal employability are significantly more likely than old respondents with a high perceived internal employability to be a receiver of unemployment benefits instead of being an employee continuously. This is in line with hypothesis 3: For older people, perceived internal employability is positively related to their career paths.

Table 8: Three different models describing chance (odds ratio) of being in cluster 2 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 2	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	1,692***	1,701***	1,606***
High (ref)	.	.	.
<b>Age category</b>			
Old		1,442***	1,411***
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		,843	,862
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,367***
Middle			1,144*
High (ref)			.
<b>Gender</b>			
Male			1,099
Female (ref)			.
<b>Financial Hardship</b>			
Low			,698***
High (ref)			.
<b>Employment commitment</b>			
Low			1,109
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 9: Three different models describing chance (odds ratio) of being in cluster 2 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 2	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,895***	1,555***	1,516***
High (ref)	.	.	.
<b>Age category</b>			
Old		1,214*	1,190
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		1,332*	1,328*
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,366***
Middle			1,125
High (ref)			.
<b>Gender</b>			
Male			1,092
Female (ref)			.
<b>Financial Hardship</b>			
Low			,707***
High (ref)			.
<b>Employment commitment</b>			
Low			1,136*
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

For the other clusters which visualize the career paths of individuals who make a transition from employee to respectively; self-employed, receiver of illness- or work-disabled income, receiver of pension income and also three other somewhat less clear career paths no significant relationships were found for the employability score moderated by the age category. The tables with all the associated odds ratios are therefore included in appendix 4.

When comparing cluster 1 to cluster 0 in a multinomial logistic regression analysis, significant interaction effects of perceived external employability and age were found, while no significant interaction effects of perceived internal employability and age were found. But, when comparing cluster 2 to cluster 0, the opposite is true, significant interaction effects of perceived internal employability and age were found, while no significant interaction effects of perceived external employability and age were found. Therefore both hypothesis 5 (*For young people, perceived external employability is a better predictor for career paths than perceived internal employability*) and hypothesis 6 (*For older people, perceived internal employability is a better predictor for career paths than perceived external employability*) are rejected.

## Discussion

This study was built on the question: “Can perceived employability be used as a predictor for the career path of an individual?” If it is possible to use perceived employability as a predictor for the career path of an individual, then this knowledge can be used to create an intervention for people who seem to be in a risk group of a negative career path (e.g. starting as an employee and becoming a receiver of unemployment benefits).

Sequence analysis was used to visualize the career path for each respondent. Then a typology of possible career paths was created using cluster analysis. So each respondent belonged to a certain category of this typology, also known as a cluster. This typology was then used as the dependent variable in multinomial logistic regression analyses, with perceived internal or external employability as the independent variable and several control variables. In the search for an answer, six hypotheses were investigated.

Only in four instances a significant interaction effect was found. Firstly, young respondents with a low perceived external employability are significantly less likely than young respondents with a high perceived external employability to be an employee for most of the time instead of being an employee continuously. This is in line with the first hypothesis: *“For young people, perceived external employability relates negatively to their career paths”*. Secondly young respondents with a low perceived internal employability are significantly less likely than young respondents with a high perceived internal employability to be a receiver of unemployment benefits instead of being an employee continuously. Which is in line with the second hypothesis: *“For young people, perceived internal employability relates negatively to their career paths”*. Furthermore, old respondents with a low perceived internal employability are significantly more likely than old respondents with a high perceived internal employability to be a receiver of unemployment benefits instead of being an employee continuously. It is in line with the third hypothesis: *“For older people, perceived internal employability is positively related to their career paths”*. Finally, old respondents with a low perceived external employability are significantly more likely than old respondents with a high perceived external employability to be an employee for most of the time instead of being an employee continuously. This is in line with the fourth hypothesis: *“For older people, perceived external employability is positively related to their career paths”*. These results support the *Lifespan Theory of Control* (Heckhausen & Schulz, 1995) which suggests that the strategies (e.g. job search strategies) people use to keep their situation under control, differ with age.

When comparing cluster 1 to cluster 0 in a multinomial logistic regression analysis, significant interaction effects of perceived external employability and age were found, while no significant interaction effects of perceived internal employability and age were found. But, when comparing cluster 2 to cluster 0, the opposite is true, significant interaction effects of perceived internal employability and age were found, while no significant interaction effects of perceived external employability and age were found. Therefore both hypothesis 5 (*For young people, perceived external employability is a better predictor for career paths than perceived internal employability*) and hypothesis 6 (*For older people, perceived internal employability is a better predictor for career paths than perceived external employability*) are rejected.

The fact that no significant interactions for the (internal or external) employability score moderated by the age category of clusters 3 through 8 compared to reference cluster 0 were found, might be due to the size of those clusters. Apart from the reference cluster, which contained no less than 78,2% of all respondents, cluster 1 (including respondents who were employees most of the examined months) and cluster 2 (including employees who make a transition from being an employee to being a receiver of unemployment income), were the clusters containing the most respondents.

A shortcoming of this study is that the group of individuals who are approaching the end of their career path, i.e. retiring in the near future from the moment they responded to the NWCS survey, might be less interesting to take into account as retirement is the final transition of career paths. Furthermore, part of the receivers of illness- or work-disabled income are permanently locked out of the labour market, which would explain why the perceived employability of those individuals is low.

Another limitation of this study is that it is all about the employability of employees. It might be difficult for employees who are not necessarily in the position of needing/wanting to have a new job, to estimate their own perceived (internal or external) employability.

In the current study the data on the respondent groups of both the NWCS 2010 and NWCS 2011 were put together, but due to possible changes in economic prosperity over time it might also be interesting to conduct the analyses separately for the data collected with each survey. Of course in a follow-up study other time periods could also be considered. It could also be interesting to include type of employment contract (e.g. permanent, fixed term, temporary), as a dependent variable in a follow-up study.



As it is possible to use perceived employability as a predictor for the career path of an individual this knowledge can be used to create an intervention for people who seem to be in a risk group of a negative career path. When this intervention shows positive results (e.g. more people are able to stay employed, so less people are receiving unemployment benefits) the total costs of the Dutch social security system will decrease.

Of course sequence and cluster analysis as used in this study, can also be used to study other topics than the labour market. In social sciences these analyses are of interest for studying life trajectories (Gabadinho, Ritschard, Mueller & Studer, 2011a), like career paths, but other forms of life trajectories could also be studied, cohabitational life courses for example (e.g. “Single – Married – Married, with children – Divorced”).

## References

- Bagshaw M. (1997). Employability – creating a contract of mutual investment. *Industrial and Commercial Training*, 29, 6, 187-199.
- Bakker, B. F., van Rooijen, J., & van Toor, L. (2014). The system of social statistical datasets of Statistics Netherlands: An integral approach to the production of register-based social statistics. *Statistical Journal of the IAOS*, 30(4), 411-424.
- Bandura, A. (1994). Self-efficacy. In V. Ramachandran (Ed.), *Encyclopedia of human behavior: 4*, 71-81. New York: Academic Press.
- Bassanini A. (2006). Training, wages and employment security: an empirical analysis on European data. *Applied Economics Letters*, 13, 523-527.
- Berglund, T., & Wallinder, Y. (2015). Perceived Employability in Difficult Economic Times: The significance of education systems and labour market policies. *European Societies*, 17(5).
- Berntson, E., Sverke, M., & Marklund, S. (2006). Predicting perceived employability: human capital or labour market opportunities? *Economic and Industrial Democracy*, 27(2), 223-244.
- Blatter, B., Dorenbosch, L. & Keijzer, L. (2014). 'Duurzame inzetbaarheid in perspectief. *Inzichten en oplossingen op sector, organisatie en individueel niveau*'. Leiden, TNO.
- Carver, C. (2006). Approach, avoidance, and the self-regulation of affect and action. *Motivation and Emotion*, 30(2), 105-110.
- CBS (2013). Ruim een half miljoen mensen heeft twee banen. Den Haag/Heerlen: Centraal Bureau voor de Statistiek (CBS, 2 December 2013, consulted in May 2017 at [www.cbs.nl](http://www.cbs.nl)).
- CBS (2014). Aantal mensen met twee banen neemt toe. Den Haag/Heerlen: Centraal Bureau voor de Statistiek (CBS, 14 November 2014, consulted in May 2017 at [www.cbs.nl](http://www.cbs.nl)).
- Chkalova, K., van Genabeek, J., Sanders, J., & Smits, W. (2017). Dynamiek op de Nederlandse arbeidsmarkt: de focus op ongelijkheid. CBS/TNO.
- Cornwell, B. (2015). *Social sequence analysis: Methods and applications* (Vol. 37). Cambridge University Press.
- De Coen, A., Forrier, A., De Cuyper, N., & Sels, L. (2012). Andere leeftijd, ander zoekgedrag? Een studie bij Vlaamse deelnemers aan outplacement. *Over. werk. Tijdschrift van het Steunpunt WSE*, 22(2), 47-55.
- Eurobarometer (2006). European employment and social policy. Special Eurobarometer, (261) (European commission, consulted in March 2017 at [www.ec.europa.eu](http://www.ec.europa.eu)).
- Eurobarometer (2009). European employment and social policy. Special Eurobarometer, (316) (European commission, consulted in March 2017 at [www.ec.europa.eu](http://www.ec.europa.eu)).

- Eurobarometer (2011). Employment and social policy. Special Eurobarometer, (377)  
(European commission, consulted in March 2017 at [www.ec.europa.eu](http://www.ec.europa.eu)).
- Gabadinho, A., Ritschard, G., Mueller, N. S., & Studer, M. (2011a). Analyzing and visualizing state sequences in R with TraMineR. *Journal of Statistical Software*, 40(4), 1-37.
- Gabadinho, A., Ritschard, G., Studer, M., & Müller, N. S. (2011b). Mining sequence data in R with the TraMineR package: A user's guide for version 1.8. *Geneva: University of Geneva*.
- Groot, W., Maasen van den Brink, H., (2000). Education, training and employability. *Applied Economics Journal*, 32, 573-581.
- Hamil-Luker, J., & Uhlenberg, P. (2002). Later Life Education in the 1990s Increasing Involvement and Continuing Disparity. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 57(6), S324-S331.
- Heckhausen, J. & Schulz, R. (1995). A Life-Span Theory of Control. *Psychological Review*, 102(2), 284-304.
- Hooftman, W., Koppes, L., de Vroome, E., Kraan, K., Driessen, M., & Bossche, S. (2011). NEA 2010: Vinger aan de pols van werkend Nederland.
- IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
- Juhdi, N., Pa'Wan, F., Othman, N. A., & Moxsin, H. (2010). Factors influencing internal and external employability of employees. *Business and Economics Journal*, 11, 1-10.
- Kanfer, R., Wanberg, C.R. & Kantrowitz, T.M. (2001). Job search and employment: A personality-motivational analysis and meta-analytic review. *Journal of Applied Psychology*, 86(5), 837-855.
- Koppes, L. L. J., De Vroome, E. M. M., Mol, M. E. M., Janssen, B. & Van den Bossche, S. N. J. (2011). *Nationale Enquête Arbeidsomstandigheden 2010. Methodologie en globale resultaten*. TNO.
- Koppes, L. L. J., De Vroome, E. M. M., Mol, M. E. M., Janssen, B. , Van Zwieten, M.H.J. & Van den Bossche, S. N. J. (2012b). *Nationale Enquête Arbeidsomstandigheden 2011. Methodologie en globale resultaten*. TNO.
- Koppes, L., van Zwieten, M., Hooftman, W., Lautenbach, H., de Vroome, E. & Bossche, S. (2012a). NEA 2011: Vinger aan de pols van werkend Nederland.
- Maestas, N., & Li, X. (2006). Discouraged workers? Job search outcomes of older workers.
- Mincer J. (1991). Education and Employment. Working Paper 3838, National Bureau of Economic Research, Cambridge, Massachusetts.
- Noe R.A., (2008). Employee training and development. New York: McGraw-Hill.
- Porter, A. (2014). Student employability index 2014: Part two.

- Powers, W.T. (1991). Commentary on Bandura's "Human Agency". *American Psychologist*, 46, 151-153.
- R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Sanders, J. & de Grip, A. (2004). Training, task flexibility and the employability of low skilled workers. *International Journal of Manpower*, 25, 1, 73-89.
- Studer, M. (2013). WeightedCluster library manual: A practical guide to creating typologies of trajectories in the social sciences with R.
- Sturges, J., Guest, D., Davey, K.M. (2000). Who's in charge? Graduates' attitudes to and experience of career management and their relationship with organizational commitment. *European Journal of Work and Organizational Psychology*, 9, 3, 351-70.
- Tome E. (2007). Employability, skills and Training in Portugal (1988-2000): Evidence from official data. *Journal of European Industrial Training*, 31, 5, 336-357.
- Van Dam, K. & Menting, L. (2012). The role of approach and avoidance motives for unemployed job search behavior. *Journal of Vocational Behavior*, 80(1), 108-117.
- Van Echtelt, P., Croezen, S., Vlasblom, J. D., & de Voogd-Hamelink, M. (2016). Aanbod van arbeid 2016. Werken, zorgen en leren op een flexibele arbeidsmarkt. Sociaal en Cultureel Planbureau.
- Van der Heijde, C.M., & Van der Heijden, B.I.J.M. (2006). A competence-based and multidimensional operationalization and measurement of employability. *Human Resource Management*, 45(3), 449-476.
- Van der Heijden B. I. J. M. (2002). Prerequisites to guarantee life-long employability. *Personnel Review*, 31, 1, 44-61.
- Van der Heijden, B. I. J. M. (2010). Rapportage inzake verantwoording keuze employability meetinstrument voor CBS.
- Van Hooft, E.A.J., Born, M.P., Taris, T.W., Flier, H.V.D. & Blonk, R.W.B. (2004). Predictors of job search behaviour among employed and unemployed people. *Personnel Psychology*, 57(1), 25-59.
- Van Hooft, E.A.J. & Crossley, C.D. (2008). The joint role of locus of control and perceived financial need in job search. *International Journal of Selection and Assessment*, 16(3), 258-271.
- Vansteenkiste, M., Lens, W., De Witte, H. & Feather, N.T. (2005). Understanding unemployed people's job search behaviour, unemployment experience and well-being: A comparison of expectancy-value theory and self-determination theory. *British Journal of Social Psychology*, 44(2), 269-287.

- Vlasblom, J. D., Van Echtelt, P. & de Voogd-Hamelink, M. (2015). *Aanbod van arbeid 2014. Arbeidsdeelname, flexibilisering en duurzame inzetbaarheid*. Sociaal en Cultureel Planbureau.
- Vroom, V.H. (1964). *Work and motivation*. New York: Wiley.
- Wanberg, C.R., Zhang, Z. & Diehn, E.W. (2010a). Development of the "Getting Ready for Your Next Job" inventory for unemployed individuals. *Personnel Psychology*, 63(2), 439-478.
- Wanberg, C.R., Zhu, J., & Van Hooft, E.A.J. (2010b). The job search grind: Perceived progress, self-reactions, and self-regulation of search effort. *Academy of Management Journal*, 53(4), 788-807.
- Wittekind, A., Raeder, S., & Grote, G. (2010). A longitudinal study of determinants of perceived employability. *Journal of Organizational Behavior*, 31(4), 566-586.

## Appendix 1: Converting the dataset

### Variables of interest for the sequence and cluster analyses

When performing the sequence analysis for this study some variables are of interest. Firstly a variable that indicates which data belongs to which respondent. Consequently, the dependent variable, the monthly measured social economic status of each respondent. In addition to these, a variable which indicates the moments (months) when the measurement has taken place is also necessary. Lastly, the independent variable, perceived employability, can be used as a grouping variable. This way, the career paths of the respondents can be compared between groups. These variables are used in the upcoming explanation on how the dataset was converted from the original SPSS dataset to a format in which R handles the sequence and cluster analyses.

### Converting the dataset to STS format.

In the original SPSS dataset, each respondent corresponds to a single case (a row; see table 10). Each value for social economic category (SECM), which is measured each month is displayed in a unique variable (column).

Table 10: Example of data in the original format

<b>Respondent</b>	<b>Perceived employability</b>	<b>SECM October 2010</b>	<b>SECM November 2010</b>	<b>SECM December 2014</b>
1	4	Employee	Employee	Employee
2	3	Employee	Employee	Receiver of pension income
3	2	Employee	Self-employed	Self-employed

Before loading the dataset into R, the dataset needs to be converted to a so-called “spell” format. In the spell format, each measured value for SECM is displayed on a separate line (see table 11).

Table 11: Example of data in spell format

<b>Respondent</b>	<b>Perceived employability</b>	<b>Month</b>	<b>SECM</b>
1	4	October 2010	Employee
1	4	November 2010	Employee
1	4	December 2014	Employee
2	3	October 2010	Employee
2	3	November 2010	Employee
2	3	December 2014	Receiver of pension income
3	2	October 2010	Employee
3	2	November 2010	Self-employed
3	2	December 2014	Self-employed

Finally, after loading the (spell format) dataset in R, the dataset can be changed to states-sequence (STS) format (refer to Appendix 2 for the R script). In the STS format each month is a unique variable (column; see table 12). This might seem similar to the original format of the dataset, but it is important to notice that something has changed. The score on perceived employability has also become a monthly value. Of course this is true as well for all other variables in the dataset. This makes it possible to sort the sequences by groups during the sequence analysis.

Table 12: Example of data in the STS-format

Respondent		October 2010	November 2010	December 2014
<b>1</b>	<b>Perceived employability</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>1</b>	<b>SECM</b>	Employee	Employee	Employee
<b>2</b>	<b>Perceived employability</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>2</b>	<b>SECM</b>	Employee	Employee	Receiver of pension income
<b>3</b>	<b>Perceived employability</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>3</b>	<b>SECM</b>	Employee	Self-employed	Self-employed

## Appendix 2: R script example

```
# Install and switch on packages
.libPaths("\\\\cbsp.nl/Profiel/Productie/SECJSMR/Documents/R/lib/i386-3.2.3")
#install("TraMineR")
# The TraMineR package is used for the sequence analysis
library("TraMineR", lib.loc="\\\\cbsp.nl/Profiel/Productie/SECJSMR/Documents/R/lib/i386-3.2.3")
#The haven package is used for loading an SPSS file in R
library("haven")
#install("weightedCluster")

#Loading SPSS data file in R
Analyse9 <- read_spss("//Cbsp.nl/Productie/Primair/SSBAD_NEAond_SEC1/werk/Bestanden/2017/Employability/NEA_employability_2010_2011_longi_325var_werknemerSECM_max38maa

#Integer values for social economic category per month (SECM).
secm_rec <- as.integer(Analyse9$werknemerSECM)
#Display total number of cases for each social economic category in a table
table(secm_rec)

#Convert the data to a dataframe, add the newly created variable with integer values of SECM.
Analyse2010 <- data.frame(Analyse9, secm_rec)
#Convert the dataframe from spell-format to sts-format (processor usage 100%, RAM memory around 60%, this will take about 10 minutes)
Analyse2010.sts <- seqformat(Analyse2010, id="RINPERSOON", begin="Maandv2", end="Maandv2", status="secm_rec", from="SPELL", to="STS", process=FALSE)
## time axis: 1 -> 39, SPELL data converted into sample_n8078 STS sequences

#It might be necessary to restart R soon, when encountering a too high usage of RAM memory, so save the dataframes
#Save the original spell formatted dataframe and the sts formatted dataframe for later use
save(Analyse2010, file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/2010dataframe_werknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")
save(Analyse2010.sts, file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/stswerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")

#If it is necessary to restart R

# Switch on packages
# The TraMineR package is used for the sequence analysis
library("TraMineR", lib.loc="\\\\cbsp.nl/Profiel/Productie/SECJSMR/Documents/R/lib/i386-3.2.3")

#Load saved files.
load(file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/2010dataframe_werknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")
load(file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/stswerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")
```



```

## Add perceived internal employability, couple it to respondent ID
baanhuidig.v <- Analyse2010[,c("RINPERSOON", "nieuwebaanhuidig")]
baanhuidig.v
#table
baanhuidig.av <- aggregate(baanhuidig.v, by = list(baanhuidig.v$RINPERSOON), FUN = min)[-1]
baanhuidig.av
#set as factor and display factor
baanhuidig.av$nieuwebaanhuidig <- factor(baanhuidig.av$nieuwebaanhuidig)
baanhuidig.av$nieuwebaanhuidig

## Add perceived external employability, couple it to respondent ID
baanander.v <- Analyse2010[,c("RINPERSOON", "nieuwebaanander")]
baanander.v
#table
baanander.av <- aggregate(baanander.v, by = list(baanander.v$RINPERSOON), FUN = min)[-1]
baanander.av
#set as factor and display factor
baanander.av$nieuwebaanander <- factor(baanander.av$nieuwebaanander)
baanander.av$nieuwebaanander

#labeling
Analyse2010.lab <- c("werknemer",
  "Directeur-grootaandeelhouder",
  "zelfstandig ondernemer",
  "Overige zelfstandige",
  "Meewerkend gezinslid",
  "Ontvanger werkloosheidsuitkering",
  "Ontvanger bijstandsuitkering",
  "Ontvanger uitkering sociale voorz.overig",
  "Ontvanger uitkering ziekte/AO",
  "Ontvanger pensioenuitkering",
  "Nog niet schoolg./schol./stud. met ink.",
  "Nog niet schoolg./schol./stud. geen ink.",
  "Overig zonder inkomen",
  "Missing")
Analyse2010.code <- c("w", "DGA", "z", "oz", "MWG", "WLU", "BU", "USVO", "UZA0", "PU", "NNSMI", "NNSGI", "OZI", "M")

#Calculate the sequences, add values for the notation of time (which will be used on the x-axis of plots)
Analyse2010.seq <- seqdef(Analyse2010.sts, 0:39, states = Analyse2010.code, labels = Analyse2010.lab, xtstep = 6, missing = NA)
names(Analyse2010.seq)[1:39] <- c(0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20,
  21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38)

#Display first 5 sequences in STS and SPS format
print(Analyse2010.seq[1:5,], format = "STS")
print(Analyse2010.seq[1:5,], format = "SPS")

#Add colours to SECM
attr(Analyse2010.seq, "cpal") <- c("black", "violetred2", "darkgreen", "yellow", "blue",
  "purple", "red", "white", "chocolate4", "orange",
  "cyan", "magenta", "green", "grey")

```

```

#Plot sequences for SECM over the 38 months, split them by perceived internal employability or perceived external employability
seqipplot(Analyse2010.seq, tlim = 0, border = NA, space = 0, cex.plot = .8, cex.legend = .8, group = baanhuidig.av$nieuwebaanhuidig, title = c("Helemaal niet mee eens",
seqipplot(Analyse2010.seq, tlim = 0, border = NA, space = 0, cex.plot = .8, cex.legend = .8, group = baanander.av$nieuwebaanander, title = c("Helemaal niet mee eens", "

#Plot average number of months for SECM, split them by perceived internal employability or perceived external employability
seqmpplot(Analyse2010.seq, ylim = c(0,35), cex.plot = .8, cex.legend = .5, group = baanhuidig.av$nieuwebaanhuidig, title = c("Helemaal niet mee eens", "Niet mee eens",
seqmpplot(Analyse2010.seq, ylim = c(0,35), cex.plot = .8, cex.legend = .5, group = baanander.av$nieuwebaanander, title = c("Helemaal niet mee eens", "Niet mee eens", "M

#Plot total status distribution for SECM over the 38 months
seqdplot(Analyse2010.seq, border = NA, cex.legend = .8, group = baanhuidig.av$nieuwebaanhuidig, title = c("Helemaal niet mee eens", "Niet mee eens", "Mee eens", "Hele
seqdplot(Analyse2010.seq, border = NA, cex.legend = .8, group = baanander.av$nieuwebaanander, title = c("Helemaal niet mee eens", "Niet mee eens", "Mee eens", "Helema

#Compute transition rates and create substitution costs matrix and show it
#The substitution cost matrix shows how probable it is that one changes from one SECM category to another.
#The minimal costs are 0 (when remaining in the same category) the maximal costs are 2.
#The higher the costs, the less likely it is for the transition to take place.
#In this case the transition from employee to student without income or vice versa is most likely (1.770762)
scost <- seqsubm(Analyse2010.seq, method = "TRATE")
scost

#Compute transition rates, round them on two decimals and show them in a matrix
Analyse2010.trate <- seqtrate(Analyse2010.seq)
round(Analyse2010.trate,2)

#Display transversal status distribution (state frequencies, valid states and entropy per month)
seqstatd(Analyse2010.seq[,1:39])

#Before the cluster analysis starts, it is necessary to restart R to free up some RAM memory
#Save the sequences and transition rates for the cluster analysis
save(Analyse2010.seq, file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClusterseqwerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")
save(Analyse2010.trate, file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClustertratewerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")

#Restart R to clear extra RAM memory

#switch on packages
library("TraMineR", lib.loc="\\\\cbsp.nl/Profiel/Productie/SECJSMR/Documents/R/lib/i386-3.2.3")
library("weightedCluster", lib.loc="\\\\cbsp.nl/Profiel/Productie/SECJSMR/Documents/R/lib/i386-3.2.3")

#Load saved files.
load(file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClusterseqwerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")
load(file="//cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClustertratewerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")
memory.size()
gc()
memory.size()

#Calculate sequence dissimilarities using Dynamic Hamming Distance method and transition rates
dist.dhd <- seqdist(Analyse2010.seq, method = "DHD", sm = "Analyse2010.trate" , with.missing = TRUE)

#Remove the sequences and transition rates. Free up some RAM memory
memory.size()
rm(Analyse2010.trate,Analyse2010.seq)
memory.size()
gc()
memory.size()

#Calculate clusters (processor usage 100%, RAM memory around 80%, this will take about 40 minutes)
cluster <- agnes(dist.dhd, diss = TRUE, method = "ward")
plot(cluster)

```

```

#Load the sequences
load(file="//Cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClusterseqwerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")

#Fill out how many clusters to plot
#"Error in plot.new() : figure margins too large" > make the plot window bigger and try again.
cluster.8 <- cutree(cluster, k=16)
cluster.8fac <- factor(cluster.8, labels = c("cluster 1" , "cluster 2" , "cluster 3" , "cluster 4" , "cluster 5" ,
      "cluster 6", "cluster 7" , "cluster 8" , "cluster 9" , "cluster 10",
      "cluster 11", "cluster 12", "cluster 13", "cluster 14", "cluster 15", "cluster 16"
))
#Plot clusters per sequence or in total
seqiplot(Analyse2010.seq, group = cluster.8fac, tlim = 0, border = NA, space = 0, withlegend = FALSE, mfrow = c(4,2))
seqdplot(Analyse2010.seq, group = cluster.8fac, border = NA, space = 0, withlegend = FALSE, mfrow = c (2,4))

#Save object "cluster" for later use
save(cluster, file="//Cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClusterwerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")

#Load object cluster when necessary
load(file="//Cbsp.nl/Profiel/Productie/SECJSMR/Documents/My Documents/ClusterwerknemerSECM_max38maanden_werknemerNEAafname_sample_n8078.RData")

```

Appendix 3: Other cluster typologies different from the chosen typology with 9 clusters.

Figure 3a: A 2-cluster typology showing the proportion of social economic states per month for each cluster.

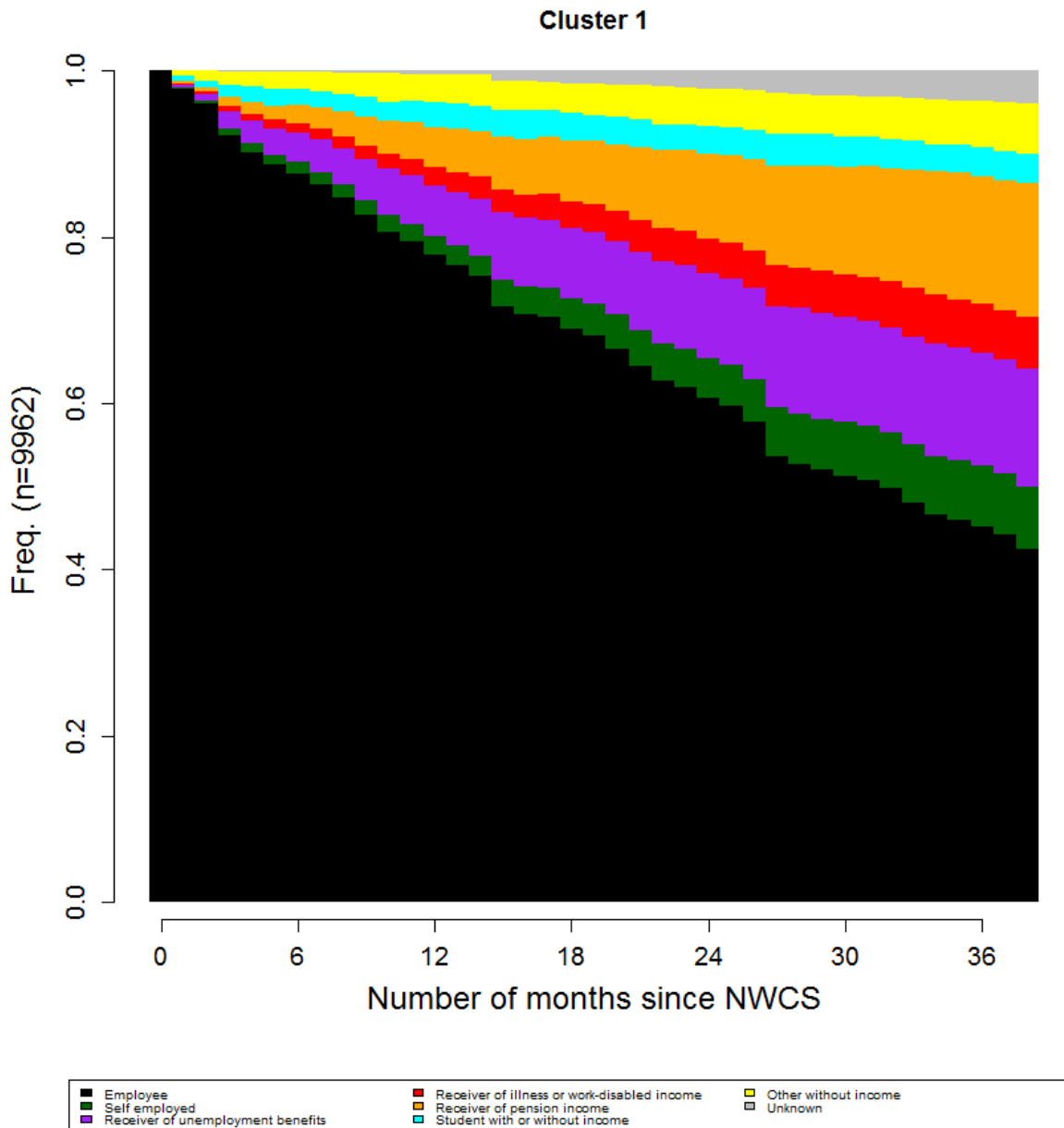


Figure 3b: A 2-cluster typology showing the individual sequences of social economic states per month for each cluster.

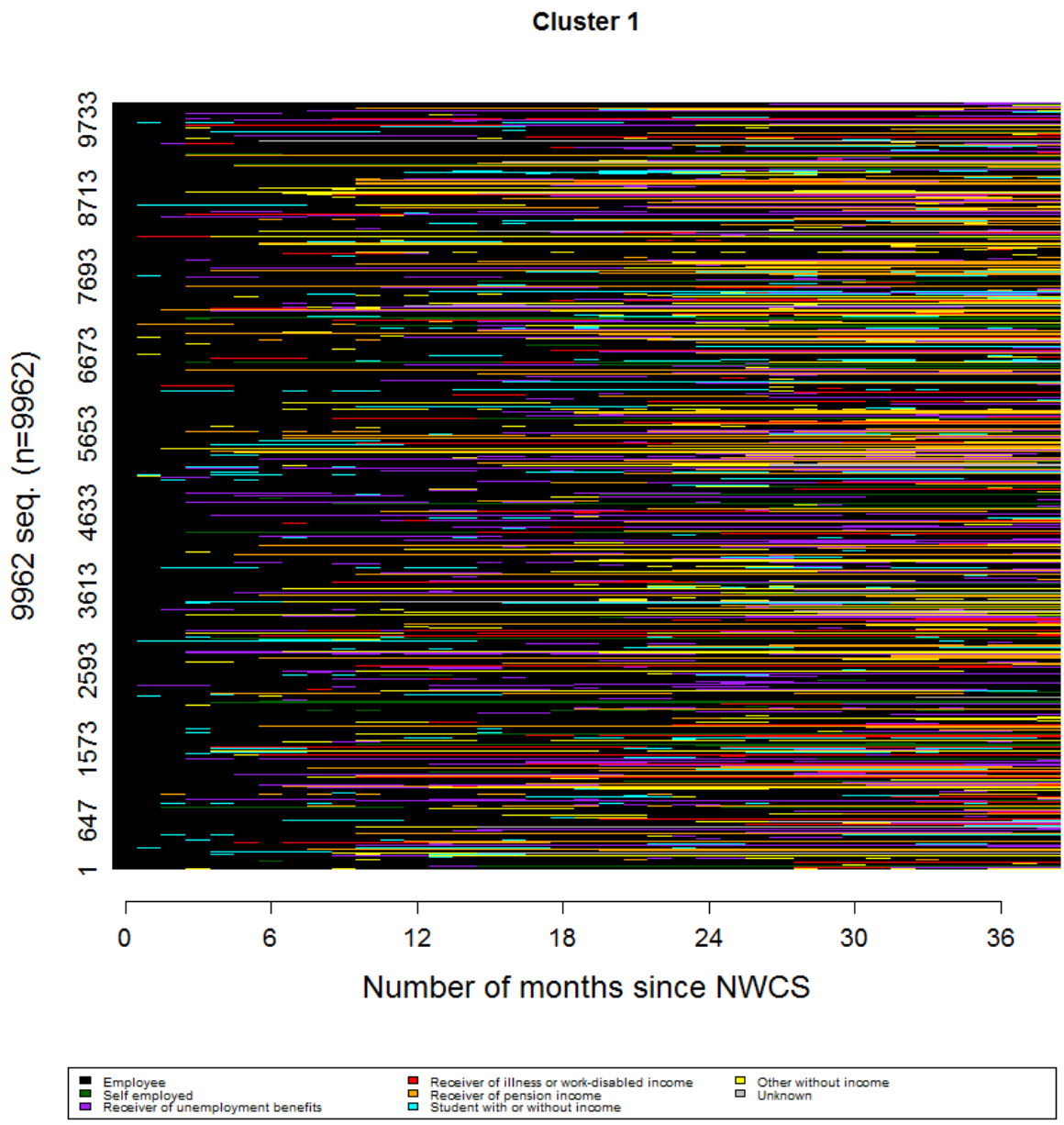


Figure 4a: A 3-cluster typology showing the proportion of social economic states per month for each cluster.

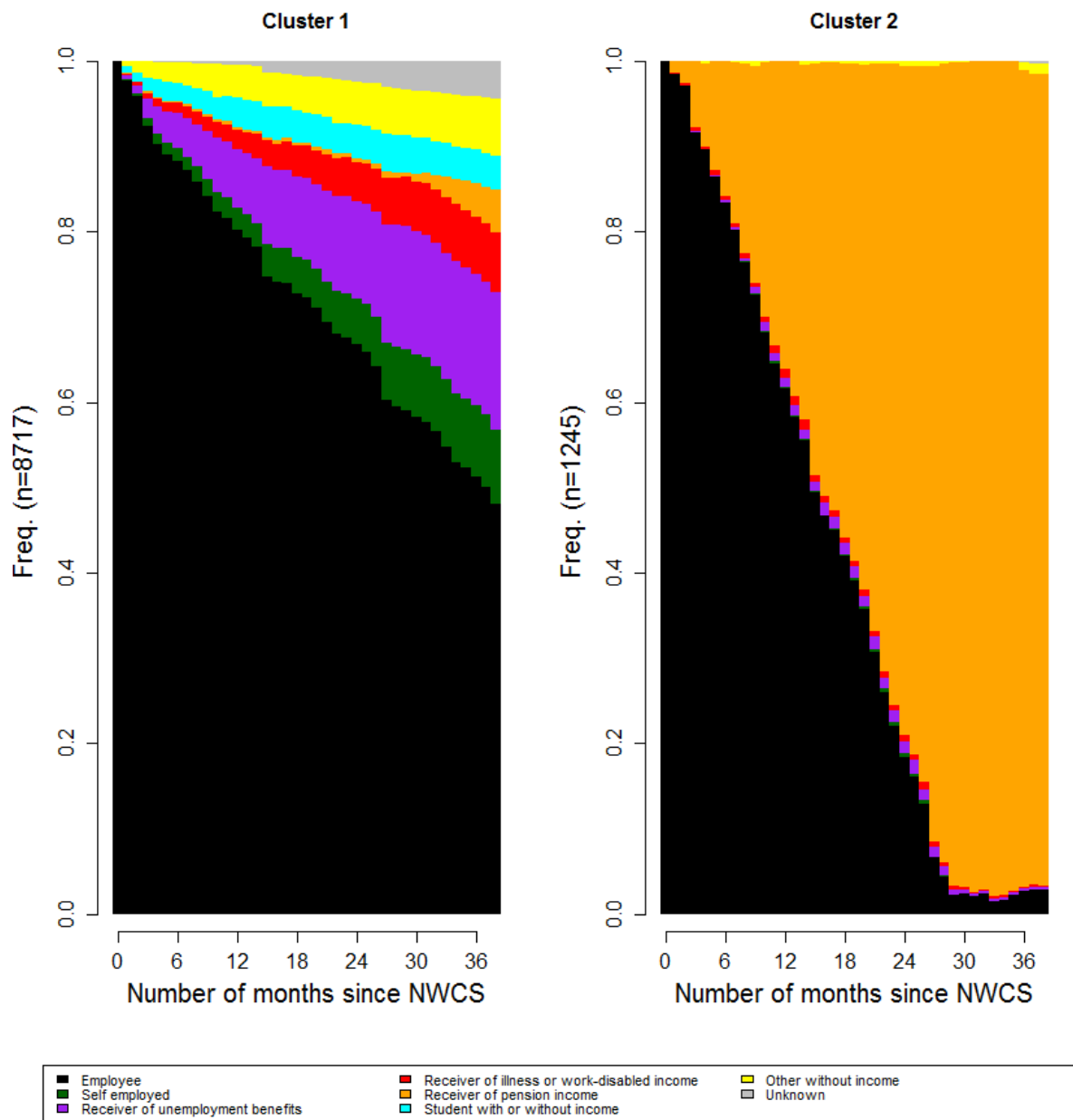


Figure 4b: A 3-cluster typology showing the individual sequences of social economic states per month for each cluster.

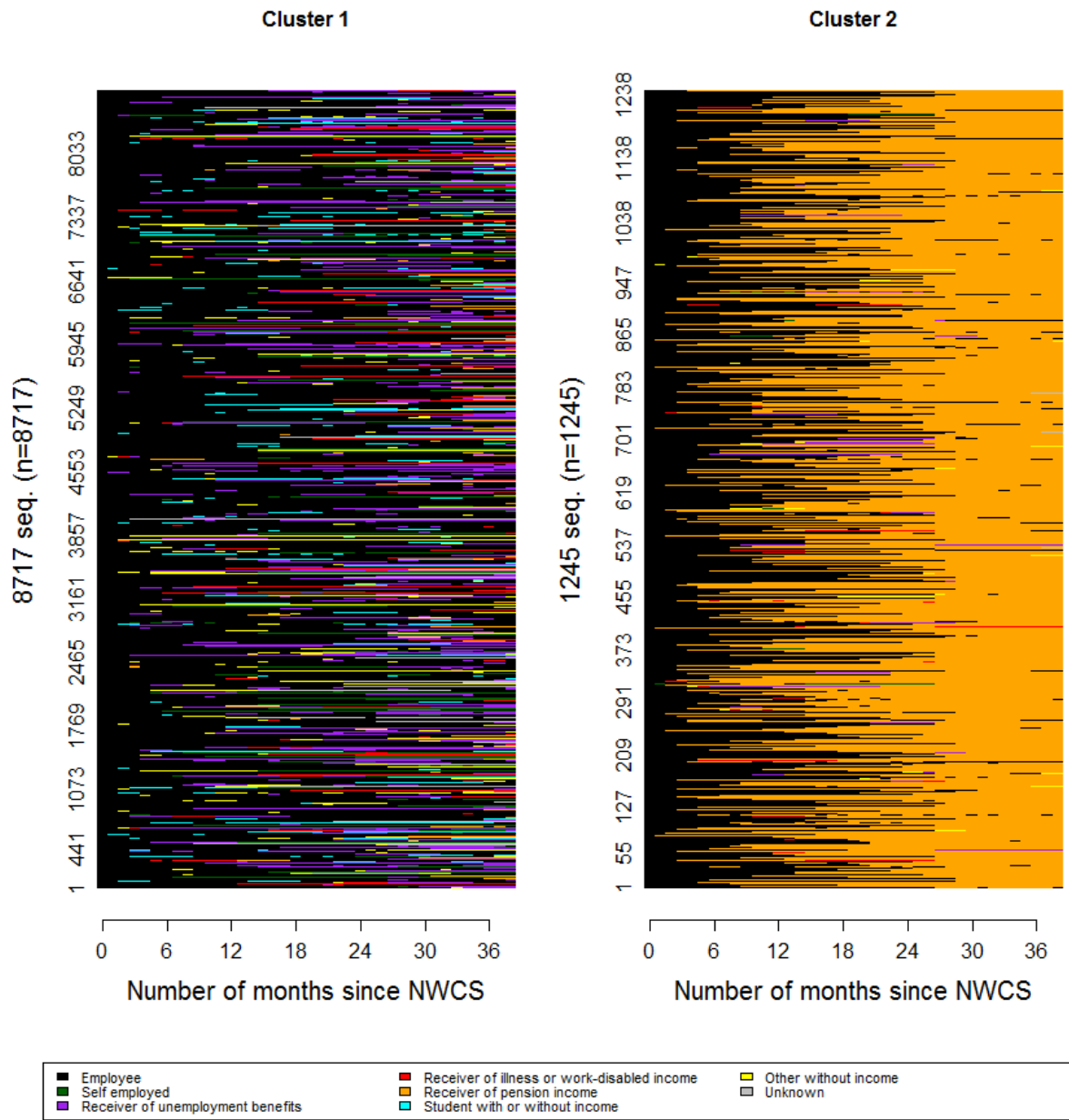


Figure 5a: A 4-cluster typology showing the proportion of social economic states per month for each cluster.

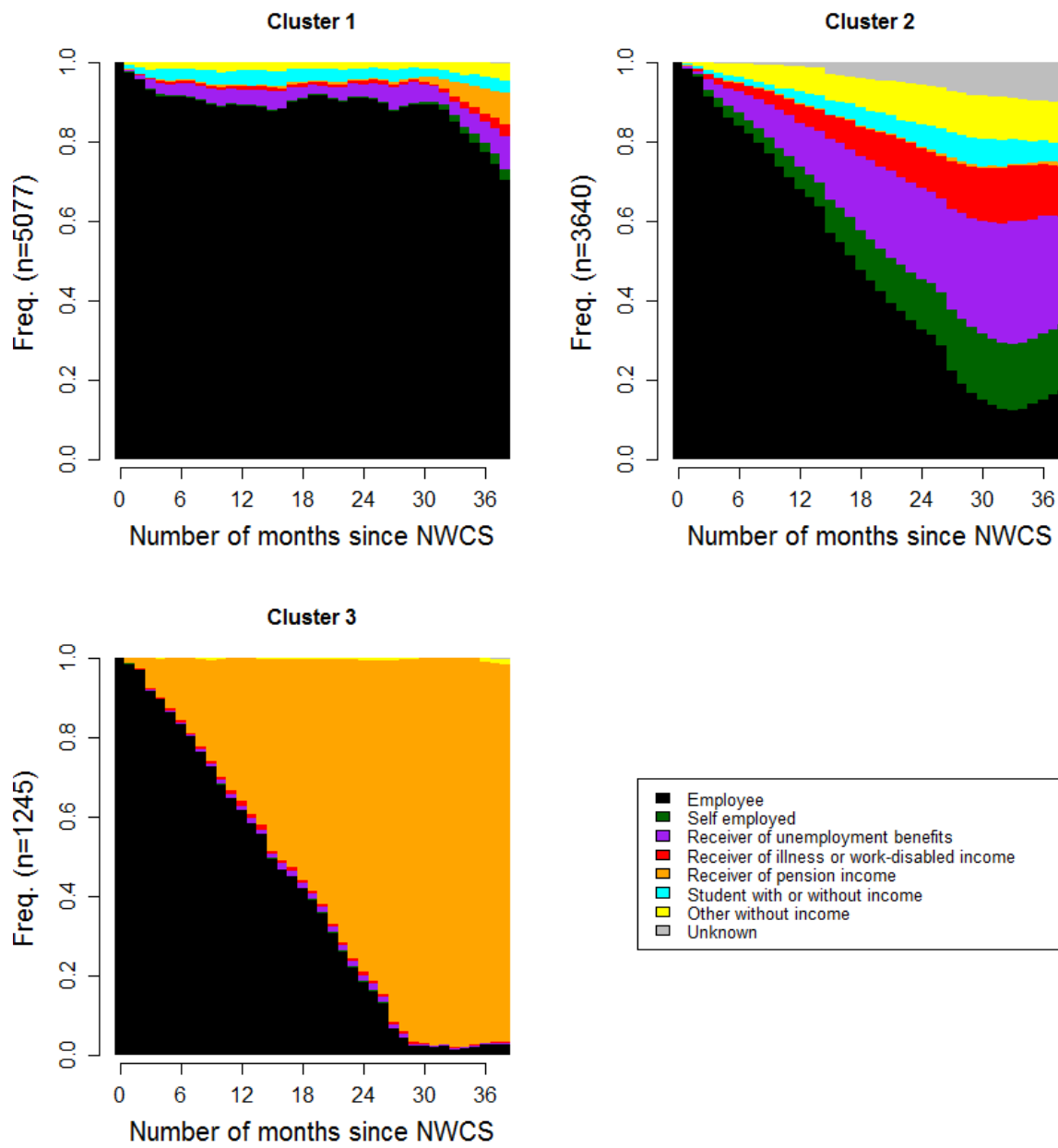




Figure 5b: A 4-cluster typology showing the individual sequences of social economic states per month for each cluster.

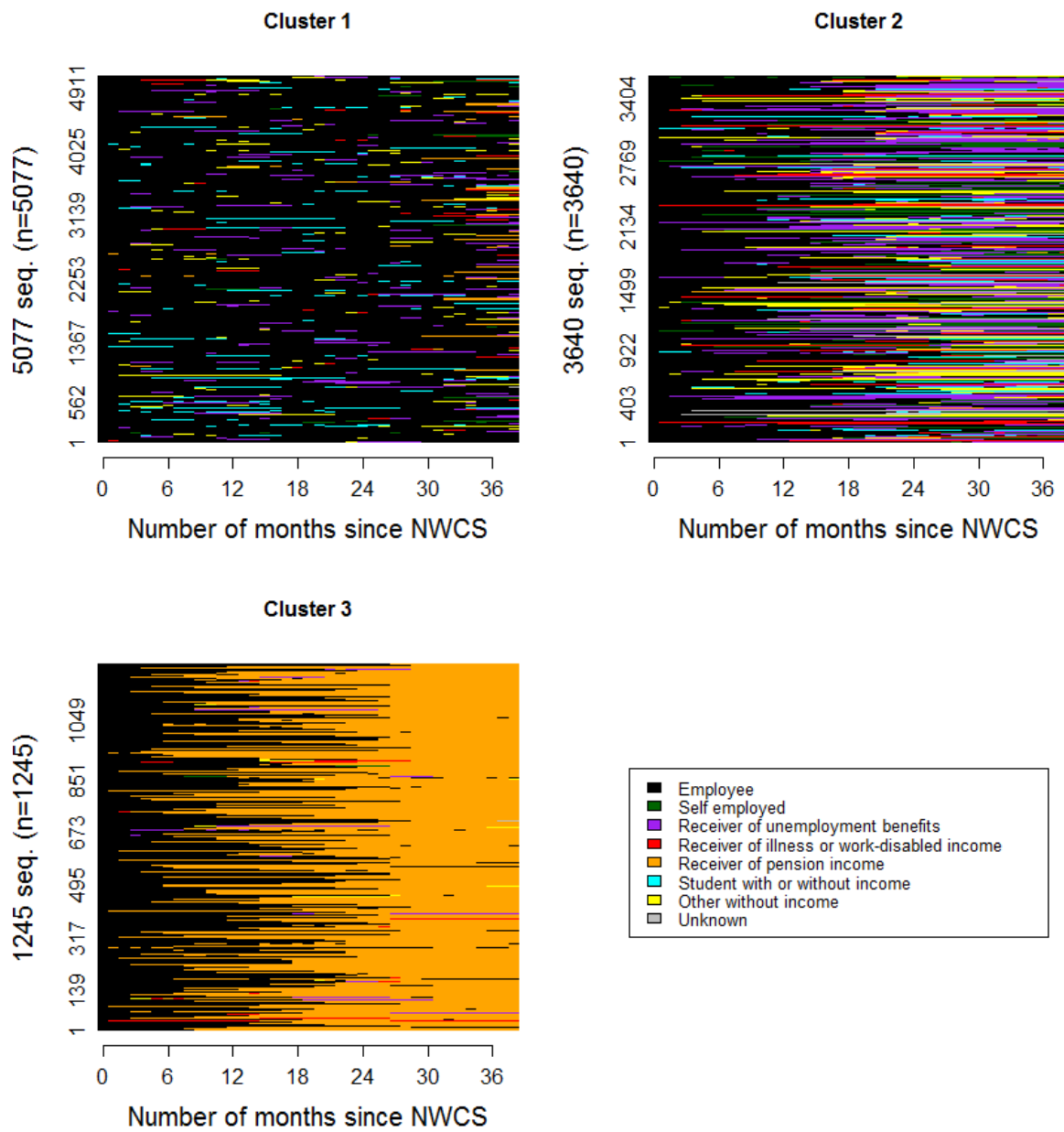


Figure 6a: A 5-cluster typology showing the proportion of social economic states per month for each cluster.

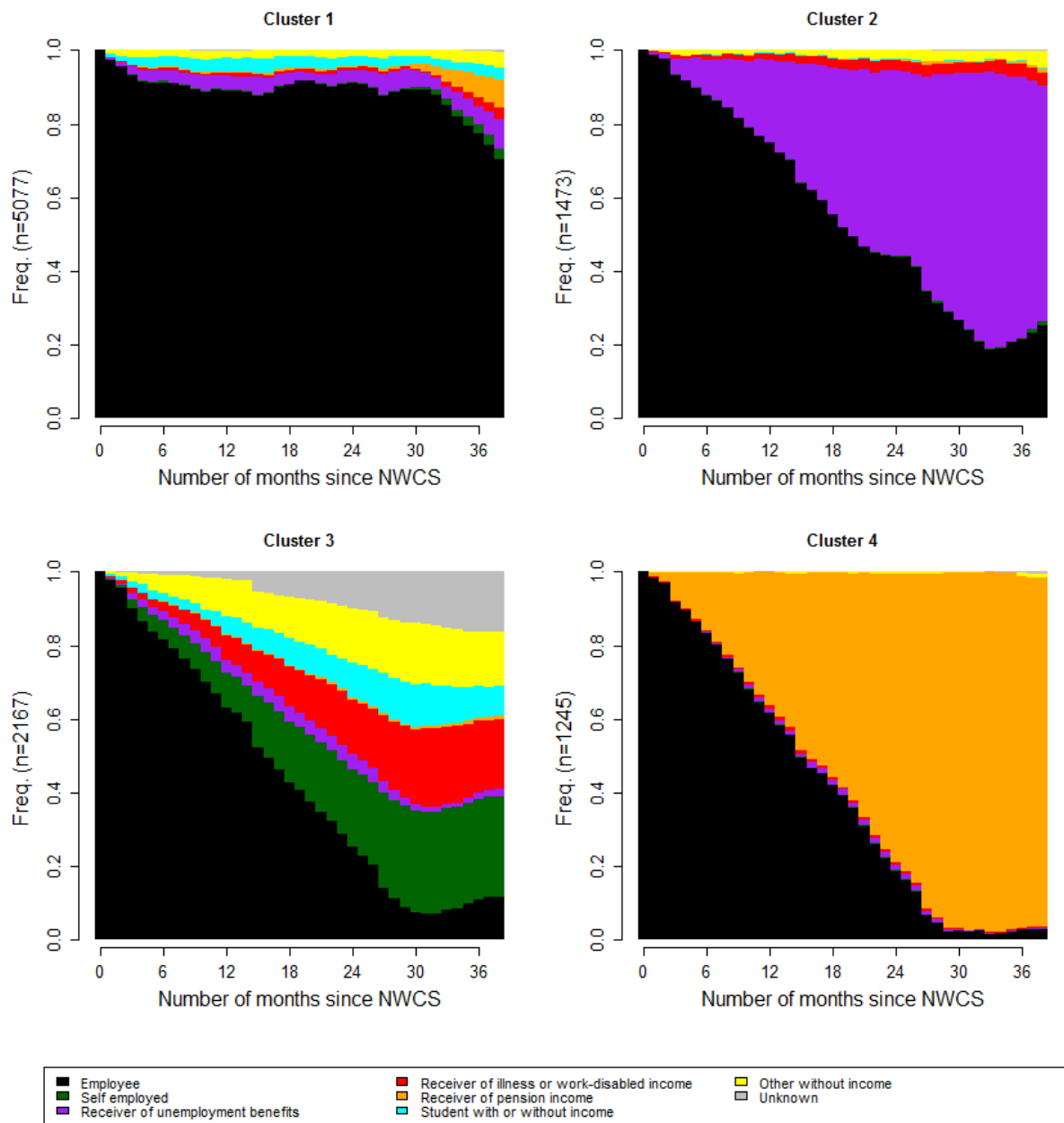


Figure 6b: A 5-cluster typology showing the individual sequences of social economic states per month for each cluster.

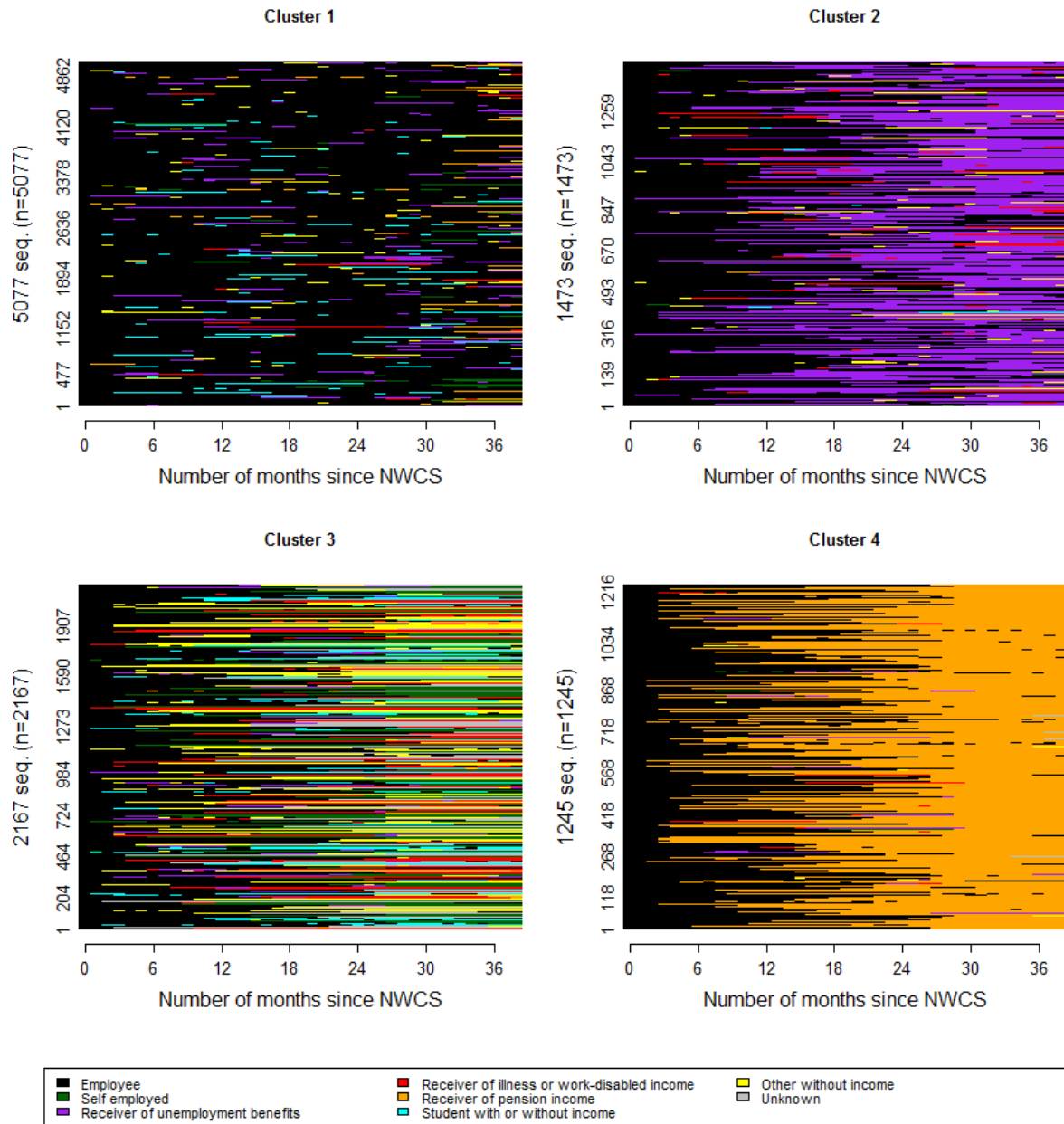


Figure 7a: A 6-cluster typology showing the proportion of social economic states per month for each cluster.

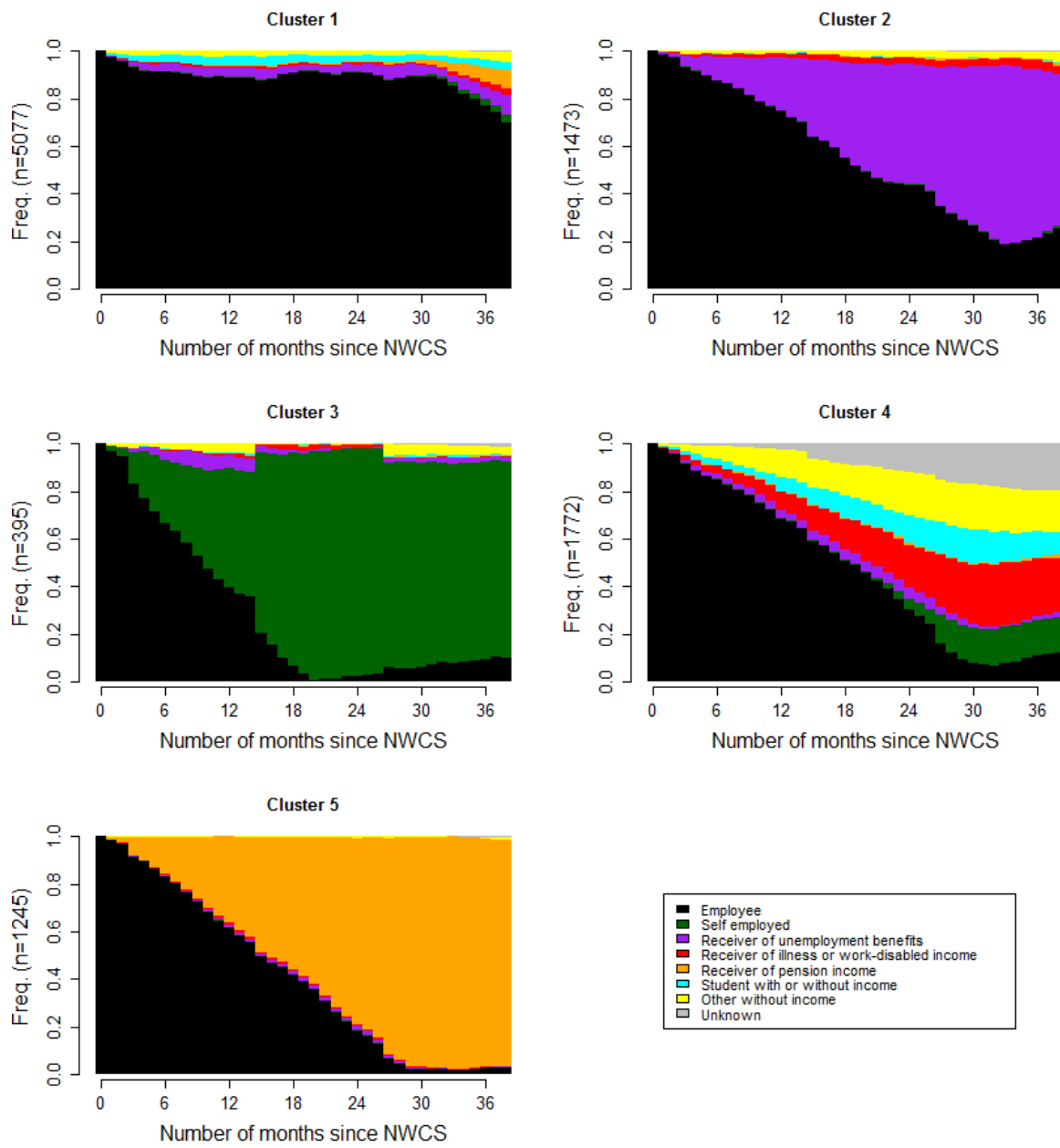


Figure 7b: A 6-cluster typology showing the individual sequences of social economic states per month for each cluster.

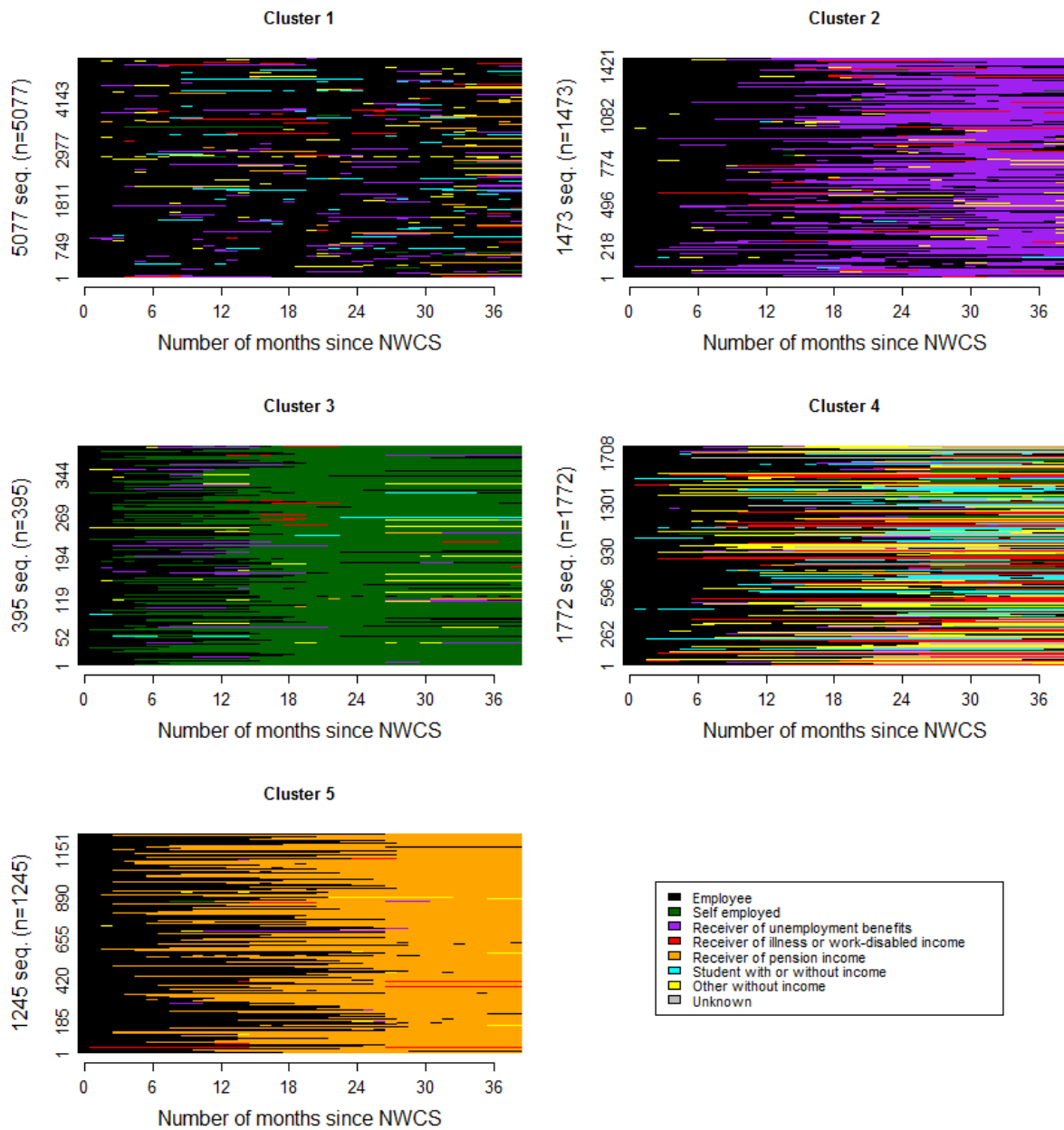


Figure 8a: A 7-cluster typology showing the proportion of social economic states per month for each cluster.

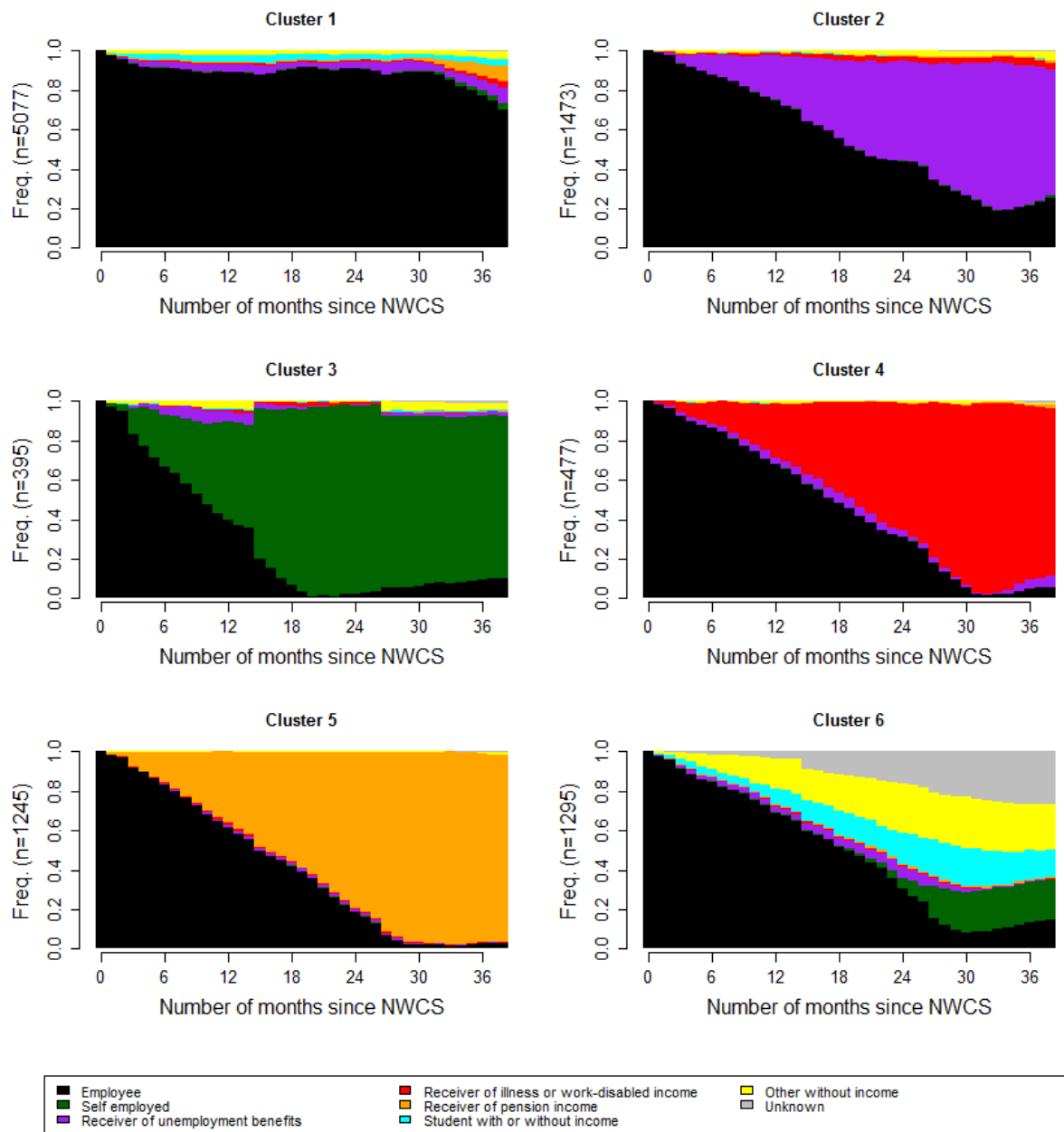


Figure 8b: A 7-cluster typology showing the individual sequences of social economic states per month for each cluster.

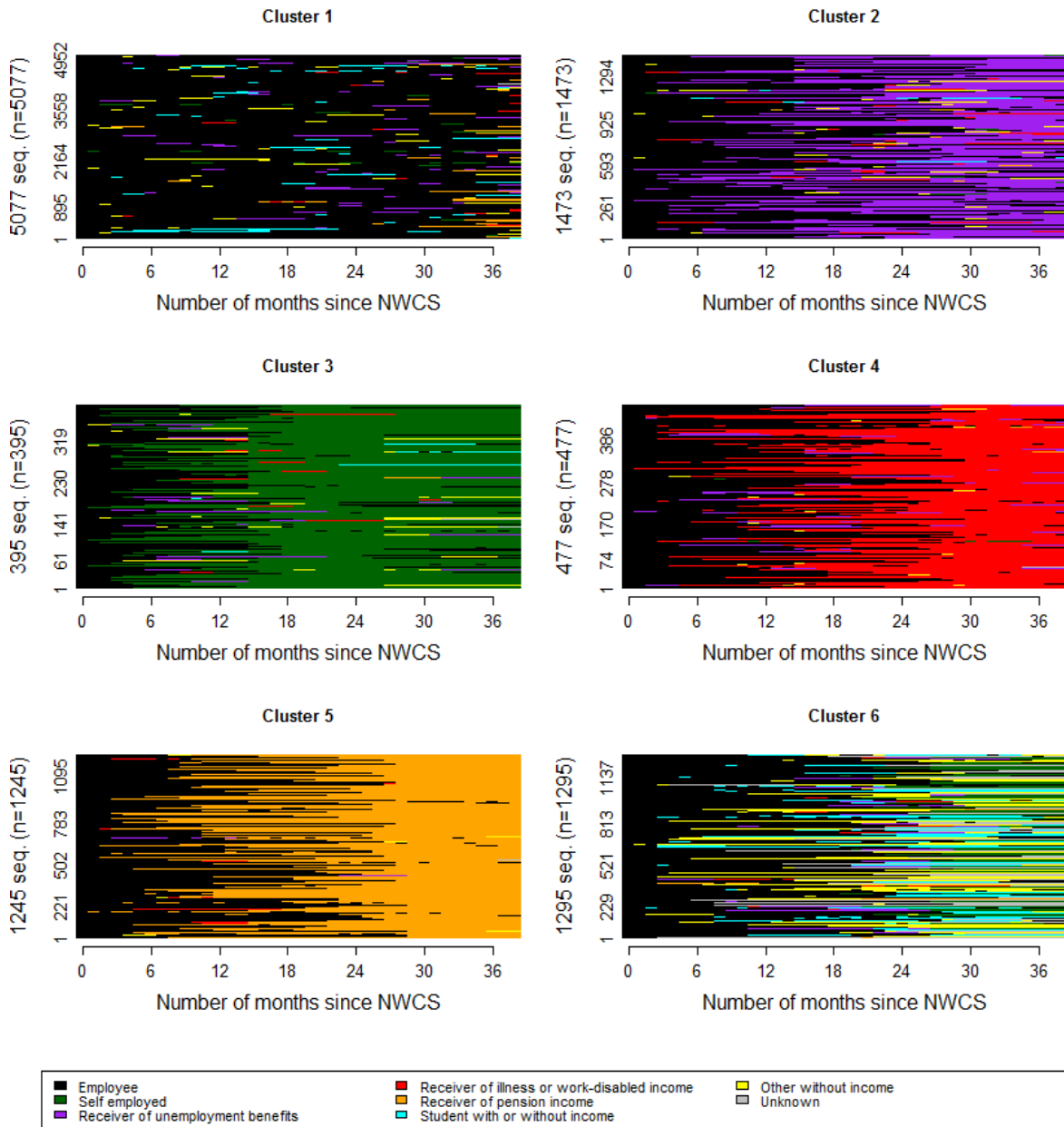


Figure 9a: An 8-cluster typology showing the proportion of social economic states per month for each cluster.

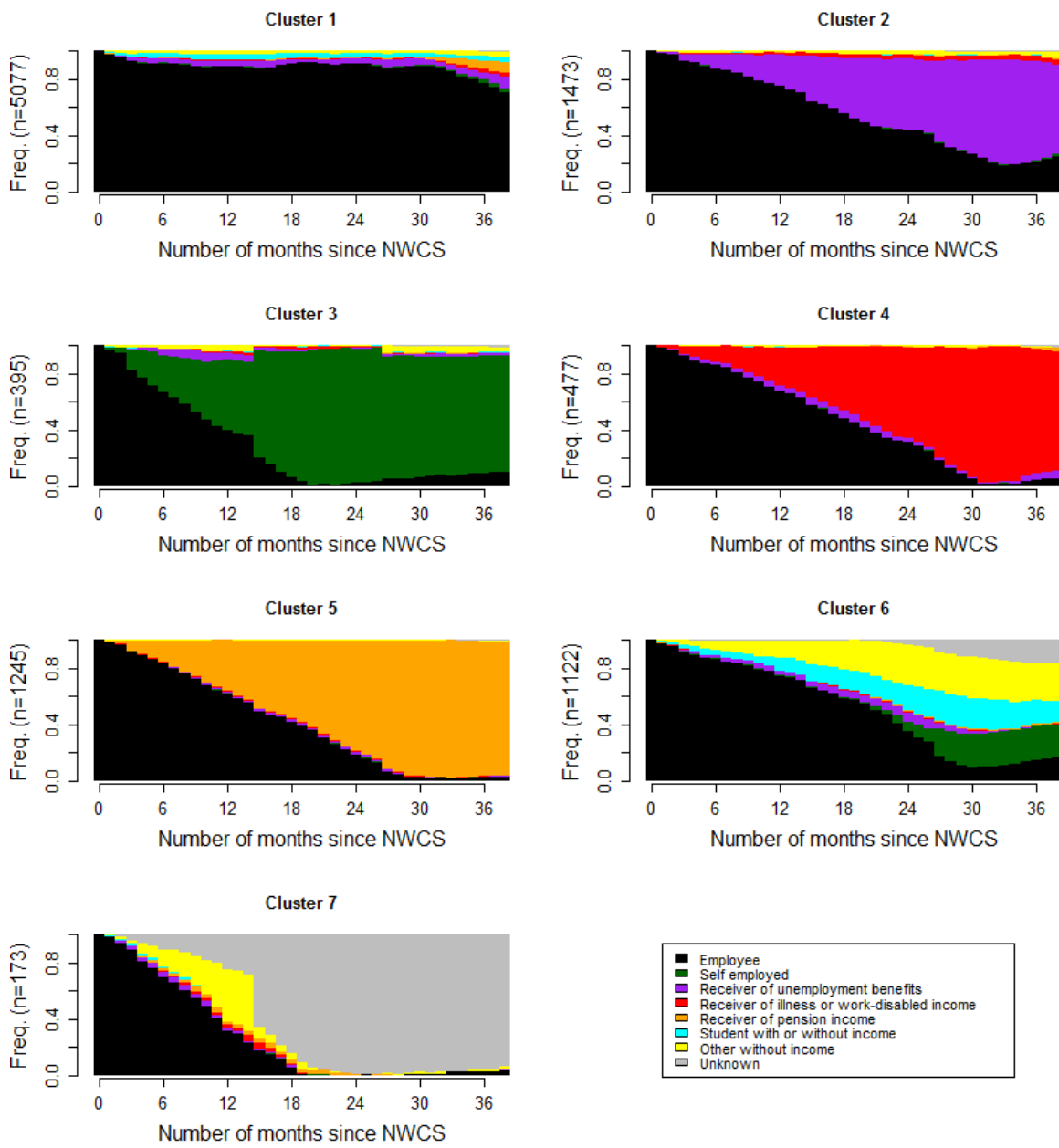




Figure 9b: An 8-cluster typology showing the individual sequences of social economic states per month for each cluster.

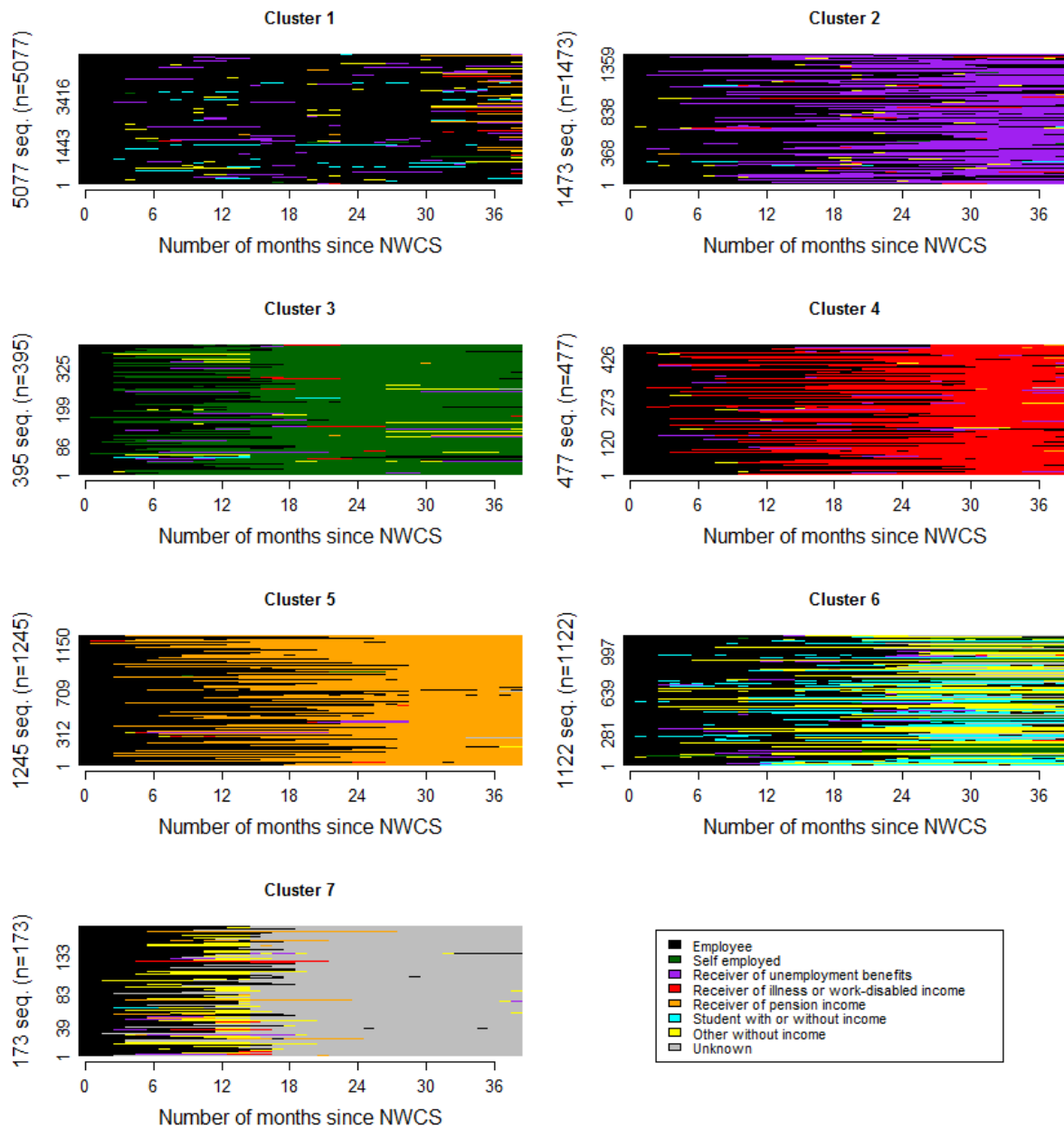


Figure 10a: A 10-cluster typology showing the proportion of social economic states per month for each cluster.

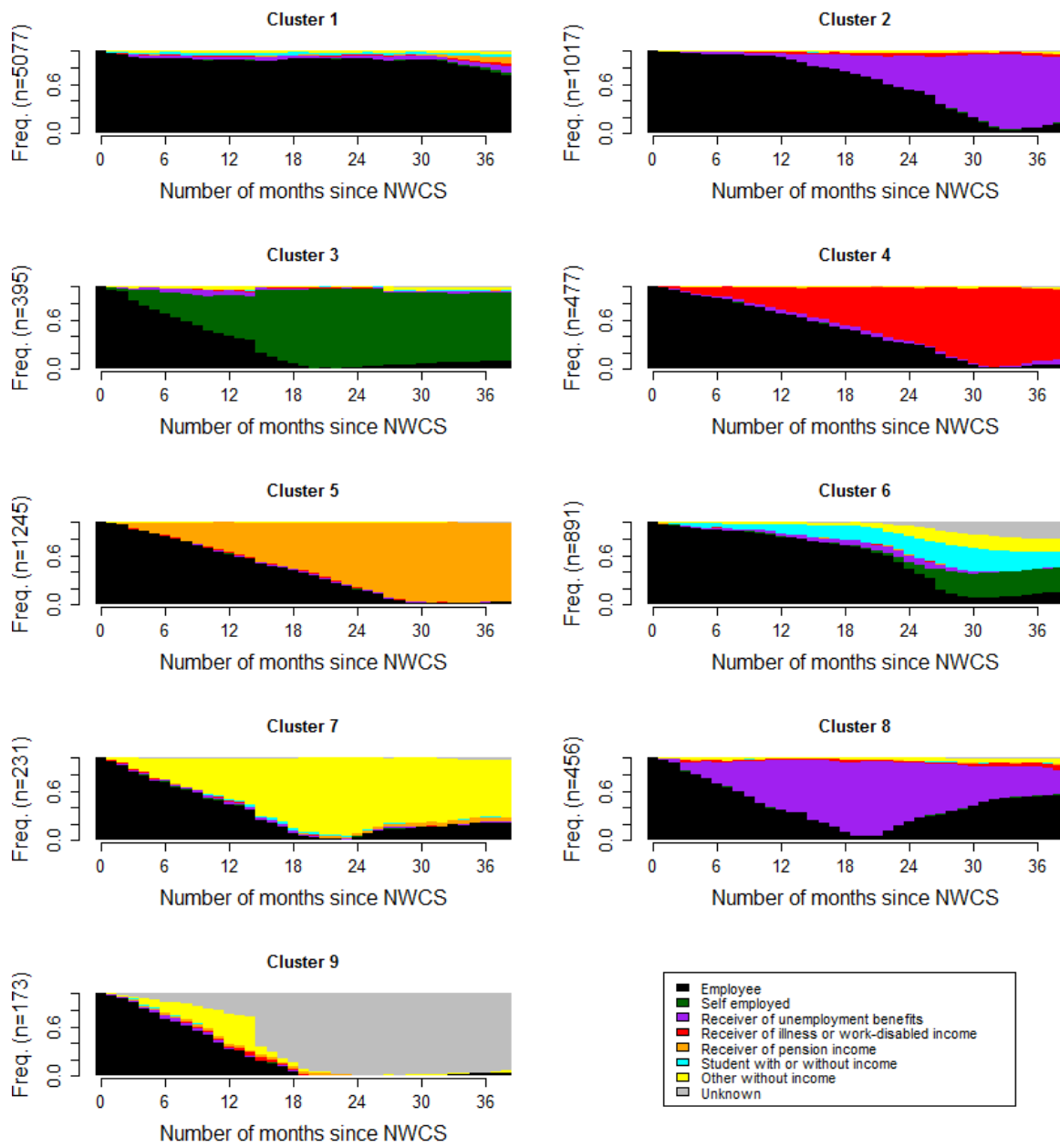


Figure 10b: A 10-cluster typology showing the individual sequences of social economic states per month for each cluster.

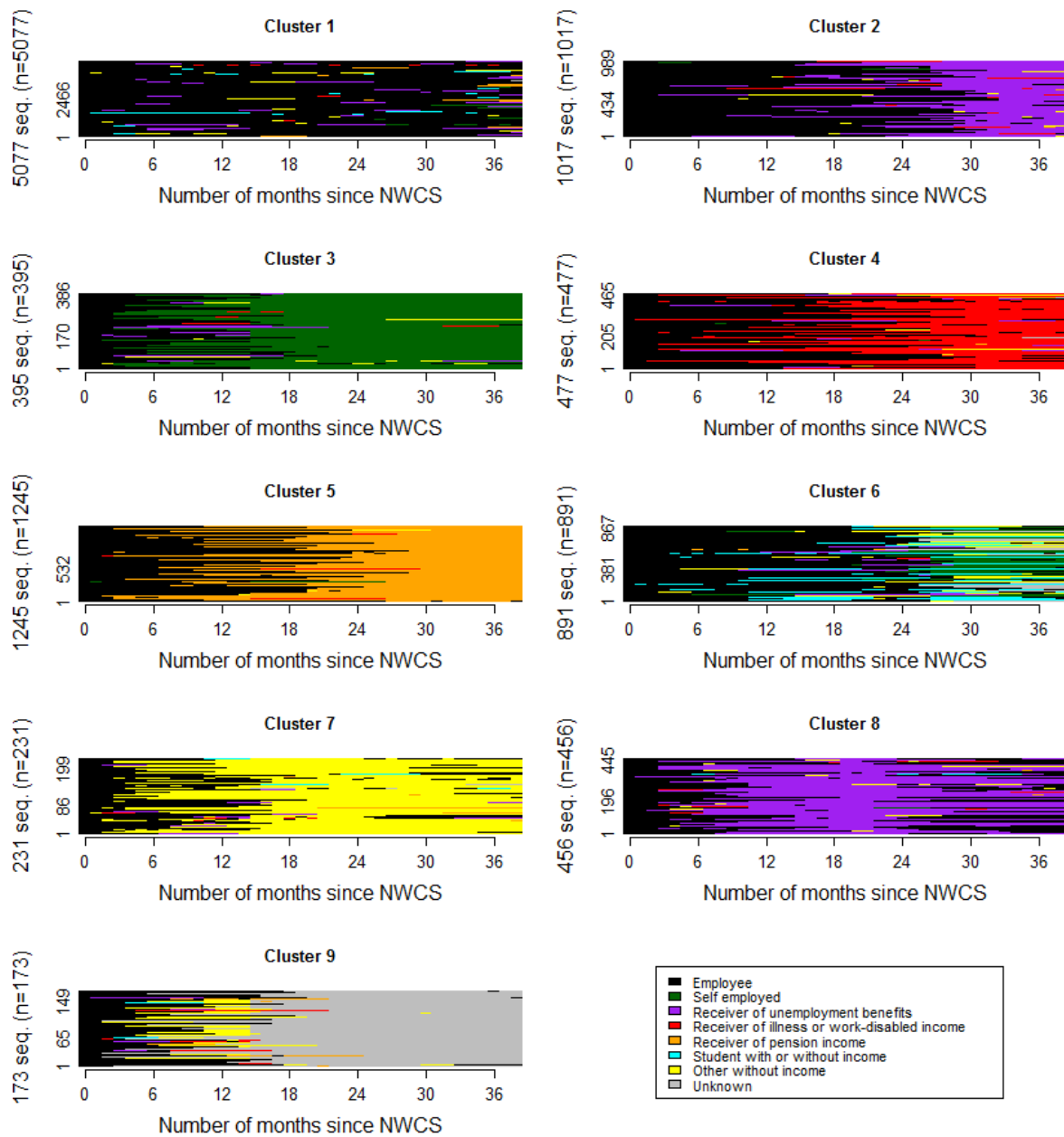


Figure 11a: An 11-cluster typology showing the proportion of social economic states per month for each cluster.

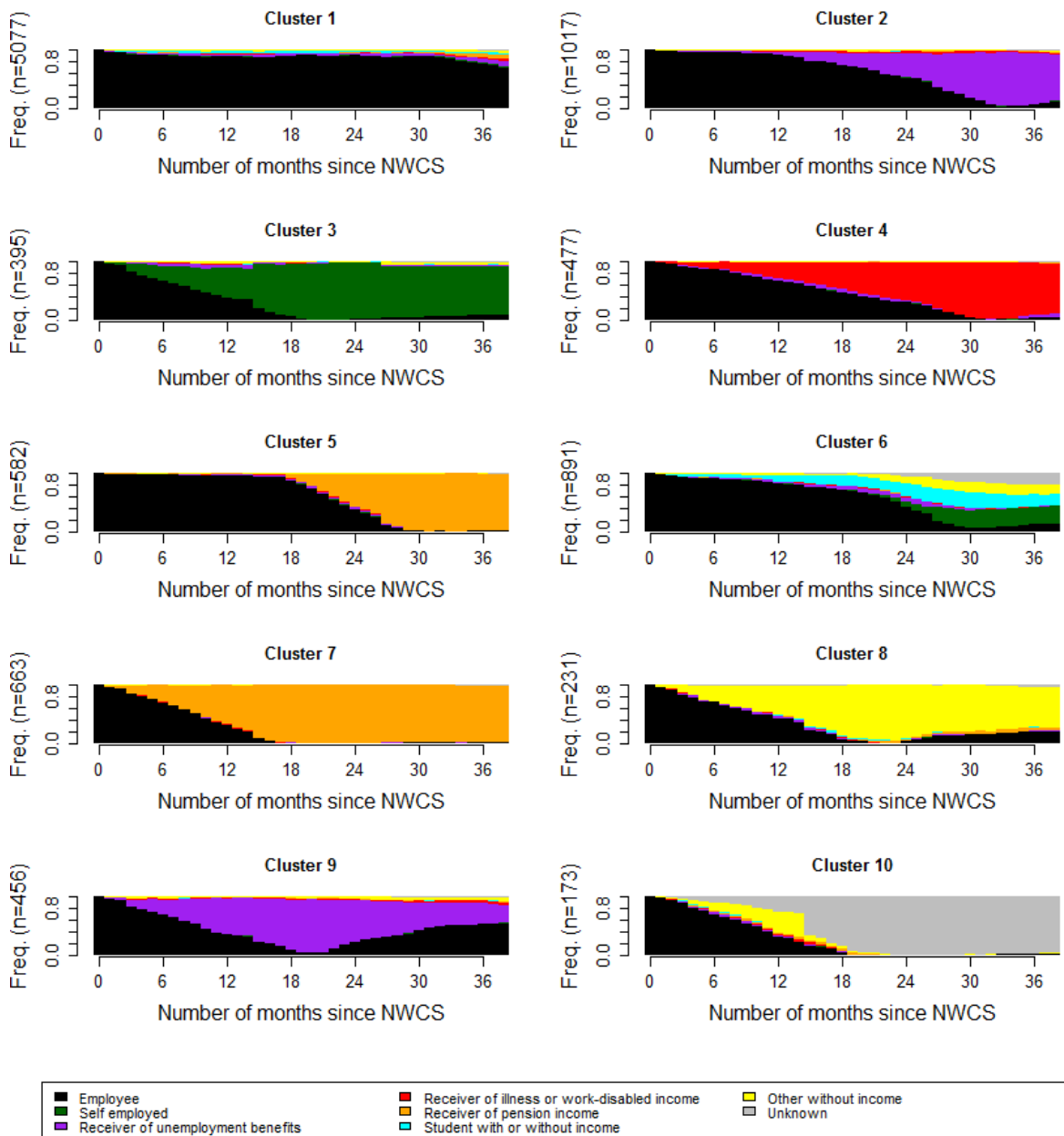


Figure 11b: An 11-cluster typology showing the individual sequences of social economic states per month for each cluster.

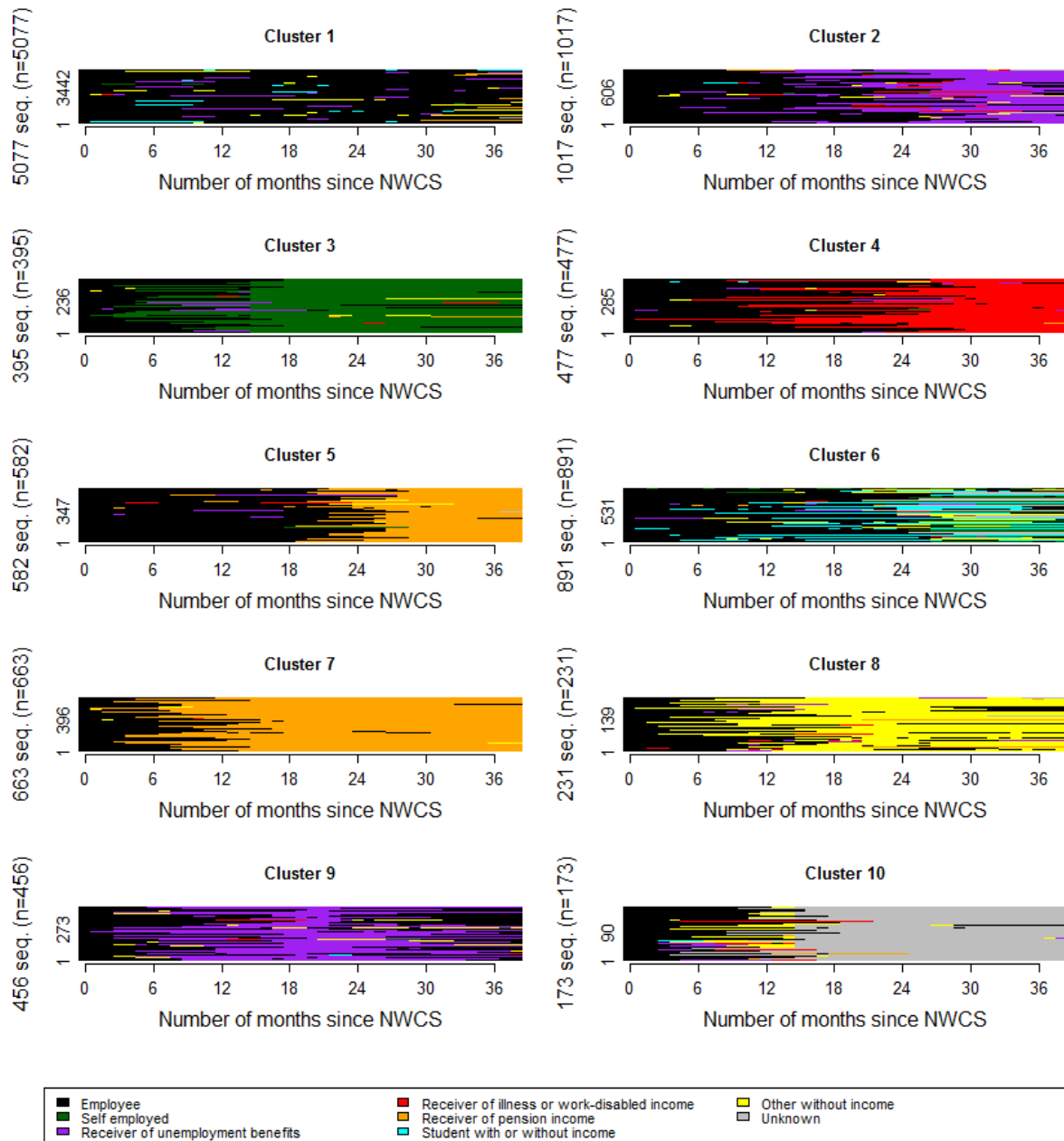


Figure 12a: A 12-cluster typology showing the proportion of social economic states per month for each cluster.

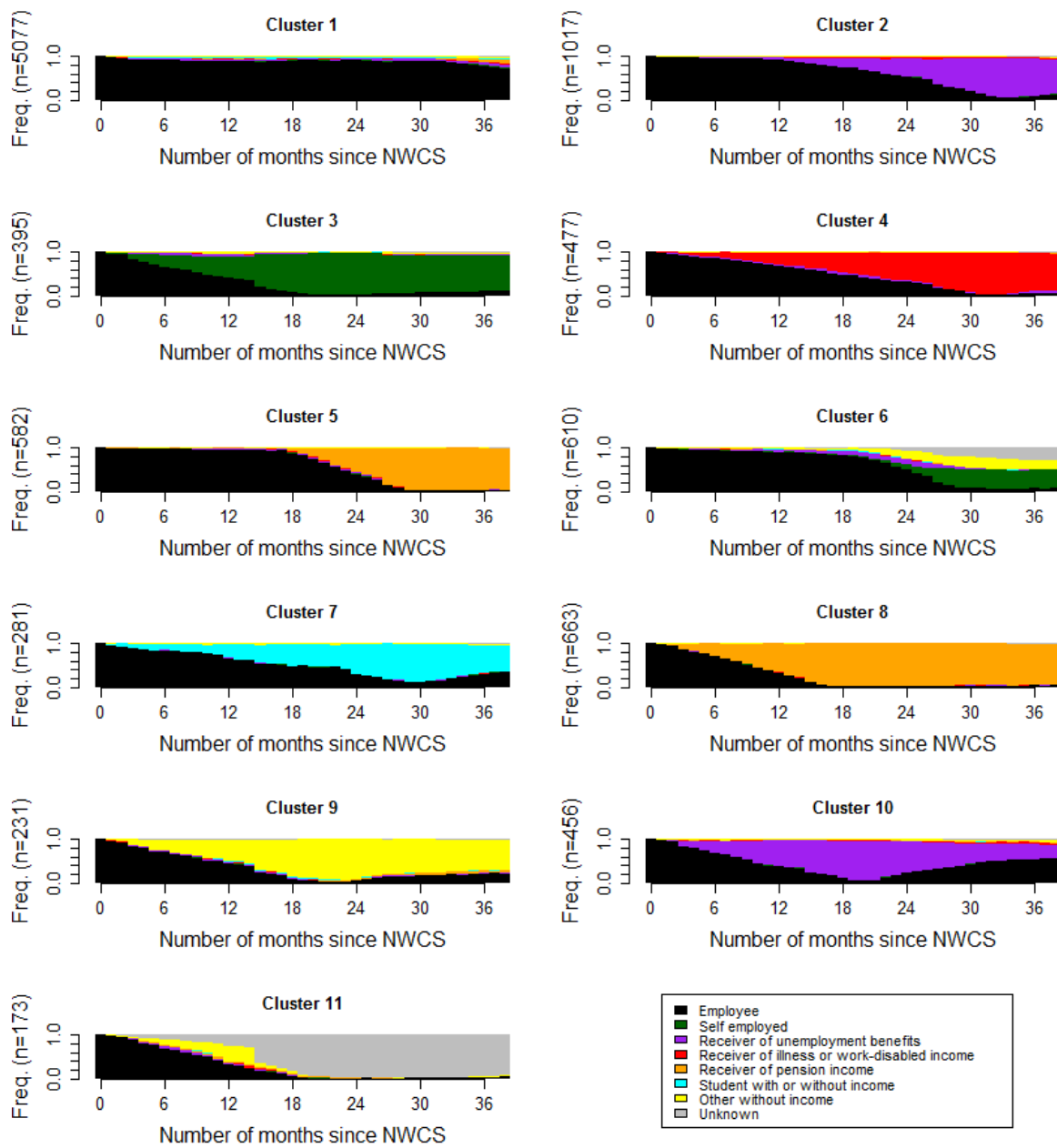


Figure 12b: A 12-cluster typology showing the individual sequences of social economic states per month for each cluster.

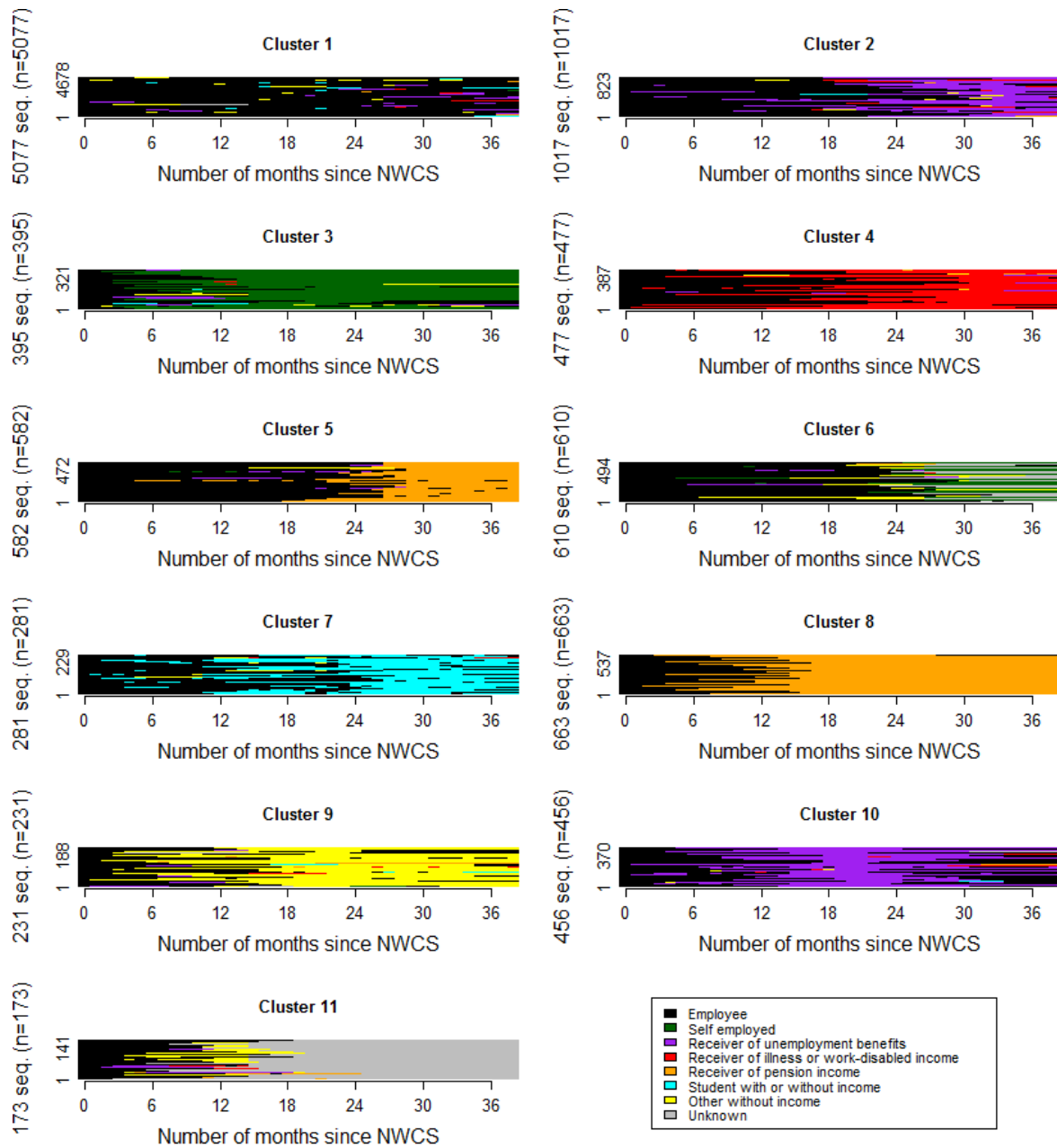


Figure 13a: A 13-cluster typology showing the proportion of social economic states per month for each cluster.

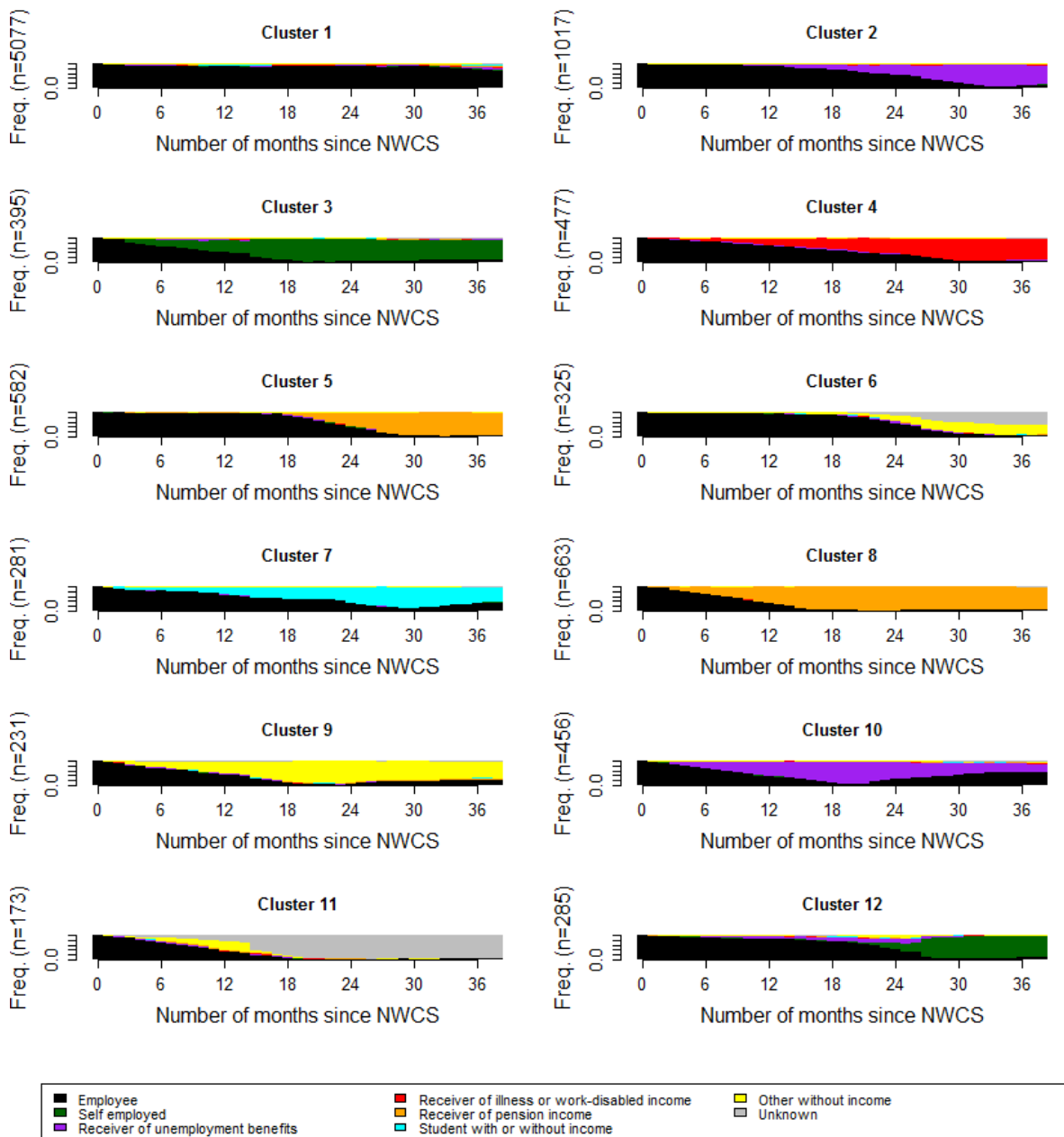




Figure 13b: A 13-cluster typology showing the individual sequences of social economic states per month for each cluster.

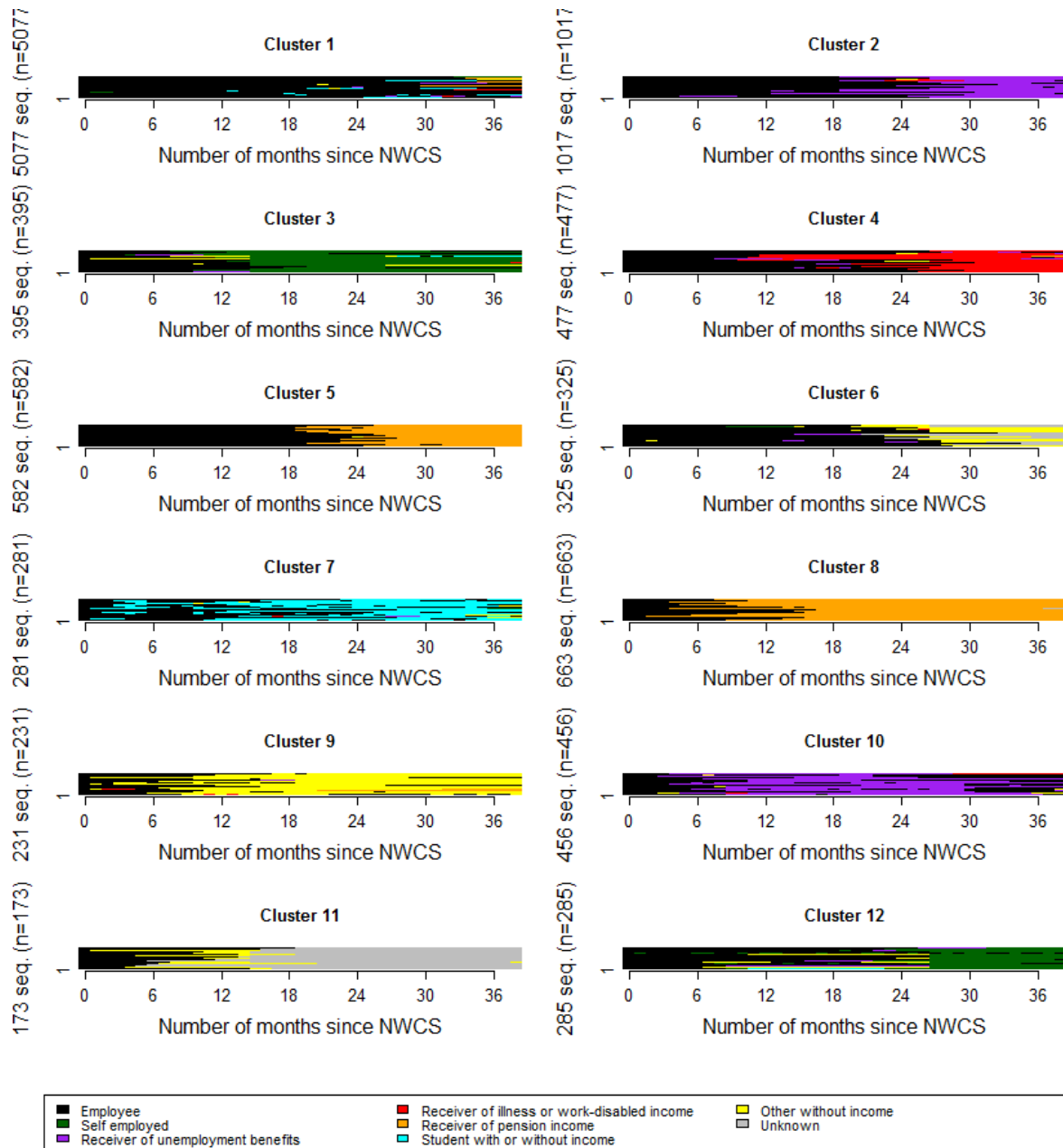


Figure 14a: A 14-cluster typology showing the proportion of social economic states per month for each cluster.

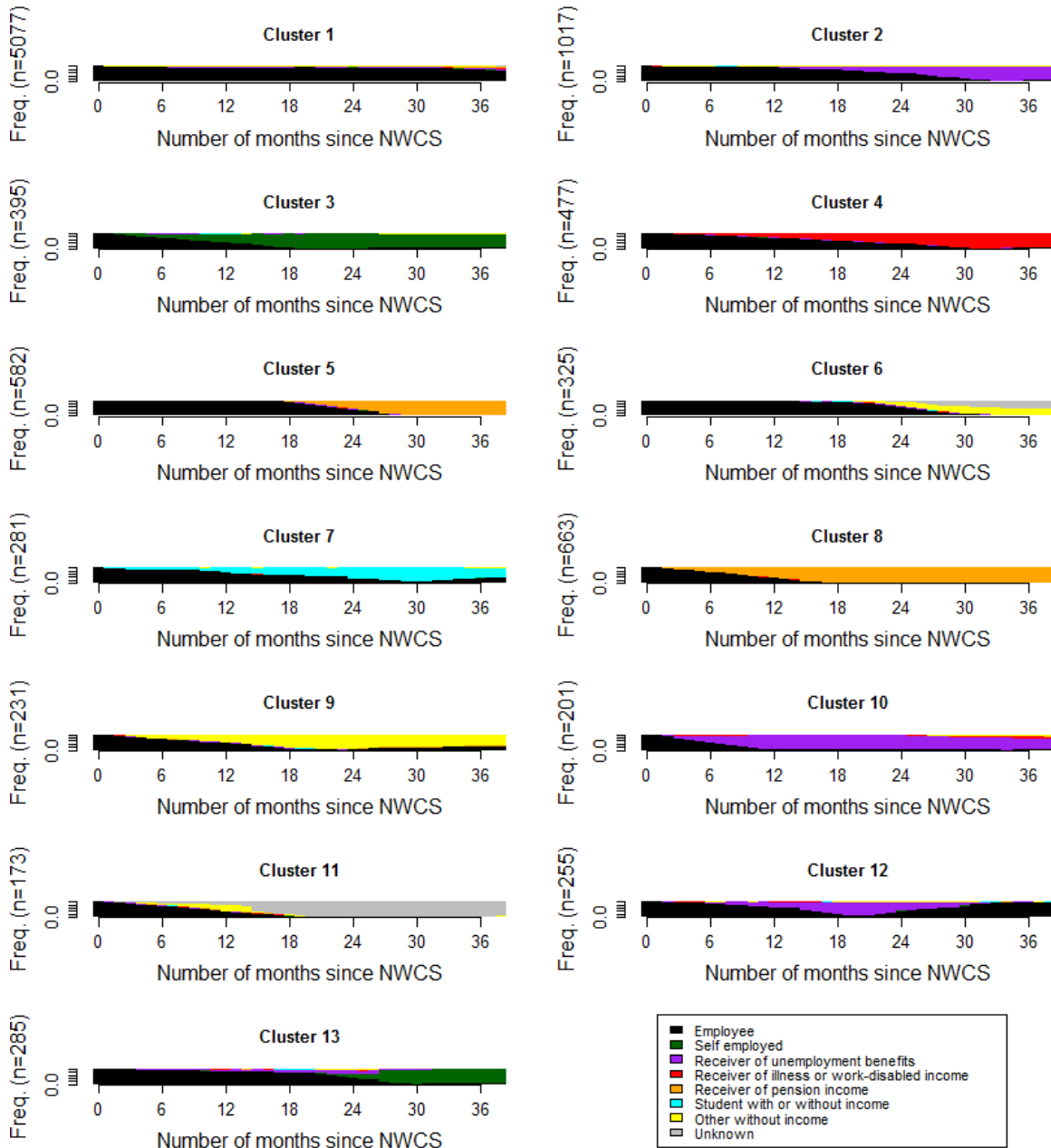
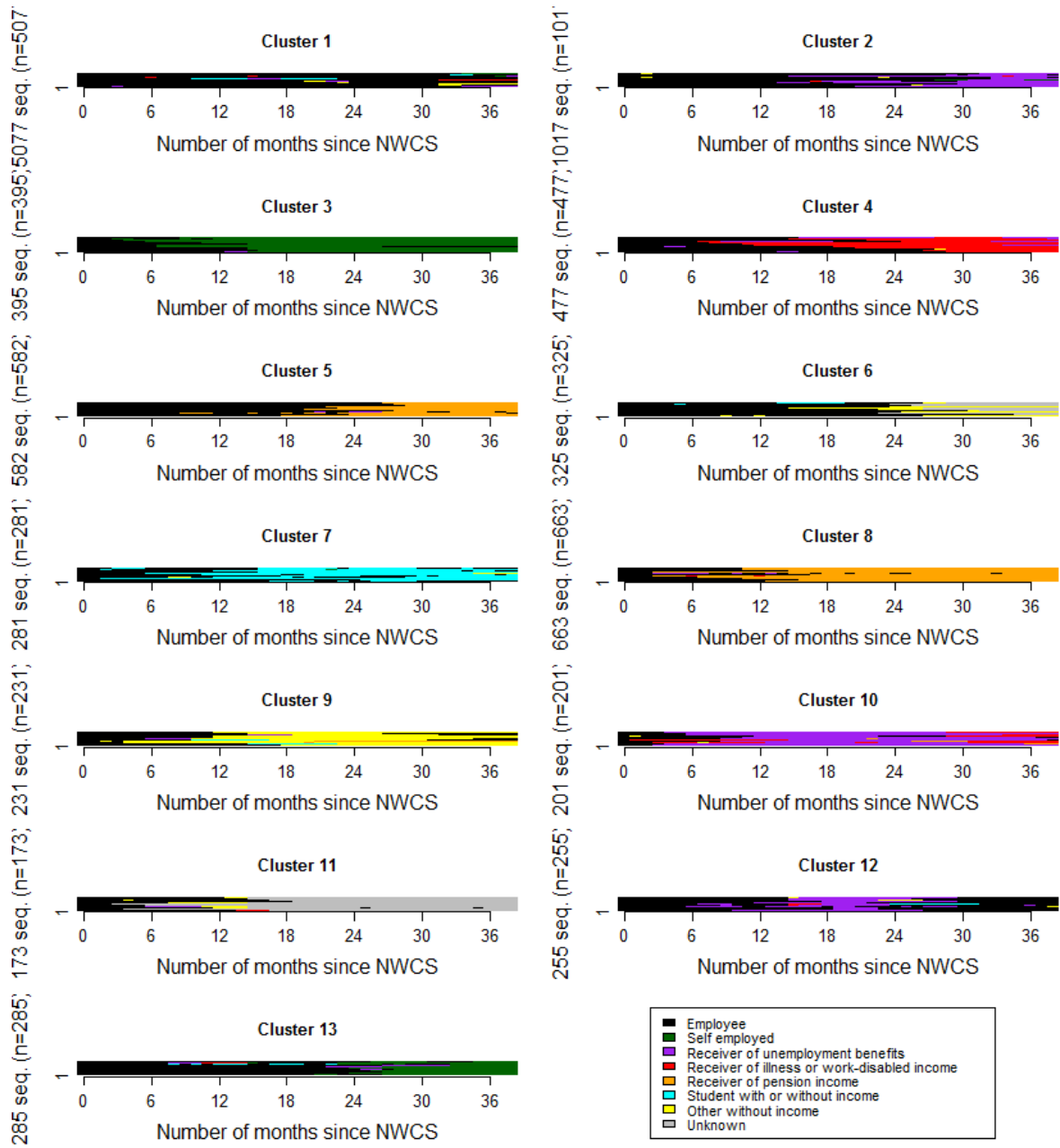


Figure 14b: A 14-cluster typology showing the individual sequences of social economic states per month for each cluster.



## Appendix 4: Other tables with odds ratios

Table 13: Three different models describing chance (odds ratio) of being in cluster 3 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 3	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	,423***	,472***	,489***
High (ref)	.	.	.
<b>Age category</b>			
Young		1,498**	1,534**
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		1,049	1,101
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			,618**
Middle			,600***
High (ref)			.
<b>Gender</b>			
Male			1,270*
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,027
High (ref)			.
<b>Employment commitment</b>			
Low			,915
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 14: Three different models describing chance (odds ratio) of being in cluster 4 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 4	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	2,401***	2,096***	1,957***
High (ref)	.	.	.
<b>Age category</b>			
Young		,613**	,651**
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		,907	,823
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			2,833***
Middle			2,126***
High (ref)			
<b>Gender</b>			
Male			,876
Female (ref)			.
<b>Financial Hardship</b>			
Low			,487***
High (ref)			.
<b>Employment commitment</b>			
Low			1,125
High (ref)			

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 15: Three different models describing chance (odds ratio) of being in cluster 5 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 5	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	4,503***	2,285***	2,322***
High (ref)	.	.	.
<b>Age category</b>			
Young		3,043E-11	3,440E-11
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		72386847	72983389
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,080
Middle			,713***
High (ref)			.
<b>Gender</b>			
Male			1,467***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,691***
High (ref)			.
<b>Employment commitment</b>			
Low			1,441***
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 16: Three different models describing chance (odds ratio) of being in cluster 6 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 6	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	,598***	,757*	,732*
High (ref)	.	.	.
<b>Age category</b>			
Young		2,191***	2,291***
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		1,023	1,025
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,484***
Middle			1,058
High (ref)			.
<b>Gender</b>			
Male			,943
Female (ref)			.
<b>Financial Hardship</b>			
Low			,934
High (ref)			.
<b>Employment commitment</b>			
Low			1,096
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 17: Three different models describing chance (odds ratio) of being in cluster 7 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 7	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	1,417**	1,544*	1,432
High (ref)	.	.	.
<b>Age category</b>			
Young		1,072	1,113
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		,824	,776
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			2,614***
Middle			1,327
High (ref)			.
<b>Gender</b>			
Male			,291***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,191
High (ref)			.
<b>Employment commitment</b>			
Low			1,059
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category



Table 18: Three different models describing chance (odds ratio) of being in cluster 8 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, young is set against old.

Cluster 8	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	1,074	,997	,984
High (ref)	.	.	.
<b>Age category</b>			
Young		,887	,911
Old (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Young		1,118	1,240
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			,909
Middle			,556**
High (ref)			.
<b>Gender</b>			
Male			1,655**
Female (ref)			.
<b>Financial Hardship</b>			
Low			,865
High (ref)			.
<b>Employment commitment</b>			
Low			1,622*
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 19: Three different models describing chance (odds ratio) of being in cluster 3 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 3	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	,964	,891	,900
High (ref)	.	.	.
<b>Age category</b>			
Young		1,688**	1,690**
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		1,241	1,300
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			,583**
Middle			,590***
High (ref)			.
<b>Gender</b>			
Male			1,299*
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,039
High (ref)			.
<b>Employment commitment</b>			
Low			,893
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 20: Three different models describing chance (odds ratio) of being in cluster 4 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 4	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	2,004***	1,974***	1,886***
High (ref)	.	.	.
<b>Age category</b>			
Young		,555***	,591**
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		,853	,825
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			2,982***
Middle			2,153***
High (ref)			.
<b>Gender</b>			
Male			,859
Female (ref)			.
<b>Financial Hardship</b>			
Low			,480***
High (ref)			.
<b>Employment commitment</b>			
Low			1,165
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 21: Three different models describing chance (odds ratio) of being in cluster 5 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 5	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	2,004***	1,585***	1,645***
High (ref)	.	.	.
<b>Age category</b>			
Young		2,260E-11	2,561E-11
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		63733260	62013199
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,144
Middle			,728***
High (ref)			.
<b>Gender</b>			
Male			1,465***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,714***
High (ref)			.
<b>Employment commitment</b>			
Low			1,462***
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 22: Three different models describing chance (odds ratio) of being in cluster 6 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 6	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,017	,994	,946
High (ref)	.	.	.
<b>Age category</b>			
Young		2,239***	2,337***
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		1,169	1,189
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			1,432***
Middle			1,040
High (ref)			.
<b>Gender</b>			
Male			,969
Female (ref)			.
<b>Financial Hardship</b>			
Low			,955
High (ref)			.
<b>Employment commitment</b>			
Low			1,099
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 23: Three different models describing chance (odds ratio) of being in cluster 7 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 7	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,421**	1,310	1,255
High (ref)	.	.	.
<b>Age category</b>			
Young		,824	,875
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		1,148	1,117
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			2,704***
Middle			1,325
High (ref)			.
<b>Gender</b>			
Male			,288***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,202
High (ref)			.
<b>Employment commitment</b>			
Low			1,077
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 24: Three different models describing chance (odds ratio) of being in cluster 8 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, young is set against old.

Cluster 8	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	,753	,869	,813
High (ref)	.	.	.
<b>Age category</b>			
Young		1,024	1,021
Old (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Young		,724	,837
Low*Old		.	.
High*Young		.	.
High*Old		.	.
<b>Education level</b>			
Low			,929
Middle			,558**
High (ref)			.
<b>Gender</b>			
Male			1,615**
Female (ref)			.
<b>Financial Hardship</b>			
Low			,832
High (ref)			.
<b>Employment commitment</b>			
Low			1,628*
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 25: Three different models describing chance (odds ratio) of being in cluster 3 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 3	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	,964	1,106	1,170
High (ref)	.	.	.
<b>Age category</b>			
Old		,592**	,592**
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		,806	,769
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			,583**
Middle			,590***
High (ref)			.
<b>Gender</b>			
Male			1,299*
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,039
High (ref)			.
<b>Employment commitment</b>			
Low			,893
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category



Table 26: Three different models describing chance (odds ratio) of being in cluster 4 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 4	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	2,004***	1,685**	1,556**
High (ref)	.	.	.
<b>Age category</b>			
Old		1,803***	1,692**
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		1,172	1,212
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			2,982***
Middle			2,153***
High (ref)			.
<b>Gender</b>			
Male			,859
Female (ref)			.
<b>Financial Hardship</b>			
Low			,480***
High (ref)			.
<b>Employment commitment</b>			
Low			1,165
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 27: Three different models describing chance (odds ratio) of being in cluster 5 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 5	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	2,004***	250368,51***	253923,47***
High (ref)	.	.	.
<b>Age category</b>			
Old		109666095***	97174108***
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		6,330E-6	6,479E-6
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,144
Middle			,728***
High (ref)			.
<b>Gender</b>			
Male			1,465***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,714***
High (ref)			.
<b>Employment commitment</b>			
Low			1,462***
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 28: Three different models describing chance (odds ratio) of being in cluster 6 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 6	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,017	1,162	1,125
High (ref)	.		.
<b>Age category</b>			
Old		,447***	,428***
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		,855	,841
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,432***
Middle			1,040
High (ref)			.
<b>Gender</b>			
Male			,969
Female (ref)			.
<b>Financial Hardship</b>			
Low			,955
High (ref)			.
<b>Employment commitment</b>			
Low			1,099
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 29: Three different models describing chance (odds ratio) of being in cluster 7 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 7	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	1,421**	1,503*	1,402
High (ref)	.	.	.
<b>Age category</b>			
Old		1,214	1,142
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		,871	,895
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			2,704***
Middle			1,325
High (ref)			.
<b>Gender</b>			
Male			,288***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,202
High (ref)			.
<b>Employment commitment</b>			
Low			1,077
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 30: Three different models describing chance (odds ratio) of being in cluster 8 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived internal employability is the independent variable, where low perceived internal employability is compared to high perceived internal employability. In addition, for the moderating variable age, old is set against young.

Cluster 8	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived internal employability</b>			
Low	,753	,629*	,680
High (ref)	.	.	.
<b>Age category</b>			
Old		,977	,979
Young (ref)		.	.
<b>Interaction: perc. int. empl. *age cat.</b>			
Low*Old		1,382	1,195
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			,929
Middle			,558**
High (ref)			.
<b>Gender</b>			
Male			1,615**
Female (ref)			.
<b>Financial Hardship</b>			
Low			,832
High (ref)			.
<b>Employment commitment</b>			
Low			1,628*
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 31: Three different models describing chance (odds ratio) of being in cluster 3 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 3	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	,423***	,495***	,538***
High (ref)	.	.	.
<b>Age category</b>			
Old		,667**	,652**
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		,953	,909
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			,618**
Middle			,600***
High (ref)			.
<b>Gender</b>			
Male			1,270*
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,027
High (ref)			.
<b>Employment commitment</b>			
Low			,915
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 32: Three different models describing chance (odds ratio) of being in cluster 4 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 4	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	2,401***	1,900***	1,611**
High (ref)	.	.	.
<b>Age category</b>			
Old		1,631**	1,536**
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		1,103	1,215
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			2,833***
Middle			2,126***
High (ref)			.
<b>Gender</b>			
Male			,876
Female (ref)			.
<b>Financial Hardship</b>			
Low			,487***
High (ref)			.
<b>Employment commitment</b>			
Low			1,125
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 33: Three different models describing chance (odds ratio) of being in cluster 5 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 5	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	4,503***	409911,393***	426097,780***
High (ref)	.	.	.
<b>Age category</b>			
Old		81469889,38***	73071592,08***
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		5,573E-6	5,451E-6
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,080
Middle			,713***
High (ref)			.
<b>Gender</b>			
Male			1,467***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,691***
High (ref)			.
<b>Employment commitment</b>			
Low			1,441***
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category



Table 34: Three different models describing chance (odds ratio) of being in cluster 6 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 6	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	,598***	,774**	,750**
High (ref)	.	.	.
<b>Age category</b>			
Old		,456***	,437***
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		,978	,976
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			1,484***
Middle			1,058
High (ref)			.
<b>Gender</b>			
Male			,943
Female (ref)			.
<b>Financial Hardship</b>			
Low			,934
High (ref)			.
<b>Employment commitment</b>			
Low			1,096
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 35: Three different models describing chance (odds ratio) of being in cluster 7 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 7	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	1,417**	1,272	1,111
High (ref)	.	.	.
<b>Age category</b>			
Old		,933	,898
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		1,214	1,288
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			2,614***
Middle			1,327
High (ref)			.
<b>Gender</b>			
Male			,291***
Female (ref)			.
<b>Financial Hardship</b>			
Low			1,191
High (ref)			.
<b>Employment commitment</b>			
Low			1,059
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category

Table 36: Three different models describing chance (odds ratio) of being in cluster 8 instead of reference cluster 0 in the multinomial logistic regression analysis. Perceived external employability is the independent variable, where low perceived external employability is compared to high perceived external employability. In addition, for the moderating variable age, old is set against young.

Cluster 8	Model 1	Model 2	Model 3
	Odds ratio	Odds ratio	Odds ratio
<b>Perceived external employability</b>			
Low	1,074	1,115	1,221
High (ref)	.	.	.
<b>Age category</b>			
Old		1,127	1,098
Young (ref)		.	.
<b>Interaction: perc. ext. empl. *age cat.</b>			
Low*Old		,894	,806
Low*Young		.	.
High*Old		.	.
High*Young		.	.
<b>Education level</b>			
Low			,909
Middle			,556**
High (ref)			.
<b>Gender</b>			
Male			1,655**
Female (ref)			.
<b>Financial Hardship</b>			
Low			,865
High (ref)			.
<b>Employment commitment</b>			
Low			1,622*
High (ref)			.

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

ref = reference category