The German Job Search Panel

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This version: 30 December 2022

Abstract

This report introduces the German Job Search Panel, a monthly survey that follows people who registered as job seeking over the course of up to two years. The focus of the survey is on the well-being and health of jobseekers, with special emphasis on workers affected by mass layoffs. The use of an innovative survey app allows for frequent measurement every month and for conducting the experience sampling method to measure affective well-being. The collected data may be linked to administrative records of the Federal Employment Agency subject to participant consent. For a subsample of surveyed jobseekers hair cortisol levels are available as a biomarker for chronic stress. In this report, we describe the sampling procedure, adjustments over the recruitment period and the collected data. We moreover examine selective participation in the panel. It turns out that high-skilled workers, young individuals and women were more likely to sign up. Age increases the probability to take part in the hair sampling. People working in East Germany are more likely to consent to the linkage of survey data and administrative records. However, the aggregated bias resulting from selective participation is small.

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Acknowledgements. The authors are indebted to the IAB-DIM unit, in particular Stephan Griesemer who carried out the sampling, and thank Benjamin Küfner for valuable research assistance. Financial support by the German Science Foundation (DFG) through projects EI 379/11-1, EI 379/11-2, SCHO 1270/5-1, SCHO 1270/5-2, STE 1424/4-1 and STE 1424/4-2 as well as by the Institute for Employment Research (IAB) through projects 3111, 3874, 3877 and 3905 is gratefully acknowledged.

1. Introduction

In recent years, well-being indicators have become an important tool for the analysis of the individual impact of unemployment (e.g., Hetschko & Schöb, 2017; Paul & Moser, 2009; Wanberg, 2012). However, previous research has mainly focused on one measure of subjective well-being, overall life satisfaction (e.g., Luhmann et al., 2012, 2014; Luhmann & Eid, 2009), for exceptions, see Knabe et al. (2010)). The German Job Search Panel (GJSP) intends to broaden this perspective. It is a collection of monthly panel data of jobseekers, which allows researchers examining the impact of unemployment on three different dimensions of well-being at the same time – subjective, eudaimonic and physical well-being. In the process, multiple indicators are available for each construct. For instance, subjective well-being can be elicited via different measures of cognitive well-being as well as measures of affective well-being. As a result, the GJSP enables researchers to analyze if the changes in well-being following unemployment vary between well-being constructs. These differences may be mapped over time, with relatively short time lags of one month between the points of measurement.

This data report describes the GJSP. A first focus is on the data generating process. It is based on the notification process of jobseekers with the German Federal Employment Agency (*Bundesagentur für Arbeit*, BA) and identifies people who consider likely that their employment relationship ends in the course of the following months to invite them to participate in a panel survey about job search. The sampling places special emphasis on mass layoffs as reason for the termination of a job. Participants are then surveyed once a month over a period of up to two years. These comprehensive panel data are collected using an innovative generic smartphone app. The survey data may be linked to high-quality register-based data of the *Institute for Employment Research* (IAB) and to people's objectively measured chronic stress levels, ascertained by hair cortisol. These two features are further novelties in the research on unemployment and well-being.

During the recruitment of participants, we had to deal with low sign-up rates initially. This issue was aggravated further by the fact that less than half of the persons that signed up could actually be considered for the final sample for methodological reasons. We therefore adjusted the way we contacted participants in several ways over the recruitment period. This included extending the sample to non-mass-layoff-related jobseeker registrations. Thus, a second focus of this data report is to give an account of these adjustments and the evolution of the sign-up rate. Moreover, we describe the scheme used to incentivize repeated participation over time and give an overview of the collected data.

Unavoidably, sign-up to a smartphone-based survey is non-random. A third focus of this data report is therefore on sample selectivity. This concerns initial participation, survival in the panel over time, consent to linking administrative records to the survey data as well as the willingness to provide sensitive health data through hair cortisol. Our sampling process allows us to investigate selectivity in depth, as we are able to link participation data ('paradata') to the register data available at IAB. While the average non-response bias is only 3.7% across characteristics, it turns out that females and relatively educated people are significantly more likely to sign up for the study and to continuously participate over many months than males and less educated people. Younger age groups are more likely to participate in general whereas older participants are more willing to provide hair samples for cortisol measurement.

2. Sampling

For our data collection, the Data and IT Management (DIM) unit of IAB identified workers who had registered as jobseekers in the German unemployment insurance system prior to entering unemployment. In Germany, to be eligible for insurance-based unemployment benefits (*Arbeitslosengeld*), employees are obliged to register as job seeking with the employment agency at the latest three months before they expect (having) to terminate their job. If they learn about the termination of their employment later, they will have to register as a jobseeker within three days. Otherwise, a cut-off period for the receipt of unemployment benefits may apply. By contacting them early on when they had just registered as jobseekers, we ensured that our survey would include one measurement wave before workers potentially enter unemployment.

Many people who register as jobseekers, however, do not enter unemployment later on. For instance, if employers announce mass layoffs, it is often unclear for some time who actually loses work and who is able to stay with the firm. Fixed-term contracts are also often prolonged shortly before the expiration date which means that people register as jobseekers pro forma. Hence, many workers who have registered as jobseekers three months before possibly terminating their jobs eventually stay employed at the same firm. Stephan (2016) shows that only slightly more than half of the people that register as job seeking actually become unemployed within the following three months. A relatively high share of registered jobseekers stays employed with the same firm or immediately takes up a new job. The GJSP exploits this institutional background to provide a comparison group of employed workers for individuals entering unemployment. Both groups are surveyed after the registration of jobseekers, whether

or not they actually become unemployed later on. The fact that both groups start the panel as registered jobseekers ensures some principle similarity.

IAB-DIM obtains the address data of recently registered jobseekers through the data warehouse of the Federal Employment Agency, with a delay of about two to eight weeks after registration. For the period from November 2017 to May 2019, they identified jobseekers that registered between the 15th day of the second-last month to the 14th day of the last month as potential participants of the GJSP. This means we sampled jobseekers during a period of low overall unemployment in Germany, varying between 3% and 4% over our sampling phase (OECD, 2022). People were contacted if they met the following conditions¹: German nationality (as our surveys were conducted in German language only), age between 18 and 60 years, the current employment relationship is subject to social insurance contributions (*sozialversicherungspflichtige Beschäftigung*) and has lasted for at least 150 days (i.e., probation is most likely over). Moreover, their registration as jobseeker had not been directly preceded by a previous registration. Partly due to these restrictions, we primarily sampled jobseekers that were eligible for unemployment benefits in case of job loss.²

Due to our particular interest in the effects of involuntary unemployment, we started off drawing samples of registered jobseekers who were likely affected by a mass layoff only (over the whole recruitment period, $N = 79,092$ invites were sent out to this group).³ However, we decided to draw an additional sample from August 2018 onwards as our mass layoff sample had filled up only slowly over time. Therefore, we additionally identified an equally sized random sample of recently registered jobseekers out of the group of people who did not fulfill the requirements of a mass layoff (from August 2018 to May 2019, $N = 48,109$). While a focus on mass layoffs limits the extent of unobservable heterogeneity, comparing multiple reasons for job search with respect to their impact on well-being is of interest for researchers in itself (Chadi & Hetschko, 2018).

¹ IAB-DIM initiated the dispatch of invitation letters and emails through the postal office of the Federal Employment Agency. This procedure also ensured that we did not have access to the address data.

² Provided that the unemployed person has been employed for 12 months in the last 30 months, unemployment benefits replace 60% (people without children) / 67% (people with children) of the previous net salary. The receipt usually expires after 12 months. The duration is shorter for people who were employed for less than two years before entering unemployment and longer for workers who are at least 50 years old and were employed for at least 30 months before entering unemployment. Afterwards, people are eligible for means-tested welfare benefits (*Arbeitslosengeld II*).

³ We apply the thresholds for a notifiable mass layoff according to §17(1) of the German employment protection act (*Kündigungsschutzgesetz*): > 5 layoffs in plants with 21 to 59 employees, 10% in plants with 60 to 250 employees, > 25 layoffs in plants with 251 to 499 employees, ≥ 30 layoffs in plants with 500 or more employees. In addition, we assume a mass layoff in a plant of ≤ 20 employees if the staff reduced by more than five people.

As it takes some time to learn about newly registered jobseekers through the data warehouse of the BA, many people had already stopped working when they received the invitation to the study. We therefore used the first couple of questions of the app-based survey ('entry survey') to carry out further exclusions. Most importantly, people who reported to have become unemployed already at the time of the entry survey were not considered further for the study ($N = 1,424$).⁴ Again, this was to ensure the availability of a pre-event measure of well-being. 215 subjects were excluded because they were still in their probation period. Of the remaining group, every third person was randomly excluded to run an experiment on the effect of participating in the study on future labor market outcomes ($N = 940$). Moreover, 246 individuals did not submit their entry survey. While 4,698 persons signed up for the study initially, only 1,873 (40%) people were kept in the final sample.⁵

The survey was conducted by an independent research institute, the Happiness Research Organization (HRO). The HRO developed a generic app specifically for this purpose, the Happiness Analyzer (Ludwigs & Erdtmann, 2019). The app was adjusted and used for commercial use such as employee surveys and for research (for previous applications, see, e.g., Hendriks et al., 2016; Ludwigs et al., 2020).⁶ Note that people did not need to be online when participating. Questionnaires and the gathered data were locally stored and only transmitted once people had Wi-Fi access.

3. Contact modes and adjustments over time

As shown in Figure 1, the number of identified jobseekers varied substantially across the recruitment period.⁷ Note that the number of people that were invited would be half as high from August 2018 onwards had we not extended invitations to a second sample of non-mass-layoff jobseekers. The number of contacted jobseekers peaked in November 2018. This might reflect a high number of people terminating seasonal jobs or having contracts that expire at the end of the year, thus noticing the employment agency in fall.

⁴ 45 individuals claimed to be employed and were included in the final sample even though they were already no longer employed at the time of their jobseeker registration according to later updates of the administrative data.

⁵ The numbers presented here might slightly differ from substantive analyses based on the GJSP due to specific strategies of dealing with a small number of people who were invited more than once or who potentially falsely claimed to be still employed at sign-up. These cases can be identified via variables in the dataset.

⁶ During our recruitment period, over 95% of smartphones used in Germany relied on Android or iOS as operating systems (Statista, 2022). The Happiness Analyzer runs on both, circumventing selective participation dependent on system software.

⁷ The figure starts with January 2018 as we only contacted a subsample of the actual target group as a pilot study in November 2017 and December 2017 (1,430 invitees combined).

People were initially contacted via a physical letter sent to their home addresses (Appendix B, Material B1). The letter highlighted the study purposes and informed about the institutions involved. It also provided extensive information on data privacy (Appendix B, Material B2) and included a personal token needed to register for the study. The initial sign-up rate in January 2018 and February 2018 was relatively low (see, again, Figure 1). Less than 2% of contacted people installed the app and inserted their token successfully. Accordingly, the number of people actually recruited (final sample) was tiny. We therefore decided to augment the letter by an elaborate and professionally designed flyer (see Appendix B, Material B3). Apart from other nicely presented information about the study, it henceforth contained QR codes directing subjects to the Google PlayStore or Apple Appstore to download the survey app, which were formerly part of the letter.

The sign-up rate soared significantly after the flyer was included in the envelope, providing descriptive support for its effectiveness in recruiting people for the study. We kept providing flyers with the physical letters until the end of the recruitment period. Still, the final sample filled up slowly. As mentioned before, we therefore decided to randomly draw an equally sized second sample of non-mass-layoff jobseekers from the eligible group of individuals, doubling the number of potential participants ('dual sampling').

Moreover, if an email address was available to the BA, people were invited via email instead of a physical letter from August 2018 onwards (see Appendix B, Material B4). Emails conveniently enable participants to use a link to download the app on their smartphone. Links can lead to informative websites. However, email invitations may be misinterpreted as spam and fail to convey the legitimacy of the study. It is therefore a priori unclear whether this step increases participation. At least, contacting people by email helps to save postage costs.

The left-hand panel (A) of Figure 2 presents the sign-up rates by mode of contact from August 2018 to October 2018. It turns out that many more people who were contacted by email installed the app and registered for the survey. This does not need to be an effect of the contact mode though. People who provide an email address might differ also in other respects from those who do not, for instance, when it comes to age, openness to using digital tools, concerns about data privacy and thus be more likely to participate in an app-based study than the latter.

To explore these possibilities and to exploit the potential of the GJSP for methodological research, we ran an experiment on the mode of contact from November 2018 until the end of the recruitment period. We randomly assigned three contact modes to equally sized subgroups of those people who provided an email address (see Lawes et al., 2022a): physical letter, email and a physical pre-announcement letter followed by an email (Appendix B, Material B5).

Figure 1. Contacted jobseekers and sign-up rates over time

Source. Paradata on GJSP participation.

The results of the experiment are presented in the right-hand panel (B) of Figure 2. Neither physical letters nor emails yield higher participation rates. People that provide an email address are simply also more likely to participate in this kind of study. Sending a pre-announcement letter notifying people that they will receive an email inviting them to the GJSP leads to a significantly higher sign-up rate than the other conditions. It seems to combine the advantages of both modes, conveying the legitimacy of the study (physical pre-announcement letter) and convenience when it comes to downloading the app (follow-up email).

As a final adjustment toward the end of the recruitment period, we focused on individuals who received the letter because they had not provided an email address to the Federal Employment Agency. In particular, we tried to formulate the invitation in a simpler and more appealing way. In addition, we experimented with goal framing, placing stronger emphasis on either the monetary incentives provided by the study or the normative goal of making a contribution to society by participating in a research project (Lindenberg & Steg, 2007). Against the background of a limited budget and improving sign-up rates, we terminated recruiting further participants in May 2019.

Despite the positive trend in sign-up to the GJSP over time, the participation rate seems relatively low, overall. People might have hesitated to sign up for an obviously burdensome

study that requires them to indicate plenty of information over a long time every month. Others may have anticipated that they are not part of the target group anymore as they had already lost their jobs. Moreover, people could contact the research team for queries and to provide feedback via telephone and email after they received the invitation. Based on their many calls and messages, we suspect that the extensive public discussion in the run-up to the introduction of the EU's General Data Protection Regulation (GDPR) in spring 2018 did not help in recruiting participants, despite the fact that our study complied with all rules of that directive from the beginning. Other major concerns were of a technical nature, such as uncertainty about one's eligibility for the study, disabled tokens and switching smartphones during participation.⁸

Participation in app-based surveys is generally higher if subjects are recruited from a population of active survey participants, which are obviously prone to take part in studies. Even in these cases the sign-up rate is often below 20%, sometimes only 5%.⁹ There is a lack of evidence on sign-up rates to app-based panel surveys for samples of people who were not previous survey participants, as in our case. We suspect that people's concerns about data protection with respect to smartphone usage generally limit participation in app-based surveys.

Figure 2. Sign-up rates by mode of contact

Note. Panel A depicts sign-up rates of people who received a physical letter, as they had not provided an email address and people for which an email address was available. Panel B depicts sign-up rates for people who provided an email address and were randomly assigned to one of the three contact modes. It is based on Lawes et al. (2022a). Whiskers denote 95% confidence intervals.

Source. Paradata on GJSP participation.

⁸ Once used, tokens needed to be reactivated to avoid multiple participation of the same person.

⁹ Kreuter et al. (2019) invited active participants of the German PASS panel to take part in a mobile data collection. Further examples include Scherpenzeel (2017) and Jäckle et al. (2019) based on British UKHLS data. Keusch et al. (2019) invited previously interviewed refugees to provide passive data through an app.

4. Incentives and smartphone provision

Continued participation is key to any panel survey. We thus rewarded people who had steadily participated in the study (see Table A1 for an overview). Subjects received 10 euros in the form of a money transfer or an Amazon voucher for each month they completed at least 80% of all items in the first year. Continued participation was rewarded further by a loyalty bonus of 40 euros after the sixth and the twelfth month.¹⁰ People who did not reach the threshold of 80% in two months lost eligibility for the loyalty bonus. Those who sent in hair bundles for the measurement of cortisol got another incentive of 10 euros per hair sample. Self-administered hair sampling entailed extracting a hair bundle and sending it to us in a readymade envelop. Subjects could get feedback on their cortisol values if they completed all five measurements.

Regular incentives were no longer paid during the second year of participation, as the first year was most important for our study purposes. However, people could get lottery tickets in year two. After two years, we drew lots for cash prizes worth 5,000 euros in total. Subjects who still participated after April 2020 received a cash incentive of 10 euros per month again because we wanted to ensure that they continued to participate in order to map their well-being around waves of Covid-19. We also continued hair sampling for this group.

An obvious concern about an app-based study is the participation of people who lack access to smartphones. Using apps as survey mode favors the participation of young and educated people as well as people living in areas with widespread broadband internet access. To encourage participation of jobseekers who did not possess a smartphone to participate in the study, we allowed them to complete the entry survey online by using any computer with internet access and to request a smartphone provided through the HRO. Once they received the smartphone, they had to use the app to continue participating. As we will describe in more detail in the next section, the most important reason for us to require smartphones as survey mode is the collection of data on affective well-being via experience sampling. The 179 individuals who borrowed a smartphone did not receive any payments or Amazon vouchers. They could keep the smartphone as a gift after repeatedly participating in the panel study upon the condition that they had completed at least 80% of all questionnaires in year one. This created an incentive to continue participation over time also for this group of people. The monetary value of the smartphone resembled the money obtained through incentives when participating continuously using one's own device.

¹⁰ Initially we paid 15 euros every other month of the first year, ten euros every other month of the second year and no loyalty bonus. The incentive scheme changed for current and new participants.

5. Collected data

Once people had successfully installed the survey app, completed the entry survey and were included in the final sample, the app notified them about new questionnaires on up to eight consecutive days each month over a period of two years. This allowed us to balance the burden of participation over several days during a month. The time needed to complete a daily survey was roughly five minutes. As some questions were asked only every three months or six months, participation in months 1, 4, 7, 10, 13, 16, 19, 22 and 25 was more time consuming.

Table 1 details the collected data and the corresponding frequency of measurement. In response to the Covid-19 pandemic, we added items in relation to the event, such as experience with a Covid-19 infection and taking part in the German job retention scheme (*Kurzarbeit*, i.e. ‘short-time work’) as well as a few other items (highlighted bold). The wording of all questions can be found in our codebook on the Open Science Framework’s (OSF) webpage of the German Job Search Panel (<https://osf.io/h4f25/>), unless access to a scale is legally restricted. The collection of well-being data followed guidelines by the OECD and the US National Academy of Sciences (National Research Council, 2013; OECD, 2013). Cognitive well-being (module C) was assessed by the Satisfaction With Life Scale (Diener et al., 1985), Cantril’s (1965) ladder and life domain-specific satisfaction indicators.

For measuring affective well-being (module A), we used the experience sampling method (ESM; Hektner et al., 2007; Larson & Csikszentmihalyi, 1983), among others. Measuring affective well-being is ideally based on real-time information, since retrospective measurement is prone to errors (OECD, 2013). Before the smartphone era, researchers had to equip subjects with pagers that needed to be carried at all times. Now, participants only need to install the app on their smartphone and wait for the ESM notifications, as most of them carry their smartphone anyway. This renders collecting ESM data much less expensive and burdensome for participants than before, allowing for large sample sizes and repeated measurement (Bryson & MacKerron, 2017).

In our study, people were requested to complete an ESM for their current activity on six randomly chosen time points over the course of one day per month. Those who completed less than three episodes were asked to repeat the ESM module at the end of the monthly questionnaire cycle. The mood states elicited were based on the Multidimensional Mood State Questionnaire (*Multidimensionaler Befindlichkeitsfragebogen*, see Steyer et al. (1997)). Specifically, panelists were asked about their momentary happiness/unhappiness, awakeness/sleepiness and calmness/restlessness.

We also employed the day reconstruction method (DRM; Kahneman et al., 2004) to assess affective well-being. The DRM requires people to complete a diary of the previous day with all activities, for which they are then to indicate their emotional state. We ascertained the emotions happy, nervous, sad, worried, enthusiastic, bored, lonely and stressed. Later on, we also included a summary affective well-being measure concerning the previous day. In addition, people completed a German short version of the Center of Epidemiological Studies Depression Scale (*CES-D / Allgemeine Depressionsskala*, see, e.g., Hautzinger et al. (2012) over the previous week which can be seen as a measure of mental health as well as affective well-being.

Eudaimonic well-being (module E) was measured in three ways. First, by using an adapted 24-item short version of the Ryff (1989) Scale of Psychological Well-Being which was obtained from applying confirmatory factor analysis in combination with an ant algorithm (Schultze, 2017). Four items each assessed the six facets self-acceptance, positive relations, autonomy, environmental mastery, personal growth and purpose in life. Second, by asking individuals during each ESM episode whether their current activity is perceived as meaningful. Third, respondents were asked in the DRM if they had perceived the activity as meaningful.

Further main psychological variables (module P) included a 21-item version of the five facets proactive coping, reflective coping, strategic planning, instrumental support seeking and avoidance coping of the Proactive Coping Inventory (Greenglass et al., 1999). It was reduced to 21 items by a principal component analysis. We also included selected dimensions of the AVEM (*Arbeitsbezogenes Verhaltens- und Erlebensmuster*, work-related behavior and experience patterns, see Schaarschmidt & Fischer (2008), a mood regulation inventory (Lischetzke et al., 2001) and the subscale ‘perceived available support’ of the Berlin Social Support Scales (Schulz & Schwarzer, 2003). Finally, we augmented our version of the CES-D with similarly worded questions on perceived stress and loneliness.

For the measurement of physical health (module H), we closely followed the German Ageing Survey (DEAS; Engstler et al., 2013) and asked people, *inter alia*, about their current health status, diagnosed diseases and health expectations. As mentioned before, we also measured hair cortisol as a biomarker for chronic stress (Stalder & Kirschbaum, 2012). Chronic stress increases the risk for cardiovascular diseases (Dimsdale, 2008), type 2 diabetes (Pouwer et al., 2010), ulcerative colitis (Mawdsley et al., 2006) and decreases fertility (Ebbesen et al., 2009). We further asked subjects to indicate which hair styling products they use, how long they are exposed to the sunlight and whether they use any cortisol-based medication (Dettenborn et al., 2012). The Dresden Lab Service determined the chronic stress level over the past three months in 3 cm hair segments.

Table 1. Questionnaire modules

Module			Frequency
C	C0	Satisfaction With Life Scale	Monthly
	C1	Cantril's ladder	Quarterly
	C2	Satisfaction with various life domains	Monthly
A	A0	Day reconstruction method (feelings)	Quarterly
	A1	Yesterday's mood (new)	Monthly
	A2	Experience sampling: Multidimensional Mood State Questionnaire	Monthly
	A3	Center for Epidemiologic Studies Depression Scale	Monthly
E	E0	Ryff Scale of Psychological Well-Being	Monthly
	E1	Experienced meaningfulness (as part of A0 / A1)	Monthly / quarterly
P	P0	Proactive Coping Inventory	Monthly
	P1	Perceived stress (as part of A0 and add-on to A3)	Monthly
	P2	Loneliness (as part of A0 and later also added to A3)	Monthly
	P3	Work-related Behavior and Experience Patterns (selected dimensions)	Entry survey
	P4	Tendency to resign and problem coping	Monthly
	P5	Mood regulation questionnaire	Monthly
	P6	Berlin Social Support Scale, Perceived support	Monthly (adjusted)
H	H0	Self-assessed health	Monthly
	H1	Changes in health (last five years)	Entry survey
	H2	Expected changes in health (next three years)	Entry survey
	H3	Weight	Monthly
	H4	Disability	Biyearly
	H5	Diseases	Monthly
	H6	Doctoral visits (last three months)	Quarterly
	H7	Overnight stays in hospital (last three months)	Quarterly
	H8	Height	Entry survey
	H9	Hair cortisol concentration as a biomarker of chronic stress	Quarterly
	H10	Worries about health and beyond (new)	Monthly
	H11	Covid-19 infection (new)	Monthly
	H12	Covid-19 contact (new)	Monthly
	H13	Covid-19 quarantine (new)	Monthly
0	00	Consent to record linkage	Month 1, 2 or 3
	01	Employment is still the same	Entry survey
	02	Start date of employment	Entry survey
	03	Reason for job seeker registration	Entry survey
	04	Working hours	Entry survey
	05	Long hours (adjusted)	Entry survey
	06	Earnings	Entry survey
	07	Job characteristics	Entry survey
	08	Employment-related expectation	Entry survey
	09	Smartphone awareness	Entry survey
1	10	Marital status	Biyearly
	11	Partnership	Biyearly
	12	Employment status of partner	Biyearly
	13	Place of residence in 1989	Entry survey
	14	Education / training	Biyearly
	15	Number of children	Biyearly
	16	Household income	Monthly
	17.1	Prejudice toward the unemployed (new)	Monthly
	17.2	Big five personality traits, risk aversion	Quarterly
	17.3	Patience (new)	Monthly
2	18	Fairness, locus of control	Quarterly
	19	Religion	Biyearly
	20	Labour market status	Monthly
	21	Termination of employment relationship (adjusted)	Monthly
	22	Working hours	Quarterly
	23	Long hours	Quarterly
	24	Earnings	Quarterly
	25	Job characteristics	Quarterly
	26	Employment-related expectations	Monthly (adjusted)
	27	Kurzarbeit scheme (short-time work, new)	Monthly
3	28	Key worker (new)	Monthly
	29	Working from home (new)	Monthly
	30	Reemployment planning	Monthly
	31	New job part-time or fulltime	Monthly
	32	Employability	Monthly
	33	Reservation wage	Monthly
	34	Re-employment expectations	Monthly
	35	Job search	Monthly
	36	Employment-related expectations	Monthly
	37	Unemployment benefits (<i>Arbeitslosengeld</i>)	Monthly
39	38	Unemployment benefits II (<i>Arbeitslosengeld II</i>)	Monthly
	39	Re-employment intentions (new)	Monthly

Note. Bold items were added/adjusted in April/July 2020. For all details on the items see the codebook on the OSF webpage of the German Job Search Panel (<https://osf.io/h4f25/>).

What is more, we gathered data on multiple individual characteristics (modules numbered 0-3). These were mostly based on the German Socio-Economic Panel (SOEP, see Wagner et al., 2007), on the DEAS and on the survey ‘The Value of Work’ (Knabe et al., 2010). Subjects were required to indicate their employment status, as we wanted to know when individuals had entered unemployment or found a new job. We also asked them about their job search (if unemployed), job characteristics (if employed), personality traits, family background and so forth. For people who consented to linking the process data of the Federal Employment Agency, information on previous times of employment, unemployment, benefit receipt, participation in labor market policy schemes, among others, can be merged with the survey data.

6. Selectivity analysis

Participation

The final GJSP sample is not representative of the invited group of jobseekers, as we required people to use a smartphone and as the response rate to our study invitation was low. In general, the degree of non-representativeness (i.e., non-response bias) might be the higher the lower the sign-up rate of particular sub-groups (Groves & Peytcheva, 2008). To document the degree of non-response bias and identify patterns of selective participation, we merge paradata on study participation with the Integrated Employment Biographies (IEB) of the IAB (v16). These register-based data combine individual-level information on periods of dependent employment (not as a public servant though), unemployment/welfare benefit receipt, job seeking and participation in active labor market programs (see Jacobebbinghaus & Seth, 2007 for more details on the IEB). A small number of individuals was accidentally contacted more than once (636 individuals). In this report, each individual is included with their first jobseeker registration only. Note that paradata on study participation can be linked to the IEB for all contacted persons through an anonymized person identifier. On the contrary, linking survey data with the IEB requires the explicit consent of participants.

All variables are measured at the time of registering as a jobseeker, i.e., shortly before people received the study invitation. We exclude people who, according to the data, earn unrealistically low wages (≤ 5 euros per day) or wages above the ceiling for social insurance contributions (230 euros per day in 2020 for unemployment insurance in Western German federal states), which are prone to measurement error. In addition to the IEB variables, we include the recruitment month and a variable indicating belonging to the mass layoff sample. Table 2 presents descriptive statistics for the invited group of eligible jobseekers, the sample of

people who signed up and the final sample of people who fulfilled the inclusion criteria. Differences between people who signed up and people who were finally included may be driven by the inclusion criteria. We treat people who did not sign-up as a reference group to test for statistically significant differences between participants and non-participants. It turns out that participants are significantly younger, more likely female, better educated and earn higher wages than non-participants. They also have less work experience over the past ten years. The federal state where people live as well as the recruitment month are also significantly correlated with the probability of signing up. The sign-up rate in the mass-layoff sample was lower compared to the non-mass-layoff samples, but the inclusion criteria seem to have corrected for this bias by chance. What is more, the differences in characteristics between participants and non-participants are highly similar to the whole sample in the group of jobseekers who were contacted as part of the mass layoff sample (cf. Tables 2 and A2 in the Appendix).

Average non-response bias

One may also calculate the average absolute non-response bias ($Y_{absolute}$) separately for both definitions of participation (people who signed up initially and people who were finally included). In line with the literature (e.g., Sakshaug et al., 2019), we compute proportions (Y_k) of persons who participate (S) and compare them to the group of contacted jobseekers (JS) across a wide range of categories ($k = 1, \dots, K$) of variables. The average absolute non-response bias is the sum of all absolute differences between the two samples and the contacted individuals ($|Y_{k,S} - Y_{k,JS}|$) for all categories, divided by the total number of categories:

$$Average\ Absolute\ Bias_S = \frac{\sum_{k=1}^K |Y_{k,S} - Y_{k,JS}|}{K}$$

For binary variables only one category is considered (e.g., female). Ratio variables need to be categorized to obtain proportions that can be compared between people who signed up / belong to final sample and the eligible jobseekers. If their distribution is highly skewed (e.g., periods of welfare benefit receipt over the past ten years), we collapse them into a binary variable (any indication / no indication). Other ratio variables (e.g., age) are categorized into quartiles of the sample of contacted jobseekers. Table A3 in the Appendix details the corresponding statistics. The absolute non-response bias amounts to 3.0% in the group of people who signed up and to 3.7% in the final sample. Non-response biases are thus rather low. This is also true for jobseekers who were invited to participate in the study after experiencing a mass layoff. The average bias is 3.5% for group who signed up and 4.2% for final sample, respectively.

Table 2. Descriptive statistics of invited sample, responders and final sample

	(1) Invited sample			(2) Did not sign up			(3) Signed up			(4) Final sample		
	Mean	(std. dv.)	N	Mean	(std. dv.)	N	Mean	(std. dv.)	N	Mean	(std. dv.)	N
Age (17 - 60)	41.25	(11.23)	127,201	41.35	(11.24)	122,503	38.50***	(10.57)	4,698	38.62***	(10.26)	1,873
Tenure (.41 - 22.1)	3.51	(4.81)	123,095	3.51	(4.83)	118,551	3.39	(4.24)	4,544	3.47	(4.23)	1,826
<i>Employment history over past 10 years (measured in years)</i>												
Regular employment (.21 - 10)	7.27	(2.56)	127,196	7.29	(2.55)	122,498	6.81***	(2.67)	4,698	6.79***	(2.65)	1,873
Unemployment benefit receipt (0 - 5.33)	0.48	(0.69)	127,196	0.49	(0.69)	122,498	0.34***	(0.56)	4,698	0.33***	(0.55)	1,873
Welfare benefit receipt (0 - 10)	0.71	(1.71)	127,196	0.71	(1.72)	122,498	0.54***	(1.46)	4,698	0.47***	(1.34)	1,873
Registered as jobseeker (0 - 10)	1.66	(2.06)	127,196	1.67	(2.07)	122,498	1.34***	(1.84)	4,698	1.30***	(1.75)	1,873
Participation in policy schemes (0 - 10)	0.28	(0.67)	127,196	0.28	(0.68)	122,498	0.23***	(0.61)	4,698	0.19***	(0.54)	1,873
Female (shares)	0.40	(0.49)	127,198	0.40	(0.49)	122,500	0.50†††	(0.50)	4,698	0.51†††	(0.50)	1,873
<i>Highest level of qualification (shares)</i>												
Missing	0.00	(0.00)	127,201	0.00	(0.00)	122,503	0.00†††	(0.00)	4,698	0.00†††	(0.00)	1,873
None	0.05	(0.21)	127,201	0.05	(0.22)	122,503	0.02†††	(0.15)	4,698	0.02†††	(0.12)	1,873
Vocational training	0.61	(0.49)	127,201	0.62	(0.49)	122,503	0.35†††	(0.48)	4,698	0.30†††	(0.46)	1,873
A-levels	0.01	(0.11)	127,201	0.01	(0.11)	122,503	0.02†††	(0.14)	4,698	0.01†††	(0.12)	1,873
A-levels and vocational training	0.14	(0.34)	127,201	0.13	(0.34)	122,503	0.19†††	(0.39)	4,698	0.19†††	(0.39)	1,873
Tertiary degree	0.19	(0.39)	127,201	0.18	(0.39)	122,503	0.42†††	(0.49)	4,698	0.48†††	(0.50)	1,873
<i>Federal state (shares)</i>												
Schleswig-Holstein	0.03	(0.18)	127,148	0.03	(0.18)	122,450	0.03†††	(0.17)	4,698	0.03†††	(0.16)	1,873
Hamburg	0.02	(0.14)	127,148	0.02	(0.14)	122,450	0.03†††	(0.18)	4,698	0.03†††	(0.18)	1,873
Lower Saxony	0.11	(0.31)	127,148	0.11	(0.31)	122,450	0.09†††	(0.29)	4,698	0.10†††	(0.31)	1,873
Bremen	0.01	(0.10)	127,148	0.01	(0.10)	122,450	0.01†††	(0.10)	4,698	0.01†††	(0.11)	1,873
North Rhine Westphalia	0.19	(0.39)	127,148	0.19	(0.39)	122,450	0.19†††	(0.39)	4,698	0.18†††	(0.39)	1,873
Hesse	0.06	(0.24)	127,148	0.06	(0.24)	122,450	0.05†††	(0.22)	4,698	0.06†††	(0.23)	1,873
Rhineland Palatinate	0.05	(0.21)	127,148	0.05	(0.21)	122,450	0.04†††	(0.19)	4,698	0.03†††	(0.18)	1,873
Baden Württemberg	0.09	(0.29)	127,148	0.09	(0.29)	122,450	0.10†††	(0.31)	4,698	0.11†††	(0.31)	1,873
Bavaria	0.18	(0.38)	127,148	0.18	(0.38)	122,450	0.16†††	(0.37)	4,698	0.14†††	(0.35)	1,873
Saarland	0.01	(0.12)	127,148	0.01	(0.12)	122,450	0.01†††	(0.11)	4,698	0.01†††	(0.11)	1,873
Berlin	0.05	(0.21)	127,148	0.05	(0.21)	122,450	0.09†††	(0.29)	4,698	0.09†††	(0.29)	1,873
Brandenburg	0.04	(0.19)	127,148	0.04	(0.19)	122,450	0.04†††	(0.18)	4,698	0.04†††	(0.20)	1,873
Mecklenburg Western Pomerania	0.02	(0.15)	127,148	0.02	(0.15)	122,450	0.02†††	(0.15)	4,698	0.02†††	(0.15)	1,873
Saxony	0.06	(0.24)	127,148	0.06	(0.24)	122,450	0.06†††	(0.24)	4,698	0.06†††	(0.24)	1,873
Saxony Anhalt	0.04	(0.20)	127,148	0.04	(0.21)	122,450	0.03†††	(0.18)	4,698	0.03†††	(0.18)	1,873
Thuringia	0.04	(0.20)	127,148	0.04	(0.20)	122,450	0.03†††	(0.18)	4,698	0.04†††	(0.18)	1,873
Abroad	0.00	(0.02)	127,148	0.00	(0.02)	122,450	0.00†††	(0.00)	4,698	0.00†††	(0.00)	1,873
Mass layoff sample (share)	0.62	(0.48)	127,201	0.62	(0.48)	122,503	0.56†††	(0.50)	4,698	0.63	(0.48)	1,873

Table to be continued on the next page.

Table 2 (continued)

	Invited sample			Did not sign up			Signed up			Final sample		
	Mean	(std. dv.)	N	Mean	(std. dv.)	N	Mean	(std. dv.)	N	Mean	(std. dv.)	N
<i>Recruitment month (shares)</i>												
Pre-test (November, December 2017)	0.01	(0.11)	127,201	0.01	(0.11)	122,503	0.00 ^{†††}	(0.07)	4,698	0.00 ^{†††}	(0.05)	1,873
January 2018	0.06	(0.24)	127,201	0.06	(0.24)	122,503	0.02 ^{†††}	(0.14)	4,698	0.02 ^{†††}	(0.14)	1,873
February 2018	0.04	(0.20)	127,201	0.04	(0.20)	122,503	0.02 ^{†††}	(0.14)	4,698	0.02 ^{†††}	(0.15)	1,873
March 2018	0.03	(0.16)	127,201	0.03	(0.16)	122,503	0.03 ^{†††}	(0.16)	4,698	0.04 ^{†††}	(0.19)	1,873
April 2018	0.02	(0.14)	127,201	0.02	(0.14)	122,503	0.01 ^{†††}	(0.11)	4,698	0.01 ^{†††}	(0.09)	1,873
May 2018	0.03	(0.17)	127,201	0.03	(0.17)	122,503	0.03 ^{†††}	(0.16)	4,698	0.03 ^{†††}	(0.18)	1,873
June 2018	0.03	(0.18)	127,201	0.03	(0.18)	122,503	0.03 ^{†††}	(0.18)	4,698	0.04 ^{†††}	(0.19)	1,873
July 2018	0.03	(0.16)	127,201	0.03	(0.16)	122,503	0.02 ^{†††}	(0.14)	4,698	0.02 ^{†††}	(0.15)	1,873
August 2018	0.06	(0.25)	127,201	0.06	(0.25)	122,503	0.07 ^{†††}	(0.26)	4,698	0.07 ^{†††}	(0.26)	1,873
September 2018	0.05	(0.21)	127,201	0.05	(0.21)	122,503	0.05 ^{†††}	(0.22)	4,698	0.05 ^{†††}	(0.23)	1,873
October 2018	0.04	(0.21)	127,201	0.05	(0.21)	122,503	0.04 ^{†††}	(0.20)	4,698	0.03 ^{†††}	(0.18)	1,873
November 2018	0.15	(0.36)	127,201	0.15	(0.36)	122,503	0.19 ^{†††}	(0.39)	4,698	0.22 ^{†††}	(0.42)	1,873
December 2018	0.08	(0.27)	127,201	0.08	(0.27)	122,503	0.08 ^{†††}	(0.27)	4,698	0.05 ^{†††}	(0.22)	1,873
January 2019	0.09	(0.28)	127,201	0.09	(0.28)	122,503	0.08 ^{†††}	(0.27)	4,698	0.06 ^{†††}	(0.24)	1,873
February 2019	0.07	(0.26)	127,201	0.07	(0.26)	122,503	0.07 ^{†††}	(0.25)	4,698	0.05 ^{†††}	(0.22)	1,873
March 2019	0.06	(0.24)	127,201	0.06	(0.24)	122,503	0.06 ^{†††}	(0.24)	4,698	0.06 ^{†††}	(0.24)	1,873
April 2019	0.05	(0.23)	127,201	0.05	(0.23)	122,503	0.06 ^{†††}	(0.24)	4,698	0.06 ^{†††}	(0.24)	1,873
May 2019	0.09	(0.29)	127,201	0.09	(0.29)	122,503	0.13 ^{†††}	(0.33)	4,698	0.15 ^{†††}	(0.35)	1,873
<i>Employment status (shares)</i>												
Employed, contributing to social insurance	0.97	(0.18)	127,201	0.97	(0.18)	122,503	0.97	(0.18)	4,698	0.97	(0.16)	1,873
Marginally employed	0.00	(0.04)	127,201	0.00	(0.04)	122,503	0.00	(0.04)	4,698	0.00	(0.03)	1,873
Other (i.e. apprenticeship)	0.03	(0.17)	127,201	0.03	(0.17)	122,503	0.03	(0.17)	4,698	0.02	(0.15)	1,873
Part-time job (share)	0.24	(0.43)	123,095	0.23	(0.42)	118,551	0.29 ^{†††}	(0.46)	4,544	0.33 ^{†††}	(0.47)	1,826
Daily wage (5.02 - 229.35)	92.99	(42.23)	120,266	92.56	(41.95)	115,854	104.27 ^{***}	(47.73)	4,412	108.01 ^{***}	(47.75)	1,795
Individuals	127,201			122,503			4,698			1,873		

Note. Asterisks denote significant differences between the samples of people who signed up / the final sample and the sample of people who did not sign-up: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. We performed Chi2 tests for categorical and dummy variables: †, ††, ††† denote significance at least at 5%, 1% and 0.1% level respectively.

Source. Paradata on GJSP participation and IEB version v16.

Multivariate analyses

Next, we run separate multivariate analyses on the probabilities of signing up and of belonging to the final sample to identify drivers of selective participation. For instance, the finding that people with less work experience in employment subject to social insurance contributions over the last ten years are relatively likely to sign up might be driven by age (see, again, Table 2). Likewise, the fact that both educational attainment and wages increase the probability to participate might originate from one of the two characteristics only. Table 3 presents the corresponding logit estimates and the marginal effects in percentage points of the probability to belong to the respective sample. Still, young individuals, females and part-time workers were relatively likely to sign up and be part of the final sample, despite potential overlap between these groups, which is now controlled for.¹¹ A lower daily wage and longer previous spells of receiving unemployment benefits decrease the likelihood of signing up and final sample inclusion. People in the mass layoff sample were less likely to sign up, but more likely to be included in the final sample. As we report in Table A4 in the Appendix, all of the previous findings on significant predictors of participation emerge likewise within the mass layoff sample.

Most strikingly, education has a strong effect on the probability to participate in the GJSP. For example, people with a tertiary degree are about 3.9 percentage points more likely to sign up than people with no degree when all other covariates are at their mean (mass layoff sample: 3.6 p.p.). This stark difference reduces to 1.7 percentage points (mass layoff sample: 1.5 p.p.) when it comes to the probability of belonging to the final sample. Generally, the marginal effects (and, hence, the conditional variable-specific non-response biases) appear smaller for the final sample than for sign up.¹²

¹¹ According to Lawes et al. (2022a), the gender difference in sign-up would not exist had we been able to invite everyone by a pre-announcement letter and a subsequent email. Males are almost as likely to sign up as females in the corresponding treatment condition of their experiment.

¹² Note that this observation is not based on tests for statistically significant differences.

Table 3. Probability of signing up and belonging to the final sample, conditional estimates

	Probability of signing up			Probability of belonging to final sample		
	Logit estimates	(Standard errors)	Marginal effects	Logit estimates	(Standard errors)	Marginal effects
Age in years / 10	-0.181***	(0.018)	-0.507***	-0.187***	(0.028)	-0.194***
Tenure in years / 10	0.031	(0.044)	0.086	0.058	(0.068)	0.060
<i>Employment history (over past 10 years)</i>						
Regular employment (.21 - 10)	-0.011	(0.008)	-0.030	-0.022	(0.012)	-0.023
Unemployment benefit receipt (0 - 5.33)	-0.146***	(0.041)	-0.409***	-0.208***	(0.063)	-0.216***
Welfare benefit receipt (0 - 10)	-0.060*	(0.024)	-0.167*	-0.165***	(0.035)	-0.171***
Registered as jobseeker (0 - 10)	0.046*	(0.022)	0.130*	0.139***	(0.031)	0.144***
Participation in policy schemes (0 - 10)	0.056	(0.029)	0.156	-0.009	(0.050)	-0.009
Female (shares)	0.248***	(0.034)	0.696***	0.282***	(0.053)	0.292***
<i>Level of qualification (ref. no degree)</i>						
Vocational training	0.339**	(0.107)	0.950**	0.479*	(0.193)	0.497*
A-levels	1.084***	(0.151)	3.039***	1.021***	(0.271)	1.060***
A-levels and vocational training	1.067***	(0.110)	2.993***	1.316***	(0.196)	1.366***
Tertiary degree	1.397***	(0.109)	3.917***	1.666***	(0.194)	1.729***
<i>Federal state (ref. Schleswig Holstein)</i>						
Hamburg	0.228	(0.126)	0.640	0.368	(0.201)	0.382
Lower Saxony	-0.024	(0.104)	-0.068	0.234	(0.170)	0.243
Bremen	-0.044	(0.184)	-0.123	0.288	(0.266)	0.299
North Rhine Westphalia	0.017	(0.098)	0.047	0.135	(0.163)	0.140
Hesse	-0.217	(0.114)	-0.608	-0.000	(0.183)	-0.000
Rhineland Palatinate	-0.019	(0.121)	-0.054	0.089	(0.199)	0.092
Baden Württemberg	0.062	(0.103)	0.175	0.215	(0.170)	0.223
Bavaria	0.049	(0.099)	0.137	0.080	(0.166)	0.083
Saarland	-0.005	(0.169)	-0.013	0.097	(0.273)	0.100
Berlin	0.358***	(0.106)	1.005***	0.416*	(0.174)	0.432*
Brandenburg	0.168	(0.123)	0.470	0.518**	(0.193)	0.538**
Mecklenburg Western Pomerania	0.153	(0.141)	0.430	0.455*	(0.219)	0.472*
Saxony	0.115	(0.110)	0.323	0.216	(0.181)	0.224
Saxony Anhalt	0.089	(0.125)	0.249	0.295	(0.202)	0.306
Thuringia	0.095	(0.125)	0.267	0.347	(0.199)	0.360
Mass layoff sample	-0.114**	(0.035)	-0.321**	0.123*	(0.055)	0.128*
<i>Recruitment month (ref. November 2018)</i>						
Pre-test (November, December 2017)	-0.638**	(0.220)	-1.788**	-1.397**	(0.453)	-1.450**
January 2018	-0.607***	(0.113)	-1.703***	-0.790***	(0.180)	-0.820***
February 2018	-0.296**	(0.113)	-0.830**	-0.367*	(0.169)	-0.381*
March 2018	0.030	(0.101)	0.083	0.019	(0.142)	0.020
April 2018	-0.336*	(0.144)	-0.943*	-0.786**	(0.251)	-0.816**
May 2018	-0.314**	(0.103)	-0.881**	-0.347*	(0.143)	-0.360*
June 2018	-0.027	(0.092)	-0.075	-0.131	(0.133)	-0.136
July 2018	-0.277*	(0.116)	-0.778*	-0.422*	(0.172)	-0.438*
August 2018	-0.060	(0.068)	-0.168	-0.203*	(0.103)	-0.210*
September 2018	-0.003	(0.079)	-0.009	-0.029	(0.117)	-0.030
October 2018	-0.057	(0.085)	-0.159	-0.364*	(0.143)	-0.378*
December 2018	-0.016	(0.067)	-0.046	-0.508***	(0.119)	-0.528***
January 2019	0.001	(0.066)	0.004	-0.334**	(0.110)	-0.346**
February 2019	-0.087	(0.069)	-0.245	-0.403***	(0.114)	-0.419***
March 2019	0.018	(0.072)	0.050	-0.046	(0.108)	-0.047
April 2019	-0.029	(0.074)	-0.081	-0.106	(0.113)	-0.110
May 2019	0.172**	(0.056)	0.481**	0.163*	(0.081)	0.169*
Part-time job (share)	0.189***	(0.040)	0.530***	0.401***	(0.061)	0.417***
Daily wage in euros / 10	0.043***	(0.004)	0.120***	0.062***	(0.007)	0.065***
Individuals	120,187		120,187	117,570		117,570

Note. The table presents logit estimates and marginal effects (at means, percentage points) of the probability to sign up / belong to the final sample of the GJSP survey. The number of individuals is lower compared to Table 2 since only individuals without any missing information in the relevant variables are included in the estimation. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Source. Paradata on GJSP participation and IEB version v16.

Compliance with record linkage and hair sampling

All analyses considering hair cortisol or linking survey data to administrative data would be subject to further sample selection unless the willingness to provide hair samples or to give consent to the record linkage was random. Table A5 in the Appendix displays to what extent the final sample differs from the groups who expressed this willingness. It also provides figures on another relevant comparison group, the subsample of people that were asked to send hair samples / consent to record linkage which is not the same as the final sample. Differences in this respect may originate from attrition up to the points where we inquired if people were prepared to comply with our requests (cortisol: end of the first week of questions, record linkage: months two and three). However, Table A5 reveals hardly any differences. People who approve of linking their administrative records to their survey data resemble the final sample largely. Hence, in this respect the non-response bias is small.

The high number of compliers (cortisol: 81.8%, linkage consent: 90.7% and 81.4% and 90.4% for the mass layoff sample, respectively) may cover important reasons for belonging to the exceptional group of people that does not give their consent to the record linkage / is unwilling to submit hair samples. We therefore run a multivariate analysis, separately estimating the propensities of consent to record linkage and indicated willingness to participate in the cortisol study based on the respective samples of people who were asked to comply. The results of the corresponding logit estimations are depicted by Table 4.

We find a couple of substantial marginal effects. The effects of only three individual characteristics, however, are statistically significant: age increases the probability of participating in the cortisol study. While we can only speculate about the reason for this finding, it seems plausible that older people are more interested in health-related studies. This is also true for the mass layoff sample as we show in Table A6 (Appendix), where, additionally, the daily wage attracts a statistically significantly negative effect. A much more detailed analysis of participation in the hair sampling can be obtained from Lawes et al. (2022b). In the process, further obstacles to participation after indicating a principal willingness are analyzed and discussed. For instance, not all willing individuals could actually participate in the hair-sampling as their hair was too short. What is more, not all eligible subjects stuck to completing the whole process which includes retrieving and sending a sample of their hair by postal letter.

People working in East Germany have a higher propensity to consent to the linkage of their administrative records in both the full sample as well as the mass layoff subsample. Time spent regularly employed (i.e., employed subject to social security contributions) increases the propensity to indicate a willingness to partake in the cortisol study, too. This result is not statistically significant in the mass layoff sample, where, however, part-time work attracts a significantly positive effect.

Table 4. Determinants of linkage consent and hair sampling participation

	Probability of Linkage consent			Probability of willingness to participate in the hair sampling		
	Logit estimates	(Standard errors)	Marginal effects	Logit estimates	(Standard errors)	Marginal effects
Age in years / 10	0.233	(0.128)	1.688	0.276**	(0.090)	3.923**
Tenure in years / 10	-0.494	(0.287)	-3.576	-0.182	(0.206)	-2.596
<i>Employment history (over past 10 years)</i>						
Regular employment (.21 - 10)	0.111*	(0.052)	0.803*	0.023	(0.036)	0.326
Unemployment benefit receipt (0 - 5.33)	-0.524	(0.287)	-3.792	0.009	(0.208)	0.129
Welfare benefit receipt (0 - 10)	-0.110	(0.158)	-0.794	0.102	(0.116)	1.452
Registered as jobseeker (0 - 10)	0.033	(0.144)	0.239	-0.136	(0.101)	-1.934
Participation in policy schemes (0 - 10)	0.413	(0.273)	2.993	0.095	(0.176)	1.356
Female (shares)	-0.354	(0.217)	-2.562	0.121	(0.153)	1.728
Mass layoff sample	-0.247	(0.234)	-1.786	-0.082	(0.165)	-1.168
Academic degree	0.307	(0.249)	2.224	0.064	(0.175)	0.909
East Germany	0.972**	(0.340)	7.036**	0.257	(0.198)	3.656
<i>Recruitment month (ref. November 2018)</i>						
Pre-test (November, December 2017)	0.000	(.)	0.000	0.000	(.)	0.000
January 2018	-0.601	(0.706)	-4.352	0.403	(0.653)	5.740
February 2018	0.728	(1.085)	5.273	0.049	(0.658)	0.700
March 2018	0.987	(1.061)	7.145	-0.205	(0.496)	-2.924
April 2018	0.000	(.)	0.000	0.955	(1.056)	13.598
May 2018	-0.307	(0.510)	-2.223	-0.111	(0.411)	-1.582
June 2018	0.634	(0.574)	4.589	0.058	(0.404)	0.831
July 2018	0.577	(0.782)	4.179	-1.007*	(0.435)	-14.332*
August 2018	-0.018	(0.411)	-0.128	-0.132	(0.306)	-1.884
September 2018	0.724	(0.637)	5.245	-0.380	(0.356)	-5.416
October 2018	1.196	(1.047)	8.663	-0.063	(0.481)	-0.896
December 2018	0.096	(0.484)	0.693	-0.740*	(0.319)	-10.529*
January 2019	0.254	(0.484)	1.840	-0.503	(0.318)	-7.156
February 2019	-0.014	(0.430)	-0.102	0.468	(0.389)	6.667
March 2019	0.322	(0.452)	2.329	0.188	(0.342)	2.672
April 2019	0.387	(0.520)	2.803	0.155	(0.369)	2.201
May 2019	-0.032	(0.317)	-0.234	-0.426	(0.232)	-6.061
Part-time job (share)	0.399	(0.276)	2.892	0.252	(0.196)	3.581
Daily wage in euros / 10	-0.008	(0.031)	-0.055	-0.035	(0.022)	-0.491
Individuals	1,194		1,194	1,341		1,341

*Note. The table presents logit estimates and marginal effects (at means, percentage points) of the two outcomes (linkage consent, cortisol participation), conditional on being asked to comply with the respective outcome. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.*

Source. Paradata on GJSP participation and IEB version v16.

Panel stability

The upper panel of Figure 4 depicts the retention rates for each month of the first year of the study. Both the number of people missing the 80% threshold as well as the number of people failing to respond to any item in a given months are displayed. Panel attrition seems to slow down over time. In particular, the 80% threshold was reached by a stable number of participants from the second month onwards. One might speculate whether the first month was used by many participants as a trial.

The lower panel of Figure 4 depicts retention rates across recruitment quarters based on the number of people that answered at least one item. It turns out that panel attrition was high at the beginning of the study. The recruitment waves in the first quarter of 2018 are associated with the worst retention. This might be due to technical difficulties with the app-based survey during this time, which could explain why about 30% of participants successfully recruited in the first quarter of 2018 failed to answer at least a single item in the first month. As depicted in Figure 4, the following recruitment quarters perform much better in this respect, which suggests that the underlying problem was solved.

To further analyze panel stability over time, we estimate the probabilities to participate in the survey after 6 months (wave 7, M7) and one year (wave 13, M13), respectively, conditional on the characteristics previously used to explain initial sign-up (see Table 3). Table 5 shows to what extent the participants in M7 and M13 differ from the final sample. We find only a small number of significant results. Females are more likely to still participate in wave 7 of the survey than males. In the subsample of mass layoffs this result is still statistically significant at M13 (see, in addition, Table A7 in the Appendix). Individuals with longer tenures (insignificant in mass layoff sample) and A-level education (but no higher degree) are more likely to continue participation at least until month 13. Again, the first monthly recruitment waves are associated with much larger attrition than later waves. Overall, this means that the sample did not become substantially more selective over time.

Figure 4. Panel stability

Source. Paradata on GJSP participation.

Note. The solid (dashed) line in the upper panel of the figure depicts the number of participants responding to at least one (80 %) of the questions each month. The lower panel depicts the share of participants included in the final sample responding to at least one item per month for each quarterly period of recruitment.

Table 5. Determinants of continuous participation of at least six months / one year

	Probability of participating in M7			Probability of participating in M13		
	Logit estimates	(Standard errors)	Marginal effects	Logit estimates	(Standard errors)	Marginal effects
Age in years / 10	0.028	(0.058)	0.700	0.087	(0.059)	2.152
Tenure in years / 10	0.258	(0.145)	6.447	0.294*	(0.147)	7.309*
<i>Employment history (over past 10 years)</i>						
Regular employment (0.21 - 10)	0.012	(0.025)	0.294	0.001	(0.025)	0.034
Unemployment benefit receipt (0 - 5.33)	-0.135	(0.139)	-3.364	-0.129	(0.142)	-3.195
Welfare benefit receipt (0 - 10)	-0.088	(0.077)	-2.198	-0.146	(0.079)	-3.627
Registered as jobseeker (0 - 10)	0.078	(0.069)	1.941	0.091	(0.070)	2.250
Participation in policy schemes (0 - 10)	-0.115	(0.110)	-2.882	-0.056	(0.114)	-1.382
Female (shares)	0.209*	(0.106)	5.215*	0.143	(0.107)	3.559
<i>Level of qualification (ref. no degree)</i>						
Vocational training	0.186	(0.434)	4.637	0.422	(0.484)	10.471
A-levels	0.836	(0.583)	20.898	1.263*	(0.628)	31.353*
A-levels and vocational training	0.499	(0.439)	12.466	0.674	(0.488)	16.719
Tertiary degree	0.555	(0.436)	13.875	0.737	(0.485)	18.301
<i>Federal state (ref. Schleswig Holstein)</i>						
Hamburg	-0.685	(0.418)	-17.120	-0.585	(0.423)	-14.521
Lower Saxony	-0.240	(0.358)	-5.991	-0.042	(0.359)	-1.043
Bremen	-0.700	(0.561)	-17.478	-0.568	(0.591)	-14.112
North Rhine Westphalia	-0.530	(0.344)	-13.229	-0.319	(0.345)	-7.929
Hesse	-0.382	(0.385)	-9.544	-0.216	(0.385)	-5.370
Rhineland Palatinate	-0.306	(0.416)	-7.635	-0.183	(0.418)	-4.548
Baden Württemberg	-0.513	(0.357)	-12.813	-0.297	(0.358)	-7.368
Bavaria	-0.713*	(0.349)	-17.823*	-0.484	(0.351)	-12.017
Saarland	0.364	(0.585)	9.093	-0.197	(0.576)	-4.883
Berlin	-0.512	(0.364)	-12.795	-0.256	(0.365)	-6.364
Brandenburg	-0.150	(0.405)	-3.756	0.018	(0.407)	0.454
Mecklenburg Western Pomerania	0.076	(0.466)	1.896	0.072	(0.472)	1.775
Saxony	-0.387	(0.382)	-9.670	-0.230	(0.383)	-5.715
Saxony Anhalt	-0.624	(0.426)	-15.578	-0.489	(0.436)	-12.145
Thuringia	-0.457	(0.416)	-11.418	-0.315	(0.418)	-7.810
Mass layoff sample	0.090	(0.112)	2.243	0.125	(0.111)	3.099
<i>Recruitment month (ref. November 2018)</i>						
Pre-test (November, December 2017)	0.000	(.)	0.000	0.000	(.)	0.000
January 2018	-1.604***	(0.477)	-40.063***	0.000	(.)	0.000
February 2018	-1.366***	(0.403)	-34.120***	0.000	(.)	0.000
March 2018	-1.385***	(0.327)	-34.593***	-1.413***	(0.348)	-35.086***
April 2018	-0.590	(0.514)	-14.746	-0.568	(0.527)	-14.094
May 2018	-0.241	(0.290)	-6.020	-0.197	(0.291)	-4.883
June 2018	-0.310	(0.268)	-7.733	-0.327	(0.271)	-8.123
July 2018	-0.015	(0.348)	-0.370	-0.020	(0.348)	-0.507
August 2018	-0.121	(0.208)	-3.021	-0.343	(0.211)	-8.520
September 2018	-0.048	(0.238)	-1.211	-0.144	(0.240)	-3.570
October 2018	-0.087	(0.289)	-2.169	-0.293	(0.294)	-7.269
December 2018	0.032	(0.241)	0.792	-0.050	(0.242)	-1.234
January 2019	-0.098	(0.222)	-2.460	-0.001	(0.222)	-0.015
February 2019	0.660**	(0.243)	16.478**	0.477*	(0.233)	11.837*
March 2019	0.228	(0.220)	5.696	0.114	(0.217)	2.818
April 2019	0.019	(0.228)	0.471	-0.052	(0.229)	-1.283
May 2019	0.070	(0.165)	1.747	0.057	(0.164)	1.418
Part-time job (share)	0.110	(0.129)	2.739	0.044	(0.130)	1.092
Daily wage in euros / 10	-0.002	(0.015)	-0.038	-0.003	(0.015)	-0.076
Individuals	1,790		1,790	1,713		1,713

Note. The table presents logit estimates and marginal effects (at means, percentage points) of continued participation after six months and after one year, respectively (conditional on belonging to the final sample). The number of individuals is lower compared to the number of individuals in Table 2 since only individuals without any missing values on the relevant variables are included in the estimations.

** $p < 0.001$, * $p < 0.01$, $p < 0.05$.

Source. Paradata on GJSP participation and IEB version v16.

7. Conclusions

The GJSP is a new source of panel data with a focus on well-being and health. Jobseekers are surveyed on a monthly basis using a smartphone app. The data collection is innovative along several dimensions: It allows for collecting longitudinal data on various well-being facets and chronic stress using state-of-the-art methods (e.g., experience sampling and hair cortisol) before and after a job loss. Further, the survey data may be linked to rich administrative records covering participants full employment history with a few exceptions (e.g. periods as public servant). The sampling allows for comparing unemployed jobseekers to a highly comparable group of continuously employed individuals. These merits, however, come at some cost, first, low participation, and, second, selective participation.

The low sign-up proved to be an issue, bearing the risk of large non-response bias. Reassuringly, the aggregate bias turned out to be quite low. Nevertheless, the question arises as to why people hesitate to sign up for an app-based survey. The act of downloading, registering, and actively engaging with an app for frequent measurement may still be burdensome. Moreover, people might be concerned about the protection of their data in particular if smartphones are used as survey mode. Not surprisingly, an app-based survey on well-being and health attracts a non-random group of participants. Although aggregate bias is low, there are patterns of self-selection into the sample, most importantly of women, highly educated people and young workers.

On a more general note, when choosing a survey mode, low sign-up and selective participation need to be considered and weighed against the advantages of using smartphone apps over traditional web surveys or face-to-face and telephone surveys. These advantages include convenient high-frequency assessment, increased flexibility for participants, push notifications, reminders and interventions. The case of the GJSP highlights one of these advantages. Data such as experience sampling would be difficult or almost impossible to gather by other means than via a smartphone app.

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Appendix A: supplementary tables

Table A1. Incentive scheme

Month	Monthly bonus	Loyalty bonus	Incentive per month	Sum of incentives	Sum of lottery tickets
1	10.00 €		10.00 €	10.00 €	
2	10.00 €		10.00 €	20.00 €	
3	10.00 €		10.00 €	30.00 €	
4	10.00 €		10.00 €	40.00 €	
5	10.00 €		10.00 €	50.00 €	
6	10.00 €	40.00 €	50.00 €	100.00 €	
7	10.00 €		10.00 €	110.00 €	
8	10.00 €		10.00 €	120.00 €	
9	10.00 €		10.00 €	130.00 €	
10	10.00 €		10.00 €	140.00 €	
11	10.00 €		10.00 €	150.00 €	
12	10.00 €	40.00 €	50.00 €	200.00 €	
13				200.00 €	2
14				200.00 €	4
15				200.00 €	6
16				200.00 €	8
17				200.00 €	10
18				200.00 €	12
19				200.00 €	14
20				200.00 €	16
21				200.00 €	18
22				200.00 €	20
23				200.00 €	22
24				200.00 €	24
25				200.00 €	26

Table A2. Descriptive statistics mass layoff samples

	(1) Invited sample			(2) Did not sign up			(3) Signed up			(4) Final sample		
	Mean	(std. dv.)	N	Mean	(std. dv.)	N	Mean	(std. dv.)	N	Mean	(std. dv.)	N
Age (17 - 60)	41.99	(11.06)	79,092	42.10	(11.07)	76,474	38.62***	(10.42)	2,618	38.48***	(10.13)	1,174
Tenure (0.41 - 22.1)	3.84	(5.14)	77,903	3.84	(5.16)	75,336	3.69	(4.44)	2,567	3.73	(4.36)	1,153
<i>Employment history over past 10 years (measured in years)</i>												
Regular employment (0- 10)	7.52	(2.50)	79,089	7.54	(2.49)	76,471	6.90***	(2.71)	2,618	6.86***	(2.69)	1,174
Unemployment benefit receipt (0 - 4.93)	0.49	(0.71)	79,089	0.50	(0.71)	76,471	0.31***	(0.54)	2,618	0.30***	(0.50)	1,174
Welfare benefit receipt (0 - 10)	0.62	(1.61)	79,089	0.63	(1.62)	76,471	0.50***	(1.41)	2,618	0.43***	(1.27)	1,174
Registered as job seeker (0 - 10)	1.59	(2.00)	79,089	1.60	(2.00)	76,471	1.27***	(1.81)	2,618	1.23***	(1.68)	1,174
Participation in policy schemes (0 - 10)	0.24	(0.63)	79,089	0.24	(0.63)	76,471	0.20***	(0.58)	2,618	0.16***	(0.50)	1,174
Female (shares)	0.35	(0.48)	79,090	0.34	(0.47)	76,472	0.45†††	(0.50)	2,618	0.49†††	(0.50)	1,174
<i>Highest level of qualification (shares)</i>												
Missing	0.00	(0.00)	79,092	0.00	(0.00)	76,474	0.00†††	(0.00)	2,618	0.00†††	(0.00)	1,174
None	0.05	(0.22)	79,092	0.05	(0.22)	76,474	0.02†††	(0.14)	2,618	0.02†††	(0.14)	1,174
Vocational training	0.63	(0.48)	79,092	0.64	(0.48)	76,474	0.35†††	(0.48)	2,618	0.30†††	(0.46)	1,174
A-levels	0.01	(0.11)	79,092	0.01	(0.11)	76,474	0.02†††	(0.14)	2,618	0.02†††	(0.13)	1,174
A-levels and vocational training	0.12	(0.32)	79,092	0.12	(0.32)	76,474	0.16†††	(0.37)	2,618	0.16†††	(0.37)	1,174
Tertiary degree	0.19	(0.39)	79,092	0.18	(0.38)	76,474	0.45†††	(0.50)	2,618	0.50†††	(0.50)	1,174
<i>Federal state (shares)</i>												
Schleswig-Holstein	0.03	(0.17)	79,055	0.03	(0.17)	76,437	0.03†††	(0.16)	2,618	0.03†††	(0.16)	1,174
Hamburg	0.02	(0.13)	79,055	0.02	(0.13)	76,437	0.03†††	(0.17)	2,618	0.03†††	(0.17)	1,174
Lower Saxony	0.11	(0.31)	79,055	0.11	(0.31)	76,437	0.10†††	(0.30)	2,618	0.11†††	(0.32)	1,174
Bremen	0.01	(0.10)	79,055	0.01	(0.10)	76,437	0.01†††	(0.10)	2,618	0.01†††	(0.12)	1,174
North Rhine Westphalia	0.18	(0.38)	79,055	0.18	(0.38)	76,437	0.18†††	(0.39)	2,618	0.19†††	(0.39)	1,174
Hesse	0.06	(0.23)	79,055	0.06	(0.23)	76,437	0.05†††	(0.21)	2,618	0.05†††	(0.21)	1,174
Rhineland Palatinate	0.04	(0.21)	79,055	0.04	(0.21)	76,437	0.03†††	(0.18)	2,618	0.03†††	(0.17)	1,174
Baden Württemberg	0.08	(0.28)	79,055	0.08	(0.28)	76,437	0.10†††	(0.30)	2,618	0.10†††	(0.30)	1,174
Bavaria	0.19	(0.40)	79,055	0.20	(0.40)	76,437	0.16†††	(0.37)	2,618	0.14†††	(0.35)	1,174
Saarland	0.01	(0.12)	79,055	0.01	(0.12)	76,437	0.01†††	(0.10)	2,618	0.01†††	(0.09)	1,174
Berlin	0.05	(0.21)	79,055	0.05	(0.21)	76,437	0.10†††	(0.30)	2,618	0.10†††	(0.30)	1,174
Brandenburg	0.04	(0.19)	79,055	0.04	(0.19)	76,437	0.04†††	(0.19)	2,618	0.04†††	(0.21)	1,174
Mecklenburg Western Pomerania	0.02	(0.15)	79,055	0.02	(0.15)	76,437	0.02†††	(0.15)	2,618	0.03†††	(0.16)	1,174
Saxony	0.06	(0.24)	79,055	0.06	(0.24)	76,437	0.06†††	(0.25)	2,618	0.06†††	(0.24)	1,174
Saxony Anhalt	0.05	(0.21)	79,055	0.05	(0.22)	76,437	0.03†††	(0.18)	2,618	0.03†††	(0.17)	1,174
Thuringia	0.05	(0.21)	79,055	0.05	(0.21)	76,437	0.04†††	(0.19)	2,618	0.04†††	(0.19)	1,174
Abroad	0.00	(0.02)	79,055	0.00	(0.02)	76,437	0.00†††	(0.00)	2,618	0.00†††	(0.00)	1,174

Table to be continued on the next page.

Table A2 (continued)

	Invited sample			Did not sign up			Signed up			Finale sample	
	Mean	(std. dv.)	N	Mean		(std. dv.)	N	Mean		Mean	(std. dv.)
<i>Recruitment month (shares)</i>											
Pre-test (November, December 2017)	0.02	(0.13)	79,092	0.02	(0.13)	76,474	0.01 ^{†††}	(0.09)	2,618	0.00 ^{†††}	(0.07)
January 2018	0.10	(0.29)	79,092	0.10	(0.30)	76,474	0.04 ^{†††}	(0.19)	2,618	0.03 ^{†††}	(0.17)
February 2018	0.06	(0.24)	79,092	0.06	(0.25)	76,474	0.04 ^{†††}	(0.19)	2,618	0.04 ^{†††}	(0.19)
March 2018	0.04	(0.21)	79,092	0.04	(0.21)	76,474	0.05 ^{†††}	(0.22)	2,618	0.06 ^{†††}	(0.23)
April 2018	0.03	(0.17)	79,092	0.03	(0.17)	76,474	0.02 ^{†††}	(0.14)	2,618	0.01 ^{†††}	(0.12)
May 2018	0.05	(0.22)	79,092	0.05	(0.22)	76,474	0.05 ^{†††}	(0.21)	2,618	0.05 ^{†††}	(0.22)
June 2018	0.05	(0.22)	79,092	0.05	(0.22)	76,474	0.06 ^{†††}	(0.24)	2,618	0.06 ^{†††}	(0.24)
July 2018	0.04	(0.20)	79,092	0.04	(0.20)	76,474	0.04 ^{†††}	(0.19)	2,618	0.03 ^{†††}	(0.18)
August 2018	0.05	(0.22)	79,092	0.05	(0.22)	76,474	0.06 ^{†††}	(0.24)	2,618	0.06 ^{†††}	(0.24)
September 2018	0.04	(0.19)	79,092	0.04	(0.19)	76,474	0.04 ^{†††}	(0.19)	2,618	0.03 ^{†††}	(0.18)
October 2018	0.04	(0.19)	79,092	0.04	(0.19)	76,474	0.03 ^{†††}	(0.17)	2,618	0.02 ^{†††}	(0.15)
November 2018	0.12	(0.33)	79,092	0.12	(0.33)	76,474	0.18 ^{†††}	(0.39)	2,618	0.22 ^{†††}	(0.42)
December 2018	0.06	(0.24)	79,092	0.06	(0.24)	76,474	0.05 ^{†††}	(0.23)	2,618	0.04 ^{†††}	(0.20)
January 2019	0.07	(0.25)	79,092	0.07	(0.25)	76,474	0.06 ^{†††}	(0.24)	2,618	0.05 ^{†††}	(0.21)
February 2019	0.06	(0.23)	79,092	0.06	(0.23)	76,474	0.05 ^{†††}	(0.23)	2,618	0.05 ^{†††}	(0.21)
March 2019	0.05	(0.21)	79,092	0.05	(0.21)	76,474	0.06 ^{†††}	(0.23)	2,618	0.06 ^{†††}	(0.23)
April 2019	0.04	(0.21)	79,092	0.04	(0.20)	76,474	0.05 ^{†††}	(0.21)	2,618	0.04 ^{†††}	(0.20)
May 2019	0.08	(0.26)	79,092	0.07	(0.26)	76,474	0.12 ^{†††}	(0.32)	2,618	0.13 ^{†††}	(0.34)
<i>Employment status (shares)</i>											
Employed, contributing to social insurance	0.98	(0.12)	79,092	0.99	(0.12)	76,474	0.98 [†]	(0.14)	2,618	0.98	(0.13)
Marginally employed	0.00	(0.03)	79,092	0.00	(0.03)	76,474	0.00 [†]	(0.00)	2,618	0.00	(0.00)
Other (i.e. apprenticeship)	0.01	(0.12)	79,092	0.01	(0.12)	76,474	0.02 [†]	(0.14)	2,618	0.02	(0.13)
Part-time job (share)	0.20	(0.40)	77,903	0.20	(0.40)	75,336	0.29 ^{†††}	(0.45)	2,567	0.34 ^{†††}	(0.47)
Daily wage (5.02 - 229.05)	97.34	(41.51)	77,106	96.98	(41.28)	74,561	107.66 ^{***}	(46.62)	2,545	109.30 ^{***}	(46.39)
Individuals	79,092			76,474			2,618			1,174	

Source. Paradata on GJSP participation and IEB version v16.

Table A3. Figures underlying bias calculation

	Invited Sample	N	Signed Up	N	Final Sample	N
Female (shares)	39.99	127,198	49.81	4,698	51.09	1,873
<i>Employment status (shares)</i>						
Employed subject to social insurance contributions	96.77	127,201	96.72	4,698	97.49	1,873
Marginally employed	0.15	127,201	0.15	4,698	0.11	1,873
Other (i.e. apprenticeship)	3.07	127,201	3.13	4,698	2.40	1,873
Part-time job (share)	23.70	123,095	29.27	4,544	33.13	1,826
<i>Highest level of qualification (shares)</i>						
None	4.84	127,201	2.19	4,698	1.55	1,873
Vocational training	61.07	127,201	35.21	4,698	30.38	1,873
A-levels	1.23	127,201	2.00	4,698	1.49	1,873
A-levels and vocational training	13.65	127,201	18.60	4,698	18.74	1,873
Tertiary degree	19.21	127,201	42.00	4,698	47.84	1,873
<i>Age</i>						
17 - 30 years	22.63	127,201	28.71	4,698	26.16	1,873
31 - 40 years	25.70	127,201	31.76	4,698	33.64	1,873
41 - 50 years	23.60	127,201	20.65	4,698	22.10	1,873
51 - 60 years	28.07	127,201	18.88	4,698	18.10	1,873
<i>Daily wage</i>						
5.02 - 63.53 euros	25.00	120,266	19.45	4,412	15.49	1,795
63.54 - 85.44 euros	25.00	120,266	21.31	4,412	21.00	1,795
85.45 - 113.71 euros	25.00	120,266	25.25	4,412	27.24	1,795
113.72 - 229.35 euros	25.01	120,266	34.00	4,412	36.27	1,795
<i>Tenure</i>						
0.41 - .66 years	24.91	123,095	17.89	4,544	17.03	1,826
0.66 - 1.56 years	25.08	123,095	25.81	4,544	24.04	1,826
1.56 - 3.86 years	25.01	123,095	30.83	4,544	32.48	1,826
3.87 - 22.1 years	25.00	123,095	25.46	4,544	26.45	1,826
<i>Employment, past 10 years</i>						
0.21 - 5.43 years	25.00	127,196	32.46	4,698	32.84	1,873
5.43 - 7.97 years	24.97	127,196	25.35	4,698	25.57	1,873
7.97 - 9.6 years	24.97	127,196	20.60	4,698	20.50	1,873
9.6 - 10 years	25.06	127,196	21.58	4,698	21.09	1,873
Unemployment benefit receipt, past 10 years	53.74	127,196	47.30	4,698	46.61	1,873
Welfare benefit receipt, past 10 years	26.74	127,196	24.33	4,698	23.28	1,873
Job seeking, past 10 years	100.00	127,196	100.00	4,698	100.00	1,873
Participation in policy scheme, past 10 years	38.03	127,196	32.03	4,698	29.47	1,873
<i>Federal state (shares)</i>						
Schleswig-Holstein	3.25	127,148	2.92	4,698	2.51	1,873
Hamburg	1.98	127,148	3.30	4,698	3.36	1,873
Lower Saxony	10.51	127,148	9.39	4,698	10.41	1,873
Bremen	0.93	127,148	0.96	4,698	1.23	1,873
North Rhine Westphalia	18.78	127,148	19.24	4,698	18.31	1,873
Hesse	6.00	127,148	5.19	4,698	5.66	1,873
Rhineland Palatinate	4.50	127,148	3.60	4,698	3.36	1,873
Baden Württemberg	9.19	127,148	10.49	4,698	10.89	1,873
Bavaria	17.75	127,148	16.09	4,698	14.31	1,873
Saarland	1.35	127,148	1.21	4,698	1.12	1,873
Berlin	4.70	127,148	8.98	4,698	9.29	1,873
Brandenburg	3.71	127,148	3.53	4,698	4.16	1,873
Mecklenburg Western Pomerania	2.45	127,148	2.17	4,698	2.40	1,873
Saxony	6.22	127,148	6.30	4,698	5.98	1,873
Saxony Anhalt	4.39	127,148	3.30	4,698	3.47	1,873
Thuringia	4.28	127,148	3.32	4,698	3.52	1,873
Abroad	0.02	127,148	0.00	4,698	0.00	1,873
<i>Recruitment month (shares)</i>						
Pre-test (November, December 2017)	1.12	127,201	0.47	4,698	0.27	1,873
January 2018	5.97	127,201	2.09	4,698	1.98	1,873
February 2018	3.96	127,201	2.06	4,698	2.24	1,873
March 2018	2.77	127,201	2.75	4,698	3.58	1,873
April 2018	1.90	127,201	1.19	4,698	0.91	1,873
May 2018	3.14	127,201	2.58	4,698	3.31	1,873
June 2018	3.27	127,201	3.41	4,698	3.84	1,873
July 2018	2.52	127,201	2.02	4,698	2.19	1,873
August 2018	6.49	127,201	7.41	4,698	7.10	1,873
September 2018	4.60	127,201	5.00	4,698	5.45	1,873
October 2018	4.50	127,201	4.30	4,698	3.36	1,873
November 2018	15.38	127,201	19.09	4,698	22.26	1,873
December 2018	7.65	127,201	7.71	4,698	5.02	1,873
January 2019	8.58	127,201	8.07	4,698	6.09	1,873
February 2019	7.26	127,201	6.77	4,698	5.34	1,873
March 2019	6.00	127,201	6.34	4,698	6.30	1,873
April 2019	5.48	127,201	6.05	4,698	6.09	1,873
May 2019	9.42	127,201	12.71	4,698	14.68	1,873
Individuals	127,201		4,698		1,873	

Source. Paradata on GJSP participation and IEB version v16.

Note. The numbers of observations differ across characteristics as not all characteristics are available for each individual.

Table A4. Estimated probability of sign up and inclusion in final sample (mass layoffs only)

	Probability of signing up			Probability of belonging to final sample		
	Logit estimates	(Standard errors)	Marginal effects	Logit estimates	(Standard errors)	Marginal effects
Age in years / 10	-0.202***	(0.024)	-0.487***	-0.225***	(0.036)	-0.219***
Tenure in years / 10	0.025	(0.055)	0.060	0.056	(0.082)	0.054
<i>Employment history (over past 10 years)</i>						
Regular employment (0 - 10)	-0.013	(0.010)	-0.031	-0.012	(0.015)	-0.012
Unemployment benefit receipt (0 - 4.93)	-0.205***	(0.057)	-0.496***	-0.280***	(0.083)	-0.273***
Welfare benefit receipt (0 - 10)	-0.067*	(0.032)	-0.163*	-0.174***	(0.045)	-0.170***
Registered as jobseeker (0 - 10)	0.054	(0.029)	0.129	0.148***	(0.039)	0.144***
Participation in policy schemes (0 - 10)	0.063	(0.040)	0.152	-0.044	(0.069)	-0.043
Female (shares)	0.224***	(0.046)	0.542***	0.305***	(0.066)	0.298***
<i>Level of qualification (ref. no degree)</i>						
Vocational training	0.375**	(0.142)	0.906**	0.346	(0.223)	0.337
A-levels	1.122***	(0.199)	2.710***	1.023***	(0.311)	0.999***
A-levels and vocational training	1.159***	(0.147)	2.799***	1.154***	(0.229)	1.126***
Tertiary degree	1.505***	(0.144)	3.634***	1.538***	(0.225)	1.501***
<i>Federal state (ref. Schleswig Holstein)</i>						
Hamburg	0.126	(0.170)	0.304	0.166	(0.255)	0.162
Lower Saxony	-0.176	(0.138)	-0.425	0.092	(0.207)	0.090
Bremen	-0.291	(0.239)	-0.704	0.091	(0.317)	0.089
North Rhine Westphalia	-0.108	(0.130)	-0.261	0.015	(0.199)	0.015
Hesse	-0.377*	(0.153)	-0.912*	-0.295	(0.231)	-0.288
Rhineland Palatinate	-0.143	(0.162)	-0.345	-0.150	(0.252)	-0.146
Baden Württemberg	-0.090	(0.138)	-0.217	-0.026	(0.210)	-0.026
Bavaria	-0.151	(0.132)	-0.365	-0.185	(0.204)	-0.181
Saarland	-0.383	(0.237)	-0.926	-0.373	(0.369)	-0.364
Berlin	0.262	(0.139)	0.633	0.267	(0.211)	0.260
Brandenburg	0.118	(0.161)	0.286	0.435	(0.235)	0.425
Mecklenburg Western Pomerania	0.253	(0.180)	0.610	0.495	(0.260)	0.483
Saxony	-0.064	(0.146)	-0.155	-0.011	(0.222)	-0.011
Saxony Anhalt	-0.128	(0.166)	-0.309	-0.031	(0.255)	-0.031
Thuringia	-0.018	(0.162)	-0.044	0.177	(0.244)	0.173
<i>Recruitment month (ref. November 2018)</i>						
Pre-test (November, December 2017)	-0.634**	(0.222)	-1.531**	-1.447**	(0.455)	-1.412**
January 2018	-0.586***	(0.119)	-1.414***	-0.816***	(0.186)	-0.796***
February 2018	-0.285*	(0.118)	-0.687*	-0.419*	(0.174)	-0.409*
March 2018	0.004	(0.106)	0.009	-0.044	(0.147)	-0.043
April 2018	-0.358*	(0.148)	-0.864*	-0.852***	(0.254)	-0.832***
May 2018	-0.357***	(0.107)	-0.861***	-0.428**	(0.147)	-0.418**
June 2018	-0.073	(0.097)	-0.177	-0.226	(0.137)	-0.220
July 2018	-0.313**	(0.119)	-0.756**	-0.493**	(0.175)	-0.482**
August 2018	-0.137	(0.096)	-0.330	-0.337*	(0.137)	-0.329*
September 2018	-0.101	(0.116)	-0.244	-0.392*	(0.178)	-0.383*
October 2018	-0.078	(0.127)	-0.188	-0.543*	(0.214)	-0.530*
December 2018	-0.122	(0.100)	-0.293	-0.524**	(0.162)	-0.511**
January 2019	-0.046	(0.098)	-0.111	-0.414**	(0.155)	-0.404**
February 2019	-0.159	(0.100)	-0.385	-0.461**	(0.153)	-0.450**
March 2019	0.043	(0.100)	0.103	-0.048	(0.142)	-0.047
April 2019	-0.034	(0.106)	-0.081	-0.274	(0.159)	-0.268
May 2019	0.161*	(0.078)	0.388*	0.095	(0.106)	0.092
Part-time job (share)	0.208***	(0.054)	0.501***	0.425***	(0.077)	0.415***
Daily wage in euros / 10	0.037***	(0.006)	0.090***	0.053***	(0.008)	0.052***
Individuals	77,050		77,050	75,652		75,652

Note. The table presents logit estimates and marginal effects (at means, percentage points) of the probability to sign up / belong to the final sample of the GJSP survey. The number of individuals can be lower compared to Table 2 since only individuals without any missing values on the relevant variables are included in the estimation. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Source: Paradata on GJSP participation and IEB version v16.

Table A5. Consent to record linkage and willingness to participate in cortisol study

	Eligible jobseekers		Final sample		IEB consent enquired		IEB consent given		Cortisol enquired		Cortisol agreed	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Age (17 - 60)	41.25	127,201	38.62	1,873	38.67	1,262	38.89	1,144	38.43	1,407	38.84	1,151
Tenure (.41 - 22.1)	3.51	123,095	3.47	1,826	3.61	1,229	3.61	1,116	3.57	1,369	3.59	1,121
<i>Employment history (over past 10 years)</i>												
Regular employment (.21 - 10)	7.27	127,196	6.79	1,873	6.82	1,262	6.87	1,144	6.83	1,407	6.86	1,151
Unemployment benefit receipt (0 - 5.33)	0.48	127,196	0.33	1,873	0.32	1,262	0.31	1,144	0.31	1,407	0.32	1,151
Welfare benefit receipt (0 - 10)	0.71	127,196	0.47	1,873	0.46	1,262	0.46	1,144	0.45	1,407	0.45	1,151
Registered as jobseeker (0 - 10)	1.66	127,196	1.30	1,873	1.29	1,262	1.29	1,144	1.26	1,407	1.26	1,151
Participation in policy schemes (0 - 10)	0.28	127,196	0.19	1,873	0.18	1,262	0.18	1,144	0.18	1,407	0.18	1,151
Female (shares)	0.40	127,198	0.51	1,873	0.53	1,262	0.53	1,144	0.52	1,407	0.53	1,151
Mass layoff sample (share)	0.62	127,201	0.63	1,873	0.62	1,262	0.62	1,144	0.63	1,407	0.62	1,151
Academic degree (share)	0.19	127,201	0.48	1,873	0.49	1,262	0.50	1,144	0.49	1,407	0.49	1,151
East Germany (share)	0.21	126,654	0.20	1,867	0.20	1,257	0.21	1,141	0.20	1,402	0.21	1,147
<i>Recruitment month (shares)</i>												
Pre-test (November, December 2017)	0.01	127,201	0.00	1,873	0.00	1,262	0.00	1,144	0.00	1,407	0.00	1,151
January 2018	0.06	127,201	0.02	1,873	0.01	1,262	0.01	1,144	0.02	1,407	0.02	1,151
February 2018	0.04	127,201	0.02	1,873	0.01	1,262	0.01	1,144	0.01	1,407	0.01	1,151
March 2018	0.03	127,201	0.04	1,873	0.02	1,262	0.02	1,144	0.02	1,407	0.02	1,151
April 2018	0.02	127,201	0.01	1,873	0.01	1,262	0.01	1,144	0.01	1,407	0.01	1,151
May 2018	0.03	127,201	0.03	1,873	0.03	1,262	0.03	1,144	0.04	1,407	0.04	1,151
June 2018	0.03	127,201	0.04	1,873	0.05	1,262	0.05	1,144	0.04	1,407	0.05	1,151
July 2018	0.03	127,201	0.02	1,873	0.02	1,262	0.02	1,144	0.02	1,407	0.02	1,151
August 2018	0.06	127,201	0.07	1,873	0.07	1,262	0.07	1,144	0.07	1,407	0.07	1,151
September 2018	0.05	127,201	0.05	1,873	0.05	1,262	0.05	1,144	0.05	1,407	0.04	1,151
October 2018	0.04	127,201	0.03	1,873	0.03	1,262	0.03	1,144	0.03	1,407	0.03	1,151
November 2018	0.15	127,201	0.22	1,873	0.24	1,262	0.23	1,144	0.23	1,407	0.23	1,151
December 2018	0.08	127,201	0.05	1,873	0.05	1,262	0.05	1,144	0.05	1,407	0.05	1,151
January 2019	0.09	127,201	0.06	1,873	0.06	1,262	0.06	1,144	0.06	1,407	0.06	1,151
February 2019	0.07	127,201	0.05	1,873	0.06	1,262	0.06	1,144	0.06	1,407	0.06	1,151
March 2019	0.06	127,201	0.06	1,873	0.07	1,262	0.07	1,144	0.07	1,407	0.07	1,151
April 2019	0.05	127,201	0.06	1,873	0.06	1,262	0.06	1,144	0.06	1,407	0.06	1,151
May 2019	0.09	127,201	0.15	1,873	0.15	1,262	0.15	1,144	0.15	1,407	0.15	1,151
Reward: smartphone (share)			0.10	1,873	0.10	1,262	0.10	1,144	0.09	1,407	0.10	1,151
<i>Employment status (shares)</i>												
Employed, contributing to social insurance	0.97	127,201	0.97	1,873	0.97	1,262	0.98	1,144	0.97	1,407	0.97	1,151
Marginally employed	0.00	127,201	0.00	1,873	0.00	1,262	0.00	1,144	0.00	1,407	0.00	1,151
Other (i.e. apprenticeship)	0.03	127,201	0.02	1,873	0.03	1,262	0.02	1,144	0.03	1,407	0.03	1,151
Part-time job (share)	0.24	123,095	0.33	1,826	0.35	1,229	0.35	1,116	0.34	1,369	0.36	1,121
Daily wage (5.02 - 229.35)	92.99	120,266	108.01	1,795	108.25	1,207	108.21	1,096	108.07	1,341	106.81	1,096
Individuals	127,201		1,873		1,262		1,144		1,407		1,151	

Source. Paradata on GJSP participation and IEB version v16.

Table A6. Determinants of linkage consent and hair sampling participation (mass layoffs only)

	Probability of Linkage consent			Probability of willingness to participate in the hair sampling		
	Logit estimates	(Standard Errors)	Marginal effects	Logit estimates	(Standard Errors)	Marginal effects
Age in years / 10	0.319	(0.164)	2.295*	0.302**	(0.116)	4.282**
Tenure in years / 10	-0.620	(0.338)	-4.465	-0.182	(0.237)	-2.589
<i>Employment history (over past 10 years)</i>						
Regular employment (0 - 10)	0.124	(0.064)	0.893*	0.047	(0.045)	0.664
Unemployment benefit receipt (0 – 4.93)	-0.621	(0.417)	-4.470	0.157	(0.295)	2.234
Welfare benefit receipt (0 - 10)	-0.099	(0.203)	-0.712	0.082	(0.148)	1.157
Registered as jobseeker (0 - 10)	0.034	(0.190)	0.244	-0.153	(0.134)	-2.174
Participation in policy schemes (0 - 10)	0.630	(0.418)	4.535	0.043	(0.224)	0.612
Female (shares)	-0.290	(0.269)	-2.090	0.271	(0.194)	3.842
Academic degree	0.164	(0.316)	1.184	0.279	(0.223)	3.957
East Germany	1.316**	(0.462)	9.477**	0.338	(0.259)	4.802
<i>Recruitment month (ref. November 2018)</i>						
Pre-test (November, December 2017)	0.000	(.)	0.000	0.000	(.)	0.000
January 2018	-0.611	(0.733)	-4.400	0.250	(0.672)	3.550
February 2018	0.678	(1.116)	4.878	0.011	(0.676)	0.149
March 2018	0.865	(1.074)	6.224	-0.295	(0.513)	-4.189
April 2018	0.000	(.)	0.000	0.862	(1.066)	12.237
May 2018	-0.371	(0.537)	-2.671	-0.214	(0.430)	-3.039
June 2018	0.603	(0.597)	4.342	-0.006	(0.423)	-0.084
July 2018	0.512	(0.800)	3.687	-1.069*	(0.455)	-15.162*
August 2018	0.054	(0.544)	0.391	-0.354	(0.385)	-5.026
September 2018	1.108	(1.077)	7.980	-0.377	(0.549)	-5.350
October 2018	0.092	(1.100)	0.659	-0.236	(0.690)	-3.355
December 2018	-0.136	(0.607)	-0.976	-0.461	(0.444)	-6.545
January 2019	-0.005	(0.606)	-0.033	-0.778	(0.433)	-11.035
February 2019	0.028	(0.589)	0.198	0.645	(0.564)	9.146
March 2019	0.248	(0.551)	1.784	-0.352	(0.395)	-4.997
April 2019	0.105	(0.679)	0.759	0.304	(0.536)	4.310
May 2019	-0.032	(0.412)	-0.229	-0.448	(0.300)	-6.352
Part-time job (share)	0.868*	(0.357)	6.246*	0.055	(0.250)	0.781
Daily wage in euros / 10	0.032	(0.040)	0.227	-0.063*	(0.027)	-0.900*
Individuals	757		757	860		860

Note. The table presents logit estimates and marginal effects (at means, percentage points) of the two outcomes (linkage consent, cortisol participation), conditional on being asked to comply with the respective outcome. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Source: Paradata on GJSP participation and IEB version v16.

Table A7. Determinants of continuous participation until waves 7/13 (mass layoffs only)

	Probability of participating in M7			Probability of participating in M13		
	Logit estimates	(Standard errors)	Marginal effects	Logit estimates	(Standard errors)	Marginal effects
Age in years / 10	0.013	(0.077)	0.336	0.064	(0.079)	1.584
Tenure in years / 10	0.255	(0.177)	6.363	0.324	(0.182)	8.068
<i>Employment history (over past 10 years)</i>						
Regular employment (0 - 10)	0.030	(0.032)	0.738	0.012	(0.032)	0.301
Unemployment benefit receipt (0 – 4.93)	0.067	(0.197)	1.679	0.094	(0.206)	2.337
Welfare benefit receipt (0 - 10)	0.047	(0.102)	1.174	-0.057	(0.107)	-1.410
Registered as job seeker (0 - 10)	-0.039	(0.090)	-0.965	-0.044	(0.093)	-1.099
Participation in policy schemes (0 - 10)	-0.251	(0.160)	-6.283	-0.089	(0.159)	-2.206
Female (shares)	0.291*	(0.136)	7.265*	0.295*	(0.139)	7.333*
<i>Level of qualification (ref. no degree)</i>						
Vocational training	0.183	(0.525)	4.583	0.509	(0.587)	12.648
A-levels	1.292	(0.693)	32.300	1.814*	(0.756)	45.103*
A-levels and vocational training	0.530	(0.535)	13.259	0.800	(0.596)	19.887
Tertiary degree	0.696	(0.526)	17.397	0.954	(0.588)	23.734
<i>Federal state (ref. Schleswig Holstein)</i>						
Hamburg	-1.344*	(0.541)	-33.605*	-1.015	(0.557)	-25.246
Lower Saxony	-0.350	(0.445)	-8.749	-0.103	(0.451)	-2.555
Bremen	-0.735	(0.682)	-18.373	-0.645	(0.729)	-16.032
North Rhine Westphalia	-0.651	(0.429)	-16.280	-0.312	(0.438)	-7.763
Hesse	-0.810	(0.494)	-20.242	-0.586	(0.501)	-14.566
Rhineland Palatinate	-0.346	(0.537)	-8.646	-0.206	(0.545)	-5.113
Baden Württemberg	-0.748	(0.453)	-18.687	-0.333	(0.459)	-8.277
Bavaria	-0.733	(0.440)	-18.322	-0.415	(0.449)	-10.309
Saarland	0.132	(0.803)	3.298	-0.662	(0.836)	-16.475
Berlin	-0.733	(0.451)	-18.324	-0.416	(0.458)	-10.354
Brandenburg	-0.299	(0.502)	-7.484	0.107	(0.514)	2.656
Mecklenburg Western Pomerania	-0.165	(0.559)	-4.136	-0.100	(0.579)	-2.490
Saxony	-0.515	(0.482)	-12.882	-0.244	(0.490)	-6.072
Saxony Anhalt	-1.099*	(0.560)	-27.471*	-1.196*	(0.609)	-29.754*
Thuringia	-0.515	(0.526)	-12.876	-0.472	(0.533)	-11.726
<i>Mass layoff sample</i>						
<i>Recruitment month (ref. November 2018)</i>						
Pre-test (November, December 2017)	0.000	(.)	0.000	0.000	(.)	0.000
January 2018	-1.685***	(0.491)	-42.127***	0.000	(.)	0.000
February 2018	-1.506***	(0.416)	-37.636***	0.000	(.)	0.000
March 2018	-1.520***	(0.340)	-38.000***	-1.507***	(0.361)	-37.471***
April 2018	-0.670	(0.523)	-16.739	-0.584	(0.539)	-14.523
May 2018	-0.305	(0.305)	-7.634	-0.182	(0.306)	-4.517
June 2018	-0.359	(0.283)	-8.975	-0.313	(0.285)	-7.779
July 2018	-0.114	(0.361)	-2.853	-0.058	(0.363)	-1.439
August 2018	-0.273	(0.280)	-6.835	-0.489	(0.283)	-12.172
September 2018	-0.026	(0.372)	-0.652	-0.017	(0.372)	-0.432
October 2018	-0.357	(0.441)	-8.928	-0.466	(0.455)	-11.599
December 2018	-0.280	(0.332)	-7.011	-0.095	(0.333)	-2.358
January 2019	-0.114	(0.318)	-2.840	0.064	(0.318)	1.600
February 2019	0.376	(0.322)	9.390	0.350	(0.315)	8.713
March 2019	0.062	(0.292)	1.559	-0.096	(0.290)	-2.390
April 2019	0.085	(0.328)	2.136	-0.053	(0.325)	-1.318
May 2019	0.035	(0.218)	0.871	0.139	(0.216)	3.459
Part-time job (share)	0.079	(0.168)	1.967	0.021	(0.171)	0.517
Daily wage in euros / 10	0.001	(0.019)	0.023	-0.001	(0.019)	-0.032
Individuals	1,142		1,142	1,065		1,065

Note. The table presents logit estimates and marginal effects (at means, percentage points) of continued participation after six months and after one year, respectively (conditional on belonging to the final sample). The number of individuals is lower compared to the number of individuals listed in Table A2 since only individuals without any missing values on the relevant variables are included in the estimation.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Source: Paradata on GJSP participation and IEB version v16.

Appendix B: invitation messages

Material B1: Study Invitation for Letter Condition

«Mr/Mrs/Ms» «last name»	Person of Contact
«address»	Mario Lawes
«post code» «city»	Phone: 030 XXXXXXXX
	Email: XXxX@XXXXXX.de
	Nürnberg and Berlin, XX.XX.XXXX

Your Experiences matter! Research Project Job Search and Quality of Life!

Dear «Mr/Mrs/Ms» «last name»,

The Freie Universität Berlin and the Institute for Employment Research invite you to take part in our research project "Job Search and Quality of Life". In this study, we investigate the quality of life of people who have recently registered as job seeking at the Federal Employment Agency, but are still employed. With your help, we want to study how changes in your professional career affect quality of life. We want to develop policies that are designed to improve people's well-being!

The key features of the study:

- Your participation is, of course, **voluntary**. All your answers will be anonymized.
- If you belong to the target group, your participation in the study will take several months und will be rewarded with up to 200 Euro
- To make the participation convenient, the survey will be conducted via a smartphone app.
- For further information, please see the attached leaflet and visit our website www.arbeitssuche-und-lebensqualität.de.

Your personal access code to the study: «access code»

With your personal access code, you may register for our research project until «closing date». The survey app is available for download under the search terms **Arbeitssuche** and **Lebensqualität** in your AppStore or Playstore, or by scanning the QR codes on the flyer.

In case you do not own a smartphone, we are happy to provide one to you. For requesting a smartphone, you simply register on our project website www.arbeitssuche-und-lebensqualitaet.de.

On the back of this letter, your will find all the relevant information on the protection of your personal data. Your kind support will be greatly appreciated!

With kind regards,

<< Signatures >>

Prof. Dr. Michael Eid, Dr. Clemens Hetschko, Prof. Dr. Ronnie Schöb, Prof. Dr. Gesine Stephan

For further information, please visit our website

www.arbeitssuche-und-lebensqualitaet.de and www.iab.de/de/befragungen.aspx.

Material B2: Data Protection Policy

Data Protection and Confidentiality

The Institute for Employment Research of the Federal Employment Agency and the Freie Universität Berlin have launched the research project 'Job Search and Quality of Life'. The survey is conducted by the Happiness Research Organisation. To contact potential participants, the Institute for Employment Research has identified individuals from the data of the Federal Employment Agency who are registered job-seekers.

We hereby certify that any information you provide will be treated with strict confidentiality and will not in any way be traceable to your person. **Your participation in the study is voluntary.** Non-participation will not cause you any disadvantages. All the persons involved in the project, at all times, strictly comply with the data protection laws.

How did the Institute for Employment Research obtain your contact details? Was the GDPR (General Data Protection Regulation) complied with?

The Institute for Employment Research is the research institute of the Federal Employment Agency. In accordance with §282, section 2 of the Third Book of the German Social Security Code (SGB III), analyzing effects of employment promotion is a key aspect of employment research. Your name and address were retrieved from data supplied by the Federal Employment Agency to the Institute for Employment Research for research purposes. **The Institute of Employment Research thereby acted in full compliance with the applicable data protection laws.** The fundamental right to data protection is subject to restriction by statute only, which in this case was enacted through § 282 section 5 of the Social Security Code III, where it reads: „Innerhalb der Bundesagentur dürfen die Daten aus ihrem Geschäftsbereich dem Institut für Arbeitsmarkt- und Berufsforschung zur Verfügung gestellt und dort für dessen Zwecke genutzt und verarbeitet werden.“ (Within the Federal Employment Agency, all data pertaining to its domain may be made available to the Institute for Employment Research and processed by the latter for research purposes). In the process of adjusting German laws to the GDPR, this particular regulation was not modified, which is in accordance to article 6 section 3 in connection with section 1e) of the GDPR. **The Institute for Employment Research is therefore legally entitled to contact any individuals whose contact details are registered at the Federal Employment Agency, without being obliged to ask their prior consent.**

What happens to your contact details?

Any names, addresses and, if applicable, email addresses are handled exclusively by a trustee – the IT department of the Institute for Employment Research – solely for contacting purposes. **The Federal Employment Agency / Institute for Employment Research has not and will not disclose any of your contact details to the Freie Universität Berlin or the Happiness Research Organisation.** The Freie Universität Berlin is listed on the invitation letter only because it is the inviting institution. It will not have access to any names, addresses or email addresses at any time. Should you decide to participate in the study, the anonymized access code will guarantee the strictly anonymous evaluation of your data. The Happiness Research Organisation will not know your name, address and email address unless you supply it to them yourself. Even in that event, no data will be passed on to any of the researchers involved in the project or to any other parties. Furthermore, the Happiness Research Organisation will delete any data provided to them immediately after the survey has been completed.

What happens to your data?

Any personal data you provide will be treated strictly confidential and in compliance with applicable data protection regulations. This means that any responses you give will be fully anonymized. **There is no way anybody may subsequently learn anything about whether you participated in the study or about your responses.**

The Happiness Research Organisation will pass on all data in anonymous form only to the researchers involved at the Institute for Employment Research and the Freie Universität Berlin, or to any other researchers thereafter. You will, of course, be free to leave individual questions unanswered or revoke your participation at any time without giving reasons for it. Upon collection of the data, all the participants' data from the app questioning will be jointly evaluated and published in aggregated form. Any data shared with any third parties will not give any indication as to your person. The data will be used for research purposes only.

The above-listed persons of contact will be glad to answer any further questions you may have on the protection of your data. In addition, please feel free to contact the respective data protection supervisors at the Institute for Employment Research and the Freie Universität Berlin.

Institute for Employment Research: «email address»

Freie Universität Berlin: «email address»

We thank you for your participation and your trust in our work!

Material B3: Flyer

Any further questions?

For detailed information on our research project, the questioning procedure, bonus payments and how to register when you do not have a smartphone, please visit our website: www.arbeitssuche-und-lebensqualitaet.de.
On the back of the attached letter, you will find all relevant information on data protection.

The Happiness Research Organisation conducts the questioning. For more detailed information regarding the app and how it works, please feel free to contact
(0211) XXXXXXXX or XXXX@XXXXXX.org.

For any other questions, please feel free to contact us:
Clemens Hetschko: (030) XXXXXXXX
Mario Lawes: (030) XXXXXXXX
XXXXXX@XXXX.de

You want to start right away,
register and download the app?

We are very happy about that. You will find the app under the search names **job search** and **life quality** in your app store or play store or by scanning one of the QR codes:

QR-Code for Android

QR-Code for iOS

RESEARCH PROJECT JOB SEARCH & QUALITY OF LIFE

Your
Experiences
matter!

Take part in our app-based study and help us find out how job search affects the quality of life.

Participation
is rewarded
with up to
200 €

What is the study about?

The Freie Universität Berlin and the Institute for Employment Research (IAB) have launched a research project to investigate how job-related changes affect the quality of life. With the help of an innovative long-term study, we wish to develop concrete policy recommendations centered on the well-being of employees. The research project is financially supported by the German Research Foundation (DFG).

What do you need to know?

- Your participation is, of course, **voluntary**.
- All your answers will be **anonymized**.
- You simply use an **app** on your smartphone.
- If you do not own a **smartphone**, we will provide you one.
- **The survey goes on for several months.**
- **You may stop participating at any time.**

Why should I take part?

- You can actively contribute to improving **labor market policy**.
- You will receive a summary of your results in your personal **„happiness profile“**.
- Your participation will be rewarded with up to 200€.
- In a lottery, you have the chance to win additional cash prizes in the total amount of 5.000€.

How does it work?

To many, working is one of the most important areas of their lives, where changes can have significant effects on the quality of one's life. To get a better idea about the involved processes, we will want to ask you regularly about your well-being.

But don't worry: Due to the clear and simple design of the questions on the smartphone app, you will easily be able to integrate the survey in your daily life.
In a first round of questions, we clarify if you belong to the target group of the study. After that, the study starts and the app will ask you questions once a month over the course of one week.

Objective stress measure
(optional).

An additional and health-related part of our research project is measuring the stress hormone cortisol. In this part of the study is also voluntary, i.e. you may take part in the rest of the study without taking part in the cortisol study. By registering for the study, you simply agree that we may invite you separately to the cortisol study later on. The app will ask you about this at the end of the first week of the survey and will provide you with further information.

What are the next steps?

You may register directly via your smartphone – or online on our website – with your personal access code. You will find your personal access code in the attached letter.

Material B4: Study Invitation for Email Condition

Dear «Mr/Mrs/Ms» «last name»,

the Freie Universität Berlin and the Institute for Employment Research invite you to take part in our research project. We investigate the quality of life of people who have registered as job-seekers at the German Employment Agency, but are still employed. With your help, we hope to improve the labor market policy in Germany.

The key features of the study:

- Your participation is, of course, **voluntary**. All your answers will be **anonymized**.
- If you belong to the target group, your participation in the study will take several months und will be rewarded with up to **200 Euro** or a **Samsung Galaxy A40**.
- To make the participation convenient, the survey will be conducted via a smartphone app.

For more detailed information on the procedure, bonus payments, how to register when you do not have a smartphone, as well as on the protection of your personal data, please visit our website www.arbeitssuche-und-lebensqualitaet.de.

Would you like to participate?

Simply download the survey app developed by the Happiness Research Organisation using the search names **Arbeitssuche** and **Lebensqualität** from your AppStore or GooglePlayStore. If you are reading this email on your smartphone, you can also just simply click on your type of device **iOS** or **Android**. You may register for participation until «closing date» with your personal access code: **«access code»**

In case you do not own a smartphone and wish to be provided with one, please register using the above-mentioned website and your personal access code.

How did we obtain your contact details?

The Institute for Employment Research is a research institute of the Federal Employment Agency, which carries out independent research projects and is legally entitled to use data of the Federal Employment Agency for research purposes, in strict compliance with applicable data protection laws. Detailed information on the protection of your personal data can be found [here](#).

Do you have any further questions?

Please feel free to contact Mario Lawes by phone (+49 30 XXXXXXXX) or by replying to this email. Please remember to delete your personal access code from your reply email.

Your kind support will be greatly appreciated!

Prof. Dr. Michael Eid, Dr. Clemens Hetschko, Mario Lawes, Prof. Dr. Ronnie Schöb, Prof. Dr. Gesine Stephan

Institute for Employment Research
Research institute of the Federal Employment Agency
Regensburger Straße 100, 90478 Nürnberg

You do not wish to receive any further emails like these?

Please notify us if you do not wish to participate in the research project and do not wish to be contacted by the Institute for Employment Research or its research partners. We will then refrain from sending you any further emails or letters.

Material B5: Pre-Announcement Letter**Person of Contact**

Mario Lawes

Phone: 030 XXXXXXXX

Email: XXxX@XXXXX.de

Nürnberg and Berlin, XX.XX.XXXX

«Mr/Mrs/Ms» «last name»

«address»

«post code» «city»

Your Experiences matter! Pre-Announcement of our app study "Job Search and Quality of Life"!

Dear «Mr/Mrs/Ms» «last name»,

The Freie Universität Berlin and the Institute for Employment Research would like to find out more about the quality of life of people searching for a new job. We, therefore, cordially invite you to take part in our smartphone study "Job Search and Quality of Life". Please help us improve the labor market policies in Germany!

Within the next days, you will receive an email at the email address known to us («email address»).

The email will contain a personal access code to register for the study.

If you choose to participate, the survey will go on for several months and will be rewarded with **up to 200 Euro or a Samsung Galaxy A40**. Please see the attached flyer for more detailed information on the project and the survey procedure.

For the moment, you can just wait for our invitation email. Once you have received your personal access code, you are good to go!

The protection of your personal data is very important to us. On the back of this letter, you will find all the relevant information on data protection and confidentiality.

Your kind support will be greatly appreciated!

<< *Signatures* >>

Prof. Dr. Michael Eid, Dr. Clemens Hetschko, Prof. Dr. Ronnie Schöb, Prof. Dr. Gesine Stephan

For further information, please visit our website

www.arbeitssuche-und-lebensqualitaet.de and www.iab.de/de/befragungen.aspx.