

TI 2026-018/V
Tinbergen Institute Discussion Paper

A randomized experiment on improving job search skills of older unemployed workers

Nynke de Groot¹

Bas van der Klaauw²

¹ National Healthcare Institute

² Vrije Universiteit Amsterdam, Tinbergen Institute

Tinbergen Institute is the graduate school and research institute in economics of Erasmus University Rotterdam, the University of Amsterdam and Vrije Universiteit Amsterdam.

Contact: discussionpapers@tinbergen.nl

More TI discussion papers can be downloaded at <https://www.tinbergen.nl>

Tinbergen Institute has two locations:

Tinbergen Institute Amsterdam
Gustav Mahlerplein 117
1082 MS Amsterdam
The Netherlands
Tel.: +31(0)20 598 4580

Tinbergen Institute Rotterdam
Burg. Oudlaan 50
3062 PA Rotterdam
The Netherlands
Tel.: +31(0)10 408 8900

A randomized experiment on improving job search skills of older unemployed workers

Nynke de Groot* Bas van der Klaauw§

May 1, 2026

Abstract

Active labor market programs targeted at older unemployed workers are often believed to be ineffective. We exploit a large-scale randomized experiment involving approximately 50,000 older unemployed workers to evaluate an intensive job search assistance program that focuses on exploiting the social network. Participation in the program increases exits from unemployment insurance by 4.4 percentage points. Program participation reduces cumulative benefit payments by about €715, exceeding the program costs of €470. Participants compensate the reduced benefits receipt with higher earnings. We find that participants change their job search behavior according to the content of the program, and that both the trainer and the training group composition affect the program effectiveness.

Keywords: Randomized experiment, older unemployed workers, ALMP, job search assistance, social network. JEL-code: C93, J14, J64

*National Healthcare Institute, The Netherlands

§Vrije Universiteit Amsterdam and Tinbergen Institute
nynkedegroot@gmail.com, b.vander.klaauw@vu.nl

Thanks to Aard-Jan Seppenwoolde, Betsie Gerrits, Rita van Wel and Han van der Heul from the Dutch unemployment insurance administration (UWV) for jointly organizing the randomized experiment and for providing access to the data. The non-public microdata are under certain conditions accessible for statistical and scientific use. Thanks to seminar participants at BI Oslo, the University of Maastricht, CPB The Hague, the Ministry of Social Affairs, the Dutch unemployment insurance administration and conference participants at the Labor Workshop in Uppsala, Evaluation of Labor Market Policies Workshop in Copenhagen, Economics and Sociology Workshop in Amsterdam, CAFE workshop in Ebeltoft, the joint IFAU/IZA conference on Labor Market Policy Evaluation in Bonn, the EALE conference, the ESPE conference and the IZA Summer School.

1 Introduction

With ageing populations and rising retirement ages, older workers are becoming increasingly important in the labor market. However, when older workers lose their jobs, they face a high risk of long-term unemployed, which often results in a permanent transition into inactivity. This risk is particularly high during recessions, when job finding rates are low. We focus on a period of recession in the Netherlands during which almost half of the unemployed workers older than 55 years were unemployed for more than two years, compared to roughly 20% of unemployed workers younger than 45 years.¹ Le Barbanchon et al. (2024) conclude that the behavioral costs of providing benefits to unemployed workers are substantial. Active labor market programs (ALMPs) can be used to reduce these behavioral costs and stimulate unemployed workers to find work more quickly. However, ALMPs targeted at older unemployed workers are often considered ineffective because the benefits system is typically more generous for older unemployed workers and their remaining time in the labor market is relatively short.² For older workers a new job is much less likely a stepping stone to better jobs and OECD (2006) already documented that older unemployed workers are more likely to suffer wage losses in their new job.

In this paper we use a large-scale randomized experiment to estimate the effects of a Dutch job search assistance program, *Successfully to Employment Program* (STEP), targeted at older unemployed workers. STEP is a ten-week program in which groups of about 12 older unemployed workers learn job search skills with a special emphasis on exploiting their social network. During the program participants are trained to discuss potential job opportunities with friends, family and former co-workers. STEP is available for unemployed workers aged 50 and above who have not found work shortly after entering unemployment insurance (UI). The aim of the program is to increase the job finding rate of participants.

Empirical evidence on the effectiveness of ALMPs targeted at older unemployed workers is scarce (Card et al., 2018). When ALMPs are targeted, they mainly focus on youth, immigrants or disadvantaged unemployed workers (Le Barbanchon

¹Unemployment rates of younger and older workers do not substantially differ, which implies different unemployment dynamics for younger and older workers. Chan and Stevens (2001) show for example large negative effects of job displacement for older workers compared to younger workers.

²Potential benefits durations often depend on the employment history, which implies that older workers are entitled to longer benefits periods and therefore have weaker incentives to accept a job quickly. Several studies show that longer entitlement periods reduce job finding probabilities as job seekers become more selective in which jobs to accept (e.g. Lalive, 2008; Schmieder et al., 2012; De Groot and Van der Klaauw, 2019).

et al., 2024). Traditionally, older unemployed workers faced milder job search requirements and were often exempted from participation in ALMPs (Bloemen et al., 2013). Ahammer et al. (2025) use regression discontinuity at age 50 to evaluate a temporary job guarantee for older long-term unemployed workers in Austria. They find large effects on employment, which are driven by reduced early retirement rather than lower unemployment. Boockmann et al. (2012) find no effects of hiring subsidies for older unemployed workers in Germany, except for women in East Germany.³ The program we evaluate has some similarities with a program for older unemployed workers in Israel studied by Kutai et al. (2025), which offers in-person training on changing job search strategies. They find positive employment effects of using digital search tools, but only for men. Arni (2015) exploits a randomized experiment to study the effect of a job search assistance program for older unemployed workers in Switzerland. He finds that early intensive counseling and coaching increase job finding rates and decrease reservation wages only for job seekers between 45 and 55 years, there are no positive effect for individuals older than 55 years.

Our randomized experiment includes all Dutch workers aged 50 to 63 who entered UI between November 2014 and July 2015 and remained unemployed for at least three months. The total sample contains about 50,000 individuals of whom 10,000 were randomized into the control group. We use an encouragement design (Duflo et al., 2007). Unemployed workers in the treatment group were invited by their caseworker to participate in STEP after three months of UI receipt, whereas unemployed workers in the control group were not invited to participate in STEP. The participation rate of STEP in the treatment group was 54%, while participation in the control group was 8% due to some administrative errors and requests of unemployed workers. The difference in participation rates between the treatment group and the control group is thus substantial. Using administrative data from the UI administration, we estimate the effects of the program participation on various labor market outcomes including outflow from UI and employment, earnings, working hours and contract type. We also observe some measures for job search behavior, which allows us to get more insight in the behavioral responses to STEP participation. In addition, we observe the composition of the training groups and some characteristics of the trainers.

Our approach fits within a recent literature using randomized experiments to

³Boockmann and Brändle (2019) exploit regional variation in program participation to estimate the effects of a program targeted at older welfare recipients that mainly consists of coaching, job search assistance and skills assessment. While the program has a substantial lock-in effect, it eventually increases exits to non-subsidized employment.

evaluate ALMPs (see Card et al., 2018; Le Barbanchon et al., 2024; Rothstein and von Wachter, 2017, for overviews). Compared to other studies the program that we evaluate is substantial, STEP contains 12 meetings and some tasks for participants. Kutai et al. (2025) study a program with a similar number of meetings. Moreover, the scale of our randomized experiment is large with about 50,000 individuals.⁴ The large scale of our experiment allows us to study heterogeneity in the treatment effects of STEP. Since the randomized experiment involves the entire inflow of eligible older UI recipients in the Netherlands there are no concerns of external validity.

Our empirical results show positive effects of STEP on both the exit from UI and job finding. One year after UI inflow, unemployed workers assigned to the treatment group are about two %-points more likely to exit UI and most exits occur towards employment. This significantly reduces cumulative UI benefits payments by approximately €715, which exceeds the costs of providing the program of €470. From the perspective of the UI administration, STEP is cost-effective, which was an important condition for the Ministry of Social Affairs to continue the training. For participants, the reduction on UI benefits is on average almost fully compensated with higher earnings. Le Barbanchon et al. (2024) emphasize that ALMPs can be costly and that therefore costs effectiveness is important. We do not find that STEP affects men and women differently and effects also do not differ by age, but STEP is more effective for participants with a stronger labor market attachment, such as unemployed workers with a higher education, higher pre-unemployment earnings and who were not employed in the temporary work sector.

STEP affects job search behavior. Participants respond less often to open vacancies and engage more in network activities, which was a goal of STEP. We find that the effectiveness of STEP differs across trainers, but these differences cannot be explained by observed trainer characteristics. In addition, all participants benefit from having some low-educated individuals in their training group, indicating that a heterogeneous group composition improves the program’s effectiveness. Our findings are in line with the literature documenting that social networks can be useful for job search. Granovetter (1995) reports that more than half of the workers

⁴France recently had some large-scale randomized experiments. For example, Behaghel et al. (2024) study a randomized experiment with 800,000 job seekers on directing job seekers’ applications toward establishments likely to recruit, while Ben Dhia et al. (2022) analyze a program providing personalized job search advice and coaching in an randomized experiment with over 200,000 unemployed workers. Two other substantial randomized experiments are the Indian Welfare Reform evaluation with roughly 66,000 individuals, of which 3,000 in the control group (Beecroft et al., 2003) and the Dutch broader search intervention with about 130,000 individuals of which 10% are in the control group (Van der Klaauw and Vethaak, 2022).

find jobs through family, friends, neighbors or former colleagues.⁵ Gee et al. (2017) show using Facebook data that social ties are important in job finding. Brown et al. (2016) show that informally referred workers are more likely to be hired and experience a higher initial wage than non-referred workers. Despite the evidence on the importance of social networks in job finding, ALMPs designed to *stimulate* the use of social networks have not yet been empirically evaluated. Our estimated program effects are relatively large compared to regular job search assistance programs, which suggests that stimulating the use of social networks is a useful policy.

The remainder of this paper is organized as follows. The next section describes the job search assistance program for older unemployed workers. Section 3 presents the details of the randomized experiment and Section 4 describes the data and characterizes the participants in the program. Section 5 discusses the estimation strategy and presents the main results. Section 6 examines the importance of the trainer and the composition of the training group. Section 7 concludes.

2 Job search assistance program STEP

In this section, we provide details on the job search assistance program, the enrollment process, and the assignment to training groups.

2.1 The program

Between 2008 and 2012, the unemployment rate among workers older than 50 in the Netherlands more than doubled. In response, the Dutch government launched the four-year action plan *50-plus Works* in 2013. This plan included several initiatives aimed at supporting older unemployed workers receiving UI benefits.⁶

The main component of this action plan was the job search program *Successfully*

⁵In general, the job finding rate of an unemployed worker increase with the employment rate in the network of former co-workers (Cingano and Rosolia, 2012; Glitz, 2017), friends (Cappellari and Tatsiramos, 2015) and neighborhood (Jahn and Neugart, 2020). Other studies find evidence that workers from the same neighborhood are more likely to cluster in the same firm (Bayer et al., 2008; Hellerstein et al., 2011) and that young workers are more likely to get a job at the plant where their parents work (Kramarz and Skans, 2014).

⁶In the Netherlands, workers were entitled to UI benefits if they had worked at least 26 of the previous 36 weeks and lost at least five working hours, or 50% of their working hours if they worked less than ten hours per week. The entitlement period varied based on employment history and ranges from three to 38 months. During the first two months, UI benefits amounted to 75% of the previous wage (capped at a maximum); thereafter, the benefits level dropped to 70%. See De Groot and Van der Klaauw (2019) for a more detailed discussion of the Dutch UI system.

Table 1: Outline of STEP

Meeting	Topic
Group meeting 1	Introduction and assessment of abilities and job interests
Group meeting 2	Review of abilities and results of test meeting 1
Group meeting 3	Networking
Group meeting 4	STARR technique and analysis of job openings
Group meeting 5	Social media
Individual meeting 1	Progress evaluation
Group meeting 6	Repetition, extension and questions
Group meeting 7	Communication techniques
Group meeting 8	Job interview training
Group meeting 9	Elevator pitch
Group meeting 10	Repetition, extension and questions
Individual meeting 2	Program conclusion

Source: Dutch UI administration

to *Employment Program* (STEP).⁷ The goal of STEP was to enhance job search effectiveness by improving participants' job search skills, particularly their ability to exploit their social networks. STEP was an intensive program consisting of ten group sessions, each lasting approximately four hours, and two shorter individual meetings with a trainer.⁸

Table 1 provides an overview of the program structure. The training covered fundamental job search skills such as job interview practice, resume writing, and finding job openings, but also focuses on improving networking skills and the use of social media. A consultant specializing in employer relations attended two or three group meetings – typically group meetings 4, 8, and 9 – offering guidance on how participants could present themselves to employers and providing updates on job openings. Participants were encouraged to have at least one conversation per week with someone in their social network regarding potential employment opportunities. The total costs of STEP were approximately €470 per participant and increase to €490 when the additional use of schooling vouchers is also taken into account.

2.2 Enrollment in the program

The standard procedure was that a potential participant received an invitation to join STEP during her first meeting with a caseworker, typically held in the fourth

⁷Other components of the action plan were a schooling subsidy, financial incentives for private temporary work agencies for finding work for older job seekers, matching events between older job seekers and employers, and a nationwide publicity campaign targeting employers.

⁸Trainers were usually caseworkers from the UI administration who had received specific training to provide STEP.

month of receiving UI benefits. Participation in STEP was voluntary. While caseworkers could strongly encourage participation, they could not sanction someone for not participating. Caseworkers and trainers were not subject to targets or financial incentives regarding STEP participation or job placement outcomes afterwards.

Each STEP training group consisted of approximately 12 older job seekers, and group composition remained fixed throughout the program. A few local offices made separate groups for low-educated and high-educated unemployed workers, all other local offices had heterogeneous groups. Once an individual decided to participate in STEP, the worker was assigned to the first available slot.

The Ministry of Social Affairs funded STEP under the condition that the UI administration enrolled at least 40,000 individuals per year in the program. This target was one of ten annual performance objectives for the UI administration.⁹ The nationwide target was subsequently allocated to local offices, requiring each office to enroll in STEP at least 50% of UI recipients aged 50 to 63 who did not exit UI within three months after inflow.

3 The randomized experiment

In this section, we describe the design and implementation of the randomized experiment used to evaluate STEP.

The experiment targeted all unemployed workers who started collecting UI benefits between November 2014 and July 2015, were between 50 and 63 years old at the moment of UI entry, and received UI benefits for three months. Individuals with substantial income from other sources were not eligible to participate.¹⁰ Approximately 50,000 older unemployed workers met these criteria and were included in the experiment.

Individuals were randomly assigned to either the treatment or control group based on the last digit of their social security number. Since STEP was only available to individuals aged 50 and older, individuals whose social security number ended in “5” or “0” were assigned to the control group. This ensured that approximately 20% of the participants in the experiment were assigned to the control group. The size of the control group was determined to allow the UI administration to meet the

⁹If the UI administration fails to meet a target, it is required to develop an improvement plan to ensure compliance in subsequent years.

¹⁰The Dutch UI system allows for part-time UI benefits, meaning that workers can receive UI while also having a part-time job or receiving disability insurance (DI) benefits. Individuals receiving DI benefits or working more than eight hours per week were excluded from the experiment.

training participation target set by the Ministry of Social Affairs (see Section 2).

We employed an encouragement design. During their caseworker meeting in the fourth month of UI receipt, individuals in the treatment group were strongly encouraged to participate in STEP. The experimental population attended these meetings between February and October 2015. Caseworkers were explicitly instructed not to discuss the possibility of STEP participation with individuals in the control group.¹¹

Noncompliance could occur in both groups. Individuals in the treatment group could refuse to participate in STEP, while individuals in the control group could request to participate. The latter mainly happened when individuals learned about STEP through the UI administration’s website, media coverage, or from other people.¹²

More than 1,250 caseworkers across 30 local UI offices were involved in the experiment. We implemented several measures to ensure compliance. Before the experiment, we visited all 30 offices to inform caseworkers and managers about the experiment and answer questions. During these sessions, we emphasized the importance of compliance and stressed that control group members should not be offered an alternative to STEP unless they would have received the same alternative had they been in the treatment group.¹³

To ensure compliance, the UI administration’s operating system was modified. If a caseworker scheduled a meeting with an individual assigned to the control group, the caseworker received a warning not to invite the individual to STEP. Every week we monitored the progress of the experiment. If we observed that an individual in the control group participated in STEP, a senior manager from the head office of the UI administration notified the manager of the responsible caseworker. Each month, a summary of the average participation rates in the treatment and control group in each office was sent to all managers so that they could compare compliance in their local offices with other local offices. Monitoring continued until July 2018, as control group members remained ineligible for STEP participation for three years.

¹¹Two of the 30 local offices conducted group meetings instead of individual meetings in the fourth month of UI receipt for most unemployed workers in their region. These offices exempted control group members from meetings where STEP participation was discussed.

¹²In our power calculation, we assumed a 50% compliance rate with the treatment assignment. The number of participants in the experiment was determined based on a power calculation assuming a 2%-point increase in UI exit within 12 months, which would make STEP cost-effective for the UI administration.

¹³At the time of the experiment, the UI administration had little means to provide alternative job search assistance. Available options included short online courses and occasional “speed dating” events, where unemployed workers could meet with temporary work agencies (see Van der Klaauw and Ziegler, 2025).

4 Data

In this section, we first present the data sources that we have merged for the empirical analysis. Next, we show that the treatment and control group are well balanced. Finally, we show that assignment to the treatment group has a large effect on participation in STEP and we characterize the participants in STEP.

4.1 Data sources and descriptive statistics

We collect data from several administrative sources of the UI administration, which can be linked using individual identifiers. Using data on unemployment and employment spells we build a labor market history containing information on benefits payments, wages, working hours and type of contract for all participants in our experiment. We observe unemployment and employment spells starting five years before the start of our experiment up till at least 18 months after the start of the experiment. These data also include a limited set of individual characteristics.

We match the labor market histories to data on caseworker meetings and participation in ALMPs. We observe the moment of the caseworker meeting in which participation in STEP was discussed with the individuals in our treatment group and the starting date for participation in the STEP training. For the STEP training only attendance in the first meeting is recorded.¹⁴ We observe who the trainer is for each STEP group and some characteristics of the trainer. Participation in other job search assistance programs is also observed.

The job application register contains weekly information on the job search activities. UI benefits recipients are obliged to register their job applications in this register and this register is used by caseworkers to monitor job search behavior. Benefits recipients may not register all job applications since the UI administration only requires them to make one job application each week. For about 20% of the individuals we have information from the work profiler register, which is a survey on job search skills and motivation, health, financial situation, job requirements, etc.

Table 2 describes characteristics of individuals in the treatment and control group. As noted in Section 2 unemployed workers are invited to STEP during their first meeting with a caseworker. This meeting takes place in the fourth month of collecting benefits. The first panel shows that both in the treatment and the

¹⁴Survey information shows that roughly 30% of the participants in STEP attend all ten group meetings, 42% attend eight or nine meetings, 20% attend between five and seven meetings and the remaining 8% attend four meetings or less.

Table 2: Descriptive statistics for the treatment and control group

	Treatment group	Control group	Difference	p-value
<i>Meetings, participation in STEP and other programs</i>				
Attended first meeting caseworker (%)	83.0	83.7	-0.8	0.07
Participated in STEP (%)	53.7	8.3	45.5	0.00
Other ALMP activities (%)	4.9	4.9	0.1	0.73
<i>Personal characteristics</i>				
Female (%)	45.0	44.6	0.4	0.44
Age (in years)	55.9	55.9	-0.1	0.15
Single (%)	24.5	24.9	-0.4	0.39
Non-Dutch (%)	1.1	1.2	-0.1	0.53
<i>Education (%)</i>				
Primary education	13.8	13.7	0.1	0.79
Lower vocational education	17.0	17.3	-0.3	0.43
Secondary education	45.2	44.8	0.3	0.53
College or university	23.7	23.7	0.0	0.97
<i>UI characteristics</i>				
UI benefits (€ per month)	1,511	1,513	-3	0.78
Maximum entitlement period (in weeks)	153	153	0	0.22
Weekly hours unemployed	31.5	31.6	-0.1	0.41
Employed at start of UI (%)	16.3	16.5	-0.1	0.75
UI in previous six months (%)	6.7	7.1	-0.4	0.15
Also disability insurance benefits (%)	2.0	2.1	-0.1	0.58
<i>Characteristics job before UI</i>				
Wage (€ per year)	30,495	30,520	-24	0.94
Temporary contract (%)	41.4	41.4	0.1	0.89
Monthly contract hours	130	131	-1	0.31
<i>Sector last job (%)</i>				
Health care	21.2	20.8	0.4	0.40
Business	20.8	20.9	-0.1	0.76
Industry	11.8	12.3	-0.4	0.23
Temporary work	11.7	12.1	-0.3	0.36
Trade	9.2	8.8	0.4	0.20
Transport	6.8	6.8	0.0	0.92
Other	18.4	18.3	0.1	0.76
Observations	39,990	9,939		

Note: The p-values are for t-test of similar means.

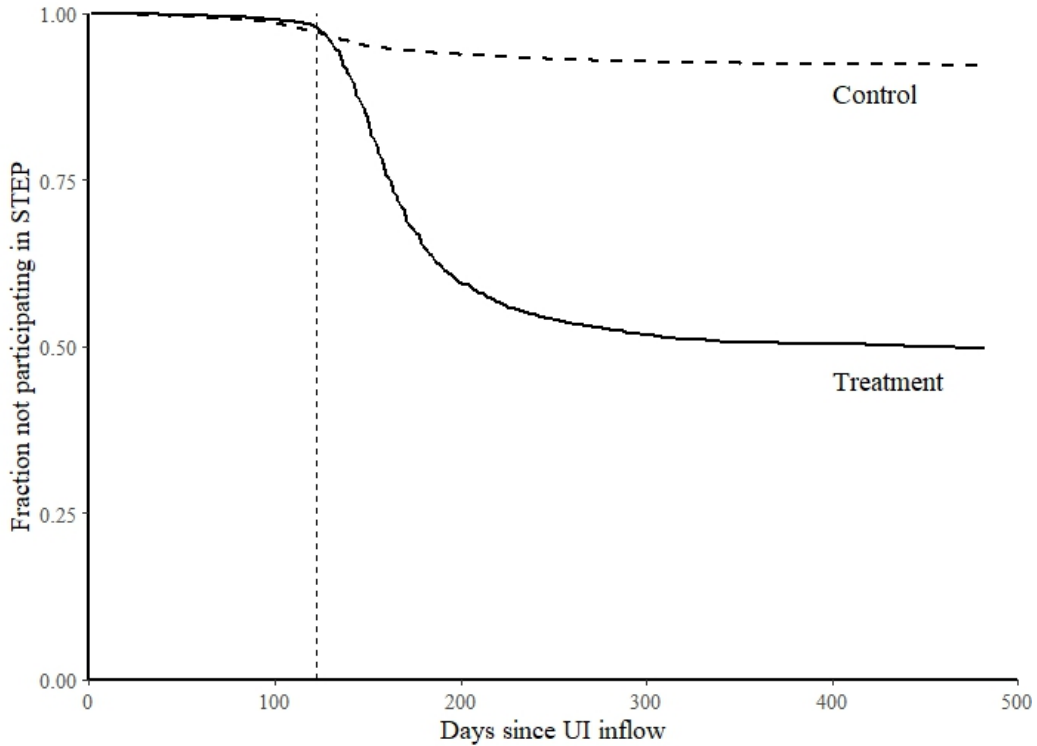
control group about 83% of the individuals attended such a first meeting.¹⁵ There are several reasons for not attending the first meeting, e.g. already having accepted a job, sickness, having a part-time job or holidays. Almost 54% of the unemployed workers in the treatment group participated in STEP. Caseworkers report various reasons why job seekers may choose not to participate in the training. The reasons that are mentioned most often are that the job seeker has health problems, already has a (part-time) job with irregular working hours, participated in a similar program in a previous UI spell or simply does not want to participate. In the control group about 8% of the individuals participate, 2% explicitly asked the caseworker to participate and 6% were invited by mistake. There is some evidence that a few caseworkers ignored the rules of the experiment believing that no older unemployed workers should be excluded from the training. We do not observe significant differences for participation in other ALMPs. Here, we only include ALMP activities without a direct link to STEP. Activities such as a trial placement can be a direct effect of participation in STEP. We consider participation in those activities as outcomes and discuss these in the next section.

The other panels of Table 2 show that the treatment and control group are very well balanced. The average age of the individuals in the experiment is 55.9 years, almost 45% of the unemployed workers are female and the majority is married or cohabiting. For about 45% of the individuals the highest completed education is secondary education, and around 24% have a college or university degree. On average, the unemployed workers receive about €1500 of UI benefits and they are entitled to benefits for 153 weeks. The individuals in the experiment are on average unemployed for 32 hours per week and about 16% are also part-time employed when starting collecting UI benefits. Approximately 7% of the unemployed workers experienced a UI spell in the half year before the current UI spell, in which case the previous UI spell continues and the length of the entitlement period is reduced by the length of the previous UI spell.

Average earnings in the last job before entering UI were about €30,500 and individuals worked on average 130 hours per months. About 41% of the workers had a temporary contract prior in their last job and about 2% entered UI after first collecting disability insurance (DI) benefits. Roughly 21% of the unemployed

¹⁵Two of the 30 local UI offices organized group meetings for the treatment group. One of these local offices did not register attendance during these group meetings. Individuals in the control group had individual meeting and there attendance was registered. Therefore, we observe a somewhat higher attendance of the first meeting in the control group. Our results are robust to removing this UI office from the analysis.

Figure 1: Survival of not participation in the training STEP



Note: The vertical line indicates four months (122 days) after UI inflow.

workers had a job in health care before UI and the same share a job in the business sector. In comparison, the share of those sectors for the full UI inflow of individuals aged between 15 and 67 in 2014 was about 15% for both sectors (UWV, 2015). Approximately 12% of our sample had a job at a private temporary employment agency, 12% had a job in the industrial sector and about 9% in the trade sector.

4.2 Participants in STEP

Figure 1 shows the survival curves of not participating in STEP for the treatment and control group. Although the majority of the older unemployed workers are invited to the training during their fourth month of collecting UI benefits, a few individuals start the training earlier. Most unemployed workers start the training in the fifth months since UI inflow, which is also the period when the gap in participation between the treatment and the control group emerges. This gap continues to slowly increase afterwards.

To obtain insight in the participation decision, Table 3 presents the estimation results from a regression of STEP participation on job seeker characteristics, separately for the treatment and control groups. If we assume monotonicity – there

are no job seekers who would participate in STEP if they are in the control group and who would not participate if they are in the treatment group – we can define the non-participants in the treatment group as never-takers and the participants in the control group as always-takers. This means we can interpret the estimation results in column (1) as the association between the job seekers’ characteristics and the probability of being a complier or always-taker compared to a never-taker. The main take-away from Table 3 is that job seekers are more likely to be a never-taker if they are men, non-Dutch, older than 60 or low-educated. Job seekers are also more likely to be a never-taker if they are employed at the start of UI or if they received UI or DI benefits in the period before the current UI spell.

Column (2) of Table 3 shows the estimation results for participation in STEP in the control group. These results describe how individual characteristics correlate to being an always-taker. Unemployed workers in the control group are more likely to be an always-taker if they are younger than 60, are not employed at the moment of UI inflow or if they collected DI benefits before entering UI.¹⁶

5 Effects of STEP

In this section, we first show graphical evidence that assignment to the treatment group increases the exit from UI. Next, we describe our estimation strategy and show that participation in the program is cost effective for the UI administration and that participants (partly) compensate the lower UI benefits receipt with increased earnings from work. Finally, heterogeneous treatment effects show that STEP is most effective for who individuals who previously had a stronger connection to the labor market, i.e. had higher earnings before entering UI and were not working through a temporary work agency.

5.1 Graphical evidence

The left graph of Figure 2 shows the Kaplan-Meier estimate of survival in UI for the treatment and control group. Since our experiment includes only individuals who

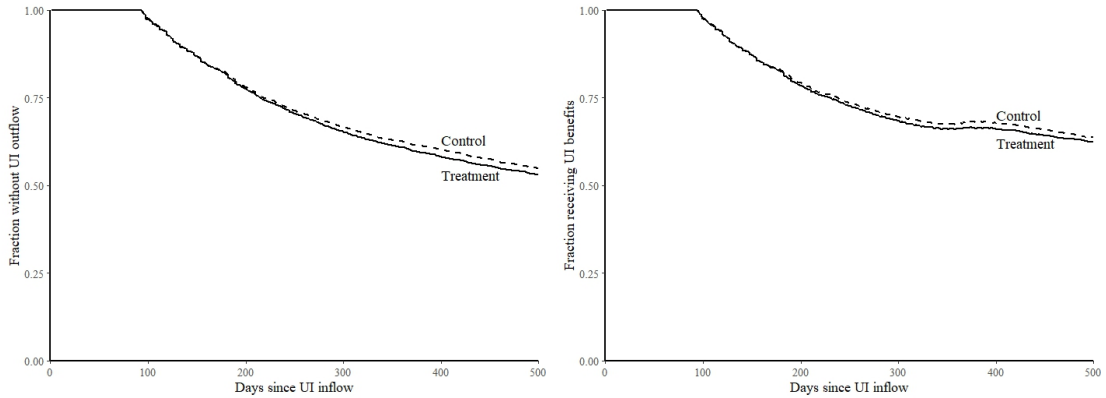
¹⁶Recall that there are three reasons why someone in the control group participates in STEP. The job seeker asks the caseworker to participate in STEP, the caseworker invites the job seeker by mistake or the caseworker ignores the experiment and intentionally invites someone in the control group. We are not able to distinguish between the latter two reasons, but we do observe whether someone asked to participate themselves. Table A1 in Appendix A shows that men, non-Dutch, individuals older than 60 and individuals who return to UI within six months or collect UI benefits part-time are less likely to ask to participate in STEP.

Table 3: Estimation results for participating in STEP within the treatment and control group

	Treatment group		Control group	
<i>Personal characteristics</i>				
Female	0.099***	(0.006)	0.030***	(0.007)
Younger than 55 (reference)	—		—	
55-59 years at inflow	0.009	(0.006)	−0.004	(0.007)
60-63 years at inflow	−0.085***	(0.007)	−0.029***	(0.008)
Single	0.000	(0.006)	0.020***	(0.007)
Non-Dutch	−0.242***	(0.017)	−0.036*	(0.019)
At most vocational education	−0.083***	(0.007)	−0.012	(0.008)
Secondary education	−0.002	(0.006)	0.004	(0.008)
College or University (reference)	—		—	
<i>UI characteristics</i>				
Maximum entitlement period	0.002***	(0.000)	0.000	(0.000)
Weekly hours unemployed	−0.001	(0.000)	0.001**	(0.000)
Employed at start of UI	−0.135***	(0.007)	−0.030***	(0.007)
UI in previous six months	−0.186***	(0.009)	−0.031***	(0.008)
Also disability insurance benefits	−0.158***	(0.017)	0.055**	(0.025)
<i>Characteristics job before UI</i>				
Wage below €25,000 (reference)	—		—	
Wage above €25,000	0.039***	(0.006)	−0.006	(0.007)
Temporary contract	−0.097***	(0.006)	−0.015**	(0.006)
Monthly contract hours	−0.000	(0.000)	0.000	(0.000)
<i>Sector last job</i>				
Health care	0.039***	(0.008)	0.003	(0.009)
Business	0.081***	(0.007)	0.012	(0.009)
Temporary work	−0.015*	(0.009)	−0.009	(0.009)
Industry	0.063***	(0.008)	0.013	(0.010)
Trade	0.055***	(0.009)	0.003	(0.012)
Other (reference)	—		—	
Observations	39,989		9,919	

Note: Regressions include fixed effects for month of UI inflow and local UI office. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

Figure 2: Survival in UI (left graph) and receiving UI benefits including re-entry (right panel)



received UI benefits for at least three months, no outflow from UI occurs during this initial period. Individual are invited to participate in STEP during their fourth month of receiving UI and the training lasts approximately ten weeks. Consequently, training participation mainly takes place between the fifth and the sixth month of collecting UI. During this period the survival curves of the treatment and control group are very similar, suggestion that there is no substantial lock-in effect. This is not surprising because STEP encouraged participants to continue searching and applying for jobs. After about seven months since UI inflow, the survival curve of the treatment group falls below the survival curve of the control group and the gap between both curves slowly widens over time. This indicates that assignment to the treatment group increases the outflow from UI.

The right graph of Figure 2 displays the fraction of individuals in the treatment and control group receiving UI benefits, which accounts for re-entry into UI. Again, we observe a lower fraction of benefits receipt in the treatment group after about seven months since UI inflow. Around one year after the first inflow into UI, there is a slight increase in benefits receipt, suggesting that some workers return to UI. However, the difference in benefits receipt between the treatment and control group persists.

5.2 Estimation strategy

To estimate the effects of STEP on several outcomes Y , each measured at different moments since inflow into UI, we specify the regression model

$$Y_i = \alpha + \delta D_i + X_i\beta + U_i \quad (1)$$

The variable D is the treatment variable, and X is a vector of individual pre-determined characteristics, including gender, household composition, nationality, earnings before entering UI, sector, age, the maximum entitlement period and fixed effects for the local UI office and the month of UI inflow, which control for regional and calendar time variation.

Due to noncompliance to the randomization in the experiment, participation in STEP is likely selective. For example, more motivated job seekers who have higher job finding probabilities may be more likely to participate in STEP, or caseworkers may encourage individuals to participate in STEP for whom they expect high returns. To address selective participation we follow two approaches. First, we define the treatment variable D as indicator for being assigned to the treatment group. In that case, the treatment parameter δ describes an intention-to-treat effect. Recall that participation in STEP is voluntary and about 54% of the individuals in the treatment group participate. At the time of the experiment the UI administration did not exhaust the budget for STEP. Therefore, we assume that none of the eligible job seekers in the treatment group have been denied access. The intention-to-treat effect is policy relevant, as it indicates the effect of the opportunity for participation in STEP for the population of job seekers over 50 years old. However, due to some participation in the control group the intention-to-treat effect is slightly underestimated.

In the second approach the treatment variable D describes actual participation in STEP. To account for selective participation, we introduce a first-stage regression where participation in STEP is instrumented by the random assignment to the treatment group, denoted by Z ,

$$D_i = \eta + \gamma Z_i + X_i\theta + V_i \quad (2)$$

Random assignment ensures exogeneity of the instrumental variable. The instrument is highly relevant, with an estimated γ of 0.445 (s.e. 0.005).¹⁷ This confirms that assignment to the treatment group strongly influences participation in STEP. The exclusion restriction requires that unemployed workers do not change their la-

¹⁷See Table B1 in Appendix B for the estimation results of the first-stage regression.

bor market behavior in response to assignment to the treatment or control group. The graphical analysis in the previous subsection does not indicate any threat or anticipation effect. Most program participants start STEP around the fifth months of collecting UI benefits. Some individuals enroll later, which may imply that, for a small group of individuals, a longer period of collecting UI benefits causes participation in STEP (reverse causality).

Only few individuals in the control group participated in STEP. Most were mistakenly invited and participated, while a smaller group actively requested to participate. We assume that these individuals would have also participated in STEP if assigned to the treatment group. This implies that the monotonicity assumption holds, and we can interpret the instrumental variable estimates as local average treatment effects.

5.3 Estimated effects of STEP

Table 4 presents the estimated intention-to-treat and local average treatment effects on UI outflow, UI benefits receipt and cumulative UI benefits at different points in time since inflow into UI. The first panel confirms the graphical evidence, showing that STEP has significant effects on UI outflow before nine, 12, 18 and 24 months after inflow. One year after entering UI, the exit rate in the treatment group is 2.0%-points higher than in the control group, increasing UI outflow from 38% to 40%. The local average treatment effect on UI inflow within 12 months is 0.044, implying that participation in STEP increases the exit rate from UI with 4.4%-points. This exceeds the 2%-points increase assumed in the power calculations conducted before the experiment. The estimated effect on UI outflow within 18 months is similar to that within to 12 months.¹⁸ The lack of catching up in the control group suggests that STEP does not just lead to earlier UI exits but also results in more exits among older unemployed workers.

The second panel focuses on UI outflow within 12 months after inflow and examines four distinct channels for stopping collecting UI benefits. STEP has the largest effect on outflow to work, which is also the most common reason for leaving UI. There are no significant effects on exits due to sick leave, exhaustion of UI entitlement, or other reasons.

Individuals who exit UI can often return to UI almost immediately if they lose

¹⁸Figure C1 in Appendix C displays local average treatment effects for each months since UI inflow. confirming that the effect of STEP remains roughly constant from about 12 months onwards.

Table 4: Estimated intention-to-treat (ITT) and local average treatment effect (LATE) of STEP on outflow from UI, UI receipt and cumulative UI benefits

	ITT		LATE		Mean control
<i>Outflow from UI</i>					
UI outflow within 6 months	0.005	(0.004)	0.014	(0.011)	0.19
UI outflow within 9 months	0.012**	(0.005)	0.028**	(0.011)	0.31
UI outflow within 12 months	0.019***	(0.005)	0.043***	(0.011)	0.38
UI outflow within 18 months	0.019***	(0.005)	0.042***	(0.011)	0.47
UI outflow within 24 months	0.014***	(0.005)	0.030***	(0.011)	0.56
<i>Outflow UI within 12 months by reason of exit</i>					
Outflow to work	0.012**	(0.005)	0.027**	(0.010)	0.29
Outflow to sick leave or disability	0.004	(0.003)	0.009	(0.006)	0.06
Outflow because end of entitlement	0.001	(0.001)	0.002	(0.002)	0.01
Outflow other	0.003	(0.002)	0.006	(0.004)	0.02
<i>Receives UI benefits</i>					
Receives UI after 6 months	−0.006	(0.004)	−0.016	(0.011)	0.82
Receives UI after 9 months	−0.011**	(0.005)	−0.025**	(0.011)	0.72
Receives UI after 12 months	−0.015***	(0.005)	−0.035***	(0.011)	0.70
Receives UI after 18 months	−0.014***	(0.005)	−0.031***	(0.011)	0.64
Receives UI after 24 months	−0.006	(0.005)	−0.013	(0.012)	0.56
<i>Cumulative received UI benefits after inflow (€)</i>					
UI benefits within 6 months	−28	(33)	−75	(87)	9,081
UI benefits within 9 months	−93	(54)	−216*	(124)	12,787
UI benefits within 12 months	−162**	(74)	−364**	(166)	15,825
UI benefits within 18 months	−325***	(121)	−715***	(266)	22,378
UI benefits within 24 months	−467***	(163)	−1028***	(361)	27,506

Note: Every cell represents a separate regression including controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of UI inflow. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

their job again. If job loss occurs within six months, the individual resumes the previous UI benefits entitlement. The third panel accounts for UI re-entry by considering the UI benefits status at various points after initial UI entry. The effects of STEP are slightly smaller when considering UI receipt rather than UI outflow, suggesting that some UI outflow due to STEP is temporary. However, the effects remain substantial and statistically significant. Participation in STEP reduces the probability of UI receipt after 12 months by 3.5%-points, which corresponds to approximately 75% of the effect on UI outflow.

The final panel focuses on cumulative UI benefits payments, taking into account potential UI re-entry after employment. Participation in STEP significantly reduces cumulative UI benefits from nine months onwards. Within 18 months the total reduction in UI benefits is approximately €715, which exceeds the costs of providing STEP (€470 per participant).¹⁹ STEP is therefore a cost-effective program for the UI benefits administration.

Table 5 considers employment outcomes. The first panel shows that STEP has positive effects on having a job at six, nine and 12 months after UI inflow, although the effects are smaller than the effects on UI receipt.²⁰ Recall that UI compensates individuals for lost working hours, meaning that a worker can receive UI benefits while being part-time employed.

The second panel shows that the effects of STEP on cumulative earnings are significant and increase with the time since UI inflow. Twelve months after inflow, the positive effect on earnings exceeds the negative effect on UI benefits, but this pattern is reversed at 18 months.²¹ However, the difference is never statistically significant, which suggests that participation in STEP does not yield substantial positive income effects on average.²²

The third panel focuses on the characteristics of the job held 12 months after UI inflow. These characteristics are only observed for individuals who actually found a job. Since the job finding rate is higher in the treatment group than in the control group, the composition of job finders may differ between both groups. The esti-

¹⁹Figure C1 in Appendix C shows that beyond 14 months after UI inflow, the reduction in cumulative UI benefits exceeds the costs of providing STEP.

²⁰Employment outcomes 24 months after UI inflow are not complete for all individuals.

²¹Figure C2 in Appendix C displays that the effect of STEP on having employment occurs early during the UI spell. The effect on cumulative earnings increases steadily over time, while the effect on total income is never significant.

²²We do not observe earnings from self-employment and welfare benefits. In our sample the take-up of welfare benefits will be negligible as only about 1% of the individuals exhausts their UI entitlement.

Table 5: Estimated intention-to-treat (ITT) and local average treatment effect (LATE) of STEP on labor market outcomes

	ITT		LATE		Mean control
<i>Has job since inflow UI</i>					
Has job at 6 months	0.008*	(0.004)	0.021*	(0.012)	0.25
Has job at 9 months	0.011**	(0.005)	0.024**	(0.011)	0.32
Has job at 12 months	0.011**	(0.005)	0.026**	(0.011)	0.34
Has job at 18 months	0.007	(0.005)	0.015	(0.011)	0.40
Has job at 24 months [§]	0.009*	(0.005)	0.019*	(0.010)	0.32
<i>Cumulative earnings since inflow (€)</i>					
Cumulative earnings within 6 months	64*	(37)	170*	(97)	1,456
Cumulative earnings within 9 months	146**	(68)	339**	(157)	3,132
Cumulative earnings within 12 months	218**	(103)	488**	(230)	5,100
Cumulative earnings within 18 months	285	(179)	628	(394)	9,659
Cumulative earnings within 24 months [§]	293	(271)	656	(606)	14,801
<i>Characteristics job 12 months after UI inflow</i>					
Wage (weekly, €)	11	(15)	25	(34)	591
Weekly contract hours	0.87	(0.70)	1.95	(1.58)	33.1
Has a fixed term contract	0.013***	(0.005)	0.029***	(0.010)	0.24
Works at temp agency	0.004	(0.003)	0.010	(0.006)	0.08
Works in different sector	0.008*	(0.004)	0.017*	(0.009)	0.17
Finds work through vacancy UI admin.	0.002	(0.002)	0.005	(0.004)	0.02
<i>ALMP activities potentially linked to STEP participation</i>					
Educational voucher	0.014***	(0.003)	0.031***	(0.007)	0.10
Placement fee temp. work agencies	−0.001	(0.003)	−0.003	(0.007)	0.10
Trial placement	0.003*	(0.002)	0.007*	(0.004)	0.02

Note: Every cell represents a separate regression including controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of UI inflow. § Employment outcomes 24 months after UI inflow are not complete for all individuals in our data. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

mation results do not show significant effects on the number of working hours and wages. One of the aims of STEP was to encourage participants to broaden their job search more broadly, potentially by changing sector or working through a temporary work agency. Van der Klaauw and Ziegler (2025) study the active collaboration of the Dutch UI administration with temporary work agencies. During STEP trainers also support job seekers by referring them to vacancies in the public vacancy register of the UI administration. The estimation results show that individuals in the treatment group are somewhat more likely to work via a temporary work agency or to have found a job through the vacancy register of the UI administration. The consequence is that in the treatment group a larger share of the individuals, who found work, have (still) a temporary contract, which may signal lower job quality. Autor and Houseman (2010), Mörk et al. (2021) and Van der Klaauw and Ziegler (2025) all find that temporary work does not act as stepping stone for future employment.

The final panel focuses on the take-up of several instruments provided by the UI administration to encourage employers to hire (older) unemployed workers. These instruments are available for both STEP participants and nonparticipants. However, during STEP participants are reminded about the possibility to use these instruments when finding work. The estimation results show a modest increase in the use of trial placements and a more pronounced increase in the use of educational vouchers. A trial placement means that during the first few months of a new job the unemployed worker continues receiving UI benefits instead of a wage, but after the trial placement the employer is required to offer a permanent contract.²³ Educational vouchers can be used by employers to cover the costs of obtaining certificates required for a job. The average cost of STEP increases from €470 to €490 per participants when taking the additional take-up of educational vouchers into account.²⁴ STEP remains cost effective for the UI administration when taking the additional take-up of other available ALMP activities into account.

To examine heterogenous effects of participation in STEP, we focus on UI outflow and cumulative UI benefits within 12 months since UI inflow as outcome variables. Table 6 presents intention-to-treat effects on both outcomes for various subgroups, as well as their STEP participation rates. The first panel shows that the effects of STEP are strongest for the age group between 50 and 55 years old. For older individuals the effects are smaller, although the differences between age groups are not significantly

²³Bolhaar et al. (2020) find positive effects of the trial placement for welfare recipients in Amsterdam.

²⁴The average costs of an educational voucher are €775. The costs of trial placements are already included in the cumulative UI benefits.

Table 6: Estimated intention-to-treat effect of STEP for different subgroups

	UI outflow within 12 months		UI benefits (cumulative)		Take-up treatment group
Full population	0.019***	(0.005)	−162**	(74)	0.52
<i>By age</i>					
Younger than 55	0.024***	(0.008)	−120	(115)	0.51
Between 55 and 60	0.014*	(0.008)	−167	(124)	0.55
Older than 60	0.018*	(0.009)	−199	(151)	0.50
<i>By gender</i>					
Men	0.021***	(0.007)	−254**	(114)	0.47
Women	0.018**	(0.007)	−70	(83)	0.58
<i>By education</i>					
At most vocational education	0.004	(0.009)	−121	(111)	0.45
Secondary education	0.025***	(0.007)	−108	(106)	0.54
College or university	0.026**	(0.010)	−218	(180)	0.58
<i>By earned wage before inflow</i>					
Less than €27,000	0.014**	(0.007)	−7	(72)	0.49
More than €27,000	0.026***	(0.007)	−313**	(133)	0.57
<i>Previous employed through temp. work agency</i>					
Temporary work sector	−0.004	(0.014)	27	(187)	0.31
Other sector	0.023***	(0.005)	−199**	(79)	0.55

Note: Every cell represents a separate regression including controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of inflow in UI. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

significant. The second panel indicates that the effects are larger for men than for women, particularly when considering cumulative UI benefits. Although the effects for women are smaller, women have a higher take-up rate than men.

The third panel displays that there are hardly any effects on UI outflow for the lowest-educated individuals. Individuals with at least completed secondary education experience significantly larger effects. The fourth panel shows that the effects are larger for individuals who had higher earnings in the job prior to entering UI. The final panel shows that individuals who were previously employed through temporary work agencies do not benefit from participating in STEP.

Earnings in the job previous to UI are strongly correlated to the level of education. A regression including all interaction effects shows that the level of education has the strongest association to heterogeneous treatment effects on UI outflow (see Table D1 in Appendix D). Earnings in the job previous to UI has the strongest association to the effect on cumulative UI benefits, which is not surprising because the UI benefits level is a fraction of the last wage. Overall, we may conclude that STEP is least effective for the lowest-educated workers, and they also have the lowest take-up rate of the training.

5.4 Job search behavior

The STEP training is designed to help participants find work faster. Following standard job search theory, this could occur through three channels. Participants may increase their job search effort, direct their job applications better or lower their reservation wage. To explore the importance of these mechanisms, we use data from the job application register, which contains weekly information on job search activities.²⁵

Table 7 presents descriptive statistics on job search behavior separately for the treatment and control group. The first panel shows that prior to STEP participation individuals in both the treatment and control group have on average about 21.2 job search activities per 12 weeks. During STEP, individuals in the treatment group report about 0.8 fewer job search activities and this difference is significant. The significant reduction in job search activities persists in the six months after STEP, although the magnitude of the effect declines.

The second panel shows that about half of the job search activities are ap-

²⁵UI benefits recipients are required to make at least four job application every four weeks. While individuals may not register all applications when this exceeds the mandatory minimum, there is no reason to believe that underreporting differs between the treatment and control group.

Table 7: Job search activities per 12 weeks

	control group	treatment group	difference	p-value
<i>Total job search activities</i>				
Before STEP	21.2	21.2	-0.01	0.98
During STEP	13.1	12.2	-0.82***	0.00
0-3 months after STEP	13.0	12.6	-0.43***	0.00
3-6 months after STEP	11.6	11.4	-0.29**	0.02
> 6 months after STEP	9.4	9.5	0.04	0.80
<i>Responses to vacancies</i>				
Before STEP	10.9	11.1	0.12	0.25
During STEP	7.2	6.4	-0.82***	0.00
0-3 months after STEP	7.4	6.8	-0.62***	0.00
3-6 months after STEP	6.5	6.1	-0.40***	0.00
> 6 months after STEP	5.0	4.9	-0.09***	0.48
<i>Network activities</i>				
Before STEP	2.4	2.4	-0.07	0.25
During STEP	1.9	2.1	0.20***	0.00
0-3 months after STEP	2.0	2.3	0.29***	0.00
3-6 months after STEP	1.9	2.1	0.24***	0.00
> 6 months after STEP	1.6	1.9	0.24***	0.00
<i>Job interviews</i>				
Before STEP	0.60	0.62	0.01	0.36
During STEP	0.38	0.40	0.02*	0.08
0-3 months after STEP	0.35	0.34	0.00	0.88
3-6 months after STEP	0.28	0.29	0.00	0.76
> 6 months after STEP	0.22	0.22	0.00	0.51

Note: Mean control group and mean treatment group, difference and p-value for t-test. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

plications to publicly posted vacancies. The STEP training significantly lowers these applications and the magnitude of the effect at least as large as for total job search activities. The third panel shows that already during STEP network activities increase significantly and this persists afterwards. This indicates that the STEP training shifts job search activities away from applications to vacancies and towards networking activities. This is consistent with the goal of the STEP training. The final panel shows no significant impact on the number of job interviews. The change in job search method does not translate into an increase in the number of job interviews.

To study whether the changed job search behavior affects the type of job that people find, Table 9 reports characteristics of the first job found after unemployment. The first panel does not show significant changes between the treatment and control

Table 8: Estimated intention-to-treat effect of STEP on the first job

	Intention-to-treat effect		Control mean
<i>Job finding</i>			
Found job through vacancy at UI administration	0.008	(0.006)	0.13
Found job in the same sector	0.010	(0.008)	0.45
Works for temporary work agency	0.009	(0.006)	0.25
<i>Job characteristics</i>			
Monthly wage (€)	7	(22)	1886
Monthly contract hours	-0.08	(0.75)	112
Temporary contract	0.01	(0.006)	0.84

Note: Every cell represents a separate regression including controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of inflow in UI. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level.

group in the job search channel through which the first job is found. Recall that trainers provide vacancies listed in the UI administration to participants in the STEP training and a goal of STEP is to encourage participants to search for work in other sectors and via temporary work agencies. On all these dimension we do not find different outcomes between the treatment and the control group.

The second panel of the table shows that also the job characteristics do not differ between the treatment and control group. There is thus no evidence that participation in the STEP training affects the quality of the first job found after unemployment. This suggests that STEP participation does not affect job demands or reservation wages and also does not allow job seekers to get easier access to higher quality jobs.

From our empirical results, we conclude that STEP changes how participants search for jobs, which helps them find work faster, but does not substantially change the job quality of the match outcomes.

6 Training groups

Participation in STEP stimulates earlier job finding and the reduction in UI benefits outweighs the costs of providing the training. Participants compensate the lower UI benefits with increased earnings from work. Moreover, the STEP training causes behavioral changes that are directly related to the content of the training. Participants are more likely to find work via a temporary work agency, use the public

Table 9: Estimated intention-to-treat effect of STEP on the first job

	Intention-to-treat effect		Control mean
<i>Job finding</i>			
Found job through vacancy at UI administration	0.008	(0.006)	0.13
Found job in the same sector	0.010	(0.008)	0.45
Works for temporary work agency	0.009	(0.006)	0.25
<i>Job characteristics</i>			
Monthly wage (€)	7	(22)	1886
Monthly contract hours	-0.08	(0.75)	112
Temporary contract	0.01	(0.006)	0.84

Note: Every cell represents a separate regression including controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of inflow in UI. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level.

vacancy register of the UI administration, apply for education vouchers and take up trail placements.

This section considers how the organization of STEP affects the effectiveness. We first show that the trainer is important for the effectiveness of STEP, but that differences between trainers can not be explained by observed trainer characteristics. Next, we show that the composition of the training group matters. Participants benefit from having low-educated individuals in their STEP training group.

6.1 Trainer

As described in Section 2 each training group consists of about 12 older unemployed workers and the group composition remains fixed throughout the program. Most local offices form heterogeneous groups, only a few offices create separate groups for low-educated and high-educated participants. Once an individual agrees to participate in STEP, the individual is typically assigned to the first available spot. Trainers generally work at one local office.

Our data do not contain group identifiers. But for participants we observe the start date of the training and the identity of the trainer, which we use to reconstruct groups. We verify that all participants in a group are from the same location and we exclude individuals that are in a group with more than 15 individuals. Thereby we rule out that we are merging two groups.²⁶ Our final sample includes 13,855

²⁶Group sessions last about three hours, so in theory a trainer could start two new groups in one day.

Table 10: Effect trainer on effectiveness STEP on outcomes 12 months after inflow in UI

	Exit UI		UI benefits		Finds job		Earnings	
<i>Panel A: Trainer fixed effects</i>								
<i>F</i> -statistic	5.11		6.70		7.64		9.72	
<i>p</i> -value	0.000		0.000		0.000		0.000	
<i>Panel B: Trainer characteristics</i>								
Female	-0.019	(0.031)	764*	(391)	-0.004	(0.033)	-504	(486)
Older	0.013	(0.024)	-133	(318)	0.028	(0.025)	351	(326)
Full-time working	-0.004	(0.021)	-17	(294)	0.009	(0.023)	-143	(341)
Temporary contract	-0.029	(0.019)	172	(257)	-0.053**	(0.022)	-75	(332)
<i>p</i> -value joint significance	0.495		0.638		0.122		0.694	
Mean	0.265		17,830		0.314		3302	
<i>N</i> Trainers					197			
<i>N</i> Individuals					7788			
<i>N</i> STEP groups					1745			

Note: Older is older than 55; full-time working at least 36 hours per week. The regressions include controls for characteristics of the participant and fixed effects for local UI office and months on inflow in UI. Robust standard errors are clustered at the training group level and in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

participants who started the STEP training between January and October 2015 and within six months after entering UI.

To assess whether the effectiveness of STEP varies between trainers, we estimate a following linear regression model for outcome Y for participant i who had trainer j in local office c

$$Y_{ijc} = X_i\beta + \theta_j + \eta_c + U_{ijc}$$

The model includes the usual set of participant characteristics X_i and local office fixed effects η_c . We are mainly interested in the trainer fixed effect θ_j . To get an appropriate estimate, we only consider trainers with at least 25 observed participants and we exclude local offices that assigned low-educated and high-educated participants to separate groups. This yields a sample of 7788 participants in 1745 training groups with 197 unique trainers.

We focus on outcomes 12 months after UI inflow when the effects of STEP are most pronounced and we consider exit from UI, cumulative UI benefits, finding work and cumulative earning. Panel A of Table 10 shows that for all four outcomes the trainer fixed effects are significantly different from each other. This indicates substantial variation in STEP effectiveness across trainers.

We observe several characteristics of trainers. Over 80% of the trainers are female and they have an average tenure of 22 years at the UI administration. Almost 85% of the trainers are older than 45 years and about 45% are over 55 years. Trainers

work on average 37 hours a week and 80% are full-time employed. About 75% have a permanent contract. To examine if these characteristics can explain differences in effectiveness between trainers, we replace in the regression the trainer fixed effects θ_j with $T_j\gamma$, where T_j contains the characteristics of the trainer. We do not include experience since it correlates strongly to age and having a permanent contract.

Panel B of Table 10 shows that none of the trainer characteristics are significantly associated to better outcomes of STEP participants. Also jointly the trainer characteristics are not significant. These findings are robust to reducing the number of trainer characteristics and extending the sample by also considering trainers that have fewer than 25 participants in the sample. The key conclusion is that even though the effectiveness of STEP differs between trainers, heterogeneity in this effectiveness is not associated to observed trainer characteristics.

6.2 Group composition

Almost all local offices assign participants to the first available spot in a training group, which makes group composition as good as random.²⁷ We exploit this random variation to study whether the group composition affects the effectiveness of the STEP training. We estimate the following regression model for outcome Y_{igc} of individual i in training group g and local office c

$$Y_{igc} = X_i\beta + W_g\gamma + \eta_c + U_{ijc}$$

The regressors W_g capture group composition characteristics (measured as group averages excluding individual i). The local office fixed effects η_c ensure that identification of the peer effects relies on random assignment to training groups within local offices.

Our primary focus is on the level of education for two reasons. First, some local offices operate separate group for low-educated and high-educated participants, which makes peer effects by level education policy relevant. Second, our earlier results showed that participation in STEP is more effective for high-educated participants. We distinguish low-educated, medium-educated and high-educated job seekers.²⁸

²⁷Some local offices have separate groups for low-educated and high-educated participants.

²⁸In the Netherlands, having completed the college or academic track at secondary school or vocational education is referred to as having a basic labor market qualification. Individuals who do not meet this basic qualification are considered low educated. Individuals who meet this basic qualification are considered medium educated, while individuals who have also completed college

Table 11: Effect group composition on effectiveness STEP on outcomes 12 months after inflow in UI

	Exit UI		UI benefits		Finds job		Earnings	
<i>Panel A: Shares per STEP group</i>								
Share low educated	0.026	(0.029)	-1077***	(400)	0.014	(0.030)	54	(478)
Share high educated	-0.014	(0.026)	1531***	(365)	-0.031	(0.027)	-725	(550)
Joint significance	0.355		0.000		0.262		0.190	
<i>Panel B: Indicators for many or few</i>								
Few low educated	-0.015	(0.010)	384***	(149)	-0.004	(0.011)	-4	(194)
Many low educated	-0.013	(0.012)	-53	(163)	-0.008	(0.012)	-6	(188)
Few high educated	0.015	(0.010)	-457***	(160)	0.028***	(0.011)	323*	(180)
Many high educated	0.005	(0.012)	244	(170)	0.006	(0.013)	100	(207)
Joint significance	0.384		0.000		0.140		0.504	
<i>Panel C: only low educated</i>								
Share low educated	0.083	(0.051)	-895	(625)	0.042	(0.050)	107	(667)
Share high educated	0.029	(0.065)	1002	(817)	-0.034	(0.066)	-1232	(758)
Joint significance	0.246		0.036		0.409		0.140	
<i>Panel D: only medium and high educated</i>								
Share low educated	0.006	(0.036)	-1274**	(509)	0.011	(0.039)	139	(660)
Share high educated	-0.027	(0.030)	1698***	(427)	-0.036	(0.030)	-697	(527)
Joint significance	0.532		0.000		0.313		0.308	
<i>Panel E: other characteristics</i>								
Share female	-0.006	(0.029)	-711*	(407)	0.007	(0.027)	76	(434)
Share older	-0.030	(0.025)	-265	(360)	-0.014	(0.024)	-47	(370)
Share temp work	0.065	(0.054)	-1377*	(743)	0.058	(0.053)	343	(845)

Note: Separate regressions all panels. The regressions include controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months on inflow in UI. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

For the empirical analysis we restrict the sample to training groups for which we observe at least eight participants. This yields 9234 participants in 1274 training groups.²⁹ Panel A of Table 11 shows that participants tend to have better labor market outcomes when their training group includes a higher share of low-educated individuals and a lower share of high-educated individuals. This pattern is visible for all outcomes, but the group composition effects are only significant for cumulative UI benefits.

We examine nonlinear effects of the share of low-educated and high-educated peers. We define few low-educated or high-educated in the group when the share is below 15%. When the share is above 40% we consider many low-educated or high-educated peers. The estimation results in Panel B show that outcomes are better when there are few high-educated participants and worse when there are only few low-educated participants in the training group. Next, we split the sample into low-educated participants (Panel C) and medium and high-educated participants (Panel D). We cannot reject that the group compositions effects are different for both samples, but only for the medium and high-educated individuals the effects are in some cases significant.

The final panel explores other characteristics of the group composition. This shows only weak evidence for group composition effects for the share of women and the share of individuals with prior employment in the temporary work sector. Outcomes are better if the share of women and the share individuals who previously worked in the temporary work sector are higher.

Our earlier results showed that participation in STEP is hardly beneficial for low-educated individuals and not beneficial for those who were previously employed by temporary work agencies. It is therefore surprising that having these individuals in a training group increases the effectiveness of STEP for the other individuals in the group. One possible explanation is that trainers may focus their attention and efforts on participants with the stronger labor market prospects in the training group. In that case the STEP training is only useful for low-educated individuals if there are only few high-educated individuals in the same training group, which rarely occurs since most local offices have heterogeneous training groups. A high-educated participant may receive more individual support from the trainer if there

or university are considered high educated. In our sample about 31% are low educated, 45% are medium educated and 24% are high educated.

²⁹We maintain the same sample selections as in the previous subsection, except we no longer require trainers to have at least 25 STEP participants and we now include local offices with separate training groups for low-educated and high-educated participants.

are only few high-educated participants in their group.

7 Conclusion

In a period of recession, older workers who lose their job are particularly vulnerable to becoming long-term unemployed. For these workers, unemployment is often used to be a pathway towards retirement, and older unemployed workers were often exempted from mandatory job search requirements. ALMPs targeted at older unemployed workers were generally believed to be ineffective as these workers faced fewer obligation, more generous UI benefits and a shorter remaining time in the labor market. Some studies have evaluated ALMPs targeted at older unemployed workers (Arni, 2015; Ahammer et al., 2025; Boockmann et al., 2012; Boockmann and Brändle, 2019; Kutai et al., 2025). The results show at most modest effectiveness, often limited to specific subgroups.

In this paper we study STEP, which differs from traditional ALMPs. STEP is a ten-week training program with a strong focus on teaching older unemployed workers how to exploit their social network for job search. The rationale behind this program is that older unemployed workers often lack recent job search experience and may therefore be less familiar with skills that have become increasingly important for job finding. Participation in STEP has positive effects on UI outflow and the vast majority of the outflow is to work. STEP is an intensive and therefore costly program. Nevertheless, the reduction in cumulative UI benefits payments exceeds the costs of the program, which makes the program cost effective for the UI administration. Le Barbanchon et al. (2024) emphasize the importance of cost effectiveness for ALMPs. Participants almost fully compensate the reduced UI benefits with additional earnings. As STEP is income neutral for participants and cost effective for the UI administration, the marginal value of public funds is favorable (Hendren and Sprung-Keyser, 2020).

STEP aims to stimulate job finding by encouraging participants to use their social network. Our empirical results show changed job search behavior, participants in STEP make fewer applications to open vacancies and engage more in network activities. The increased job finding indicates that changing job search behavior accompanied with learning better network skills can be effective. In addition, the trainers of STEP advise participants to also apply for other programs that are available to them. Indeed we observe that participants in STEP are more likely to use schooling subsidies and trial placements. Bolhaar et al. (2020) show that trial

placements can be effective to increase exit from unemployment to work.

The STEP training is delivered by trainers who are often experienced caseworkers. We find substantial heterogeneity in program effectiveness across trainers, but this variation cannot be explained by observed trainer characteristics. Also the composition of the training group matters. Participants benefit from having some low-educated individuals in their STEP training group. This advocates having heterogeneous groups of participants in each training, which is also the practice in most local offices of the UI administration.

References

- Ahammer, A., Halla, M., Heckl, P., and Winter-Ebner, R. (2025). Reintegrating older long-term unemployed workers: The impact of temporary job guarantees. IZA Discussion Paper 18322.
- Arni, P. (2015). Opening the blackbox: How does labor market policy affect the job seekers' behaviour? A field experiment. IZA Discussion Paper 9617.
- Autor, D. and Houseman, S. (2010). Do temporary-help jobs improve labor market outcomes for low-skilled workers? Evidence from “work first”. *American Economic Journal: Applied Economics*, 2(3):96–128.
- Bayer, P., Ross, S., and Topa, G. (2008). Place of work and place of residence: Informal hiring networks and labor market outcomes. *Journal of Political Economy*, 116(6):1150–1196.
- Beecroft, E., Lee, W., Long, D., Holcomb, P., Thompson, T., Pindus, N., O'Brien, C., and Bernstein, J. (2003). The Indiana welfare reform evaluation: Five-year impacts, implementation, costs and benefits. Abt Associates, Cambridge, MA.
- Behaghel, L., Dromundo, S., Gurgand, M., Hazard, Y., and Zuber, T. (2024). The potential of recommender systems for directing job search: A large-scale experiment. IZA Discussion Paper 16781.
- Ben Dhia, A., Crèpon, B., Mbih, E., Paul-Delvaux, L., Picard, B., and Pons, V. (2022). Can a website bring unemployment down? Experimental evidence from France. NBER Working Paper 29914.

- Bloemen, H., Hochguertel, S., and Lammers, M. (2013). Job search requirements for older unemployed: Transitions to employment, early retirement and disability benefits. *European Economic Review*, 58:31–57.
- Bolhaar, J., Ketel, N., and Van der Klaauw, B. (2020). Caseworker’s discretion and the effectiveness of welfare-to-work programs. *Journal of Public Economics*, 183:104080.
- Boockmann, B. and Brändle, T. (2019). Coaching, counseling, case-working: Do they help the older unemployed out of benefit receipt and back into the labor market? *German Economic Review*, 20:e436–e468.
- Boockmann, B., Zwick, T., Ammermüller, A., and Maier, M. (2012). Do hiring subsidies reduce unemployment among older workers? Evidence from natural experiments. *Journal of the European Economic Association*, 10(4):735–764.
- Brown, M., Setren, E., and Topa, G. (2016). Do informal referrals lead to better matches? Evidence from a firm’s employee referral system. *Journal of Labor Economics*, 34(1):161–209.
- Cappellari, L. and Tatsiramos, K. (2015). With a little help from my friend? Quality of social networks, job finding and job match quality. *European Economic Review*, 78:55–75.
- Card, D., Kluve, J., and Weber, A. (2018). What works? A meta analysis of recent active labor market program evaluations. *Journal of the European Economic Association*, 16(3):894–931.
- Chan, S. and Stevens, A. (2001). Job loss and employment patterns of older workers. *Journal of Labor Economics*, 19(2):484–521.
- Cingano, F. and Rosolia, A. (2012). People I know: Job search and social networks. *Journal of Labor Economics*, 30(2):291–332.
- De Groot, N. and Van der Klaauw, B. (2019). The effects of reducing the entitlement period to unemployment insurance benefits. *Labour Economics*, 57:195–208.
- Duflo, E., Glennerster, R., and Kremer, M. (2007). Using randomization in development economics research: A toolkit. In Schultz, T. and Strauss, J., editors, *Handbook of Development Economics*, volume 4, chapter 61, pages 3895–3962.

- Gee, L. K., Jones, J., and Burke, M. (2017). Social networks and labor markets: How strong ties relate to job finding on facebook’s social network. *Journal of Labor Economics*, 35(2):485–518.
- Glitz, A. (2017). Coworker networks in the labour market. *Labour Economics*, 44:218–230.
- Granovetter, M. (1995). *Getting a Job: A Study of Contacts and Careers*. University of Chicago Press.
- Hellerstein, J., McInerney, M., and Neumark, D. (2011). Neighbors and coworkers: The importance of residential labor market networks. *Journal of Labor Economics*, 29(4):659–695.
- Hendren, N. and Sprung-Keyser, B. (2020). A unified welfare analysis of government policies. *Quarterly Journal of Economics*, 135(3):1209–1318.
- Jahn, E. and Neugart, M. (2020). Do neighbors help finding a job? Social networks and labor market outcomes after plant closures. *Labour Economics*, 65:101825.
- Kramarz, F. and Skans, O. N. (2014). When strong ties are strong: Networks and youth labour market entry. *Review of Economic Studies*, 81:1164–1200.
- Kutai, A., Saporta-Eksten, I., and Schlosser, A. (2025). Job search assistance for older unemployed in the digital era: Evidence from a large scale RCT. CEPR Discussion Paper 20494.
- Lalive, R. (2008). How do extended benefits affect unemployment duration? A regression discontinuity approach. *Journal of Econometrics*, 142(2):785–806.
- Le Barbanchon, T., Schmieder, J., and Weber, A. (2024). Job search, unemployment insurance, and active labor market policies. In Dustmann, C. and Lemieux, T., editors, *Handbook of Labor Economics*, volume 5, chapter 6, pages 435–580.
- Mörk, E., Ottosson, L., and Vikman, U. (2021). To work or not to work: Effects of temporary public employment on future employment and benefits. IFAU Working Paper 2021:12.
- OECD (2006). Ageing and employment policies: Live longer, work longer. OECD.

- Rothstein, J. and von Wachter, T. (2017). Social experiments in the labor market. In Banerjee, A. and Duflo, E., editors, *Handbook of Economic Field Experiments*, volume 2, chapter 8, pages 555–637.
- Schmieder, J., Von Wachter, T., and Bender, S. (2012). The effects of extended unemployment insurance over the business cycle: Evidence from regression discontinuity estimates over 20 years. *Quarterly Journal of Economics*, 127(2):701–752.
- UWV (2015). Informatie sociale verzekeringen naar sectoren 2014. UWV.
- Van der Klaauw, B. and Vethaak, H. (2022). Empirical evaluation of broader job search requirements for unemployed workers. IZA Discussion Paper 15698.
- Van der Klaauw, B. and Ziegler, L. (2025). A field experiment on labor market speeddates for unemployed workers. *Journal of Human Resources*, 60(1):259–288.

A Requesting STEP participation in the control group

Table A1: Estimation results of asking to participate in STEP within the control group.

	Control group	
<i>Personal characteristics</i>		
Female	0.016***	(0.004)
Younger than 55 (reference)	—	
55-59 years at inflow	0.002	(0.004)
60-63 years at inflow	−0.007**	(0.003)
Single	0.001	(0.003)
Non-Dutch	−0.011***	(0.003)
At most vocational education	−0.006	(0.004)
Secondary education	0.003	(0.004)
College or University (reference)	—	
<i>UI characteristics</i>		
Maximum entitlement period	0.000	(0.000)
Weekly hours unemployed	0.000	(0.000)
Employed at start of UI	−0.008***	(0.003)
UI spell in previous six months	−0.009***	(0.003)
Received disability insurance benefits	−0.007	(0.007)
<i>Characteristics job before UI</i>		
Wage below €25,000 (reference)	—	
Wage above €25,000	0.003	(0.003)
Temporary contract	0.004	(0.003)
Monthly contract hours	0.000	(0.000)
<i>Sector last job</i>		
Health care	−0.003	(0.004)
Business	0.004	(0.004)
Temporary work agency	−0.003	(0.003)
Industry	0.003	(0.005)
Trade	0.000	(0.006)
Other (reference)	—	
Observations	9,919	

Note: Regressions include fixed effects for month of UI inflow and local UI office. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

B First-stage regression

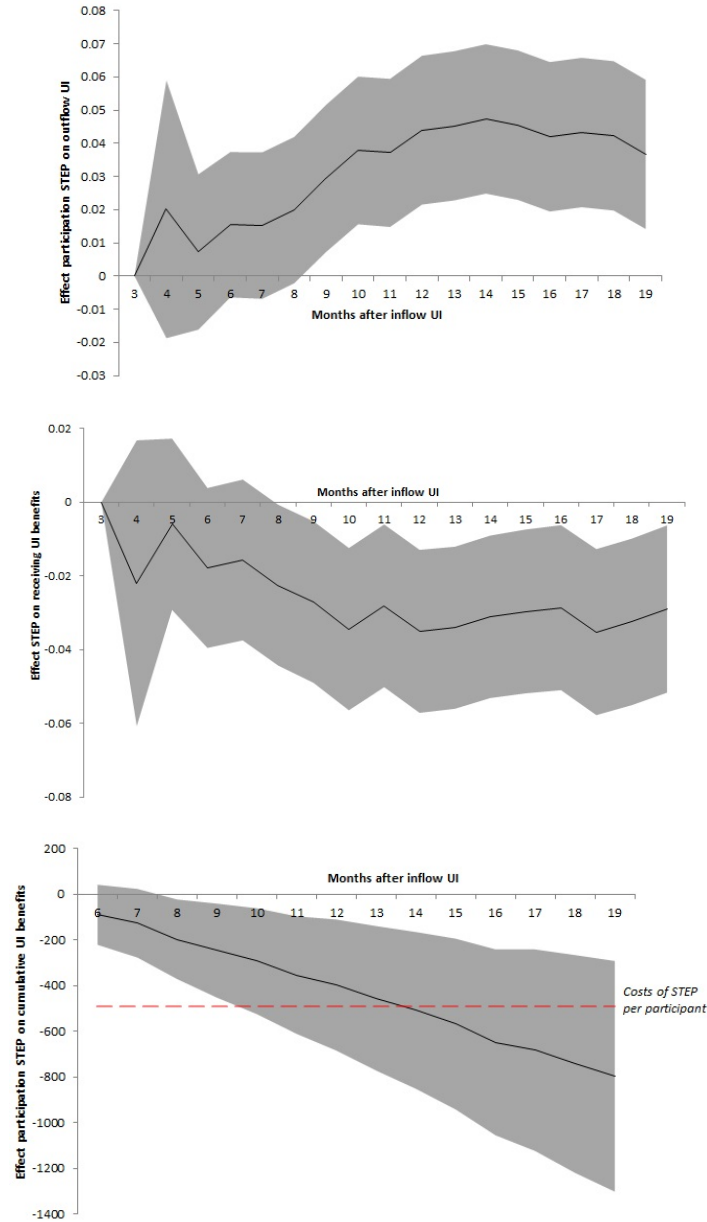
Table B1: First-stage regression – training participation within 12 months after UI inflow

	Coefficient	Standard error
Treatment group	0.445***	(0.005)
<i>Personal characteristics</i>		
Female	0.082***	(0.005)
Single	0.002	(0.005)
Non-Dutch	−0.176***	(0.015)
At most vocational education	—	
Vocational education	0.076***	(0.007)
Secondary education	0.107***	(0.006)
College of Bachelor	0.115***	(0.007)
Master	0.083***	(0.010)
<i>UI characteristics</i>		
Maximum entitlement period	0.001***	(0.000)
Weekly hours unemployed	−0.000	(0.000)
Employed at start of UI	−0.113***	(0.006)
UI spell in previous six months	−0.133***	(0.008)
Received disability insurance benefits	−0.130***	(0.015)
<i>Characteristics job before UI</i>		
Wage below €25,000 (reference)	—	
Wage above €25,000	0.033***	(0.006)
Temporary contract	−0.082***	(0.005)
Monthly contract hours	−0.000	(0.000)
<i>Sector last job</i>		
Health care	0.031***	(0.006)
Business	0.068***	(0.006)
Temporary work agency	−0.015**	(0.008)
Industry	0.053***	(0.007)
Trade	0.048***	(0.008)
Other (reference)	—	
Observations	49,929	

Note: Regressions include fixed effects for age, month of UI inflow, and local UI office. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.

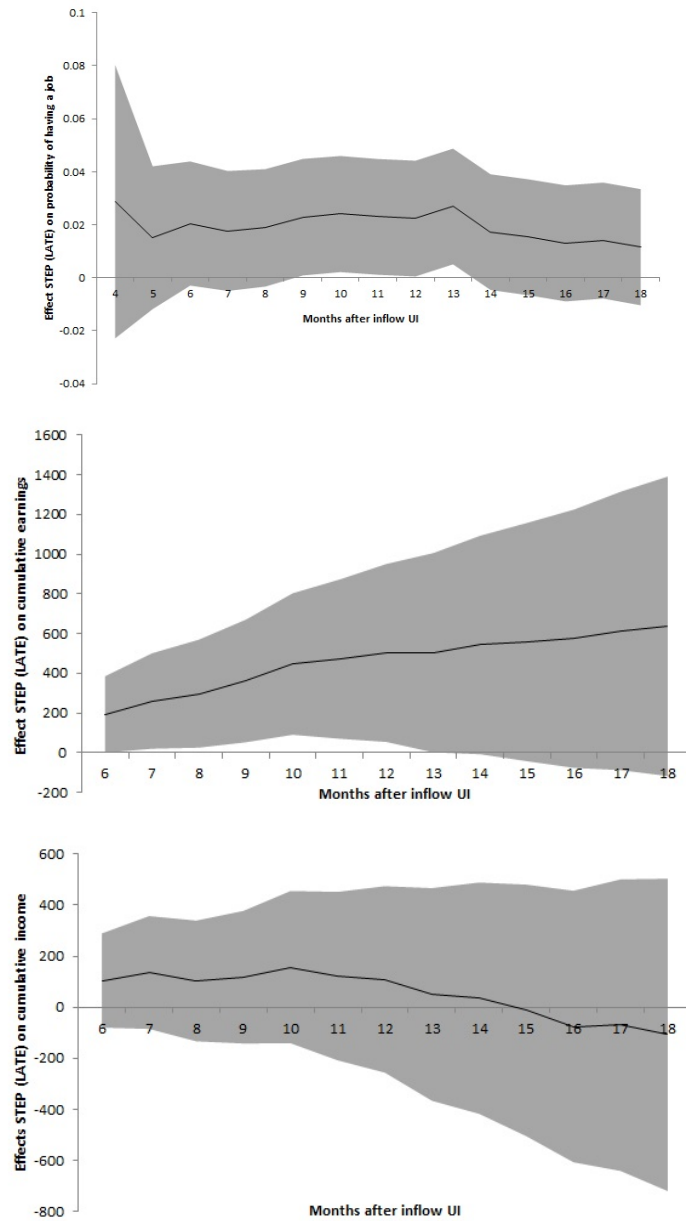
C Local average treatment effects (LATE) of STEP for each month since UI inflow

Figure C1: Estimated local average treatment effects (LATE) on UI outflow (upper panel), UI benefit receipt (middle panel) and cumulative UI benefits (lower panel) for each month since UI inflow.



Note: Each estimate in the graphs comes from a separate instrumental variables regression with controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of inflow in UI. The 95% confidence intervals in the graphs are based on robust standard errors.

Figure C2: Estimated local average treatment effects (LATE) on having a job (upper panel), cumulative earnings from employment (middle panel) and cumulative income (lower panel) for each month since UI inflow.



Note: Each estimate in the graphs comes from a separate instrumental variables regression with controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of inflow in UI. The 95% confidence intervals in the graphs are based on robust standard errors.

D Heterogeneous treatment effects

Table D1: Estimated heterogeneous intention-to-treat effects from a regression with interactions

	UI outflow within 12 months			Cumulative UI benefits								
	(1)	(2)	(3)	(1)	(2)	(3)						
Treatment	0.013	(0.014)	0.005	(0.010)	0.003	(0.009)	-141	(194)	-66	(115)	-18	(74)
× Women	-0.003	(0.011)					141	(164)				
× Between 55 and 60	-0.011	(0.012)					-32	(169)				
× Older than 60	-0.008	(0.012)					-36	(193)				
× Secondary education	0.022*	(0.012)	0.022*	(0.012)	0.023**	(0.012)	28	(157)	30	(156)		
× College or university	0.021	(0.014)	0.021	(0.014)	0.026*	(0.014)	-49	(228)	-36	(227)		
× More than €27,000	0.005	(0.012)	0.006	(0.011)			-214	(181)	-278*	(162)	-315**	(154)
× Temp. work sector	-0.027	(0.017)	-0.026	(0.016)			267	(227)	217	(214)		
joint p-value	0.24		0.08		0.09		0.54		0.28		0.04	

Note: The regressions including controls for individual characteristics, characteristics of the job before UI and fixed effects for local UI office and months of inflow in UI. Robust standard errors in parentheses. * significant at the 10% level, ** at the 5% level, *** at the 1% level.