Reframing active labor market policy: Experimental evidence of training vouchers for unemployed

PRE-ANALYSIS PLAN

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This document describes the research design and analysis strategy of our field experiment, designed to boost training and employment of unemployed. We start with a detailed outline of the two parts of the intervention, which take place in early 2021 during a Covid-19 induced partial lockdown in the region of Lower Austria (*Niederösterreich*) in Austria. Unemployed receive an email newsletter, which for some contains a training voucher and additional information. In the first intervention, we designed multiple different treatment arms to separate out direct effects of raising awareness, supporting reciprocity, and strengthening perceived autonomy. In the second intervention, we send out variations of the training voucher email, which are informed by a pre-intervention survey. We provide a detailed discussion of our sample selection, variables used and the handling of the data to make the analysis as transparent and replicable as possible. We report the outcomes of our stratified randomization. Further, we state our hypotheses and outcomes of interest motivated by the active labour market policy evaluation literature. Finally, we conclude by specifying our statistical approach to inference.

1 Background

1.1 Context of the intervention

In February and March 2021, we launch field experiment that consists of a series of adaptive information treatments and surveys. The interventions are designed in cooperation and implemented by the Public Employment Service (PES) of Lower Austria (*Arbeitsmarktservice Niederösterreich (AMS NÖ)*). The aim is to increase training and employment among the unemployed by increasing participation in and completion of training programs. The first intervention consists of an email newsletter that invites unemployed to voluntarily contact the PES to arrange a consultation on training programs. We run a follow up survey to get more granular information on the underlying mechanisms. To maximise participant welfare, the second intervention uses the provisionally most effective treatment of intervention 1 as its baseline. The treatment arms add additional information to separate out direct effects of financial aspects, information about labor market benefits of training, and a framing for more targeted course selection. The information treatments are informed by a pre-survey.

Context The newsletters are embedded in the broader PES advertisement campaign *Corona-Joboffensive* to promote participation in training programs amidst the Covid-19 pandemic. In addition to contacting unemployed directly via the newsletter, the PES is establishing a separate hotline for consultations on training opportunities and advertising training opportunities in

regional newspapers. Training program participants generally continue to receive their unemployment benefits. Financial incentives to enrolment are provided for training programs with a duration of at least 4 months starting in 2021. They amount to €4,- per day, which makes around 10-20% of the benefits received for the median unemployed.
The range of training programs is diverse: from refreshing existing technical knowledge to complete training with an apprenticeship certificate. Common courses include mechatronics, refrigeration technology, IT systems technology, programming/coding, plastics technology, as well as training and further education in professions that are in demand, such as restaurant management, hotel and catering assistance or nursing. Also individual training needs are supported, i.e. an unemployed opera singer could receive personal singing classes if this is deemed to increase employment prospects. The duration of the courses varies substantially, depending on the type of course, between several days/weeks up to 18 months for apprenticeship programs. In general, the campaign focuses on longer training programs with a duration starting at around 10 weeks.

Conditionality Currently, by law (*Arbeitslosenversicherungsgesetz (AlVG §9)*), unemployed are assigned to labor market programs by the PES. This takes place after a consultation with the job counselor. In most cases, consultations with the job counselors and program assginment is obligatory, i.e. with conditionality attached. If an unemployed does not attend a PES appointment or assigned program - typically with no shows - the unemployment benefits can be cut or - in the most severe cases - blocked temporarily. Absences with a valid excuse, such as for sick leave, are exempted. As a result, assignment to a training program is often perceived negatively as a burden or punishment rather than positively as an opportunity and support.
In general, job consultations are obligatory for unemployed and often imply limited discussion with unemployed about their preferences. In the context of our experiment, the consultation with the job counselor is open to all treatment and control groups. Attendance is voluntary and only takes place if an unemployed contacts the PES on her own initiative, i.e. as a response to the newsletter. By law, job counselors are required to assess the adequacy of any training program and approve of it (*Arbeitsmarktpolitische Prüfung*). Job counselors approve suggestions for training programs as long as they credibly contribute to increasing the employment prospects of the unemployed. Course choice that seem purely for personal pleasure are declined. The time span between selection and start of the course will be held as short as possible; usually well below 3 months.

1.2 Description of intervention 1

Intervention 1 Four different treatment arms vary the type of information provided and the perceived autonomy that the unemployed have in choosing a training program. The unemployed in the sample will be randomly allocated to each of the 4 groups on an individual level. This randomization is conducted separately for each sending date, which ensures that unemployed with different unemployment durations are equally divided within the groups. Further information about the randomization procedure is provided in section 2.4.

The different treatment arms are as follows:

1. Group: control
2. Group: treatment with newsletter (Figure 4)
3. Group: treatment with newsletter, and voucher (Figure 5, Figure 3)
4. Group: treatment with newsletter, voucher, and information prime (Figure 6, Figure 3)

Group 1 functions as the control group and is not contacted at all.
Group 2 receives a newsletter (Figure 4) that includes an invitation to a consultation to discuss potential training programs with the PES' job counselor and provides information about existing financial incentives to start a training program.
In addition, *groups 3 and 4* receive a voucher (Figure 3) worth €15.000,-, which can be redeemed to take part in training programs provided by the PES. Alternatively, the voucher can be redeemed in consultation with the PES for any outside training for up to €3.000,-.[1] The groups receiving the voucher further obtain a list of typical training programs as part of the newsletter (Figure 5). This should motivate the unemployed in these two groups to already think about their preferred training program before the consultation at the PES. Finally, job counselors are instructed to *take serious* the voucher received by unemployed. The treatment is designed to increase self-initiative for the unemployed and raise awareness for the financial value of such training programs, thus inducing reciprocity.
Finally, *group 4* receives in addition to the voucher an information treatment consisting of a list of occupations with the highest number of job vacancies (Figure 6). This information treatment is intended to counteract a frequently mentioned concern related to asymmetric information in the use of training vouchers: unemployed allegedly do not have enough information to make an informed choice about their optimal training program (Strittmatter, 2016). It will additionally increase perceived autonomy as it encourages even more to think about potential course choices before the consultation at the PES.
In general, all groups (including the control group) have access to the same training programs, both provided by the PES as well as outside training. The intervention, thus, consists of the variation in the type of information provided. Additionally, it varies the perceived autonomy that the unemployed have in choosing their courses. Importantly, the control group refers to the status quo without intervention, meaning that they are not made worse off by our intervention.

Follow-up survey Finally, we plan to run a follow-up survey for those, who were subject to the first intervention to collect more information about the impact of the treatment and their motives for participating in training or not.

1.3 Description of intervention 2

Pre-intervention survey To target the second intervention in the best way possible, we ran a pre-intervention survey, which is sent to all who were unemployed longer than a year and had a valid email address. The aim of the survey is to get a better understanding of why unemployed do not participate in training, to then address these reasons and possible solutions more directly in the second newsletter treatment. Following a related study in France from Dhia and Mbih (2020), we ask for financial constraints, time constraints, lack of information, inertia, pessimistic expectations about returns to training, and possible constraints from the caseworker. Depending on the results of the survey, we design the variations of the second intervention. The survey can be seen in *Supporting Documents and Materials*.

Intervention 2 The second intervention consists again of sending different variations of a newsletter. Treatments are assigned randomly by the researchers. To maximize the positive effects on participants, we use the most successful newsletter variation from the first intervention, *group 3*, as a baseline (see figure 5). On top, we include additional information as treatment variation. Each treatment consists of a few lines that help tackling a specific concern of unemployed to not participate in training.

[1] The PES generally provides funding of up to €3.000,- for training programs of external suppliers, including for *groups 1 and 2*. However, this is not advertised and therefore awareness wil be limited for *group 1 and 2*.

The pre-intervention survey informs the treatment selection and design. The findings point to three reasons that seem most prevalent in preventing or motivating unemployed to take up PES offered training opportunities. These are backed up by anecdotal evidence by PES experts.
1. Financial constraints Financial constraints prevent unemployed from participating in longer term training offered by the PES. Therefore, we strengthen the information on financial support during course participation, making clear that the financial assistance provided by the PES amounts to at least 1000€a month.
2. Aspiration for quicker re-employment Unemployed aspire to quickly find a job, and ideally a better one after having completed a training course. Therefore, we provide additional information on the the benefits of training programs. These include average re-employent rates and lower likelihood to become unemployed again after course completion.
3. Lack of well-matching training In the survey, unemployed were sceptical that the PES would offer well-matching training programs. Unemployed seek more tailor-made consultations or course offers. Therefore, we emphasize that consultations will be adjusted to fit best the individual needs and skills of the unemployed.

The different treatment arms are as follows:

1. Group: Baseline including newsletter with voucher (Group 3 in Intervention 1) (Figure 5, Figure 3)
2. Group: Baseline plus information on financial support (Figure 7)
3. Group: Baseline plus information on benefits of training (Figure 8)
4. Group: Baseline plus information on individualistic support (Figure 9)

1.4 Timeline for the intervention

The first intervention takes place in three waves in February 2021:

- Wave 1, February 9: unemployed with a spell of 6 to 9 months (181-270 days)
- Wave 2, February 16: unemployed with a spell of 9 to 12 months (271-365 days)
- Wave 3, February 23: unemployed with a spell of 3 to 4 months who did not receive the newsletter previously due to a too short spell [2]

The post-treatment survey for the sample of the first intervention will be sent out in mid March.

The second intervention consists of:

- February 24: Pilot survey launch (to 300 randomly chosen people out of the corresponding sample)
- March 1: Pre-intervention survey launch
- March 10: Email newsletters are dispatched
- Mid march: Postal newsletters are dispatched (to those without email)

First analyses of short-term treatment effects are intended to be carried out with outcome data provided by the PES in several rounds in 2021. Longer-term effects are intended to be estimated with data provided by the PES each year until 2026. This will allow us to estimate long-term effects up to at least 5 years after the intervention.

[2] All unemployed with a spell of 3 to 6 months (91-180 days) received the standard newsletter on February 2. They are not included in the experimental design since all received the same treatment.

1.5 Covid-19 impact

Saftey measures The PES takes specific measures to protect the health of training program participants during the pandemic. Parts of the training move to online teaching but personal presence is allowed where necessary. Wearing FFP2 masks and the distance rule of two metres is obligatory for on-site training. If required, laptops are offered to enable virtual training from home.

Labor market crisis The timing of the intervention is amidst the Covid-19 crisis, which affected the Austrian labor market severely. In December 2020 the absolute number of unemployed persons in Austria has reached nearly 500.000 people, which is around 30% higher than in December 2019 (AMS-Uebersichtsbericht, 2021). The situation in Niederösterreich, the region we study, is slightly better with around 70.000 unemployed and an increase of 18% in comparison to the previous year (AMS-Uebersichtsbericht, 2021). The most affected subgroups were young and blue collar workers. The impact is very uneven across sectors with tourism, hospitality and personal services hit hardest by a drop in employment due to government induced shutdowns (Bock-Schappelwein, Huemer, and Hyll, 2021).

Lock-in effects When considering the literature about the effects of training programs for the unemployed the presence of so-called lock-in effects is undisputed. Training programs, thus, first lead to negative employment effects, as they take up a considerable amount of time for the unemployed, which reduces time spent on job search or even prevents take-up of available jobs (Vooren et al., 2019). Positive employment effects were found to materialize only in the long-term, i.e. at the earliest one year afterwards. However, these lock-in effects are strongly dependent on the current labor market situation. In times of high unemployment and dense labor markets, these lock-in effects are reduced, which, in turn, increases the effectiveness of training programs in recessions (Card, Kluve, and Weber, 2018). In light of this evidence, the timing of the intervention was deliberately set amidst the Covid-19 crisis to maximize it's effectiveness.

2 Study design

2.1 Overview

In this section, we describe our analytical approach in detail. Firstly, we specify the criteria for inclusion in our sample and related limitations. Secondly, we describe the data. Thirdly, we present the randomisation procedure for our treatment assignments. Fourthly, we state our hypotheses regarding outcomes. Fifthly, we specify the details of our outcome variables. Finally, we discuss our estimation and inference approach.
The code implementing the following designs has been uploaded to *GitHub*, at `https://github.com/lukaslehner/Vouchers`. For the stratified randomization, we use the package *randomizr* in *R*.

2.2 Sample selection

Our sample comprises of around 24.000 unemployed. They are distributed in the first intervention over 3 waves with 3.700 people in wave 1, 4.615 in wave 2, and 2.690 in wave 3. The second intervention comprises around 15.000 unemployed. This makes up for around 40% of all currently unemployed in Lower Austria. Sample selection for waves 1 and 2 follows the criteria of every person, who has been registered as unemployed with the PES for 6 to 12 months. Additionally,

with the third wave, we also capture those, who have been unemployed at the start of the intervention for between 2 and 3 months. In intervention 1, we could only reach those, who had a valid email-address. Intervention 2 includes all unemployed, who have been registered unemployed for at least 12 months, with or without email-address. Those without an email-address receive the newsletters from the second intervention by post. Additionally, those without an email-address, who would have been included in the first intervention, because of their unemployment duration, also receive the second intervention treatments.[3]
Individuals with the status "unemployed" as well as "in job search" are included, meaning that all registered unemployed are included regardless of whether they receive unemployment benefits or not. Unemployed who are already enrolled in a training program *in Schulung* at the time of the intervention are excluded from the sample. The sample is further restricted to people, who are at least 25 years old and do not have a pending job acceptance.
The pre-intervention survey is sent to the sample for the second intervention (i.e. those unemployed for longer than 12 months), but is restricted to people with a valid email-address, as it is an online survey. Around 70% of the whole sample are thus subject to the survey. The response rate was around 30%, which is higher compared to existing studies (Dhia and Mbih, 2020) but in line with expectations by the Austrian PES. The post-intervention survey is further sent out to all unemployed who were in the sample for the first intervention, not in the control group, and who had a valid email-address (around 73% of the whole sample for intervention 1). *response rate.*

Finally, as mentioned above, the context amidst the Corona crisis is very specific. The number of unemployed people is much higher, which also influences the characteristics of the unemployed that are clearly different in recessions than during normal economic conditions. Our findings are thus very well suited to infer the effectiveness of such an intervention during a recession, but the generalizability to normal economic conditions or a boom is therefore limited. We will, however, describe how our sample of unemployed differs from the unemployed before the Covid-crisis. Additionally, a subset of our sample has been unemployed already before the Covid-crisis, which we will exploit in the heterogeneity analysis. Nevertheless, the special economic conditions will influence the effectiveness of the intervention also through other channels than the characteristics of the unemployed, such as the already mentioned lock-in effects or the number and type of job openings after the training is completed etc. Further, intervention 1 is restricted to unemployed who have a valid email-address, which could be different from those who do not have one.
These aspects have to be kept in mind when generalizing our results to a broader population of unemployed or to different economic conditions.

2.3 Data

Administrative data All administrative data used in the analysis is provided by the PES. Table 1 shows a summary and categorisation of all variables used for both interventions.

[3]This is because the procedure to contact unemployed without a valid email-address was only setup in time for the second intervention. Due to lack of administrative capacities, it was unfortunately not possible to provide them with the treatments from the first intervention, as should have been the case due to their unemployment duration.

Table 1: Variables

Type	Variable name
Primary outcomes	Training completion
	Labor market status[1]
	Job quality (Indicator including earnings and employment stability)
Secondary outcomes	Newsletter read + Clicks
	Responses via phone or mail
	Contacts with PES case workers
	Training take-up
	Type of training
Stratified Randomization	Education (binary: compulsory school, higher)
	Unemployment duration (following the 3 waves)
	Age (below 35 years, 35-50 years, above 50 years)
	Gender (binary: men, women)
	Region (Weinviertel, Mostviertel, Waldviertel, Industrieviertel)
Control Variables	Strata
	relevant variables not included in stratification:
	job counselor, income level[2], employment stability[3], sector
	medical condition, nationality, language proficiency
	occupation (ISCO-08 1-digit)[2], marginal employment
Heterogeneity analysis	Education
	Unemployment duration
	Pre- and In-Corona unemployed[4,5]
	Income level[2,4]
	Age
	Gender

[1] differentiated by employment and labor force exit.
[2] before unemployment spell.
[3] since 2011
[4] No stratification variable due to data availability.
[5] Defined as 1 month before and after the announcement of the first lockdown in Austria on 10th March 2020

Survey Data Additionally, we collect survey data from the pre-intervention and the post-intervention survey. The response rate in the pre-intervention survey amounts to around 30% and in the post-intervention survey around *number*. The pre-intervention survey will mostly be used to design the second intervention. The post-intervention survey is designed to be used for additional exploratory analyses of possible treatment mechanisms.

Attrition & Exclusions We will make an effort to keep attrition to a minimum. As we use solely administrative data, we expect attrition to be negligibly low. It is, however, possible that participants move abroad or pass away. We will test, whether those who attrit are systematically different from the rest of the sample and report the results. Further, we can provide estimates of lower and upper bounds of our estimated effects depending on different assumptions we make about the part of our sample, that shows attrition.

Additionally, those who are already taking part in a training program are also not included in our sample, because they are, in some way, already treated. It would not make any sense to treat them with our intervention, as they cannot enrol in another training program in parallel. Our findings thus extend only to those unemployed who are not already in training programs and should be generalized to the entire population of unemployed only with caution.

Eventually, the restriction to unemployed with a valid email-address in intervention 1 has also be kept in mind for generalizability of the results. However, we have data for those without email address and can compare the two groups. Additionally, in intervention 2, we reach both those with and without email-address, which makes it possible to get some evidence on the differential responsiveness of these two groups to the treatment. However, intervention 2 differs from intervention 1 in several aspects, and this analysis can thus provide only indicative evidence for the loss of generalizability due to this restriction to email-users.

2.4 Treatment assignment

2.4.1 Intervention 1

The randomization is conducted for every sending date separately, therefore stratifying by the three categories of unemployment duration dividing the waves. In addition, we use the other stratification variables as specified in table 1 to construct strata, i.e. blocks. The treatment assignment is in a next step conducted randomly within these strata. Ideally, we would like to stratify by more variables than just the five used, but the sample size does not allow more stratification variables, because then the strata would become too small.

In total, we constructed 145 strata for every possible combination of the values of the 5 strata variables. The minimum number of observations per strata is 10, while the maximum is 270, as can be seen in figure 1.

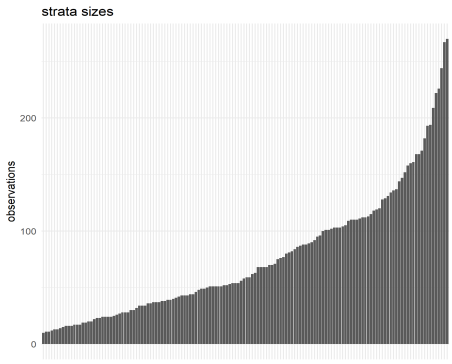

Figure 1: Strata size

However, it has to be mentioned that we had 36 observations with missing education, which we assigned randomly to the 4 groups without using strata. Further, in table 2 the distribution of covariates between the control group and the 3 treatment groups is shown. The p-value refers to the p-value of a Chi-squared test, which tests the Null-hypothesis that there are no differences between the 4 groups. We see that the p-values are large for all groups, even for those, where no

stratification has been performed.

	T1 (N=2769)	T2 (N=2766)	T3 (N=2760)	T4 (N=2755)	Total (N=11050)	p value
Gender						0.999
women	1437 (51.9%)	1434 (51.8%)	1433 (51.9%)	1434 (52.1%)	5738 (51.9%)	
men	1332 (48.1%)	1332 (48.2%)	1327 (48.1%)	1321 (47.9%)	5312 (48.1%)	
Age group						1.000
Below 35 years	831 (30.0%)	828 (29.9%)	826 (29.9%)	823 (29.9%)	3308 (29.9%)	
35 - 50 years	1062 (38.4%)	1067 (38.6%)	1064 (38.6%)	1063 (38.6%)	4256 (38.5%)	
over 50 years	876 (31.6%)	871 (31.5%)	870 (31.5%)	869 (31.5%)	3486 (31.5%)	
Education						1.000
Missing	10	9	8	9	36	
Primary	897 (32.5%)	898 (32.6%)	896 (32.6%)	891 (32.4%)	3582 (32.5%)	
Higher than primary	1862 (67.5%)	1859 (67.4%)	1856 (67.4%)	1855 (67.6%)	7432 (67.5%)	
Region						1.000
Industrieviertel	1222 (44.1%)	1225 (44.3%)	1227 (44.5%)	1219 (44.2%)	4893 (44.3%)	
Mostviertel	741 (26.8%)	731 (26.4%)	732 (26.5%)	732 (26.6%)	2936 (26.6%)	
Waldviertel	243 (8.8%)	245 (8.9%)	239 (8.7%)	241 (8.7%)	968 (8.8%)	
Weinviertel	563 (20.3%)	565 (20.4%)	562 (20.4%)	563 (20.4%)	2253 (20.4%)	
Unemp. dur.						1.000
3 - 4 Months	676 (24.4%)	675 (24.4%)	671 (24.3%)	668 (24.2%)	2690 (24.3%)	
6 - 9 Months	937 (33.8%)	937 (33.9%)	937 (33.9%)	934 (33.9%)	3745 (33.9%)	
9 - 12 Months	1156 (41.7%)	1154 (41.7%)	1152 (41.7%)	1153 (41.9%)	4615 (41.8%)	
Nationality						0.778
Missing	1	2	3	1	7	
Austria	2147 (77.6%)	2146 (77.6%)	2150 (78.0%)	2165 (78.6%)	8608 (77.9%)	
other	621 (22.4%)	618 (22.4%)	607 (22.0%)	589 (21.4%)	2435 (22.1%)	
Health						0.991
No health restriction	2185 (78.9%)	2177 (78.7%)	2168 (78.6%)	2169 (78.7%)	8699 (78.7%)	
Health restriction	584 (21.1%)	589 (21.3%)	592 (21.4%)	586 (21.3%)	2351 (21.3%)	
Marg. empl.						0.733
No	2457 (88.7%)	2479 (89.6%)	2467 (89.4%)	2463 (89.4%)	9866 (89.3%)	
Yes	312 (11.3%)	287 (10.4%)	293 (10.6%)	292 (10.6%)	1184 (10.7%)	
German						0.456
Partial or non	404 (14.6%)	403 (14.6%)	377 (13.7%)	418 (15.2%)	1602 (14.5%)	
Proficient or native	2365 (85.4%)	2363 (85.4%)	2383 (86.3%)	2337 (84.8%)	9448 (85.5%)	

Table 2: Covariate Balance Chi-squared test

We further conducted pairwise z-tests to test for differences in covariates between each of the groups separately, which can be seen in table 3. Any significant differences would be shown by a letter indicating the group to which the z-test indicated a difference. Again, we can never reject the null hypothesis that there is no difference in the covariates between each of the groups, even when compared pairwise.

	T1 (N=2769) A	T2 (N=2766) B	T3 (N=2760) C	T4 (N=2755) D
Women	51.9	51.8	51.9	52.1
Men	48.1	48.2	48.1	47.9
Below 35 years	30.0	29.9	29.9	29.9
35-50 years	38.4	38.6	38.6	38.6
Above 50 years	31.6	31.5	31.5	31.5
Primary education	32.5	32.6	32.6	32.4
Higher than primary	67.5	67.4	67.4	67.6
Industriesv.	44.1	44.3	44.5	44.2
Mostv.	26.8	26.4	26.5	26.6
Waldv.	8.8	8.9	8.7	8.7
Weinv.	20.3	20.4	20.4	20.4
2-4 Months unemp.	24.4	24.4	24.3	24.2
6-9 Months unemp.	33.8	33.9	33.9	33.9
9-12 Months unemp.	41.7	41.7	41.7	41.9
Other nationality	22.4	22.4	22.0	21.4
Austrian	77.6	77.6	78.0	78.6
No health restriction	78.9	78.7	78.6	78.7
Health restriction	21.1	21.3	21.4	21.3
No marg. empl.	88.7	89.6	89.4	89.4
Marg. empl.	111.3	10.4	10.6	10.6
Partial or no German	14.6	14.6	13.7	15.2
Proficient or native German	85.4	85.4	86.3	84.8

Table 3: Covariate Balance, pairwise z-tests

In appendix B we report the treatment assignment procedure and the balance checks for every wave separately. We do not find any substantial differences between the groups in each separate wave.

2.4.2 Intervention 2

For intervention 2, the randomization is conducted separately for those without email and shorter than 12 months unemployment duration, and for the long-term unemployed with and without email. In the second case, we stratified additionally by how the treatment was sent, i.e. via mail or post. In the first case, the sample size was too small to be able to stratify along unemployment duration within this sample. However, in the whole sample, it is then practically stratified by being unemployed for more or less than a year. In addition, we use the other stratification variables as specified in table 1 to construct strata, i.e. blocks. The treatment assignment is in a next step conducted randomly within these strata. Ideally, we would like to stratify by more variables than just the five used, but the sample size does not allow more stratification variables, because then the strata would become too small. It has also to be mentioned that 4 strata had a number of observations lower than 7, which is very small for assigning four different groups. We, therefore, excluded these strata from the stratified randomization, and assigned these 14 observations com-

pletely random to the 4 groups, alongside those observations with missing values for education (40 observations).

In total, we constructed 141 strata (excluding the 4 mentioned above) for every possible combination of the values of the 5 strata variables. The minimum number of observations per strata is 7, while the maximum is 489, as can be seen in figure 14.

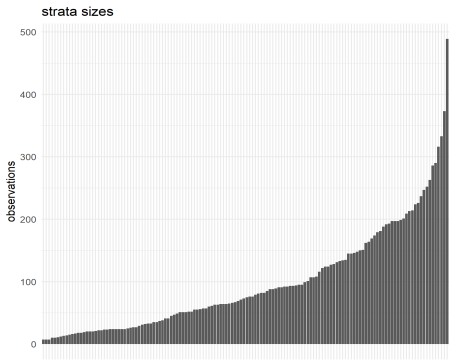

Figure 2: Strata size

In table 4 the distribution of covariates between the control group and the 3 treatment groups is shown. The p-value refers to the p-value of a Chi-squared test, which tests the Null-hypothesis that there are no differences between the 4 groups. We see that the p-values are large for all groups, even for those, where no stratification has been performed.

	T1 (N=3440)	T2 (N=3438)	T3 (N=3441)	T4 (N=3445)	Total (N=13764)	p value
Gender						0.999
women	1656 (48.1%)	1649 (48.0%)	1656 (48.1%)	1655 (48.0%)	6616 (48.1%)	
men	1784 (51.9%)	1789 (52.0%)	1785 (51.9%)	1790 (52.0%)	7148 (51.9%)	
Age group						1.000
Below 35 years	606 (17.6%)	618 (18.0%)	615 (17.9%)	616 (17.9%)	2455 (17.8%)	
35 - 50 years	1169 (34.0%)	1159 (33.7%)	1163 (33.8%)	1166 (33.8%)	4657 (33.8%)	
over 50 years	1665 (48.4%)	1661 (48.3%)	1663 (48.3%)	1663 (48.3%)	6652 (48.3%)	
Education						1.000
Missing	10	8	10	12	40	
Primary	1749 (51.0%)	1753 (51.1%)	1752 (51.1%)	1752 (51.0%)	7006 (51.0%)	
Higher than primary	1681 (49.0%)	1677 (48.9%)	1679 (48.9%)	1681 (49.0%)	6718 (49.0%)	
Region						1.000
Industrieviertel	1481 (43.1%)	1481 (43.1%)	1483 (43.1%)	1489 (43.2%)	5934 (43.1%)	
Mostviertel	904 (26.3%)	908 (26.4%)	903 (26.2%)	901 (26.2%)	3616 (26.3%)	
Waldviertel	333 (9.7%)	332 (9.7%)	332 (9.6%)	334 (9.7%)	1331 (9.7%)	
Weinviertel	722 (21.0%)	717 (20.9%)	723 (21.0%)	721 (20.9%)	2883 (20.9%)	
Unemp. dur.						0.934
3 - 4 Months	477 (13.9%)	468 (13.6%)	479 (13.9%)	472 (13.7%)	1896 (13.8%)	
6 - 9 Months	278 (8.1%)	264 (7.7%)	272 (7.9%)	253 (7.3%)	1067 (7.8%)	
9 - 12 Months	299 (8.7%)	316 (9.2%)	307 (8.9%)	334 (9.7%)	1256 (9.1%)	
more than 12 months	2386 (69.4%)	2390 (69.5%)	2383 (69.3%)	2386 (69.3%)	9545 (69.3%)	
Contact						0.998
Post	1775 (51.6%)	1770 (51.5%)	1777 (51.6%)	1781 (51.7%)	7103 (51.6%)	
Email	1665 (48.4%)	1668 (48.5%)	1664 (48.4%)	1664 (48.3%)	6661	
Nationality						0.205
Missing	9	3	7	8	27	
Austria	2514 (73.3%)	2581 (75.1%)	2533 (73.8%)	2578 (75.0%)	10206 (74.3%)	
other	917 (26.7%)	854 (24.9%)	901 (26.2%)	859 (25.0%)	3531 (25.7%)	
Health						0.839
No health restriction	2202 (64.0%)	2188 (63.6%)	2185 (63.5%)	2221 (64.5%)	8796 (63.9%)	
Health restriction	1238 (36.0%)	1250 (36.4%)	1256 (36.5%)	1224 (35.5%)	4968 (36.1%)	
Marg. empl.						0.493
No	3088 (89.8%)	3058 (88.9%)	3081 (89.5%)	3102 (90.0%)	12329 (89.6%)	
Yes	352 (10.2%)	380 (11.1%)	360 (10.5%)	343 (10.0%)	1435 (10.4%)	
German						0.329
Partial or non	857 (24.9%)	818 (23.8%)	821 (23.9%)	793 (23.0%)	3289 (23.9%)	
Proficient or native	2583 (75.1%)	2620 (76.2%)	2620 (76.1%)	2652 (77.0%)	10475 (76.1%)	

Table 4: Covariate Balance Chi-squared test

We further conducted pairwise z-tests to test for differences in covariates between each of the groups separately, which can be seen in table 5. Any significant differences would be shown by a letter indicating the group to which the z-test indicated a difference. Again, we can never reject the null hypothesis that there is no difference in the covariates between each of the groups, even when compared pairwise.

	T1 (N=2386) A	T2 (N=2390) B	T3 (N=2383) C	T4 (N=2386) D
Women	48.1	48.0	48.1	48.0
Men	51.9	52.0	51.9	52.0
Below 35 years	17.6	18.0	17.9	17.9
35-50 years	34.0	33.7	33.8	33.8
Above 50 years	48.4	48.3	48.3	48.3
Primary education	51.0	51.1	51.1	51.0
Higher than primary	51.0	51.1	51.1	51.0
Industriesv.	43.1	43.1	43.1	43.2
Mostv.	26.3	26.4	26.2	26.2
Waldv.	9.7	9.7	9.6	9.7
Weinv.	21.0	20.9	21.0	20.9
2-4 months unemp.	13.9	13.6	13.9	13.7
6-9 months unemp.	8.1	7.7	7.9	7.3
9-12 months unemp.	8.7	9.2	8.9	9.7
over 12 months unemp.	69.4	69.5	69.3	69.3
Post	51.6	51.5	51.6	51.7
Mail	48.4	48.5	48.4	48.3
Other nationality	26.7	24.9	26.2	25.0
Austrian	73.3	75.1	73.8	75.0
No health restriction	64.0	63.6	63.5	64.5
Health restriction	36.0	36.4	36.5	35.5
No marg. empl.	89.8	88.9	89.5	90.0
Marg. empl.	10.2	11.1	10.5	10.0
Partial or no German	24.9	23.8	23.9	23.0
Proficient or native German	75.1	76.2	76.1	77.0

Table 5: Covariate Balance, pairwise z-tests

In appendix B we report the treatment assignment procedure and the balance checks for the two subsamples separately. We do not find any substantial differences between the groups in each separate sample.

2.5 Hypotheses

2.5.1 Intervention 1

We have several hypotheses regarding the different treatment groups and different outcome variables:

1. *Group 2-4* will achieve higher *training program take-up* and *completion rates* than the *control group*, but *groups 3 and 4* will have even higher take-up and completion rates than *group 2*.

2. We expect negative short-term effects (due to the so-called lock-in effects) on *unemployment*

duration for *group 2-4*, which however will turn positive for all treatment groups in the long-term.

3. Further, *re-employment rates* will be highest in *group 4*, followed by *group 3, 2*, and lastly the *control group*.

4. Finally, *job quality* will follow the same pattern as re-employment rates, but probably less pronounced.

Training program take-up and completion rate The first hypothesis follows from studies, such as Doerr and Strittmatter (2018). They show that motivation to take-up and complete courses increases with voucher systems, due to increased perceived autonomy, reciprocity and higher valuation of financial costs of such programs. In turn, voucher systems lead to less drop-out from courses. Finally, *group 2* is expected to exhibit higher training program take-up rates than the *control group*, because they are informed about the positive effects of training and therefore nudged towards training program participation.

Unemployment duration As described above, negative short-term effects on unemployment duration are relatively well-established in the literature and we therefore expect them as well in our setting; however smaller in size due to limited job vaccancies as a result of the Covid-19 crisis. Further, these negative short-term effects turn into positive long-term effects on unemployment duration, as shown the literature about effects of training for the unemployed with and without vouchers (Card, Kluve, and Weber, 2018; Doerr and Strittmatter, 2018).

Re-employment rates The third hypothesis follows directly from the variation in training participation between the groups. In addition, *group 4* is expected to have higher re-employment rates because of the additional labour market information received. This information treatment is expected to counter the problem of asymmetric information with training vouchers, well established in the literature (Perez-Johnson, Moore, Santillano, et al., 2011; Strittmatter, 2016), and could therefore lead to better targeted training choices.

Job Quality The indicator for job quality, described in more detail below, consists of information about earnings in the job after the unemployment spell and the stability of employment. Earnings should follow the same pattern as re-employment rates due to the variation in training participation and the additional information in *group 4*. However, the effects on earnings are often less pronounced and clear-cut than those on re-employment (Card, Kluve, and Weber, 2018). There is not much evidence for the effect on employment stability, but we expect it to follow the same pattern as earnings.

2.5.2 Intervention 2

We do not have clear hypotheses for the second intervention. A related study in France finds increased callback rates for information treatments, but no statistically significant treatment effects on training enrolment (Dhia and Mbih, 2020). They further find increased callback rates for messages targeting registration simplicity and training returns. However, it is not clear how these results extend to our study, due to different institutional settings, time period, and national context. We will thus rely on our pre-intervention survey to formulate possible hypotheses. Nevertheless, we expect less differences between the groups in intervention 2 than in intervention 1, as the conditions are only marginally different from each other in intervention 2.

2.6 Outcomes of interest

All data on outcomes of interest are available from administrative data sources, provided by the PES.

Primary outcomes Our three primary outcomes are training completion, labor market status, and job quality. The first one refers to whether or not a course/training program is completed. The second one differentiates between: unemployed, employed, out-of-labor force. We can, thus, differentiate between people exiting unemployment because they found a job and those exiting unemployment, because they dropped out of the labor force. This differentiation is important for drawing conclusions from the findings. Finally, job quality is important, which we proxy by combining earnings and employment stability into an indicator. Employment stability is defined via the duration of the employment spell after unemployment, independent of the specific job. This means, job-to-job transitions still count as employment, but job-to-unemployment transitions do not. We first normalize both variables and then combine them with equal weight to construct the job quality indicator. However, job quality is only observed for those who actually found a job. Therefore, we provide estimates for effects on job quality conditional on finding a job, but also for effects on the probability of having an above-average job quality indicator. The latter can account for this inherent endogeneity (Rothstein and Von Wachter, 2017).

Secondary outcomes The following secondary outcomes are not per se desired outcomes, but can be seen as mechanisms leading to the primary outcomes described above. In this context we will look at whether or not the email was read, newsletter clicks, who responded to the PES via phone or mail, contacts with the PES caseworker, and course take-up. We will differentiate by the type of course to check whether the intervention also changes training choices.

2.7 Estimation and inference

Due to the clean randomization of participants into *control and treatment groups* it is possible to, in a first step, compare the relevant outcome variables directly between the 4 groups via a two-sided test, such as a T-test or Mann-Whitney test or others, which will be chosen depending on the distribution of the outcome variables (Moffatt, 2019). This will provide us with an unbiased estimate of the treatment effect that does not hinge on any assumptions other than the random assignment into the groups. Throughout the whole study, we will infer statistical significance via a p-value of 0.05 or below, thus using a 95% confidence interval.
To increase precision and test robustness we will additionally estimate parametric regressions for the treatment effects using the following estimation regression:

$$Y_i = \beta_0 + \beta_1 T_2 + \beta_2 T_3 + \beta_3 T_4 + \mathbf{X_i} + s_i + \epsilon_i \tag{1}$$

where Y_i refers to the interesting outcome variables for individual i. Depending on the scale of the outcome variable, an OLS(continuous) or a Logit(binary) regression is used. Our outcome variables are measured at different time periods and for each time period a separate regression is estimated to measure time-varying treatment effects. In the baseline specification the *control group* is the reference group, but depending on which difference between groups has to be estimated, the reference group will be chosen accordingly. T_2 to T_4 refer to the treatment groups as described above for both interventions. Additionally, we will estimate the effect of just receiving an email by combining all treatment group dummies of intervention 1 into one in equation 1. Further, we include all control variables specified in table 1 that were not used for stratification and measured before treatment, which is represented by $\mathbf{X_i}$ in the specification above. s_i indicates binary strata dummies for all stratas used in the randomization. Finally, standard errors will be adjusted to be

robust to heteroskedasticity, if necessary. The regression will be estimated such that stratification is taken into account when computing the variance and standard errors of the estimates, following Athey and Imbens (2017).
Finally, the specified regression can also be estimated conditional on reading the email, which allows us to estimate the average treatment effect on the treated as opposed to the intention-to-treat effect described above. However, this is only possible for those who received the newsletter via email. This estimate refers to the effect of the intervention for those, who actually open the email, which reduces noise from the specification introduced by those, who do not receive the intervention, because they do not open the email. However, those who open the email may differ systematically from those who do not open the email, which has to be kept in mind when interpreting these treatment effects on the treated.

Heterogeneity analysis The heterogeneity analysis will be conducted via subgroup regressions of the equation above for the variables specified in table 1. Additionally, the treatment dummies in the equation above can be interacted with the pre-specified variables in table 1 and estimated for the relevant heterogeneity variables separately.

Multiple outcomes adjustment To control the false discovery rate in conjunction with multiple hypotheses testing we will take two approaches. First, for the treatment effects on the primary outcome variables, we will report the mean standardized treatment effect with it's standard error adjusted for the dependency between the different outcome variables, following Duflo, Glennerster, and Kremer (2007). Further, we will use the Benjamini-Hochberg procedure (Romano, Shaikh, and Wolf, 2010) for the primary outcomes as well as the heterogeneity analysis, which works as follows. Sort the p-values, for each of the m hypotheses, tested by size, resulting in ordered values $P_{(j)}$. For a critical value α, find the largest value k such that

$$P_{(k)} \leq \frac{k}{m}\alpha.$$

Reject the null hypothesis for all $i = 1, \ldots, k$.

3 Publication agreement

This evaluation is based on an agreement between the researchers (i.e. Lukas Lehner and Anna Schwarz) and the *AMS NÖ*. Two key components of this agreement are that *(1) the researchers carry out the study independently and without interference by the AMS NÖ*, and *(2) the researchers are guaranteed to be entitled to publish the findings of their study in academic outlets without any interference by the AMS NÖ*. The *AMS NÖ* may publish the results of the study in mass media as well as the *AMS research network* at any time.

4 IRB approval

The experimental work described in this pre-analysis plan was reviewed and approved by the Departmental Research Ethics Committee at the Department of Social Policy and Intervention, University of Oxford and by the Competence Center for Experimental Research at the Vienna University of Economics and Business.

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A Appendix: Treatment

Figure 3: Voucher for groups 3 and 4

Bei Darstellungsproblemen klicken Sie hier.

Ihr Weg zum beruflichen Neustart

Sehr geehrte Damen und Herren,

auch jetzt in Zeiten der Krise gibt es nachgefragte Berufe und Qualifikationen mit Zukunft. Die Corona-Joboffensive bietet Ihnen die Möglichkeit, neue Qualifikationen zu erwerben, die Ihnen den Wiedereinstieg ins Berufsleben ermöglichen.

Darum lade ich Sie ganz persönlich ein: Nutzen Sie Ihre Chancen zum beruflichen Neustart mit einer Aus- oder Weiterbildung! Finden Sie gemeinsam mit Ihrer AMS-Beraterin oder Ihrem Berater den für Sie richtigen Weg zurück ins Berufsleben! In diesem Mail zeigen wir Ihnen, wie Ihr beruflicher Neustart gelingen kann.

Nehmen Sie Ihre berufliche Zukunft in die Hand – und bleiben Sie gesund!

Ihr

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Landesgeschäftsführer des AMS Niederösterreich

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Figure 4: Newsletter for group 2

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- Berufskraftfahrer/in
- Finanz- und Rechnungswesenassistenz
- Diplomlehrgang Digitaler Vertrieb
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Oder Sie schreiben uns ein E-Mail.

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Figure 5: Newsletter for group 3

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Nehmen Sie Ihre berufliche Zukunft in die Hand – und bleiben Sie gesund!

Ihr

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Landesgeschäftsführer des AMS Niederösterreich

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- Restaurantfachkraft, Hotel- und Gastgewerbeassistent/in
- Berufskraftfahrer/in
- Finanz- und Rechnungswesenassistenz
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- Pflegeassistenz, Pflegefachassistenz

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- **Dipl. Krankenpfleger, -schwestern**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **229**
- **Kraftfahrer/innen (alle Bereiche)**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **228**
- **Maurer/innen**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **170**
- **Techniker/innen für Datenverarbeitung**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **159**
- **Rohrinstallateur(e)innen, -monteur(e)innen**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **157**
- **Hotel- und Gaststättenberufe**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **132**
- **Techniker/innen für Maschinenbau**
  beim AMS NÖ gemeldete offene Stellen im Jänner: **117**
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  beim AMS NÖ gemeldete offene Stellen im Jänner: **110**
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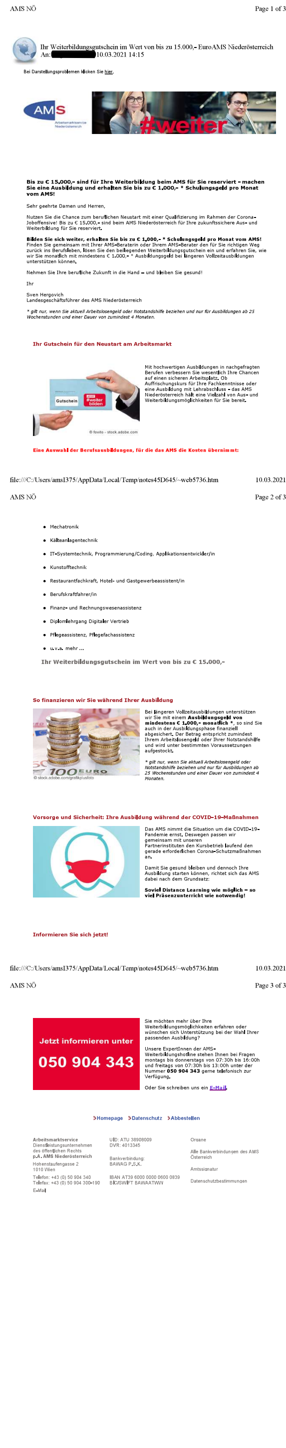
Vorsorge und Sicherheit: Ihre Ausbildung während der COVID-19-Maßnahmen

Figure 6: Newsletter for group 4



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An:[redacted]10.03.2021 14:15

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Ihr

Sven Hergovich
Landesgeschäftsführer des AMS Niederösterreich

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- Mechatronik
- Kälteanlagentechnik
- IT-Systemtechnik, Programmierung/Coding, Applikationsentwickler/in
- Kunstofftechnik
- Restaurantfachkraft, Hotel- und Gastgewerbeassistent/in
- Berufskraftfahrer/in
- Finanz- und Rechnungswesenassistenz
- Diplomlehrgang Digitaler Vertrieb
- Pflegeassistenz, Pflegefachassistenz
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Figure 7: Newsletter for group 2, intervention 2

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Ihr

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Landesgeschäftsführer des AMS Niederösterreich

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AMS NÖ Page 2 of 3

- IT-Systemtechnik, Programmierung/Coding, Applikationsentwickler/in
- Kunstofftechnik
- Restaurantfachkraft, Hotel- und Gastgewerbeassistent/in
- Berufskraftfahrer/in
- Finanz- und Rechnungswesenassistenz
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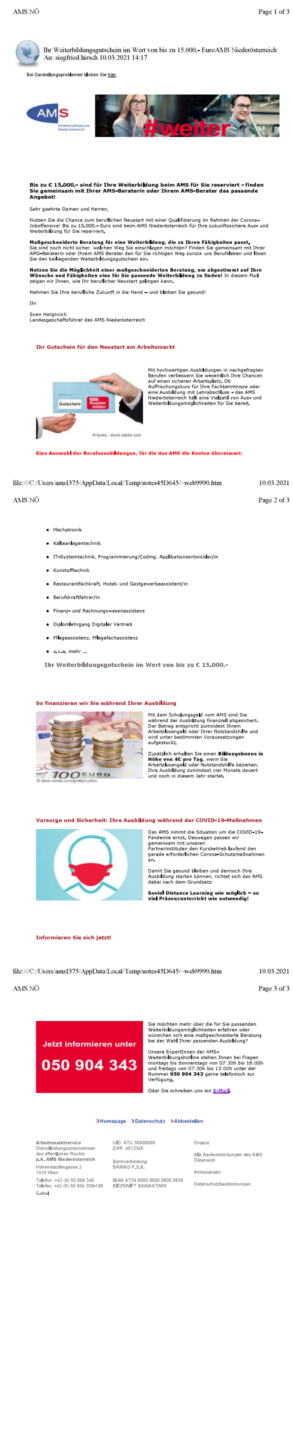
Figure 8: Newsletter for group 3, intervention 2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Maßgeschneiderte Beratung für eine Weiterbildung, die zu Ihren Fähigkeiten passt.
Sie sind noch nicht sicher, welchen Weg Sie einschlagen möchten? Finden Sie gemeinsam mit Ihrer AMS-Beraterin oder Ihrem AMS Berater den für Sie richtigen Weg zurück uns Berufsleben und lösen Sie den beiliegenden Weiterbildungsgutschein ein.

Nutzen Sie die Möglichkeit einer maßgeschneiderten Beratung, um abgestimmt auf Ihre Wünsche und Fähigkeiten eine für Sie passende Weiterbildung zu finden! In diesem Mail zeigen wir Ihnen, wie Ihr beruflicher Neustart gelingen kann.

Nehmen Sie Ihre berufliche Zukunft in die Hand – und bleiben Sie gesund!

Ihr

Sven Hergovich
Landesgeschäftsführer des AMS Niederösterreich

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Damit Sie gesund bleiben und dennoch Ihre Ausbildung starten können, richtet sich das AMS dabei nach dem Grundsatz:

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Sie möchten mehr über die für Sie passenden Weiterbildungsmöglichkeiten erfahren oder wünschen sich eine maßgeschneiderte Beratung bei der Wahl Ihrer passenden Ausbildung?

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Figure 9: Newsletter for group 4, intervention 2

B Appendix: Treatment Assignment

First Wave For the first wave, the result of the randomization is as follows. 48 strata were constructed, with a minimum of 10 observations and a maximum of 226, as can be seen in figure 10.

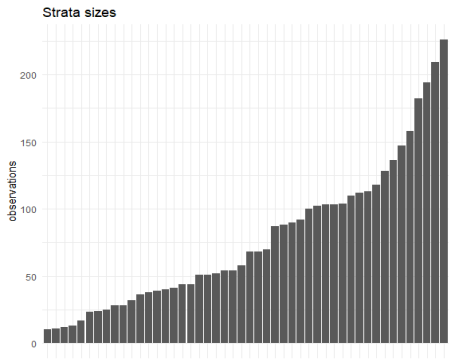

Figure 10: Strata size in Wave 1

However, it has to be mentioned that we had 7 observations with missing education, which we assigned completely random to the 4 groups. Further, in table 6 the distribution of covariates between the control group and the 3 treatment groups is shown. The p-value refers to the p-value of a Chi-squared test, which tests the Null-hypothesis that there are no differences between the 4 groups. We see that the p-values are large for all groups, even for those, where no stratification has been performed.

	T1 (N=937)	T2 (N=937)	T3 (N=937)	T4 (N=934)	Total (N=3745)	p value
Gender						0.998
women	497 (53.0%)	493 (52.6%)	495 (52.8%)	493 (52.8%)	1978 (52.8%)	
men	440 (47.0%)	444 (47.4%)	442 (47.2%)	441 (47.2%)	1767 (47.2%)	
Age group						1.000
below 35 years	283 (30.2%)	285 (30.4%)	284 (30.3%)	284 (30.4%)	1136 (30.3%)	
35 - 50 years	355 (37.9%)	355 (37.9%)	355 (37.9%)	354 (37.9%)	1419 (37.9%)	
over 50 years	299 (31.9%)	297 (31.7%)	298 (31.8%)	296 (31.7%)	1190 (31.8%)	
Education						0.996
Missing	3	1	1	2	7	
Primary	293 (31.4%)	298 (31.8%)	297 (31.7%)	293 (31.4%)	1181 (31.6%)	
Higher than primary	641 (68.6%)	638 (68.2%)	639 (68.3%)	639 (68.6%)	2557 (68.4%)	
Region						1.000
Industrieviertel	417 (44.5%)	418 (44.6%)	420 (44.8%)	419 (44.9%)	1674 (44.7%)	
Mostviertel	247 (26.4%)	244 (26.0%)	243 (25.9%)	244 (26.1%)	978 (26.1%)	
Waldviertel	77 (8.2%)	81 (8.6%)	78 (8.3%)	78 (8.4%)	314 (8.4%)	
Weinviertel	196 (20.9%)	194 (20.7%)	196 (20.9%)	193 (20.7%)	779 (20.8%)	
Nationality						0.885
Missing	0	2	2	1	5	
Austria	728 (77.7%)	737 (78.8%)	738 (78.9%)	727 (77.9%)	2930 (78.3%)	
Other nationality	209 (22.3%)	198 (21.2%)	197 (21.1%)	206 (22.1%)	810 (21.7%)	
Health						0.756
No health restriction	724 (77.3%)	733 (78.2%)	721 (76.9%)	736 (78.8%)	2914 (77.8%)	
Health restriction	213 (22.7%)	204 (21.8%)	216 (23.1%)	198 (21.2%)	831 (22.2%)	
Marg. empl.						0.843
No	837 (89.3%)	848 (90.5%)	840 (89.6%)	836 (89.5%)	3361 (89.7%)	
Yes	100 (10.7%)	89 (9.5%)	97 (10.4%)	98 (10.5%)	384 (10.3%)	
German						0.411
Partial or non	143 (15.3%)	134 (14.3%)	127 (13.6%)	151 (16.2%)	555 (14.8%)	
Proficient or native	794 (84.7%)	803 (85.7%)	810 (86.4%)	783 (83.8%)	3190 (85.2%)	

Table 6: Covariate Balance Chi-squared test Wave 1

We further conducted pairwise z-tests to test for differences in covariates between each of the groups separately, which can be seen in table 7. Any significant differences would be shown by a letter indicating the group to which the z-test indicated a difference. Again, we can never reject the null hypothesis that there is no difference in the covariates between each of the groups, even when compared pairwise.

	T1 (N=937) A	T2 (N=937) B	T3 (N=937) C	T4 (N=934) D
Women	53.0	52.6	52.8	52.8
Men	47.0	47.4	47.2	47.2
Below 35 years	30.2	30.4	30.3	30.4
35-50 years	37.9	37.9	37.9	37.9
Above 50 years	31.9	31.7	31.8	31.7
Primary education	31.4	31.8	31.7	31.4
Higher than primary	68.6	68.2	68.3	68.6
Industriesv.	44.5	44.6	44.8	44.9
Mostv.	26.4	26.0	25.9	26.1
Waldv.	8.2	8.6	8.3	8.4
Weinv.	20.9	20.7	20.9	20.7
Other nationality	22.3	21.2	21.1	22.1
Austrian	77.7	78.8	78.9	77.9
No health restriction	77.3	78.2	76.9	78.8
Health restriction	22.7	21.8	23.1	21.2
No marg. empl.	89.3	90.5	89.6	89.5
Marg. empl.	10.7	9.5	10.4	10.5
Partial or no German	15.3	14.3	13.6	16.2
Proficient or native German	84.7	85.7	86.4	83.8

Table 7: Covariate Balance, pairwise z-tests Wave 1

Second Wave For the second wave, the result of the randomization is as follows. 49 strata were constructed, with a minimum of 13 observations and a maximum of 217, as can be seen in figure 11.

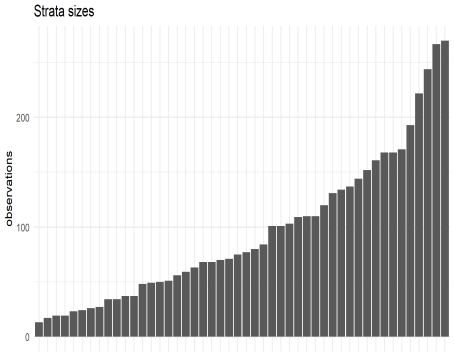

Figure 11: Strata size in Wave 2

Again, we had 18 missing values in education, which were assigned to the groups completely random. Table 8 again shows the results from Chi-squared tests of differences between the 4

groups. As in the first wave, the p-values are large, even in those groups where no stratification could be performed.

	T1 (N=1156)	T2 (N=1154)	T3 (N=1152)	T4 (N=1153)	Total (N=4615)	p value
Gender						0.993
women	594 (51.4%)	596 (51.6%)	593 (51.5%)	599 (52.0%)	2382 (51.6%)	
men	562 (48.6%)	558 (48.4%)	559 (48.5%)	554 (48.0%)	2233 (48.4%)	
Age group						1.000
below 35 years	329 (28.5%)	325 (28.2%)	326 (28.3%)	325 (28.2%)	1305 (28.3%)	
35 - 50 years	441 (38.1%)	446 (38.6%)	443 (38.5%)	445 (38.6%)	1775 (38.5%)	
over 50 years	386 (33.4%)	383 (33.2%)	383 (33.2%)	383 (33.2%)	1535 (33.3%)	
Education						1.000
Missing	4	5	4	5	18	
Primary	384 (33.3%)	382 (33.2%)	384 (33.4%)	382 (33.3%)	1532 (33.3%)	
Higher than primary	768 (66.7%)	767 (66.8%)	764 (66.6%)	766 (66.7%)	3065 (66.7%)	
Region						1.000
Industrieviertel	516 (44.6%)	517 (44.8%)	519 (45.1%)	516 (44.8%)	2068 (44.8%)	
Mostviertel	305 (26.4%)	301 (26.1%)	303 (26.3%)	300 (26.0%)	1209 (26.2%)	
Waaldviertel	89 (7.7%)	89 (7.7%)	86 (7.5%)	90 (7.8%)	354 (7.7%)	
Weinviertel	246 (21.3%)	247 (21.4%)	244 (21.2%)	247 (21.4%)	984 (21.3%)	
Nationality						0.794
Missing	1	0	1	0	2	
Austria	912 (79.0%)	907 (78.6%)	896 (77.8%)	917 (79.5%)	3632 (78.7%)	
Other	243 (21.0%)	247 (21.4%)	255 (22.2%)	236 (20.5%)	981 (21.3%)	
Health						0.985
No health restriction	904 (78.2%)	900 (78.0%)	901 (78.2%)	895 (77.6%)	3600 (78.0%)	
Health restriction	252 (21.8%)	254 (22.0%)	251 (21.8%)	258 (22.4%)	1015 (22.0%)	
Marg. empl.						0.734
No	988 (85.5%)	1002 (86.8%)	1001 (86.9%)	995 (86.3%)	3986 (86.4%)	
Yes	168 (14.5%)	152 (13.2%)	151 (13.1%)	158 (13.7%)	629 (13.6%)	
German						0.683
Partial or non	162 (14.0%)	160 (13.9%)	148 (12.8%)	168 (14.6%)	638 (13.8%)	
Proficient or native	994 (86.0%)	994 (86.1%)	1004 (87.2%)	985 (85.4%)	3977 (86.2%)	

Table 8: Covariate Balance Chi-squared test Wave 2

Finally, table 9 shows the results of the pairwise z-tests, where, again, no differences for any covariate between any groups can be found.

	T1 (N=1156) A	T2 (N=1154) B	T3 (N=1152) C	T4 (N=1153) D
Women	51.4	51.6	51.5	52.0
Men	48.6	48.4	48.5	48.0
Below 35 years	28.5	28.2	28.3	28.2
35-50 years	38.1	38.6	38.5	38.6
Above 50 years	33.4	33.2	33.2	33.2
Primary education	33.3	33.2	33.4	33.3
Higher than primary	66.7	66.8	66.6	66.7
Industriev.	44.6	44.8	45.1	44.8
Mostv.	26.4	26.1	26.3	26.0
Waldv.	7.7	7.7	7.5	7.8
Weinv.	21.3	21.4	21.2	21.4
Other nationality	21.0	21.4	22.2	20.5
Austrian	79.0	78.6	77.8	79.5
No health restriction	78.2	78.0	78.2	77.6
Health restriction	21.8	22.0	21.8	22.4
No marg. empl.	85.5	86.8	86.9	86.3
Marg. empl.	14.5	13.2	13.1	13.7
Partial or no German	14.0	13.9	12.8	14.6
Proficient or no German	86.0	86.1	87.2	85.4

Table 9: Covariate Balance, pairwise z-tests Wave 2

Third Wave For the third wave, the result of the randomization is as follows. 49 strata were constructed, with a minimum of 11 observations and a maximum of 160, as can be seen in figure 12.

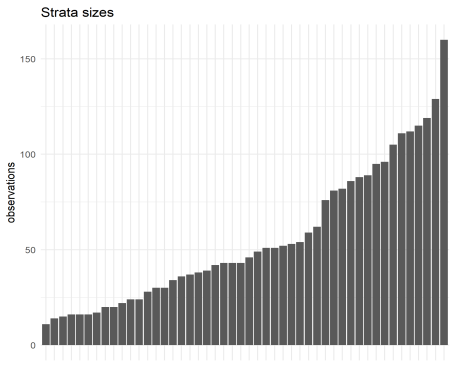

Figure 12: Strata size in Wave 3

Again, we had 11 missing values in education), which were assigned to the groups completely random. Table 10 shows the results from Chi-squared tests of differences between the 4 groups.

As in the other waves, the p-values are large, even in those groups where no stratification could be performed.

	T1 (N=676)	T2 (N=675)	T3 (N=671)	T4 (N=668)	Total (N=2690)	p value
Gender						1.000
women	346 (51.2%)	345 (51.1%)	345 (51.4%)	342 (51.2%)	1378 (51.2%)	
men	330 (48.8%)	330 (48.9%)	326 (48.6%)	326 (48.8%)	1312 (48.8%)	
Age group						1.000
below 35 years	219 (32.4%)	218 (32.3%)	216 (32.2%)	214 (32.0%)	867(32.2%)	
35 - 50 years	266 (39.3%)	266 (39.4%)	266 (39.6%)	264 (39.5%)	1062(39.5%)	
over 50 years	191 (28.3%)	191 (28.3%)	189 (28.2%)	190 (28.4%)	761 (28.3%)	
Education						0.998
Missing	3	3	3	2	11	
Primary	220 (32.7%)	218 (32.4%)	215 (32.2%)	216 (32.4%)	869 (32.4%)	
Higher than primary	453 (67.3%)	454 (67.6%)	453 (67.8%)	450 (67.6%)	1810 (67.6%)	
Region						1.000
Industrieviertel	289 (42.8%)	290 (43.0%)	288 (42.9%)	284 (42.5%)	1151(42.8%)	
Mostviertel	189 (28.0%)	186 (27.6%)	186 (27.7%)	188 (28.1%)	749(27.8%)	
Waldviertel	77 (11.4%)	75 (11.1%)	75 (11.2%)	73 (10.9%)	300(11.2%)	
Weinviertel	121 (17.9%)	124 (18.4%)	122 (18.2%)	123 (18.4%)	490(18.2%)	
Nationality						0.375
Austria	507 (75.0%)	502 (74.4%)	516 (76.9%)	521 (78.0%)	2046 (76.1%)	
Other	169 (25.0%)	173 (25.6%)	155 (23.1%)	147 (22.0%)	644 (23.9%)	
Health						0.801
No health restriction	557 (82.4%)	544 (80.6%)	546 (81.4%)	538 (80.5%)	2185 (81.2%)	
Health restriction	119 (17.6%)	131 (19.4%)	125 (18.6%)	130 (19.5%)	505 (18.8%)	
Marg. empl.						0.693
No	632 (93.5%)	629 (93.2%)	626 (93.3%)	632 (94.6%)	2519 (93.6%)	
Yes	44 (6.5%)	46 (6.8%)	45 (6.7%)	36 (5.4%)	171 (6.4%)	
German						0.872
Partial or non	99 (14.6%)	109 (16.1%)	102 (15.2%)	99 (14.8%)	409 (15.2%)	
Proficient or native	577 (85.4%)	566 (83.9%)	569 (84.8%)	569 (85.2%)	2281 (84.8%)	

Table 10: Covariate Balance Chi-squared test Wave 3

Finally, table 11 shows the results of the pairwise z-tests, where, again, no differences for any covariate between any groups can be found.

	T1 (N=676) A	T2 (N=675) B	T3 (N=671) C	T4 (N=668) D
Women	51.9	51.8	51.9	52.1
Men	48.1	48.2	48.1	47.9
Below 35 years	30.0	29.9	29.9	29.9
35-50 years	38.4	38.6	38.6	38.6
Above 50 years	31.6	31.5	31.5	31.5
Primary education	32.5	32.6	32.6	32.4
Higher than primary	67.5	67.4	67.4	67.6
Industriev.	44.1	44.3	44.5	44.2
Mostv.	26.8	26.4	26.5	26.6
Waldv.	8.8	8.9	8.7	8.7
Weinv.	20.3	20.4	20.4	20.4
Other nationality	22.4	22.4	22.0	21.4
Austrian	77.6	77.6	78.0	78.6
No health restriction	78.9	78.7	78.6	78.7
Health restriction	21.1	21.3	21.4	21.3
No marg. empl.	88.7	89.6	89.4	89.4
Marg. empl.	11.3	10.4	10.6	10.6
Partial or no German	14.6	14.6	13.7	15.2
Proficient or no German	85.4	85.4	86.3	84.8

Table 11: Covariate Balance, pairwise z-tests Wave 3

shorter-term unemployed without email For the this sample, the result of the randomization is as follows. 49 strata were constructed, with a minimum of 7 observations and a maximum of 286, as can be seen in figure 13.

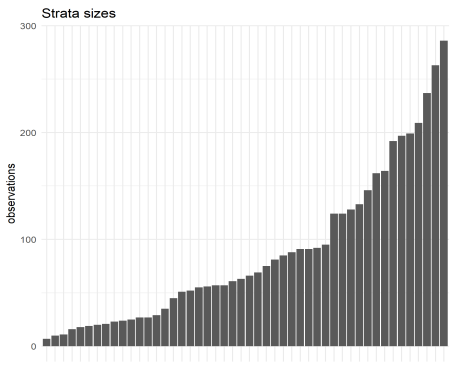

Figure 13: Strata size in Wave 4

Again, we had 13 missing values in education), which were assigned to the groups completely random. Table 12 shows the results from Chi-squared tests of differences between the 4 groups.

As in the other waves, the p-values are large, even in those groups where no stratification could be performed.

	(N=1054)	T2 (N=1048)	T3 (N=1058)	T4 (N=1059)	Total (N=4219)	p value
Gender						0.999
women	501 (47.5%)	497 (47.4%)	505 (47.7%)	504 (47.6%)	2007 (47.6%)	
men	553 (52.5%)	551 (52.6%)	553 (52.3%)	555 (52.4%)	2212 (52.4%)	
Age group						1.000
below 35 years	123 (11.7%)	125 (11.9%)	125 (11.8%)	127 (12.0%)	500 (11.9%)	
35 - 50 years	347 (32.9%)	344 (32.8%)	349 (33.0%)	350 (33.1%)	1390 (32.9%)	
over 50 years	584 (55.4%)	579 (55.2%)	584 (55.2%)	582 (55.0%)	2329 (55.2%)	
Education						0.997
Missing	4	3	3	3	13	
Primary	686 (65.3%)	687 (65.7%)	690 (65.4%)	690 (65.3%)	2753 (65.5%)	
Higher than primary	364 (34.7%)	358 (34.3%)	365 (34.6%)	366 (34.7%)	1453 (34.5%)	
Region						1.000
Industrieviertel	415 (39.4%)	414 (39.5%)	417 (39.4%)	416 (39.3%)	1662 (39.4%)	
Mostviertel	302 (28.7%)	302 (28.8%)	303 (28.6%)	302 (28.5%)	1209 (28.7%)	
Waldviertel	135 (12.8%)	132 (12.6%)	134 (12.7%)	135 (12.7%)	536 (12.7%)	
Weinviertel	202 (19.2%)	200 (19.1%)	204 (19.3%)	206 (19.5%)	812 (19.2%)	
Unemp. dur.						0.737
3 - 4 Months	477 (45.3%)	468 (44.7%)	479 (45.3%)	472 (44.6%)	1896 (44.9%)	
6 - 9 Months	278 (26.4%)	264 (25.2%)	272 (25.7%)	253 (23.9%)	1067 (25.3%)	
9 - 12 Months 299 (28.4%)	316 (30.2%)	307 (29.0%)	334 (31.5%)	1256 (29.8%)		
Nationality						0.334
Missing	3	0	3	2	8	
Austria	673 (64.0%)	708 (67.6%)	707 (67.0%)	697 (65.9%)	2785 (66.1%)	
Other	378 (36.0%)	340 (32.4%)	348 (33.0%)	360 (34.1%)	1426 (33.9%)	
Health						0.777
No health restriction	655 (62.1%)	672 (64.1%)	659 (62.3%)	664 (62.7%)	2650 (62.8%)	
Health restriction	399 (37.9%)	376 (35.9%)	399 (37.7%)	395 (37.3%)	1569 (37.2%)	
Marg. empl.						0.179
No	956 (90.7%)	951 (90.7%)	963 (91.0%)	985 (93.0%)	3855 (91.4%)	
Yes	98 (9.3%)	97 (9.3%)	95 (9.0%)	74 (7.0%)	364 (8.6%)	
German						0.269
Partial or non	383 (36.3%)	343 (32.7%)	360 (34.0%)	348 (32.9%)	1434 (34.0%)	
Proficient or native	671 (63.7%)	705 (67.3%)	698 (66.0%)	711 (67.1%)	2785 (66.0%)	

Table 12: Covariate Balance Chi-squared test

Finally, table 13 shows the results of the pairwise z-tests, where, again, no differences for any covariate between any groups can be found.

	T1 (N=1054) A	T2 (N=1048) B	T3 (N=1058) C	T4 (N=1059) D
Women	47.5	47.4	47.7	47.6
Men	52.5	52.6	52.3	52.4
Below 35 years	11.7	11.9	11.8	12.0
35-50 years	32.9	32.8	33.0	33.1
Above 50 years	55.4	55.2	55.2	55.0
Primary education	65.3	65.7	65.4	65.3
Higher than primary	34.7	34.3	34.6	34.7
Industriev.	39.4	39.5	39.4	39.3
Mostv.	28.7	28.8	28.6	28.5
Waldv.	12.8	12.6	12.7	12.7
Weinv.	19.2	19.1	19.3	19.5
3 - 4 Months unemp.	45.3	44.7	45.3	44.6
6 - 9 Months unemp.	26.4	25.2	25.7	23.9
9 - 12 Months unemp.	28.4	30.2	29.0	31.5
Other nationality	36.0	32.4	33.0	34.1
Austrian	64.0	67.6	67.0	65.9
No health restriction	62.1	64.1	62.3	62.7
Health restriction	37.9	35.9	37.7	37.3
No marg. empl.	90.7	90.7	91.0	93.0
Marg. empl.	9.3	9.3	9.0	7.0
Partial or no German	36.3	32.7	34.0	32.9
Proficient or no German	63.7	67.3	66.0	67.1

Table 13: Covariate Balance, pairwise z-tests

Long-term unemployed with and without email In this sample, we stratified by how the treatment was sent, i.e. via mail or post. We do not have to stratify by unemployment duration, as we only have one category in this sample, i.e. longer than 12 months. In addition, we use the other stratification variables as specified in table 1 to construct strata, i.e. blocks. The treatment assignment is in a next step conducted randomly within these strata. Ideally, we would like to stratify by more variables than just the five used, but the sample size does not allow more stratification variables, because then the strata would become too small. It has also to be mentioned that 4 strata had a number of observations lower than 7, which is very small for assigning four different groups. We, therefore, excluded these strata from the stratified randomization, and assigned these 14 observations completely random to the 4 groups, alongside those observations with missing values for education (27 observations).

In total, we constructed 93 strata (excluding the 4 mentioned above) for every possible combination of the values of the 5 strata variables. The minimum number of observations per strata is 7, while the maximum is 489, as can be seen in figure **??**.

In table 14 the distribution of covariates between the control group and the 3 treatment groups is shown. The p-value refers to the p-value of a Chi-squared test, which tests the Null-hypothesis

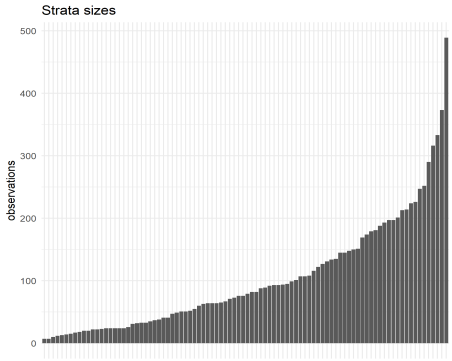

Figure 14: Strata size

that there are no differences between the 4 groups. We see that the p-values are large for all groups, even for those, where no stratification has been performed.

	T1 (N=2386)	T2 (N=2390)	T3 (N=2383)	T4 (N=2386)	Total (N=9545)	p value
Gender						0.999
women	1155 (48.4%)	1152 (48.2%)	1151 (48.3%)	1151 (48.2%)	4609 (48.3%)	
men	1231 (51.6%)	1238 (51.8%)	1232 (51.7%)	1235 (51.8%)	4936 (51.7%)	
Age group						1.000
Below 35 years	483 (20.2%)	493 (20.6%)	490 (20.6%)	489 (20.5%)	1955 (20.5%)	
35 - 50 years	822 (34.5%)	815 (34.1%)	814 (34.2%)	816 (34.2%)	3267 (34.2%)	
over 50 years	1081 (45.3%)	1082 (45.3%)	1079 (45.3%)	1081 (45.3%)	4323 (45.3%)	
Education						1.000
Missing	6	5	7	9	27	
Primary	1063 (44.7%)	1066 (44.7%)	1062 (44.7%)	1062 (44.7%)	4253 (44.7%)	
Higher than primary	1317 (55.3%)	1319 (55.3%)	1314 (55.3%)	1315 (55.3%)	5265 (55.3%)	
Region						1.000
Industrieviertel	1066 (44.7%)	1067 (44.6%)	1066 (44.7%)	1073 (45.0%)	4272 (44.8%)	
Mostviertel	602 (25.2%)	606 (25.4%)	600 (25.2%)	599 (25.1%)	2407 (25.2%)	
Waldviertel	198 (8.3%)	200 (8.4%)	198 (8.3%)	199 (8.3%)	795 (8.3%)	
Weinviertel	520 (21.8%)	517 (21.6%)	519 (21.8%)	515 (21.6%)	2071 (21.7%)	
Contact						1.000
Post	721 (30.2%)	722 (30.2%)	719 (30.2%)	722 (30.3%)	2884 (30.2%)	
Email	1665 (69.8%)	1668 (69.8%)	1664 (69.8%)	1664 (69.7%)	6661 (69.8%)	
Nationality						0.217
Missing	6	3	4	6	19	
Austria	1841 (77.4%)	1873 (78.5%)	1826 (76.8%)	1881 (79.0%)	7421 (77.9%)	
other	539 (22.6%)	514 (21.5%)	553 (23.2%)	499 (21.0%)	2105 (22.1%)	
Health						0.557
No health restriction	1547 (64.8%)	1516 (63.4%)	1526 (64.0%)	1557 (65.3%)	6146 (64.4%)	
Health restriction	839 (35.2%)	874 (36.6%)	857 (36.0%)	829 (34.7%)	3399 (35.6%)	
Marg. empl.						0.627
No	2132 (89.4%)	2107 (88.2%)	2118 (88.9%)	2117 (88.7%)	8474 (88.8%)	
Yes	254 (10.6%)	283 (11.8%)	265 (11.1%)	269 (11.3%)	1071 (11.2%)	
German						0.676
Partial or non	474 (19.9%)	475 (19.9%)	461 (19.3%)	445 (18.7%)	1855 (19.4%)	
Proficient or native	1912 (80.1%)	1915 (80.1%)	1922 (80.7%)	1941 (81.3%)	7690 (80.6%)	

Table 14: Covariate Balance Chi-squared test

We further conducted pairwise z-tests to test for differences in covariates between each of the

groups separately, which can be seen in table 15. Any significant differences would be shown by a letter indicating the group to which the z-test indicated a difference. Again, we can never reject the null hypothesis that there is no difference in the covariates between each of the groups, even when compared pairwise.

	T1 (N=2386) A	T2 (N=2390) B	T3 (N=2383) C	T4 (N=2386) D
Women	48.4	48.2	48.3	48.2
Men	51.6	51.8	51.7	51.8
Below 35 years	20.2	20.6	20.6	20.5
35-50 years	34.5	34.1	34.2	34.2
Above 50 years	45.3	45.3	45.3	45.3
Primary education	44.7	44.7	44.7	44.7
Higher than primary	55.3	55.3	55.3	55.3
Industriesv.	44.7	44.6	44.7	45.0
Mostv.	25.2	25.4	25.2	25.1
Waldv.	8.3	8.4	8.3	8.3
Weinv.	21.8	21.6	21.8	21.6
Post	30.2	30.2	30.2	30.3
Mail	69.8	69.8	69.8	69.7
Other nationality	22.6	21.5	23.2	21.0
Austrian	77.4	78.5	76.8	79.0
No health restriction	64.8	63.4	64.0	65.3
Health restriction	35.2	36.6	36.0	34.7
No marg. empl.	89.4	88.2	88.9	88.7
Marg. empl.	10.6	11.8	11.1	11.3
Partial or no German	19.9	19.9	19.3	18.7
Proficient or native German	80.1	80.1	80.7	81.3

Table 15: Covariate Balance, pairwise z-tests