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ORIGINAL ARTICLE

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Informing employees in small and medium-sized firms about training: Results of a randomized field experiment

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Abstract

We mailed brochures to 10,000 randomly chosen employed German workers who were eligible for a subsidized occupational training program called WeGebAU, informing them about the importance of skills-upgrading training in general and about WeGebAU in particular. Using survey and register data, we estimate effects of the informational brochure on awareness of the program, on take-up of WeGebAU and other training, and on subsequent employment. The brochure more than doubles awareness of the program. There are no effects on WeGebAU take-up, but participation in other (unsubsidized) training increases among employees aged under 45. Short-term labor market outcomes are not affected.

KEYWORDS
employment, information treatment, randomized controlled trial, skills, training subsidies, wages

JEL CLASSIFICATION
J18, J24, J65

1 | INTRODUCTION

Lifelong learning and employability have become focal points in the labor market policies of many advanced economies (OECD, 2012b). Economies are facing more turbulent conditions than in the past, and this requires a flexible and suitably skilled workforce. As the development of novel production technologies proceeds at a sustained high speed,

Abbreviations: BA, Bundesagentur für Arbeit (Federal Employment Agency); EUR, Euro; SME, small and medium-sized enterprises; WeGebAU, Förderung der Weiterbildung Geringqualifizierter und beschäftigter Älterer in Unternehmen (supporting training of low-skilled and older workers in companies).

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human capital adjustments are not only warranted among the inflow of new workers but also among the existing stock of workers. The extent to which training is used differs across countries as well as across employer and worker types (Brunello & Wruuck, 2020). Groups that are underrepresented in training include workers in small and medium-sized enterprises (SME), older workers, and workers with low levels of education (Bassanini et al., 2005). Governments try to encourage firms and workers to invest in training by offering financial support, such as tax deductions, grant schemes, or training vouchers.

We conducted a randomized experiment to obtain insights into the extent to which training activities of employed workers can be influenced by providing additional information on a generous training subsidy program. The German program "WeGebAU" subsidizes training for workers in SMEs by covering a substantial share of the training costs. Even though WeGebAU offers generous subsidies, take-up rates for this program have been remarkably low during recent years. We sent out brochures to randomly selected eligible workers. The brochure has two informational components that could reduce information frictions: First, it emphasizes the importance and benefits of lifelong learning, and, second, it informs its readers about the WeGebAU training subsidy. Reading the brochure might accordingly lead to two types of subsequent actions. First, a rising awareness of the importance of lifelong learning might increase the take-up of all kinds of available training. Second, newly obtained knowledge about WeGebAU might specifically increase the take-up of that subsidized training.

Matching firm data with individual register and survey data, we investigate the extent to which the information treatment increases workers' knowledge and take-up of the program, their participation in subsidized and unsubsidized training, and their short-term labor market outcomes, such as job mobility. The low-intensity intervention thus allows a number of policy-relevant effects to be estimated. Moreover, we exploit additional firm-level data to assess the importance of potential windfall gains that the subsidy program might generate for firms.

In sum, our paper contributes to the literature in several ways. First, it analyzes participation in job-related training rather than participation in training in general. Second, the study advances the literature on job-related training for two groups that are of particular interest to policy makers: (a) workers in SMEs, which typically provide less training than larger firms and (b) younger and older workers within this group, who differ strongly in regard to training participation. Third, by analyzing individual deficits in information on WeGebAU training subsidies and the importance of lifelong learning, the paper contributes to the growing experimental evidence on interventions carried out in response to incomplete benefit take-up. Fourth, our study sheds light on potential windfall gains for firms that are associated with training subsidies.

2 | REVIEW OF THE LITERATURE

2.1 | Training provision and scope for policy interventions

In a perfectly competitive labor market and when workers do not face credit constraints, workers should be the ones to finance general training, as such an investment would be risky for firms (Becker, 1964) But if firms face imperfect competition and can compress wages, they should be able to reap some of the benefits and therefore cover the costs of general training (Acemoglu, 1997; Acemoglu & Pischke, 1998). In a more competitive market, however, firms may be reluctant to provide training as competitors might benefit from their investments (Stevens, 1994). Furthermore, information asymmetries can cause an underprovision of training because firms may not be aware that training investments pay off (Chang & Wang, 1996). Thus, if firms do not provide training and workers are credit constrained, market failures may arise, justifying government interventions to subsidize training. In addition, if governments pursue the goal of giving everyone an equal opportunity to participate in training, training subsidies for underrepresented groups of workers could be socially desirable even if they are not efficient (Bassanini et al., 2005). However, government programs to stimulate employer-provided training at least partially entail transfers from the government to firms that do not affect workers' propensity to be trained (Abramovsky et al., 2011): Firms participating in a subsidy program might provide their workers with the same type and amount of training anyway.

An underprovision of training activities may be more likely to occur in SMEs. SMEs are usually defined as firms with fewer than 250 employees (EU, 2018). They typically invest less in their employees' human capital than larger firms (Bassanini et al., 2005; Dostie, 2015; Kitching, 2008; Lynch & Black, 1998). There are several possible reasons why less training is provided at SMEs. Smaller firms have a higher worker turnover, so that they may correctly perceive

firm-specific benefits of training as lower. Furthermore, their profit levels are lower on average, so that they may not have sufficient funding to provide training. Reorganizing work tasks during absences as a result of training is more difficult than in larger firms, and potential quantity discounts from training providers may be lower. As large firms usually have specialized human resource managers organizing the firm's training activities, they face lower marginal costs in organizing, structuring, and financing training activities than smaller firms.

Another notable dimension along which training participation varies is age. In general, older workers participate in training less frequently (Klehe et al., 2012; OECD, 2012a). Firms may invest less in older workers due to the fact that their remaining time at the firm is relatively short and due to a perceived lack of cognitive ability to adopt skill upgrades (Roscigno et al., 2007). Furthermore, supervisors and managers often presume that older workers are less willing or able to learn (Maurer et al., 2008; Posthuma & Campion, 2009). Indeed, from an individual's perspective, the time period in which training pays off decreases with age, and both learning attitudes and abilities of older workers may differ from those of their younger counterparts. Bellmann and Leber (2008) report that the share of older workers participating in training is particularly low in SMEs.

2.2 | Effectiveness of subsidized training for employed workers

There is a substantial body of empirical evidence available regarding the determinants and returns of occupational training for adult workers. In this review, we focus on the determinants and effects of government-sponsored vocational training for adults. A comprehensive overview of such programs is provided by McCall et al. (2016). However, much of this literature analyzes the effectiveness of subsidized training for unemployed workers, whereas we are interested in training for employed workers. We therefore restrict the following discussion to programs targeted explicitly at employed workers.[1]

If government funds are provided for in-company training, they are usually targeted at specific types of firms or employees that have below-average training participation rates. Programs such as the British "Train to Gain" or the German WeGebAU initiatives target low-skilled workers (Abramovsky et al., 2011; Dauth, 2020) or older workers (Dauth & Toomet, 2016; Leuven & Oosterbeek, 2004). With respect to firms, governments usually support specific industries, such as manufacturing (Holzer et al., 1993), as well as SMEs (Dostie, 2015; Görlitz, 2010), in which the average training incidence is low.

One strand of the literature studies firm-level outcomes such as the amount of training investment within the firm and the share of firms investing in training (see e.g., Abramovsky et al., 2011; Görg & Strobl, 2006; Görlitz, 2010). Overall, the evidence shows that the effect of public funding on the amount of training provided by firms ranges from moderately positive to non-existent.

A second strand of the literature is concerned with worker-level outcomes such as productivity, employment stability, and earnings. Findings are mixed as well and tend to depend on the type of worker. A small number of randomized controlled trials (RCT) investigate the effects of randomizing voucher receipt on employed workers. For Switzerland, Schwerdt et al. (2012) do not find average effects of vouchers on earnings, employment, or subsequent education 1 year after treatment. While persons with a low level of education were least likely to use the voucher, they experienced the highest gains from adult education. Hidalgo et al. (2014) provide randomly selected low-skilled workers in the Netherlands with training vouchers. They show that vouchers increased training participation compared to a control group, that subsidized training substituted part of the unsubsidized training taken-up by the control group, and that vouchers had no impact on wages or job mobility.

The program we analyzed—WeGebAU—was evaluated in two non-experimental studies with a focus that differed from the one in our study. Dauth and Toomet (2016) use propensity score matching to analyze employment outcomes and earnings of older workers in SMEs participating in the WeGebAU program during the start-up period of 2007–2008. They find an increased probability of workers remaining employed, particularly in the cases of those working part-time and those participating in measures lasting for more than 60 days. They find small but statistically significant effects on earnings for the entire group of participants. Dauth (2020) analyzes the effects of training subsidies for low-skilled employees on individual labor market outcomes in Germany for the period from 2007 to 2012. She exploits cross-regional variation in the program implementation of local employment agencies and estimates local average treatment effects for compliers who only participated in training because of a more accommodating policy. For this group, the subsidies increase cumulative employment duration by 30 days and earnings by 6% within the first 3 years of treatment starting. The effects are statistically significant.

2.3 | Information treatments

Our study is related to a growing strand of the literature analyzing information treatments. Individuals often fail to take up benefits for which they are eligible (Currie, 2006). To investigate this topic, a number of researchers have used the amount of information on the program as a treatment. Typically, information treatments of this kind have been applied in randomized trials. The treatment is the receipt of an informational brochure or letter, an informational event, or a consultation in person or by telephone.

The empirical evidence indicates that information often has substantive and statistically significant effects on decisions. This includes participation in various (North American) aid or social security programs. Finkelstein and Notowidigdo (2019), for example, informed randomly selected elderly individuals that they are likely to be eligible for the Supplemental Nutrition Assistance Program (SNAP). Another randomly chosen group was also offered assistance with applying for this program. The authors find substantive and statistically significant effects of these treatments on enrollment. Both Bhargava and Manoli (2015) and Chetty and Saez (2013) informed eligible individuals about the Earned Income Tax Credit (EITC). Results indicate that information about the EITC in-work benefit eliminates information deficits and increases the take-up rate. However, Chetty and Saez (2013) do not find any effect on average labor supply and earnings for EITC recipients when additional information about the EITC is provided. In another experiment, Duflo and Saez (2003) send out letters informing recipients of monetary rewards for attending an information fair about retirement plans. Compared to the control group, the attendance at the fair was more than five times higher for those treated. After the fair, enrollment in the Tax Deferred Account (TDA) was higher for the treatment group. Treatment also increased enrollment of other unemployed persons from the same university departments, a finding that points to peer group effects. In another study for the US, Liebman and Luttmer (2015) show that an information treatment of older persons regarding social security benefits led to a four percentage point increase in the employment rate after 1 year (relative to 74% for untreated persons).

Thus, a growing body of evidence suggests that individuals are often not fully informed about transfer policies relevant for economic choices. The provision of information about support programs available can thus enable individuals to draw on additional resources when making their economic choices, thereby altering these choices. Lack of information, effects of stigma in regard to program participation, transaction costs and complexity are reasons that explain incomplete take-up. Regarding information that is not used, Handel and Schwartzmann (2018) further distinguish between information frictions—costs of acquiring and processing information—and mental gaps, which they define as psychological distortions in information-gathering, attention, and processing.

Our study focuses not on the effects of workers receiving or redeeming training vouchers as such, but on the effects of information on workers' propensity to ask for vouchers and subsequent outcomes. The study that is most similar to ours from a methodological point of view—Görlitz and Tamm (2017)—evaluates a German training voucher program ("Bildungsprämie") targeted at low-income employees and self-employed persons. The voucher reduced direct training costs by 50% up to the comparatively small amount of EUR 500; the remainder of the costs had to be borne by the employees themselves. In a telephone survey, around half of the 5000 participants received information about the voucher as part of the interview. A second survey took place around 1 year later. The authors found that the increase in awareness of the "Bildungsprämie" as a result of the intervention was statistically and economically significant but did not affect voucher take-up or training participation. In contrast, an information treatment regarding postsecondary enrollment opportunities for unemployed workers in the US increased the probability of enrollment by 40% (Barr & Turner, 2018).

3 | THE WeGebAU PROGRAM

3.1 | Background

WeGebAU ("Förderung der Weiterbildung Geringqualifizierter und beschäftigter Älterer in Unternehmen," which translates as "Supporting training of low-skilled and older workers in companies") was introduced in 2007. In this program, the German Federal Employment Agency (BA) allocates funds for formal training to individual workers, whereby the training should not be exclusively or primarily beneficial for their performance in their current job alone but in alternative jobs as well. That is, it should be skill enhancing and should build on the workers' current expertise in their current occupation.

Our information treatment took place during 2014. Until 2018, the WeGebAU program targeted two groups of workers. In the first group, cost reimbursement for training was granted to workers employed in SMEs with fewer than 250 employees, irrespective of their qualifications.[2] In the second, cost reimbursement was provided for low-skilled workers in conjunction with wage support during training. Workers were classified as low-skilled if they lacked a vocational qualification or had had an unskilled job for at least the previous 4 years. The randomized controlled trial in our paper restricts the focus to the former target group.

All in all, the WeGebAU program is quite small compared to other instruments of active labor market policy in Germany. Between 2012 and 2016, the program had fewer than 7000 entries of SME employees per year on average. While there is no information available on the number of persons who would potentially be eligible for the program, Germany currently has a workforce of nearly 18 million workers employed in small and medium-sized firms (Destatis, 2022).

3.2 | Formal guidelines

The program subsidizes training of workers in SMEs by reimbursing the training costs, that is, the amount of money that the training provider receives in return for the training. Costs of transportation, accommodation, and child care are also refunded. The BA covers up to 50% of the training costs for workers aged under 45 if the employer covers the remaining costs of training. Workers aged 45 and over can be subsidized by up to a maximum of 75%. The remaining 25% of costs have to be met by the employer or employee.

The decision to subsidize costs and the decision regarding the amount of reimbursement are made by caseworkers from the local employment agency. These caseworkers belong to the "employer service" department at the agency. They assist firms in finding adequate workers, for example,[3] In larger agencies, some of these caseworkers may be WeGebAU specialists and process all WeGebAU applications.

To be subsidizable, the training has to meet several conditions. First, it must last for at least 4 weeks. Second, it must be certified. The provider itself also needs to be certified (i.e., accredited) to train workers that are subsidized by the BA. To achieve this, the provider needs to apply to one of the 31 accreditation bodies in Germany. These bodies are themselves accredited by the German national accreditation body. They verify that providers and courses meet the necessary standards to qualify for public support.

A third condition is that training must not be firm-specific. In practice, this implies that transmitted knowledge is useful in the labor market beyond a person's current job. The program might involve the acquisition of skill updates for occupations in elderly care, machine operation, transportation, the operation of heavy equipment, IT, or administration, for example. In contrast, the BA does not subsidize informal on-the-job training or in-company courses, such as those instructing workers how to use new machines that replace older machines and that are specifically tied to the current job, for instance. There is clearly a thin line here between what is only useful in the person's current job and what is also useful elsewhere. This is reflected in the discretionary power of the caseworkers. It should also be noted that the WeGebAU programs evaluated here do not include vocational training programs that take years and that provide training in a new occupation, or lengthy courses in regular adult education programs.

A fourth condition is that for the period in which subsidies are transferred, workers continue to be employed in their current job and receive their regular wage for all of their working hours, including those during which they attend training.

In 2014, the average reimbursement per WeGebAU participant amounted to about EUR 3800 (Statistics of the Federal Employment Agency, authors' own calculations).[4] This amount consisted of the fee that the training provider received plus the additional costs which participants incurred due to transportation to the training location, accommodation, and child care covered by the BA. The BA transferred monthly rates to participants in advance to cover these additional costs. Training providers received monthly rates which covered 50%–75% of the course fees depending on the target group of the program, with a delay of 30 days after the start date of the training course. A contract between the training provider and the participant recorded whether it was the worker or the employer that was to pay the remaining fees.

3.3 | Enrollment in practice

As an active labor market program, WeGebAU is unique in that it takes place during the working hours of employed workers. As a consequence, caseworkers, employees, and employers may each affect selection for the program. To

obtain some insights into the underlying mechanisms, we carried out a small qualitative study on the practical implementation of labor market policies with the help of experts employed by the BA. These experts conducted interviews in different local employment agencies with caseworkers who were involved in the WeGebAU entry decision process in 2011. The interviews focused on the mode of initiating contact between caseworker and employer/employee, on how caseworkers decided on training content and duration, and on how to grant the subsidy. The relevant insights from the interviews are summarized as follows.

Before our observation window, in the introductory phase of the program leading up to 2009, caseworkers and "training counselors" actively promoted the program. (Training counselors were employees of the local employment agencies or representatives of the companies providing training.) They sent out flyers, informed firms, work councils, and chambers of commerce, and created joint conferences for employment agencies and firms. As a consequence, the program was well known among firms in the data window we considered.

There are different ways for workers to enter training. Both workers and firms approach caseworkers to initiate entry, but in most cases it is the firms that initiate contact. This suggests that the firms have either already identified workers they want to train or that they identify potential training participants after the caseworkers have explained the program modalities. If workers initiate the subsidy claim, they are required to obtain approval for the training from their employer. If the firm is not supportive even though the workers are eligible, the workers can participate in the very same courses as WeGebAU participants in principle. The preconditions for this are that the workers find alternative ways to pay for training and that they participate during their leisure time. It should be noted that this is another reason for our informational brochure on top of the fact that it highlights advantages of lifelong learning in general: to lead workers to take up unsubsidized training. Once potential participants are identified, the employer fills out a form that collects sociodemographic worker information, details on the employer and the employment relationship, and information on the training course (content and provider) that is to be subsidized. Based on this form, caseworkers make the final decision as to whether the general eligibility criteria are met and whether the subsidy is granted. Then, caseworkers issue the training voucher that guarantees cost reimbursement for a training course held by an external training provider.

Caseworkers make their decision relatively quickly after receiving the application form (within 1–7 days). How long it takes until training starts depends on the training provider. The waiting period varies from 1 day—if a course with remaining slots is just about to start—to 6 weeks. Caseworkers tend to decline subsidy applications if they do not expect there to be a suitable training course available in the foreseeable future. This seems particularly to be the case in rural areas.

Workers and firms can search for training providers and courses on the BA website, which provides access to the data base "KURSNET". This data base contains information on certified courses offered by the provider, content, location, training dates and duration, number of slots, full-time or part-time training, prior skills required, and whether training vouchers can be redeemed.

Table 1 shows that among younger workers 51% of all subsidized WeGebAU courses lasted for less than 4 months. For older workers this figure was 41%. This implies that training for younger workers was shorter than for older workers. It should be noted that the time in months does not take account of hours per week in training. A course with 1 h of training per week for 5 months, for example, is counted as a training course that lasts for 5 months.

TABLE 1 Training duration among the inflow into WeGebAU-subsidized training in 2014 in percentages

	Under age of 45	45 and older
Duration in months...		
<4	50.9	40.9
4 to <8	18.6	18.8
8 to <11	8.4	11.2
11 to <13	10.5	17.8
≥13	11.6	11.3
Number of observations	4468	2381

Source: Statistics of the Federal Employment Agency (data warehouse).

4 | INTERVENTION AND DATA

4.1 | Intervention and sequence of events

The information treatment for our project consisted of a short cover letter and an informational brochure (see Online Appendix A for a translated version of the brochure). On June 2, 2014, we sent out the informational brochure about WeGebAU and its conditions for entitlement to the home addresses of approximately 10,000 randomly selected workers in SMEs, around half of them younger or older than the age of 45. The brochure also pointed out the importance of lifelong learning and the benefits of training in general.

The chronological sequence considered in the experiment was as follows. Potential WeGebAU participants do or do not:

(1) receive an informational brochure about the program,
(2a) gain knowledge about the program,
(2b) gain awareness of the importance of lifelong learning,
(3a) find and take up WeGebAU training,
(3b) find and take up different training,
(4) realize particular labor market outcomes.

The experiment provided random variation at stage (1) of the sequence. We could use this variation to estimate average effects of receiving information about the program on outcomes at a further stage of the sequence. As the treatment and control groups were randomly chosen and characteristics of both groups were well balanced, a comparison of mean outcomes sufficed.[5] A power analysis showed that for stage (1) the minimum detectable effect of a dummy outcome variable with a mean of 0.5 for 10,000 observations (evenly distributed across the treatment and the control group) was 0.028.

It should be noted that if the outcome of interest could only be realized after some other outcome had occurred (e.g., the destination state after exit from the person's current job), observability depended on the first event occurring before the end of our observation window (see e.g., Ham & LaLonde, 1996).[6] If workers tried to take up WeGebAU-funded training—as described in step (3a)—they needed the consent of their employer. It should be mentioned that this might have conveyed various types of signals to the employer. The workers' initiative might have shown that they wanted to become more productive and improve their wages and career prospects where they were currently employed. However, it might also have sent the signal that the workers wanted to enhance their outside options in the labor market. More generally, the type of training (that was unobservable to us) would influence the type of signal workers sent to their employers.

4.2 | Data

To gather a sample of workers eligible for receiving the WeGebAU subsidy, we combined firm panel data and administrative data from the BA. Only workers at companies with fewer than 250 employees were able to benefit from the SME subsidy program. As the BA's register data only include information on the size of the establishment rather than the size of the enterprise, and as an enterprise may consist of several establishments, we focused on workers employed in establishments that participated in the IAB Establishment Panel survey in 2012 (the latest wave available when the field experiment took place). Information from this survey allowed us to determine firm size. To identify our target group, we first excluded individuals without a vocational qualification and then selected all individuals from single-establishment firms whose number of employed workers was fewer than 250. The reason for this was that individuals without a vocational qualification would have been eligible for a more generous subsidy scheme, regardless of firm size (see section on the WeGebAU program).

To identify workers from the preselected firms, we merged the firm panel data with individual-level register data from the Integrated Employment Biographies (IEB). The IEB contain the employment histories of all employed workers liable for social security contributions in Germany. Furthermore, it comprises information on workers' unemployment spells, periods of unemployment insurance or welfare benefit receipt, and periods of participation in an active labor market policy program such as WeGebAU. As all this information is process-generated, start and end dates of the different spells are accurate to the day and the information is highly reliable (Dorner et al., 2010; Jacobebbinghaus & Seth, 2007). The IEB data are updated yearly. The selection of the sample for the experiment is based on IEB version

V11 from 2013 and took place on May 19, 2014. Subject to the strict observance of data privacy regulations, the IAB's Data and IT Management Unit provided home addresses from the BA's administrative data for the selected sample.

Based on information in the IEB, we restricted the sample to workers who started full-time employment that was subject to social security contributions before January 1, 2012, and who remained with this firm until the end of 2012, the latest moment observable in the most updated register data on the date the sample was selected. We focus on workers with permanent employment contracts, as firms have weaker incentives to train workers on temporary contracts. In Germany, firms can employ workers on temporary contracts for a maximum period of 2 years (unless they can provide good reasons that are acceptable by law). The data base implies that workers were employed at the same firm for at least 2 years when the information treatment took place, although this information may be inaccurate in some cases due to reporting delays by firms.

Our sample of administrative data which was used for the randomization of the information treatment encompasses 10,672 workers aged under 45 and working in SMEs, and 10,641 workers aged 45 or above and working in SMEs. For the experiment, we randomly selected 10,000 workers for the treatment groups: 5000 workers under 45 years old and 5000 workers of at least 45 years of age. For the control groups, we used the remaining 5672 workers below the age of 45 and 5641 older workers. Online Appendix B describes in detail how this sample was obtained from the registers and what further data limitations occurred after treatment had taken place. Randomization took place on May 19, 2014, using a digital random number generator. We sent out the letters on June 2, 2014. A total of 11,287 workers, that is, 59% of our final sample, still had the same employer as in 2012 (the latest observable year when drawing the sample). Consequently, it is likely that some employed sample members did not work at a SME when we sent out the brochure. However, this affected the treatment and the control group in the same way.[7]

In the analysis we use register data and individual-level survey data. The register data are based on the updated IEB data set V13, containing information until the end of 2016 for all workers in our initial sample. Compared to the 21,313 workers from the sample that we used to create treatment and control groups, this sample is slightly smaller, comprising 19,299 workers. This is because some workers had not received the brochure, or because the address was invalid, or they had passed away or declined any involvement with the BA after receipt of the brochure; see Online Appendix B for further information and for evidence that this does not affect our results.

The survey data concern computer-assisted telephone interviews between November 2014 and February 2015, that is, 6–8 months after treatment (see Appendix B for further information on how we selected survey participants). In the survey, we asked 1986 workers from the SME sample questions about their awareness of the WeGebAU program, participation in (unsubsidized) training, and reasons for (not) participating in training. To analyze whether the characteristics of the workers who completed the interview differed from those of the pool of workers who were contacted for an interview at least once, we checked for differences in personal characteristics. Workers who completed the interview were more likely to have a high school diploma and thus to be better qualified. This selectivity is equally distributed over our treatment and control groups, however, and should not therefore pose any problems regarding the internal validity of our further analyses (see tables C.1 and C.2 in the Online Appendix for details). External validity for the average population, however, may suffer if the treatment affects more highly educated individuals differently.

Table 2 shows sample statistics of the treatment and control groups. As expected, we do not find any statistically significant differences between the two groups due to random assignment. On average, workers in the younger sample are 34 years old, while the mean age in the older group is 51. The majority of the workers have a lower or intermediate secondary school-leaving certificate; the share with a high school diploma is larger in the younger age group. Around a quarter of the workers are working part-time, and around 80% have a permanent contract. The mean gross wage rate is nearly EUR 90 per day. On average, the workers in the sample had been working for most of the 5 years before the treatment took place, but not necessarily for the same employer. Table C.3 in the Online Appendix repeats this comparison for those individuals in the final sample who participated in the survey. Likewise for the survey participants, we do not find statistically significant differences between the brochure receipt and the control group.

5 | RESULTS

5.1 | Survey data

As described above, the survey took place around 7 months after the brochure was sent out, where the contact date is orthogonal to brochure receipt. We use the survey to infer awareness of WeGebAU and to measure participation in

TABLE 2 Selected characteristics (register data): Means for brochure receipt groups B and control groups C, and differences D

	Under age of 45			45 and older		
Variable	**B**	**C**	**D**	**B**	**C**	**D**
Age	34	34	0	51	51	0
Male	0.52	0.51	0.02	0.46	0.47	0.00
Non-German citizen	0.06	0.06	0.00	0.03	0.03	0.00
Lower or intermediate secondary school-leaving certificate	0.60	0.60	0.00	0.73	0.74	−0.01
High school diploma	0.37	0.38	−0.01	0.24	0.23	0.01
School information lacking	0.02	0.02	0.00	0.03	0.03	0.00
Part-time employment	0.25	0.25	0.00	0.30	0.29	0.01
Permanent contract	0.77	0.77	0.00	0.85	0.86	−0.01
Daily gross wage (in EUR)	87	87	0	88	90	−1
Cumulative years of employment in past 5 years	4.26	4.24	0.02	4.55	4.56	−0.01
Cumulative years of tenure with current employer, truncated at 5 years	2.40	2.41	−0.01	3.06	3.13	−0.07
Number of establishments in past 5 years	2.12	2.12	0.00	1.77	1.73	0.04*
Number of observations	4318	5284		4487	5210	

Note: In some cases, rounding errors occur in the differences.

*$\alpha = 0.05$; **$\alpha = 0.01$.

Source: IEB V13, authors' own calculations.

training in the previous 7 months by those who received the brochure and those who did not, and to gauge the type of training and the views on the usefulness of training. It is important to point out that regarding participation in training the register data allow for the observation of WeGebAU spells but not for the observation of unsubsidized training activities. Conversely, the survey data measure participation across all types of training without distinguishing between WeGebAU and other training. The discussion of the effects on WeGebAU participation is therefore deferred to the following subsection, in which the results based on the register data are presented.

The most important survey results are presented in Panel I of Table 3. First, we consider effects on the awareness of WeGebAU. Among the brochure non-recipients, 21% of the younger workers were aware of the program compared to 27% of the older workers. Among the brochure recipients, this share increases remarkably by 38 percentage points. This implies that the information treatment repairs information deficits by more than 180% for younger workers and 140% for older workers. Estimated standard errors are small (around one-tenth of the estimated treatment effect). The size of the effects and the standard errors do not change if we additionally control for sociodemographic characteristics and the individual labor market history (see Table C.4 in the Online Appendix).

Next, Panel I shows that the information treatment does indeed increase the share of younger workers who participate in training, doing so by 7 percentage points from 43 to almost 50%. This increase includes training that yields some sort of vocational certificate as well as other types of training, but, as we shall see, the effect is primarily driven by the latter.

The survey indicates that the additional training among younger workers that was generated by the brochure was almost entirely based on the workers' own initiative. Only 14% of the young non-recipients initiated training participation, while 20% of the young recipients did so.[8] This result indicates that the information in the brochure nudged part of the younger worker group to become interested in training, explore training possibilities with their employer, and participate in an adequate training program. Here we find no detectable effect for the group of workers aged 45 or above.

We also asked brochure recipients directly about the brochure itself. Their responses (in Panel II of Table 3) should be viewed with caution. In the time interval between brochure receipt and the survey interview, respondents may have forgotten about (reading) the brochure even if it subsequently affected their behavior. With this in mind, about half of the recipients claimed that they had in fact read it. Workers who reported not having read the brochure were asked for the reasons behind this. Given nonexclusive choices, around 16% of all respondents (i.e., both those who claim to have received the brochure and those claiming they did not) answered that they had already participated in some kind of

TABLE 3 Survey outcomes, brochure receipt, and training features: Means for brochure receipt groups B and control groups C, and differences D

	Under age of 45			45 and older		
Variable	**B**	**C**	**D**	**B**	**C**	**D**
(I) Program awareness, training participation, and initiative						
Awareness of WeGebAU program	0.59	0.21	0.38**	0.65	0.27	0.38**
Participation in training	0.50	0.43	0.07*	0.49	0.49	0.00
Initiative for training came from worker	0.20	0.14	0.06*	0.18	0.15	0.03
(II) Brochure receipt						
Claims to have read brochure	0.51	-		0.50	-	
Claims to have received but not read brochure	0.26	-		0.24	-	
Claims not to have received brochure	0.23	-		0.26	-	
Did not read brochure because... (multiple answers possible)						
...employer offered sufficient training	0.15	-		0.14	-	
...I was already trained	0.16	-		0.17	-	
...I did not want support from the BA	0.09	-		0.07	-	
...I was not interested in training	0.11	-		0.11	-	
...I was not interested in informational brochures	0.18	-		0.16	-	
(III) Training features (only those participating in training since Jun 2014)						
Training yields general human capital	0.89	0.89	0.00	0.87	0.86	0.02
Training took place in leisure time	0.14	0.11	0.03	0.11	0.11	0.00
Training took place during working hours	0.74	0.74	0.00	0.75	0.77	−0.03
Training took place during leisure time and working hours	0.12	0.15	−0.03	0.15	0.12	0.03
Worker covered (most of) training costs	0.08	0.06	0.03	0.03	0.03	−0.01
Firm covered (most of) training costs	0.86	0.84	0.01	0.91	0.89	0.02
Someone else covered (most of) training costs	0.06	0.10	−0.04	0.06	0.08	−0.02
(IV) Reason not to train (only those not in training during last 2 years)						
Not sure training pays off	0.26	0.20	0.06	0.31	0.23	0.08
Don't want to forgo income	0.82	0.73	0.09	0.65	0.71	−0.05
Don't want to spend any money on training	0.38	0.34	0.04	0.49	0.42	0.07
Not used to studying anymore	0.27	0.19	0.08	0.28	0.29	−0.01
Employer does not support training	0.22	0.25	−0.03	0.28	0.34	−0.06
Time investment too great	0.28	0.17	0.11*	0.36	0.17	0.19**
Learn everything needed on the job	0.59	0.53	0.06	0.64	0.67	−0.03
Qualification fully sufficient	0.71	0.71	0.00	0.73	0.79	−0.06
Health condition does not allow for training	0.09	0.03	0.06*	0.11	0.10	0.01
No suitable training available	0.25	0.34	−0.09	0.48	0.40	0.07
I have had bad experience with instructors	0.04	0.05	−0.01	0.03	0.06	−0.03

TABLE 3 (Continued)

	Under age of 45			45 and older		
Variable	**B**	**C**	**D**	**B**	**C**	**D**
Number of observations						
Panels I and II	484	502		510	490	
Panel III	242	218		252	242	
Panel IV	123	151		138	146	

*$\alpha = 0.05$, **$\alpha = 0.01$.

Source: Survey data, authors' own calculations.

training. Nearly 11% said that they were not interested in training at all. Around 8% did not want to receive support from the BA. These workers might have feared effects of stigma if their training was subsidized, as the BA is usually thought to be mostly concerned with unemployed workers (see Osiander & Stephan, 2020 as well for evidence on such effects of stigma).

We also inquired about the type of training used. Panel III of Table 3 displays the results (it should be noted that these only relate to those who actually participated in training before the end of the observation window). According to the survey respondents, more than 85% of the training courses provided knowledge that was useful not only at their current place of work. Around 75% of training took place entirely during working hours, and for around 90% of the survey participants the firm covered the training costs in full.

Those who did not participate in training were asked about the reasons for this. The responses indicate that there is no single dominating reason. One reason concerned direct and indirect training costs. More than two-thirds of those who did not participate in training did not want to forego income while in training and more than one-third did not want to spend any money on training. More than 70% answered that their qualification was fully sufficient and more than half of these workers stated that they learned everything they needed on the job. For every tenth worker bad health conditions were a reason not to take up training.

Brochure recipients cited the great time investment as one of the reasons for not participating in training more often than respondents who did not receive a brochure. The difference in citing this reason is particularly large among respondents aged 45 or above (rising from 17% to 36%). Among the respondents aged under 45, the brochure affected training participation, so that the non-trained were no longer randomly assigned, but this does not apply to the older respondents. Presumably, among the latter group, the brochure strongly raised awareness of the time investment involved in training and maybe also increased concerns that the individual returns on training investment might not justify these costs.

5.2 | Register data

As explained above, the register data enable us to investigate effects on the take-up of the WeGebAU subsidy and on further labor market outcomes.[9] Furthermore, the register data are not subject to nonresponse and they cover a larger time span (up to about 19 months after the treatment).[10]

Table 4 shows that a very small fraction (less than 1%) of the treatment and control groups actually participated in the WeGebAU program, and we find no statistically significant difference between recipients and non-recipients of the information treatment. This simply echoes the low national inflow into WeGebAU. Combining our finding with the results from the previous subsection on survey data, we conclude that the increase in training participation among workers aged under 45 is fully accounted for by non-WeGebAU training. Thus, in this age group, the information treatment statistically significantly increased general unsubsidized training participation.

We now turn to other labor market outcomes (see Table 4). First, if the brochure leads to training that increases younger workers' productivity, one might expect an increase in their wage rates and earnings. Regarding job stability it is not clear what to expect: On the one hand, training typically requires some sort of cooperation or compliance on the employer's part, suggesting that training is associated with job stability. On the other hand, training may increase the worker's market value and hence lead to a transition to a different job. We use three variables to summarize the labor market states and transitions between May 2014 and December 2015. “Uninterrupted employment” captures whether

TABLE 4 Program participation and further labor market outcomes: Means for brochure receipt groups B and control groups C, and differences D

	Under age of 45			45 and older		
Outcomes from the moment of treatment until December 31, 2015	**B**	**C**	**D**	**B**	**C**	**D**
WeGebAU participation	0.003	0.003	0.000	0.002	0.001	0.001
Job change	0.12	0.12	−0.01	0.08	0.07	0.00
Uninterrupted employment	0.71	0.70	0.01	0.77	0.77	0.00
Any unemployment	0.13	0.13	0.00	0.13	0.13	0.00
Average daily gross unconditional earnings (in EUR)	82.49	82.13	0.35	84.14	85.60	−1.46
Number of observations	4318	5284		4487	5210	

*$\alpha = 0.05$, **$\alpha = 0.01$.

Source: IEB V13, authors' own calculations.

the individual was employed throughout or not. "Job change" captures whether the individual was employed by a different employer from the one in May 2014 at some point. "Any unemployment" captures whether the individual was fully unemployed at any time during this period. It should be noted that these three variables taken together are neither exclusive nor exhaustive. In particular, some individuals may be employed for a few months and be non-participants for the remaining months (having taken early retirement, for instance), in which case they would score a zero on each of the three variables.

As it turns out, we do not find any substantively and statistically significant differences between brochure recipients and controls (see Table 4). In fact, neither group displays much mobility across labor market states. The vast majority remains employed by the same employer. This may simply reflect the short time interval in which labor market outcomes are registered. A period of 1.5–2.5 years after the information treatment may not be sufficiently long to observe mobility differences. After all, individuals who want to be trained may need time to find a suitable training program; it may take time for them to agree with their employer on a suitable moment for the actual participation, and if this increases their chances of a better job elsewhere, it may take them time to find such a job. Furthermore, any decrease in their likelihood of changing jobs compared to the controls may not become visible until a few years later, as the controls have a low baseline mobility as well.

5.3 | A note on windfall

Government support for firms to provide training might be associated with unintended transfers to firms instead of additional training. If brochure receipt increased subsidized training take-up but the same training would have taken place anyway, the subsidy would just have been a windfall gain for the firm. As brochure receipt did not affect WeGebAU participation, it did not induce any additional windfall. However, some firms may currently receive WeGebAU subsidies for training that they would also have paid for themselves. To explore this further we took the initiative to include questions about this in the 2015 wave of the IAB Establishment Panel. Firms reporting that some of their workers took part in the WeGebAU program in the first half of 2014 were asked, "Would you (your worker) have participated in training if the training had not been subsidized through WeGebAU?" Around one-third of these firms answered this question in the affirmative. Thus, one-third of firms that used WeGebAU subsidies for their employees' training effectively stated that subsidized training replaced self-financed training. Assuming that some firms denied that they would have trained employees without the subsidy program in order not to threaten its continued existence, this share can be interpreted as a lower bound result. From the government's perspective this reduces the potential social benefits of the WeGebAU program, as the purpose of the subsidy is to induce additional training within firms.

5.4 | Heterogeneous effects

In the subsection on survey data results (Table 3, Panel I) we saw that an effect of the information brochure on training take-up can only be found among those under the age of 45, which indicates heterogeneous brochure effects. In the

following, we therefore first examine whether the effect is concentrated on specific, more narrowly defined age groups. After that, we take a look at gender-specific differences. For training in general, Lössbroek and Radl (2019, p. 2171) conclude that "even basic empirical regularities on gender differences in training participation have not been established unambiguously by previous research." However, Dauth (2020) finds the most substantive differences in WeGebAU training effectiveness between men and women.[11] To reveal whether or not this also affects program awareness and training participation, in this subsection we subsequently explore potential gender differences in the awareness of WeGebAU and in regard to take-up of training.

Table 5 shows that the increase in awareness generated by the brochure is quite uniform across different types of individuals. Decomposing the sample does not provide any further insights regarding take-up among individuals aged 45 and above.

For individuals aged under 45, the stratified analyses do reveal some differences, however. First, training awareness increases substantially more for men than for women (43 percentage points or 226% as opposed to 34 percentage points or 155%, respectively). Moreover, men who received the brochure are 11 percentage points (28%) more likely to participate in training in the 6–8 months following the brochure receipt. For women, we do not find any statistically significant effect. This shows that the overall positive effect of treatment on training participation that we find is driven by men under the age of 45. Their participation rate of training in the control group is nine percentage points (19%) lower than that of women, and the brochure treatment closes this gap.

Second, within the age range 25–44, workers aged 40–44 drive the effect. The brochure increases the share of trained workers in that age range by 21 percentage points (54%) and simultaneously increases the share of those who initiated the training by 15 percentage points (150%). The results of Table 5 indicate that non-recipients (workers in the control group) aged 40–44 are the least likely to participate in training or initiate training in comparison with non-recipients in the other age groups. Thus, the information treatment seems to be most effective for the age group with the lowest training rate.

We can only speculate about the underlying reasons, however. Additional analysis shows that the results are not driven by different compositions of treatment and control groups across the samples investigated.[12] Men in the 40–44 age group may have reached a certain stage in their careers and not feel the need for further training if it is not explicitly pointed out to them.

TABLE 5 Heterogeneous effects with survey data outcomes: Means for brochure receipt groups B and control groups C

	Awareness of the WeGebAU program				Participation in further training				Initiative for training came from worker				
	B	C	D	*p* value	B	C	D	*p* value	B	C	D	*p* value	N
Under age of 45													
Men	0.61	0.19	0.43**	0.00	0.50	0.39	0.11*	0.02	0.20	0.14	0.06	0.08	496
Women	0.56	0.22	0.34**	0.00	0.50	0.48	0.02	0.60	0.20	0.14	0.06	0.06	490
<29	0.53	0.17	0.36**	0.00	0.36	0.43	−0.07	0.29	0.15	0.14	0.02	0.73	227
30–34	0.57	0.25	0.32**	0.00	0.50	0.46	0.04	0.56	0.21	0.14	0.08	0.10	265
35–39	0.60	0.16	0.44**	0.00	0.50	0.45	0.06	0.36	0.16	0.17	−0.01	0.89	247
40–44	0.64	0.25	0.39**	0.00	0.60	0.39	0.21**	0.00	0.25	0.10	0.14**	0.00	247
45 and older													
Men	0.67	0.30	0.37**	0.00	0.40	0.40	0.00	0.95	0.12	0.11	0.01	0.85	424
Women	0.63	0.24	0.40**	0.00	0.56	0.57	0.00	0.94	0.22	0.17	0.05	0.17	576
5–49	0.66	0.28	0.38	0.00	0.55	0.52	0.03	0.51	0.20	0.18	0.02	0.56	357
50–54	0.61	0.28	0.34**	0.00	0.49	0.51	−0.02	0.75	0.18	0.14	0.04	0.25	346
55–60	0.67	0.23	0.43**	0.00	0.42	0.44	−0.02	0.72	0.15	0.13	0.02	0.60	278

Note: Null hypothesis is that the means for B and C are equal: *$\alpha = 0.05$, **$\alpha = 0.01$.

Source: Survey data, authors' own calculations.

6 | CONCLUSIONS

We conducted an experimental information treatment to investigate the extent to which information frictions were responsible for the low take-up rates of a very generous training subsidy program for employed workers. Receiving a brochure with information about subsidized training and about the importance of lifelong learning substantially increased the share of individuals who were aware of the program by more than 150%. Moreover, the receipt of the brochure substantively and statistically significantly increased participation in training in general in the 7-month period following the randomization, at least among workers aged under 45. Older workers' participation in training was not affected.

We do not find evidence of effects of the information treatment on the take-up of WeGebAU subsidized training. This can obviously not be explained by information deficits regarding the WeGebAU program's existence. This finding is useful for policymakers as it shows that take-up is by no means guaranteed regarding even general programs. To understand this, effects of stigma might be relevant: In the survey data, about 8% of the workers reported that they did not want to be subsidized by the BA. Employers may shy away from the program as well if they assume that applying for subsidies could signal that they are not able to support and train their workers without state support (although this should not really be of concern to profit-maximizing employers). Another explanation for the low take-up of WeGebAU could be that even with subsidies attached, training might be too costly for firms. Firms investing in training might find program applications too complicated and time-consuming.

Our findings do not preclude the emergence of longer-term effects of the treatment. It may take years for individuals who decide to use WeGebAU to actually submit a request and enroll due to personal scheduling issues. As long as no imminent job changes are anticipated, it might actually make sense to postpone training in order to obtain the most up-to-date training content at the time it is warranted. To refute this explanation, one could argue that the information treatment does lead to a short-term increase in other training activities, which would seem to dispute the relevance of this explanation. However, it should be borne in mind here that to participate in WeGebAU training there are more steps required than for other training courses. The former requires that permission be obtained from the employer and that training be held by certified private training providers, whereas other training activities do not necessarily require any of this. Furthermore, the employer's permission may be postponed until the firm faces a slack in production, for example. All in all, these obstacles may lead to a move away from subsidized training toward other types of training.

As outlined above, the treatment increased workers' awareness of the program. In times of structural change, governments and international organizations promote lifelong learning to help workers adapt their abilities to those required. Sending individual workers additional information regarding the general benefits of training substantially increases the awareness that the government supports training efforts. This type of knowledge might further translate into an increased awareness that lifelong learning and occupational training that upgrades skills are important. Therefore, sending out such brochures may remove information frictions and set incentives to participate in training. If the ensuing increase in training is translated into an increase in productivity, this may help workers to catch up with the increasing demand for skills in the labor market. In our setting, the fact that employees respond by taking up more training without subsidies rather than more training with subsidies makes this strategy particularly interesting.

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ENDNOTES

[1] US programs under the Workforce Investment Act (WIA) sometimes provide support for employed workers as well as those who are unemployed. Andersson et al. (2013), Fortson et al. (2017), Heinrich et al. (2013) and Santillano et al. (2020) provide important evaluations of the WIA program.

[2] The firm size threshold of 250 suggests a regression discontinuity design (RDD) to evaluate the subsidy. However, in our data, take-up rates around the threshold are too low for that.

[3] The structure of local employment agencies is divided into an employer service and an employee service. Caseworkers from the employee service handle job seekers and try to help them find a new job. Caseworkers from the employer service counsel firms and try to help them find adequate personnel.

[4] Overall, the BA allocated EUR 56 million to the program in 2014.

[5] Robustness checks showed that results hardly changed if we incorporated propensity score kernel matching to control for chance differences in the distribution of observed characteristics in the treatment and in the control groups. Results are available on request.

[6] Random assignment to the "brochure receipt" treatment group is not a valid instrument for (3a) on its own to the extent that the brochure affects receipt of other sorts of training. Indeed, individuals may become more convinced of the importance of training in general and thus may be led to take up unsubsidized training more often, which may create a causal effect on their labor market outcomes that does not run through WeGebAU (van den Berg, 2007). As a separate issue, it is debatable whether (1) is a valid instrument for any actual training (3a) + (3b). This is because the randomly assigned receipt of the brochure (vs. non-receipt) may induce non-training behaviors that affect outcomes.

[7] Table C.5 and Table C.6 in the Online Appendix present the main results for the 11,287 workers who had the same employer when the sample was drawn and at the time of the information treatment. All in all, the results are very similar to the main specification.

[8] Standard errors for the estimated effects on training participation and training initiative are around one-third of the size of the effects. If we additionally control for sociodemographic characteristics and the individual labor market history, the estimated effects increase slightly and standard errors decrease.

[9] As mentioned above, the register data do not contain information on unsubsidized training.

[10] The data currently available allow us to analyze outcomes until the end of 2016. However, only 12 additional workers in the sample enter the WeGebAU program in 2016, and the estimation results for the extended period are very similar to those reported.

[11] Women benefit more from subsidized WeGebAU training than men do (Dauth, 2020): Their training measures are longer on average, which should lead to more human capital accumulation. They also earn less than men on average, which translates into larger relative returns.

[12] The results are robust if we control in regressions for the covariates contained in Table 2. Additional regressions analysis confirms that the brochure effect on training participation among those aged from 40 to 44 is also much stronger among men than among women.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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