

# Reaching the unreachable: A panel survey among unemployed young adults in Austria and recommendations on how to decrease nonresponse and attrition

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## Abstract

Survey response rates are especially low among young people, those with low levels of formal education and those who are not well integrated into society. These effects are amplified in panel studies, where similar factors influence the propensity of continued participation in survey waves. As a result, conducting a panel study on young, unemployed people is particularly challenging. The paper describes the difficulties associated with selection effects and panel mortality in this particular group and the remedies applied in the JuSAW project, where we conducted a panel survey among young adults aged 18-28 who became unemployed between May and September 2014. Based on our experiences and a detailed analysis of sample balance and panel stability, we develop recommendations for future studies.

## Keywords

panel survey, difficult target groups, nonresponse, attrition

## Die Unerreichbaren erreichen: Eine Panelstudie unter jungen Arbeitslosen in Österreich und Empfehlungen zur Reduzierung von Antwortausfällen und Panelmortalität

### Zusammenfassung

Antwortraten in Umfragen sind besonders niedrig unter jungen Erwachsenen, Personen mit geringer formaler Bildung und Personen, die nur in geringem Ausmaß in die Gesellschaft integriert sind. Diese Effekte treten in Panelstudien verstärkt auf, da ähnliche Faktoren auch die Wahrscheinlichkeit der Teilnahme an späteren Umfragewellen beeinflussen. Aus diesem Grund stellt die Durchführung einer Panelstudie unter jungen arbeitslosen Menschen eine besondere Herausforderung dar. Der Artikel beschreibt die Schwierigkeiten, die mit Selektionseffekten und Panelmortalität in dieser speziellen Gruppe verbunden sind, und die Lösungsansätze, die im Zuge der JuSAW-Studie angewandt wurden, in der eine Panelstudie unter jungen Erwachsenen im Alter von 18-28 durchgeführt wurde, die sich zwischen Mai und September 2014 arbeitslos gemeldet hatten. Basierend auf unseren Erfahrungen und einer detaillierten Analyse der Stichprobenrepräsentativität und der Panelstabilität entwickeln wir Empfehlungen für zukünftige Studien.

### Schlüsselwörter

Panelstudie, schwierige Zielgruppen, Antwortausfälle, Panelmortalität

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## 1. Introduction

Over the last decades, survey response rates have been declining (de Leeuw and de Heer 2002, 46ff; Stoop et al. 2010, 2). This poses an enormous challenge for social science research. Low response rates are not problematic per se. Rather, the problem arises when response rates differ between specific groups within the target population, for example, if voters of a certain party are less likely to participate in surveys, thereby introducing a bias in the collected data (Lynn 2005, 968). The problem is amplified in panel data. Not only may the initial sample be unrepresentative of the population, but participants who drop out of the study may systematically differ from those who remain. This introduces a so-called “attrition bias”, which may seriously affect the results of any analysis of the data (Delfabbro et al. 2017).

Many studies have focused on the factors explaining nonresponse and panel attrition. While results vary depending on the respective survey contexts (Anseel et al. 2010), some general patterns have been identified. Response probabilities have been found to differ according to gender, age, educational level, socioeconomic background, migration background, personality traits, cognitive ability, etc. (see, for example Brehm 1993; Goyder 1988; Groves and Couper 1998; Stoop et al. 2010; Tourangeau and Smith 1996), causing some societal groups to be underrepresented in survey research.

Much less work has explored how these difficult target groups may actually be reached. Techniques to boost response rates have been tested in experimental designs (for example, Feskens et al. 2008; Groves, Singer, and Corning 2000). However, the effects of individual research design features are not independent of each other. Single elements should, therefore, not be studied in isolation (Bruvold/Comer/Rospert 1990). We take a different approach in this paper. Based on a panel study among unemployed young adults in Vienna, we discuss problems of nonresponse and describe potential solutions. While we certainly cannot draw any causal inferences, even the descriptive assessments we offer can be of much value, especially since details about how surveys are conducted are usually omitted from published papers, preventing researchers from learning from the experiences of others.

The target group of the young unemployed is a particularly difficult one, because it combines many of the characteristics related to survey nonresponse. Thus, successful methods for surveying this specific group, such as a high number of contact attempts and the use of a multi-mode design, may inform other studies on how to motivate even the most unlikely survey participants. Furthermore, by matching survey data with register

data<sup>1</sup> on the target population (total number of 18–28 year-olds registered as unemployed during the field period), we were able to assess (self-)selection for participation in the first wave as well as the determinants of panel mortality. While our results may not directly apply to different settings, they may still provide useful guidelines for future research designs.

The paper is structured as follows: first, we summarize findings from previous research on nonresponse and attrition. We thereby focus on the recommendations of how to prevent these phenomena and reduce potential bias in the analysis. Then, we describe our study design and detail how the recommendations from the literature were put into practice. Finally, we assess how well these strategies seemed to have helped in increasing response and decreasing bias.

## 2. The problem: difficult target groups in (panel) surveys

The literature on difficult target groups can be divided into studies of general response rates and studies of panel attrition. In both cases, while context certainly matters, most findings are surprisingly coherent across different fields of research, different countries, and different survey modes.

The nonresponse rate is a composite of the non-contact rate and the refusal rate (de Leeuw and de Heer 2002, 52f). The reasons for encountering difficulties when contacting someone can differ from or overlap with the reasons for a subject’s refusal to take part in the survey when contacted. Whether due to non-contact or due to refusal, low response rates are observed among young and very old people, men, those with a low level of education, immigrants, the unemployed, and those living in urban areas (Stoop et al. 2010, 20). Why the young and the very old constitute difficult target groups is a puzzle yet to be solved. Gender differences in participation rates have traditionally been attributed to men being less often at home during the day and thus more difficult to reach with random-walk or random-call procedures (Stoop et al. 2010, 20). However, this argument does not hold for mail surveys, where women have also been found more likely to take part than men. Evidence concerning a gender effect on response to web surveys is mixed (Sax, Gilmartin, and Bryant 2003). An explanation for why those with lower levels of education are more likely to refuse survey participation is that they are

<sup>1</sup> We use administrative data collected by the Austrian Employment Service (AMS) and the Federation of Austrian Social Insurance Institutions (Hauptverband der Sozialversicherungsträger). These data are combined in the AMDB (Arbeitsmarktdatenbank).

more easily discouraged by the cognitive effort required for answering survey questions than those with higher levels of education (who are probably used to similar situations). Furthermore, interviews may be regarded as tests and thus scare those who fear that they might not do well (Brehm 1993, 31; Stoop et al. 2010, 124).

Similar arguments may hold for immigrants, for whom lower participation rates have been found to be mostly due to language problems (Blohm and Diehl 2016). These language problems may not only result in a refusal to take part in the survey, but may form a barrier for establishing contact in the first place (whether by letter, email, phone, or face-to-face). The fact that the unemployed are usually less likely to cooperate in surveys may partly be explained by the generally lower levels of education in this group. Van den Berg et al. (2006) hypothesize that job seekers may be especially deterred by surveys that include questions concerning job search behaviour and labour market prospects. Another explanation could be that unemployment often concurs with social isolation, which, in turn, correlates with lower levels of trust in others (Dillman 2000, 19–21) and with less voluntary activity (Abraham/Helms/Presser 2009). Lack of trust in strangers may prevent people from talking to interviewers and may go hand in hand with privacy concerns and fear of government intrusion (Stoop et al. 2010, 20). Finally, response rates are lower in urban than in rural areas (Feskens et al. 2007). On the one hand, this could be due to the fact that the inhabitants of urban areas are more likely to hold some of the characteristics mentioned above: young, migration background, unemployed, less trusting in strangers. On the other hand, people in cities might simply be more difficult to contact due to restricted entrances to apartment buildings preventing interviewers from entering, less stable addresses and other contact details (e.g., phone numbers, email addresses) and less time spent at home (Stoop et al. 2010, 125).

Dropout in panel studies can either be caused by non-contact (if the original respondents cannot be located again), refusal of further participation, incapacity (for example due to health problems or relocation), or death (de Graaf et al. 2000). Some of the likely dropouts are also likely nonrespondents. For example, youths have been found to drop out more often than people aged 30–65 (Cunradi et al. 2005; Ingen, Stoop, and Breedveld 2008; Lipps 2009; Pääkkönen 1998). Young adults are particularly difficult to keep track of, as their living situation is relatively unstable – for example, they may move out from their parents' home, or move to or away from a partner – and interviewers may be unable to track them to their new location (de Graaf et al. 2000; Tourangeau 2004). However, not only their postal address, but also

telephone numbers and email accounts may change more quickly than those of older, more settled individuals. Generally, the presence of partners, children, and the size of the household are good predictors of panel participation (Lillard and Panis 1998; Lipps 2009). Furthermore, attrition bias is often caused by a greater loss of men than women. This gender difference has been attributed to an alleged stronger sense of conscientiousness and commitment among women, despite evidence for this being mixed (Lugtig 2014). Concerning education, empirical evidence is unambiguous: less educated respondents are more likely to drop out of panel studies (Delfabbro et al. 2017). Similar to general nonresponse, this may be linked to the cognitive effort required for survey participation and may also explain the higher dropout rates among migrants (language problems). Finally, differences concerning panel participation have also been found with regard to employment status. In samples of young adults, the non-employed are more likely to drop out than their counterparts in education or employment (MaCurdy, Mroz, and Gritz 1998). However, in a panel study among unemployed, van den Berg et al. (2006) found that those who got a job between survey waves were less likely to continue participation.

Attrition in panel surveys can be analyzed more thoroughly than nonresponse in cross-sectional studies, as detailed information on those who drop out is available from previous survey waves. Several cognitive and psychological factors conducive to continued participation have been identified in the literature. For example, a higher IQ is related to a higher propensity to take part in subsequent waves (Beaver 2013). Concerning personality traits, conscientiousness is associated with a stronger commitment to the survey, while those who exhibit a higher degree of extraversion may become more easily bored or distracted, leading to panel fatigue (Lugtig 2014). Neuroticism and a lack of trust in others may also impede continued participation (Satherley et al. 2015). Furthermore, those who report poor physical and/or emotional health are found to be less likely to take part in later survey waves (Young, Powers, and Bell 2006).

In addition, readiness to cooperate and the survey experience in previous waves are good predictors of continued participation. If the respondent immediately agrees to participate in the survey study, he or she is more likely to stay put than when he or she needs additional persuasion by the interviewer (Stoop et al. 2010, 35). If a respondent does not enjoy the first interview and perceives it as either cognitively or emotionally stressful (for example, due to a lengthy questionnaire or due to challenging or too personal questions), this will reduce later panel commitment (Hill and Willis 2001; Lugtig 2014; Rogelberg et al. 2001; Stocké 2006).

### 3. Recommendations on how to increase response rates, decrease attrition, or at least reduce bias

From the findings concerning the factors responsible for nonresponse and attrition, researchers have deduced recommendations on how to enhance (continued) participation in (panel) surveys. First, the costs for the respondents regarding time, cognitive burden, and the invasion of privacy need to be reduced as much as possible. To minimize costs, questionnaires need to be short, simple and not too personal. Second, the potential benefits of participation need to be increased (Stoop et al. 2010, 25). Benefits may be material/tangible or non-material/ideational. Potential non-material or ideational benefits include, for example, engagement with an interesting topic, the satisfaction of being part of a socially useful enterprise, and the chance to influence policy-making – especially if this is portrayed as a rare opportunity (Stoop et al. 2010:25). In this context, it may be helpful to promise feedback on the survey findings in return for respondents' efforts. Moreover, it can be helpful to stress the academic background of the survey (if applicable) (Groves and Couper 1998, 139). This may not only highlight the significance of the endeavor, but also lead to a more neutral, confidential, and credible image of the survey. In fact, mentioning collaboration with a university has been found to improve response rates (Anseel et al. 2010). Nevertheless, it is conceivable that emphasis on university involvement only raises participation among those individuals who can identify with higher education, while being less effective or even counter-productive in the case of the less highly educated.

Further ideational benefits can be generated through the survey process itself if the respondent feels respected and valued and enjoys being interviewed. In this regard, the relationship between the respondent and the interviewer is crucial (Dillman 2000). Hence, recruiting face-to-face is more successful than by phone, mail or email, and results in a lower number of refusals (Anseel et al. 2010). In addition, the presence of an interviewer creates a sense of accountability among respondents and thus increases the probability that interviewees finish the whole survey and agree to participate in further survey waves (Chang and Krosnick 2009; Couper 2011; Mühlböck/Steiber/Kittel 2017). Therefore, the relationship between interviewer and interviewee is the key. A variety of factors (e.g., similarity of attitude, background, outfit) may positively affect the reception of the interviewer by the respondent (Groves/Couper 1998, 34). Additionally, interviewers can apply different techniques of tailoring, i.e. adapting their behaviour to different types of respondents and interview situations (Groves/Couper 1998, 248). Once a good and trusting relationship is established, it is worthwhile assigning the same interview-

er in subsequent survey waves as this has been found to have a strong positive effect on response rates (Hill/Willis 2001). However, if a first contact is not successful, it may be better to assign another interviewer, e.g. one who is of a different sex, age or ethnic background than the first one, to the follow-up task (Stoop et al. 2010, 36).

Material benefits from participation have become increasingly common in surveys (Tourangeau 2004). Incentives in the form of small (financial) rewards are used to motivate those who would otherwise not take part in the survey, as their perceived costs in terms of time and effort are too high or their perceived ideational benefits are too small. Using an experimental design, Groves et al. (2000) finds that incentives have little impact on the cooperation of those participants scoring high on civic engagement, while the cooperation of those with low levels of civic engagement is significantly enhanced by monetary incentives. Furthermore, individuals with low socioeconomic status, who are more concerned about financial issues, are more easily attracted by financial benefits (Creed/Klisch 2005). Hence, incentives have the strongest effect on parts of the population that would normally be least likely to participate and may thus effectively help to prevent selection bias (Tourangeau 2004).

Another way to prevent selection bias is perseverance, e.g. by increasing the number of contact attempts. Repeated callbacks have been found to be effective regardless of the survey mode (Tourangeau 2004). Yet, they are costly in terms of time and effort and there might be a saturation point, i.e. a certain number of contact attempts after which an additional trial does not enhance the response probability sufficiently to justify the costs. Survey practitioners usually perform about four contact attempts. In the European Social Survey, for example, about 97% of the final contacts have been reached within four calls, suggesting that this number provides a useful rule of thumb (Stoop et al. 2010, 135f). Once contact is established but the respondent shows signs of refusal, it is crucial that interviewers do not give up too easily but "maintain interaction" (Groves/Couper 1998, 249). Finally, even if refusal is voiced, interviewers may try to discover the reasons for the reaction and engage in refusal conversion, i.e. start a second attempt (which might take place at a later point in time or might be carried out by a different interviewer) (Burton/Laurie/Lynn 2006; Fuse/Xie 2007).

Finally, if response rates cannot be increased and attrition cannot be decreased any further, the only remaining option is to correct for a potential bias *ex post*, which is generally done by using weights (Stoop et al. 2010, 211). Weights are usually calculated either by splitting the sample into classes and defining a weight for each class based on available population statistics (post-stratification), or by estimating the propensity of responding to the survey for each sample unit using a multivariate



logistic regression model and taking the inverse of the estimate as a weight (propensity weighting). Post-stratification is used if the “true” population distributions are known for only a few variables (e.g. sociodemographic factors). Ideally, the joint distribution of these variables should be available, but this is not always the case (Stoop et al. 2010, 2008). Propensity weighting is applicable if information on a number of relevant predictors of the response probability is available for both respondents and nonrespondents. This is rarely the case in cross-sectional surveys, but more likely in panel studies, where information gathered in previous waves can help to predict participation in subsequent waves (Lee/Valliant 2009). Notwithstanding the procedure used to create the weights, weighting relies on the assumption that the units within a class (or with a particular set of characteristics that define the estimated propensity) do not differ from unobserved units in the class. Only when this condition is met can weighting reduce the probability of bias in survey estimates (Lynn 2005, 969).

To sum up, in order to increase responsiveness, researchers can try to minimize costs in terms of time and cognitive burden, generate ideational benefits of survey participation, provide financial incentives, and display perseverance regarding contact attempts and interaction. Furthermore, researchers should assess how well their sample reflects the target population and, if necessary, apply ex-post bias correction, for example by weighting the data. In the following sections, we will discuss how these strategies were put into practice in our panel study.

#### 4. Overview of the study design: A panel survey among young unemployed in Vienna

In the project “JuSAW – Jung und auf der Suche nach Arbeit in Wien” (Steiber/Mühlböck/Kittel 2015; Steiber/Mühlböck/Vogtenhuber/Kittel 2017), we were confronted with the challenges of a panel study among unemployed young adults aged 18–28 in Vienna. The goal of the project was to gather detailed information on the socio-economic background of the young unemployed, their experiences during unemployment, and the effect of the unemployment experience on their physical and mental well-being.

The panel consisted of two waves. The first wave of interviews was conducted between May and September 2014. Individuals were interviewed at the beginning of their unemployment spell (a maximum of 30 days after their first day of unemployment). The interviewers recruited potential interviewees directly at the regional branch offices of the Public Employment Service (AMS Geschäftsstellen), either when they registered as unemployed or when they had their first counseling meeting.

As an incentive, prospective respondents were promised 10 Euros for completing the 30-minute questionnaire. Those who were willing and eligible (i.e. within the age range and unemployed for no longer than 28 days) were directed to a separate space in the employment center where they filled in the questionnaire on laptops. Only the first set of questions was answered with the help of the interviewer, the rest of the survey was self-administered. However, an interviewer was always nearby to answer potential questions of the interviewees. In total, 1215<sup>2</sup> unemployed young adults participated in the first survey wave. Those who indicated willingness to participate in the second wave were asked to provide contact details.

The second wave was conducted between May and October 2015, when some of the first wave participants were still unemployed while others had found a new job. First wave respondents were contacted again twelve months after their first interview via email, phone (calls and text messages), and postal mail. Interviews were arranged individually and took place either at a branch office of the AMS or at the university – the latter of which allowed for participation after regular working hours – depending on the preferences of the panelists. In addition, interviewees were able to come by spontaneously. We also put up posters at the AMS offices in the hope that some (still unemployed) first-wave participants who had not provided their contact details would notice them and change their minds. Like in the first wave, the questionnaires were computer-assisted and self-administered, but conducted in the presence of an interviewer.

At the end of the interview period of the second wave (September and October 2015), first-wave participants who had not participated by then were additionally offered the possibility to receive a personalized link to the questionnaire so that they could complete the survey – like a standard web survey – on their home PC or on a mobile device.

Respondents were offered a financial incentive of 30 Euros for completing the 30-minute questionnaire (whether in the presence of an interviewer or online). In total, 625 young adults participated in the second wave of the panel study.<sup>3</sup>

<sup>2</sup> This number already excludes those individuals who terminated the survey early and a few individuals who were later found not to have been eligible (based on register data).

<sup>3</sup> In addition, 23 individuals started the web survey, but these observations were deleted from the final dataset either because respondents terminated the survey early (before reaching page 100), or because later analysis revealed inconsistencies or speeding.

## 5. Implementing the recommendations on how to increase response rates

Faced with a particularly challenging target population, we followed the different recommendations for enhancing response rates. First of all, we tried to minimize the costs of survey participation in terms of time and cognitive burden. As the questionnaire covered a broad range of different topics and was quite lengthy, we kept the wording of the questions as simple as possible. Even questions taken from established questionnaires (e.g. the European Social Survey, the German Socio-Economic Panel), were rephrased to enhance readability. The questionnaire also contained a few short cognitive tests,<sup>4</sup> which could have increased the perceived difficulty of the survey considerably. However, the opposite was the case: according to the answers to an open feedback question, these short tests, which were scattered throughout the questionnaire, were actually taken as a welcome diversion. The cooperation of the AMS proved extremely valuable in minimizing the respondents' costs in terms of time, as we were able to contact many respondents while they were waiting for their appointments with the AMS counsellors. In addition, the computer-assisted self-administered survey was considerably less time-consuming than an oral interview covering the same questions would have been. Being used to spending much time at computers, the respondents seemed less easily bored or distracted while sitting at the laptops than they probably would have been when answering a pen-and-pencil survey, a phone survey, or during a face-to-face interview. In general, the overwhelming majority of the first wave respondents were positively disposed after the survey: in the feedback questions at the end of the questionnaire, 93% reported that the questions had not been complicated, 86% found the survey interesting, and 98% found it either not exhausting at all or only a bit exhausting despite its long duration.

For the second wave, offering respondents the option to answer the questionnaire online (from their home PC or a mobile device) via a personalized link to the web-based questionnaire was also helpful in reducing time costs and thus increasing response rates. About 16% of the second wave respondents chose this option. Original concerns that without the presence of an interviewer, respondents might be prone to satisfac-

ing (i.e. rushing through the questionnaire, see Chang and Krosnick 2009) turned out to be moot. Apart from a slightly increased early termination rate, the online survey did not differ from the on-site survey with respect to quality indicators (for a detailed analysis, see Mühlböck et al. 2017).

The comparably generous financial incentives increased the benefits for respondents considerably.<sup>5</sup> The reactions of our participants suggest that the financial incentives were not only seen as a compensation for their time and effort, but, in addition, amplified the non-material benefits. Receiving fair payment for their labour fostered their feeling of being valued and the fact that we were ready to pay for participation boosted the importance they attributed to the project.

To *augment ideational benefits* and to stress the project's independence from the AMS, we accentuated the significance and seriousness of the project and emphasized the fact that it was conducted by the Department for Economic Sociology of the University of Vienna. We decorated the interview space at the AMS with university posters and the interviewers wore university badges. All information material as well as the questionnaire bore the logo of the university. According to our experience, this strategy was successful. Instead of being confronted with suspicious remarks towards "academic elites", the interviewers reported highly positive reactions, which, however, slightly differed according to the level of education of the respondents. While individuals with a higher education were interested in the academic output, those with lower levels of education mainly voiced their approval that there was scientific interest in them and their situation.

The importance of well-trained and enthusiastic interviewers cannot be emphasized enough. We selected them to match our target group in terms of age. Furthermore, we took care to balance the number of male and female interviewers and to also cover the most likely migration backgrounds of our potential interviewees (Turkey and Serbia). Interviewers were instructed to meet the young unemployed on an equal footing and to thank them for their help with the project. In this context, being on a first-name basis with the interviewees was essential. For the second wave, we employed some of the best interviewers from the first wave to ensure continuity and in the hope that recognition between interviewers and panelists would enhance cooperation. In fact, many second-wave participants explicitly mentioned the kindness of the interviewers in the open-ended feedback question at the end of the second wave

4 These tests included a test of cognitive speed where respondents were asked to match symbols with appropriate numbers as fast as possible (Symbol-Digit Test), a test of verbal fluency where respondents had to write down as many different animals as possible within one minute (Animal Naming Task), a test of basic numeracy, and a memory test (immediate and delayed recall of a list of ten words, for details see questionnaire in Steiber/Mühlböck/Kittel 2015).

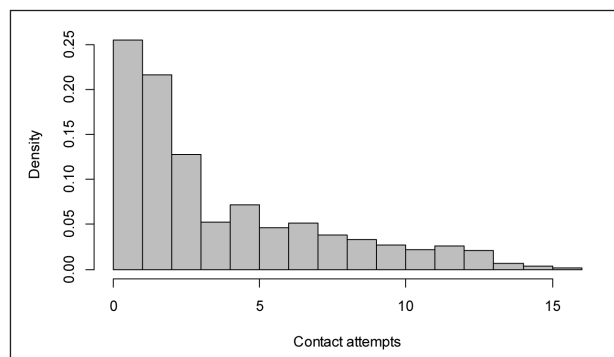
5 10 Euros for the first wave and 30 Euros for the second wave is a higher amount of money than usually offered by Austrian survey companies to respondents in surveys of similar length. Contact details were entered in a separate form and only linked to the questionnaire via an anonymized ID number.

questionnaire.

Interviewers' *perseverance*, was not only important for convincing many young unemployed to take part in the first wave, but also helped to convince additional interviewees to volunteer for the panel. The final survey question asked whether respondents would be willing to take part in the second wave. If the answer was "Yes", they were asked to enter their contact details (email and/or telephone number and/or mailing address).<sup>6</sup> When respondents collected the financial incentive after finishing the questionnaire, interviewers asked again whether they would participate in the second wave and tried to convince those who were reluctant. About 4% of the 967 individuals who provided us with their contact details were converted refusals. In the second wave, interviewers were asked to be patient and try repeatedly to reach those who had agreed to participate in the second wave. Establishing contact in the second wave turned out to be extremely difficult, even when several different contact details were available for an individual. As was to be expected, many individuals had either changed their contact details between the waves or had provided inaccurate information in the first place. In total, 6.8% of the e-mail addresses, 13.4% of the telephone numbers, and 4.9% of the mailing addresses provided were found to be incorrect.<sup>7</sup> Explicit refusals were hardly an issue – in total only 24 individuals responded that they no longer wished to take part in the study. Those who did not voice any refusal were contacted repeatedly and by different interviewers over a period of several weeks if initial attempts had failed. In total, potential panelists received up to ten e-mails, three phone calls, five text messages and three letters (depending on the contact means available), with on average five contact attempts for each potential panelist. Hence, we conducted many more contact attempts than the "rule-of-thumb" of four attempts. Figure 1 shows a histogram of the number of contact attempts undertaken for each second-wave respondent before he or she was finally reached. As can be seen, 35% of our second wave participants responded after more than four contact attempts. Even if we exclude those 16% who chose to participate in the online version (as we cannot know for sure whether it was not in fact the different participation mode that motivated them to finally participate), a considerable number of panelists needed more (or even many more) than four contact attempts to be persuaded. In this respect, our

sample of young unemployed thus seems to differ considerably from the average survey respondents.

**Figure 1:** Histogram showing the share of second wave respondents reached after a certain number of contact attempts.



## 6. Assessing response and attrition bias

The goal of our study was to sample at least 1000 individuals in the first wave and 500 in the second wave. We managed to exceed our first wave target and reached a panel stability of 51.4%. This value is slightly higher than in a comparable study among unemployed in Germany carried out by the Institute of Labor Economics (IZA) (Arni et al. 2014), despite the fact that our target group was even more challenging (consisting only of young people instead of all working-age individuals) and despite the fact that participation in the first wave was not conditional on agreement to participate in follow-up waves (in contrast to the IZA study where all first-wave respondents had to agree on participation in the panel up-front). Thus, our strategies to increase response rates seem to have been successful compared to similar studies and compared to our initial expectations. However, we have no information about the counterfactual, i.e. what would have happened if we had not applied these strategies. Furthermore, despite our efforts, there might still be some sort of bias between different subgroups in our sample, which we need to assess.

Due to our cooperation with the Austrian Federal Ministry of Labour, Social Affairs and Consumer Protection, we were able to combine the survey data with register data for those respondents who provided their social security number (about 91.4% of all first wave respondents). Hence, for the variables gender, age, and highest education, we were able to compare the distributions between our survey sample and our target population of all young adults aged 18–28 in Vienna who became unemployed during the interview period (May–September 2014). As can be seen from Table 1 (first four columns), our sample barely differs from the population

<sup>6</sup> Contact details were entered in a separate form and only linked to the questionnaire via an anonymized ID number.

<sup>7</sup> The numbers for e-mail and mail addresses need to be treated with particular caution – for e-mails, we were able to identify as incorrect only those cases in which we received error messages, not those that existed but were never looked at. For mail, only those addresses that were clearly wrong or incomplete or where the letters were returned with a note "recipient unknown/moved" could be identified as wrong or outdated. Hence, the real outage numbers may be higher.

with respect to education, which is good news considering the likely underrepresentation of less highly educated individuals in surveys. Regarding age, among our respondents the 18-20 year-olds were overrepresented. This is due to the fact that we oversampled this group. First, due to the special focus on young adults, we tried to oversample in order to reach a number that would allow for valid estimations within this group, and second, due to experiences in other panel studies, we anticipated that panel attrition would be highest among the youngest respondents. For gender, the survey sample shows a slightly higher proportion of men than the population of young newly unemployed women. Considering previous findings in the literature, which attribute a higher nonresponse rate to men, this is surprising. Yet, it may be explained by the observation of the interviewers that women were more likely than men to come to the AMS in company (either of their friends, their husbands, or their children), which in some cases proved to be a reason for refusal.

likely to drop out is corroborated, but not to the degree anticipated. Finally, those with a low level of education proved to be an especially difficult target group in the panel.

For the second wave, we were able to estimate the propensity of participation using information from the first wave questionnaire and register data<sup>8</sup> on a wide range of influencing factors, such as sociodemographic characteristics, personality traits, costs in terms of time and cognitive burden, and readiness as well as ability to participate. As the logistic regression model in Table 2 shows, some of the differences between men and women, age groups, and educational groups discovered in Table 1 are mainly caused by these additional, underlying factors. Age and education effects are less pronounced once controlling for other factors and the variable gender is rendered insignificant.

Furthermore, according to the regression model, migration background did not have any significant effect on attrition in our sample. Also, contrary to other studies

**Table 1:** Comparison of sample distributions between the target population, the first wave sample (unweighted) and the second wave sample (unweighted and weighted).

	Population		Sample 1 <sup>st</sup> wave		Sample 2 <sup>nd</sup> wave		
	N	%	N	%	N	%	% weighted
<b>Gender</b>							
Female	11,953	45.8%	507	41.7%	286	45.8%	45.0%
Male	14,156	54.2%	708	58.3%	339	54.2%	55.0%
<b>Age</b>							
18-20	5,893	22.6%	433	35.6%	206	33.0%	21.9%
21-24	9,661	37.0%	440	36.2%	221	35.4%	37.0%
25-28	10,556	40.4%	342	28.1%	198	31.7%	41.1%
<b>Highest level of education</b>							
ISCED 0-2 <sup>1</sup>	12,109	46.7%	497	44.3%	183	37.0%	40.2%
ISCED 3B <sup>2</sup>	6,799	26.2%	313	27.9%	181	27.0%	28.7%
ISCED 3A-4 <sup>3</sup>	4,651	18.0%	206	18.4%	152	22.6%	21.0%
ISCED 5-6 <sup>4</sup>	2,347	9.1%	106	9.4%	108	13.4%	10.1%
<b>Total</b>	26,110		1,215		625		

Note: <sup>1</sup> compulsory schooling, <sup>2</sup> apprenticeship/vocational training, <sup>3</sup> upper secondary school leaving exam „Matura“, or similar, <sup>4</sup> higher education

Concerning panel attrition, Table 1 indicates that gender plays an important role. While being underrepresented in the first wave, more female than male first-wave respondents took part in the second wave, thereby counterbalancing the original gender bias. Regarding age, the hypothesis that younger individuals would be more

but in line with van den Berg et al. (2006), we found that those who were still (or again) unemployed at the time of the second wave were actually more likely to take part.

<sup>8</sup> For the few individuals whose survey data could not be matched with register data, the values of the variable were imputed using multiple imputation.



**Table 2:** Logistic regression on participation in 2<sup>nd</sup> wave

	Coef.	Std. Err.	
Female	0.08	(0.15)	
Age (ref=18-20)			
21-24	0.19	(0.17)	
25-28	0.43	(0.20)	*
Education (ref: ISCED 0-2 <sup>1</sup> )			
ISCED 3B <sup>2</sup>	-0.34	(0.17)	*
ISCED 3A-4 <sup>3</sup>	0.19	(0.21)	
ISCED 5-6 <sup>4</sup>	0.52	(0.28)	
Migration background (ref: none)			
2 <sup>nd</sup> generation	0.25	(0.19)	
1 <sup>st</sup> generation	0.33	(0.19)	
Interview duration 1 <sup>st</sup> wave	-0.02	(0.01)	**
Readiness to participate 2 <sup>nd</sup> wave	2.61	(0.21)	***
Register data available	0.72	(0.27)	**
Verbal fluency	0.07	(0.02)	***
Questions too personal 1 <sup>st</sup> wave	-0.40	(0.20)	*
Trust	0.05	(0.03)	
Extraversion	-0.18	(0.07)	*
Conscientiousness	0.22	(0.08)	**
Anxiety	0.19	(0.06)	**
Household status: lives alone	-0.39	(0.18)	*
Moved between survey waves	-0.59	(0.21)	*
Health impaired (ref: yes, strongly)			
Yes, a bit	0.83	(0.36)	*
No	1.28	(0.34)	***
No answer	1.07	(0.44)	*
Kids	0.78	(0.22)	***
Unemployed at 2 <sup>nd</sup> wave	0.63	(0.17)	***
Constant	-5.87	(0.77)	***
N	1196		
Imputations	10		
Average RVI	0.01		
Correctly predicted cases	73.91%		

Note: Dependent variable: participation in 2<sup>nd</sup> wave; logistic regression with multiple imputations on the variables *Moved between survey waves* and *Unemployed* at 2<sup>nd</sup> wave; 10 imputations are sufficient as the Monte Carlo error on the coefficients is less than 10% of the standard error and the Monte Carlo error on the p-values is less than 0.01; <sup>1</sup> compulsory schooling, <sup>2</sup> apprenticeship/vocational training, <sup>3</sup> upper secondary school leaving exam „Matura“, or similar, <sup>4</sup> higher education; detailed description of all variables in the appendix; \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Personality traits mattered as expected. Higher scores on extraversion were related to higher attrition rates while higher (self-reported) levels of conscientiousness correlated with a higher propensity to partake in the second wave. The survey experience in the first wave also turned out to be an important predictor for subsequent participation. Longer interview duration, lower verbal

fluency, and the perception that questions had been “too personal”<sup>9</sup> reduced participation in the second wave. Readiness to provide contact details and social security number were strong predictors of future cooperation.

<sup>9</sup> At the end of the first wave questionnaire, we posed the question: “Finally, we would like to know how you liked our survey. What do you think about the questions? Were they ... too personal?”

Finally, panel participation was affected by factors related to the likelihood of successful contact and the ability to take part. As expected, those with stronger social ties (not living alone, having children) were more likely to participate, while those who had moved between survey waves and those with very poor health were less likely to participate.

The analysis demonstrates that while, overall, we have been successful in reaching our target group of young unemployed, there are still some differences between subgroups concerning nonresponse and panel attrition. For this reason, we calculated two different sets of weights: one for the first-wave sample and one for the panel.

For the first wave survey data we calculated post-stratification weights based on the combined distributions of the variables gender, age, and highest level of education known from register data for both the target population and our sample. To weight our panel data, we calculated propensity scores based on the regression results in Table 2 and combined them with the first wave post-stratification weights. The last column of Table 1 contains the distributions according to gender, age and education in the panel after weight adjustment. Due to the incorporation of a large number of further influential factors in the propensity weighting procedure, the distributions of individual variables in the sample differ slightly from those in the original population. However, these small deviations have to be accepted for the sake of ensuring similarity on a greater number of variables, which have been shown to influence panel participation (cf. Table 2).

Notwithstanding the benefits of using weights, one needs to be aware that while they may help to reduce attrition bias, there is no guarantee that they do so for each and every variable in the dataset, especially if a variable is not related to the factors on which the weights are based and there is an additional bias that the weights do not account for (Lynn 2005:969). Therefore, it is encouraging that, for the demographic factors displayed in Table 1 (the last three columns), the distributions within the unweighted panel sample and the population did not differ considerably in the first place.

## 7. Summary and Conclusions

Nonresponse and panel attrition may introduce a serious bias in survey data. Increasing the response rate – especially among difficult target groups – is thus crucial. Based on a panel study among unemployed young adults conducted in 2014 and 2015 in Vienna, we described and evaluated the application of different recommendations derived from the literature on how to best reach and motivate potential respondents. As our target popula-

tion exhibits many characteristics which are known to be related to survey nonresponse and panel attrition, such as youth, a low level of education, urbanity, social isolation, and deficient language abilities (due to a high proportion of migrants), the study provided an opportunity to assess whether recommendations given in the literature on how to increase response rates can be successfully applied to this challenging target group.

The successful attainment of the study targets (a minimum of 1,000 respondents in the first wave and 500 respondents in the second wave) was achieved by following different recommendations from the literature on how to raise response rates. We highlight elements that have either not yet received due recognition or can simply not be emphasized enough: the simplicity of question wording, the combination of face-to-face recruiting and computer-assisted self-administered questionnaires, multi-mode designs (e.g., the option to participate online via personalized links as an alternative to personal interviews), the fact that financial incentives may amplify non-monetary benefits, the interviewer-respondent relationship, and the number of contact attempts. All these elements have proven especially useful for reaching our target group of unemployed young adults. Furthermore, combining the survey data with information from register data has allowed for the calculation of fine-grained weights for the first wave as well as for the panel.

To what extent our results can be generalized to other target groups remains an open question. Previous research has shown that certain response-enhancing techniques may be effective in some samples but not in others. However, even if results only pertain to unemployed young adults, our examples can offer some guidelines on how to gather information from this often underrepresented group. Future research should look more closely at the factors that promise to be more likely to motivate the unlikely participants than the likely responders – for example, a large number of contact attempts, self-administered questionnaires, and financial incentives – and test whether the effects of these methods do indeed differ between these two groups. Applying tailored response-enhancing techniques would not only help to increase survey participation, but, more importantly, help to balance samples and thus reduce nonresponse bias.

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## Literature

- Abraham, Katharine G./Sara Helms/Stanley Presser (2009), How Social Processes Distort Measurement: The Impact of Survey Nonresponse on Estimates of Volunteer Work in the United States, in: *American Journal of Sociology*, Vol. 114(4), 1129–65.
- Anseel, Frederik/Filip Lievens/Eveline Schollaert/Beata Choragwicka (2010), Response Rates in Organizational Science, 1995–2008: A Meta-Analytic Review and Guidelines for Survey Researchers, in: *Journal of Business and Psychology*, Vol. 25(3), 335–49.
- Arni, Patrick/Marco Caliendo/Steffen Künn/Klaus F. Zimmermann (2014), The IZA Evaluation Dataset Survey: A Scientific Use File, in: *IZA Journal of European Labor Studies*, Vol. 3(6), 1–20.
- Beaver, Kevin M. (2013), Intelligence and Selective Attrition in a Nationally Representative and Longitudinal Sample of Americans, in: *Personality and Individual Differences*, Vol. 55(2), 157–61.
- van den Berg, Gerard J./Maarten Lindeboom/Peter J. Dolton (2006), Survey Non-Response and the Duration of Unemployment, in: *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, Vol. 169(3), 585–604.
- Blohm, Michael/Claudia Diehl (2016), Wenn Migranten Migranten befragen, in: *Zeitschrift für Soziologie*, Vol. 30(3), 223.
- Brehm, John O. (1993), *The Phantom Respondents: Opinion Surveys and Political Representation*, Ann Arbor: University of Michigan Press.
- Bruvold, Norman T./James M. Comer/Ann M. Rospert (1990), Interactive Effects of Major Response Facilitators, in: *Decision Sciences*, Vol. 21(3), 551–62.
- Burton, Jonathan/Heather Laurie/Peter Lynn (2006), The Long-Term Effectiveness of Refusal Conversion Procedures on Longitudinal Surveys, in: *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, Vol. 169(3), 459–78.
- Chang, Linchiat/Jon A. Krosnick (2009), National Surveys Via Rdd Telephone Interviewing Versus the Internet: Comparing Sample Representativeness and Response Quality, in: *Public Opinion Quarterly*, Vol. 73(4), 641–78.
- Couper, Mick P. (2011), The Future of Modes of Data Collection, in: *Public Opinion Quarterly*, Vol. , 75(5), 889–908.
- Creed, Peter A./Jan Klisch (2005), Future Outlook and Financial Strain: Testing the Personal Agency and Latent Deprivation Models of Unemployment and Well-Being, in: *Journal of Occupational Health Psychology*, Vol. 10(3), 251–60.
- Cunradi, Carol B./Roland Moore/Moira Killoran/Genevieve Ames (2005), Survey Nonresponse Bias Among Young Adults: The Role of Alcohol, Tobacco, and Drugs, in: *Substance Use & Misuse*, Vol. 40(2), 171–85.
- Delfabbro, P./H. Winefield/A. Winefield/C. Malvaso/T. Plueckhahn (2017), Factors Associated With Attrition in a 10-Year Longitudinal Study of Young People: Implications for Studies of Employment in School Leavers, in: *Australian Psychologist*, Vol. 52(1), 41–51.
- Dillman, Don A. (2000), *Mail and Internet Surveys: The Tailored Design Method*. New York: Wiley.
- Feskens, R. C. W./J. J. Hox/G. J. L. M. Lensvelt-Mulders/J. J. G. Schmeets (2007), Nonresponse Among Ethnic Minorities: A Multivariate Analysis, in: *Journal of Official Statistics*, Vol. 23(3), 387–408.
- Feskens, Remco/Joop Hox/Hans Schmeets/Willem Wetzels (2008), Incentives and Ethnic Minorities: Results of a Controlled Randomized Experiment in the Netherlands, in: *Survey Research Methods*, Vol. 2(3), 159–65.
- Fuse, Kana/Dong Xie (2007), A Successful Conversion or Double Refusal: A Study of the Process of Refusal Conversion in Telephone Survey Research, in: *The Social Science Journal*, Vol. 44(3), 434–46.
- Goyder, John (1988), *The Silent Minority: Nonrespondents on Sample Surveys*. Cambridge: Polity Press.
- de Graaf, R./R. V. Bijl/F. Smit/A. Ravelli/W. A. Vollebergh (2000), Psychiatric and Sociodemographic Predictors of Attrition in a Longitudinal Study: The Netherlands Mental Health Survey and Incidence Study (NEMESIS), in: *American Journal of Epidemiology*, Vol. 152(11), 1039–47.
- Groves, Robert M./Mick P. Couper. 1998. *Nonresponse in Household Interview Surveys*, New York: John Wiley & Sons, Inc.
- Groves, Robert M./Eleanor Singer/Amy Corning (2000), Leverage-Saliency Theory of Survey Participation: Description and an Illustration, in: *The Public Opinion Quarterly*, Vol. 64(3), 299–308.
- Hill, Daniel H./Robert J. Willis (2001), Reducing Panel Attrition: A Search for Effective Policy Instruments, in: *The Journal of Human Resources*, Vol. 36(3), 416–38.
- Ingen, Erik Van/Ineke Stoop/Koen Breedveld (2008), Nonresponse in the Dutch Time Use Survey: Strategies for Response Enhancement and Bias Reduction, in: *Field Methods*, Vol. 21(1), 69–90.
- Lee, Sunghee/Richard Valliant (2009), Estimation for Volunteer Panel Web Surveys Using Propensity Score Adjustment and Calibration Adjustment, in: *Sociological Methods & Research*, Vol. 37(3), 319–43.

- de Leeuw, Edith D./Wim de Heer (2002), Trends in Household Survey Nonresponse: A Longitudinal and International Comparison, in: Groves, R. M./D. A. Dillman/J. L. Eltinge (ed.), *Survey Nonresponse*, New York: Wiley, 41–54.
- Lillard, Lee A./Constantijn W. A. Panis (1998), Panel Attrition from the Panel Study of Income Dynamics: Household Income, Marital Status, and Mortality, in: *The Journal of Human Resources*, Vol. 33(2), 437–57.
- Lipps, Oliver (2009), Attrition of Households and Individuals in Panel Surveys, in: *SOEPpapers on Multidisciplinary Panel Data Research* 164, Internet: [https://ideas.repec.org/p/diw/diwsop/diw\\_sp164.html](https://ideas.repec.org/p/diw/diwsop/diw_sp164.html) (Access: 15/09/2018).
- Lugtig, P. (2014), Panel Attrition: Separating Stayers, Fast Attriters, Gradual Attriters, and Lurkers, in: *Sociological Methods & Research*, Vol. 43(4), 699–723.
- Lynn, Peter J. (2005), Weighting, Kempf-Leonard, K. (ed.), *Encyclopedia of Social Measurement*, New York: Elsevier, 967–73.
- MaCurdy, Thomas/Thomas Mroz/R. Mark Gritz (1998), An Evaluation of the National Longitudinal Survey on Youth, in: *The Journal of Human Resources*, Vol. 33(2), 345–436.
- Mühlböck, Monika/Nadia Steiber/Bernhard Kittel (2017), in: Less Supervision, More Satisficing? Comparing Completely Self-Administered Web-Surveys and Interviews Under Controlled Conditions, in: *Statistics, Politics and Policy*, Early view article, 1–16.
- Pääkkönen, Hannu (1998), Are Busy People Under- or Over-Represented in National Time Budget Surveys?, in: *Loisir et Société / Society and Leisure*, Vol. 21(2), 573–82.
- Rogelberg, Steven G./Gwenith G. Fisher/Douglas C. Maynard/Milton D. Hakel/Michael Horvath (2001), in: *Attitudes toward Surveys: Development of a Measure and Its Relationship to Respondent Behavior*, in: *Organizational Research Methods*, Vol. 4(1), 3–25.
- Satherley, Nicole et al. (2015), in: *Demographic and Psychological Predictors of Panel Attrition: Evidence from the New Zealand Attitudes and Values Study*, in: *PLOS ONE*, Vol. 10(3), e0121950.
- Sax, Linda J./Shannon K. Gilmartin/Alyssa N. Bryant (2003), Assessing Response Rates and Nonresponse Bias in Web and Paper Surveys, in: *Research in Higher Education*, Vol. 44(4), 409–32.
- Steiber, Nadia/Monika Mühlböck/Bernhard Kittel (2015), Jung und auf der Suche nach Arbeit in Wien: Eine deskriptive Analyse von AMS-Zugängen im Alter von 18 bis 28 Jahren. Technical Report: Austrian Ministry of Labour, Social Affairs and Consumer Protection. Internet: <http://dx.doi.org/10.13140/RG.2.1.4650.8248> (Access: 15/09/2018).
- Steiber, Nadia/Monika Mühlböck/Stefan Vogtenhuber/Bernhard Kittel (2017), Jung Und Auf Der Suche Nach Arbeit in Wien. Ergebnisse auf Basis des JuSAW-Paneldatensatzes. Technical Report: Austrian Ministry of Labour, Social Affairs and Consumer Protection. Internet: [https://soc.univie.ac.at/fileadmin/user\\_upload/i\\_soc/Personal/Publikationen/Endbericht\\_JuSAW\\_Modul2.pdf](https://soc.univie.ac.at/fileadmin/user_upload/i_soc/Personal/Publikationen/Endbericht_JuSAW_Modul2.pdf) (Access: 19/09/2018).
- Stocké, Volker (2006), Attitudes Toward Surveys, Attitude Accessibility and the Effect on Respondents' Susceptibility to Nonresponse, in: *Quality and Quantity*, Vol. 40(2), 259–88.
- Stoop, Ineke/Jaak Billiet/Achim Koch/Rory Fitzgerald (2010), Improving Survey Response: Lessons Learned from the European Social Survey, Chichester, UK: John Wiley & Sons, Ltd.
- Tourangeau, Roger (2004), Survey Research and Societal Change, in: *Annual Review of Psychology* 55(1), 775–801.
- Tourangeau, Roger/Tom W. Smith (1996), Asking Sensitive Questions: The Impact of Data Collection Mode, Question Format, and Question Context, in: *Public Opinion Quarterly*, Vol. 60(2), 275–304.
- Whiteside, Douglas M. et al. (2016), Verbal Fluency: Language or Executive Function Measure?, in: *Applied Neuropsychology. Adult*, Vol. 23(1), 29–34.
- Young, Anne F./Jennifer R. Powers/Sandra L. Bell (2006), Attrition in Longitudinal Studies: Who Do You Lose?, in: *Australian and New Zealand Journal of Public Health*, Vol. 30(4), 353–61.

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## Appendix: Description of variables

Participation in 2<sup>nd</sup> wave: 1=first wave respondent participated in follow-up survey, 0=first wave respondent did not participate in follow-up survey

Female: 1=female, 0=male

Age: in three age groups; 18-20, 21-24, 25-28

Education: in four levels according to the International Standard Classification of Education; ISCED 0-2 (compulsory schooling), ISCED 3B (vocational training), ISCED 3A-4 (upper secondary school leaving exam „Matura“, or similar), ISCED 5-6 (higher education)

Migration background: no migration background (born in Austria and at least one parent born in Austria), 2<sup>nd</sup> generation (born in Austria but both parents born abroad), 1<sup>st</sup> generation (not born in Austria)

Interview duration 1<sup>st</sup> wave: Interview duration in the 1<sup>st</sup> wave in minutes

Readiness to participate 2<sup>nd</sup> wave: 1=respondent provided contact details already when asked in the questionnaire, 0=original refusal to participate in the follow-up survey was later reverted

Register data available: 1=respondent provided valid social security number so that survey data could be matched with register data, 0=survey data could not be matched with register data

Verbal fluency: Indicator for verbal fluency based on the “Animal Naming Task” (see Whiteside et al. 2016); respondents were asked to write down as many different animals names as possible within one minute; range: 0-25

Questions too personal 1<sup>st</sup> wave: 1=respondent perceived questions as being too personal in the first wave, 0=questions were not perceived as too personal

Trust: self-assessment measured on a scale from 0=no trust to 10=complete trust

Extraversion: self-assessment measured on a scale from 1=low degree of extraversion to 5=high degree of extraversion

Conscientiousness: self-assessment measured on a scale from 1=low degree of conscientiousness to 5=high degree of conscientiousness

Anxiety: self-assessment measured on a scale from 1=low degree of anxiety to 5=high degree of anxiety

Household status: 1=lives alone; 0=more than one person living in the household

Moved between survey waves: 1=postal code of home address changed between survey waves according to register data, 0=postal code did not change

Health impaired: self-assessment in four categories; “Yes, strongly impaired”, “Yes, a bit impaired”, “No, not impaired”, No answer

Kids: 1=having kids, 0=no kids

Unemployed at 2<sup>nd</sup> wave: 1=registered as unemployed at the time of the 2<sup>nd</sup> wave, 0=not registered as unemployed at the time of the 2<sup>nd</sup> wave