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Comparing Unit Nonresponse Patterns Among Immigrant-Origin and Native Voters in a Register-Based Local Survey

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Abstract

Survey response rates are often lower among immigrant-origin populations than among natives. Using data from the longitudinal IMGES II, conducted in the western German metropolis of Duisburg during the 2021 national election campaign, I compare patterns of unit nonresponse among immigrant-origin and native voters. The probability-based two-stage design survey includes a postal screening in which target persons were asked to participate in a three-wave CATI panel. In the analyses, I use data from the sampling frame and survey response as well as supplementary information in order to model response behavior throughout the survey mobilization. The results show that, except for binary gender on the individual level and the share of foreigners on the neighborhood level, coefficients point in the same directions and reveal similar levels of precision. Higher COVID-19 incidence rates in neighborhoods are associated with lower response propensities (up to 11%, min. to max.). Higher local turnout (up to 6%, min. to max.) and formally higher educated neighbors (up to 30%, min. to max.) are positively associated with survey participation rates for both natives and immigrants. From the screening into the first CATI wave, political interest (up to 43%, min. to max.) is a positive predictor of survey participation. This demonstrates how individual characteristics and local contexts are associated with survey participation among subpopulations alike. This may help future survey projects to anticipate the extent of and processes leading to unit nonresponse in similar designs.

Keywords: immigrants, nonresponse, register, IMGES II, Germany

Planning survey projects among migrant populations can be challenging because little is still known about the extent of and reasons for unit nonresponse and panel attrition compared to natives. Anticipating unit nonresponse rates and panel attrition is particularly important when the size of an immigrant-origin population is locally limited. This is especially relevant when oversampling strategies are implemented. In order to take measures to mobilize hard-to-survey populations in surveys (see Tourangeau et al., 2014), it is therefore helpful to understand processes that are associated with survey participation. Knowing whether explanatory variables have different effects across populations can make the use of such measures more effective. However, there is a lack of certainty as to whether migrants and natives abstain from surveys for the same reasons.

Regarding the patterns of response behavior, unit nonresponse rates in surveys are often higher among immigrant-origin target populations than for natives and vary between ethnic minorities and immigrant-origin groups (Deding et al., 2008; Feskens et al., 2006, 2007). Furthermore, these subpopulations are often underrepresented in general population surveys (see Eisner & Ribeaud, 2007; Feskens et al., 2006). This can lead to biased estimates in the variables of interest such as electoral participation (Dahlgaard et al., 2019, p. 591).

In the present study, I ask whether standard individual-level and neighborhood context variables explain survey participation among immigrant-origin and native voters in the same way. This refers to the direction and precision of coefficients for variables available from an address-based sampling frame in a two-stage survey design. Using a novel data set from the survey fieldwork of the Immigrant German Election Study II (IMGES II), conducted during the course of the 2021 German national election campaign in Duisburg, I am able to observe and analyze survey participation behavior among three immigrant-origin groups (Germans of Turkish descent, Russian Germans and immigrants of any other origin) and natives from the same population register at two stages of a large-scale longitudinal survey. This includes the mobilization into a postal screening wave and a mode switch from postal screening to an initial CATI wave as part of a three-wave longitudinal survey.

Using neighborhood level data linked to the sampling frame further allows us to look beyond standard individual-level explanations of unit nonresponse (see Leclerc et al., 2022). Address-based samples have the advantage of allowing the adaptation of several survey modes while offering a lot of additional information on a complete list of households (Fowler et al., 2020, p. 632). Using the novel

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IMGES II as a data source, I want to provide new evidence on how individual-level and fine-grained contextual data can explain survey participation decisions. This may allow future research to estimate the extent of unit nonresponse and panel attrition among certain groups and to use this new information to design surveys among immigrant-origin populations.

In multivariate analyses, I test socio-demographic variables including age, binary gender, and socio-economic status, as well as respondents' neighborhood contexts, as standard predictors of survey participation (see Groves & Couper, 2012). Similar to elections as a frequently investigated participation process (Voogt & Saris, 2003), the results show that there are hardly any significant differences between migrants and natives as to the explanatory models of survey participation. It is very likely that differences in survey participation stem from group composition effects as well as further variables that I could not account for in this study.

In the following section, I give an overview of the current state of research on survey response behavior among immigrant-origin populations. The next section describes the sampling and data collection strategy of the IMGES II followed by an outline of the local context and influences of the COVID-19 pandemic in the city of Duisburg. I move on to the empirical analyses, including descriptive statistics of survey response, before comparing explanatory models between immigrant-origin and native voters. The final section discusses the results and offers suggestions on how they can be used to improve surveys among migrant populations.

The State of Research on Survey Participation Among Immigrant-Origin Populations

While unit nonresponse itself is a well-studied topic in the survey-methodological literature, analyses of immigrant-origin subpopulations are still scarce. On average, immigrant-origin target populations often show lower response rates than natives (Deding et al., 2008; Feskens et al., 2006, 2007). An associated problem is that immigrant-origin subpopulations and ethnic minorities are often underrepresented in general population surveys (see Eisner & Ribeaud, 2007; Feskens et al., 2006). This can lead to biased estimates in the variables of interest such as electoral participation (Dahlgaard et al., 2019, p. 591).

We still lack clarity about whether standard explanations for unit nonresponse and panel attrition work similarly for immigrants and natives. Studies on other participatory processes like electoral behavior find that standard explanatory approaches, including socio-demographic variables, are applicable for immigrants and natives alike and might work similarly for both groups (Spies et al., 2020). In studies of individual-level political participation, dif-

ferences between origin groups are mostly explained by group composition effects rather than by actual differences in mechanisms (Goerres et al., 2025). However, this has never been tested comparably for survey participation as a behavioral outcome variable.

Previous findings on unit nonresponse patterns in surveys that are specific to immigrant-origin populations find, for example, that lower levels of social integration into the host society can have negative effects on survey participation rates (Amaya & Harring, 2017, p. 506). Furthermore, response rates can vary considerably between groups of origin (Feskens et al., 2006, 2007). Such findings suggest that there could be something immigrant-specific about the mechanisms leading to unit nonresponse. Language proficiency is one of those obvious immigrant-specific correlates of survey participation that has to be accounted for in survey designs (Ahlmark et al., 2014).

The available studies of survey response behavior among immigrant-origin individuals can at least draw on socio-demographic variables from the sampling frame. The local context individuals are embedded in is the second large data source where predictors for survey response behaviors could be detected (see Groves & Couper, 2012). It currently remains unclear if local contexts can have different mobilizing effects on natives and immigrants. For example, living in a neighborhood with a higher proportion of foreigners could have different consequences for migrants than for natives in terms of participation processes. Immigrants, who are new to a political system, could react differently to dynamics of social involvement under which survey participation and turnout are summarized (Voogt & Saris, 2003).

In other research contexts, social involvement on the individual level is measured using variables such as employment, organizational affiliations, or family attachments (e.g., Engelhardt et al., 2010, p. 794). On the neighborhood level, such variables are rarely available. By modeling the contextual social involvement with variables such as unemployment rates, formal education, and local turnout, this study investigates the mobilization potential within neighborhoods using data on previous turnout rates and deprivation.

This study is designed to investigate how socio-demographic and neighborhood level variables are associated with survey participation behavior and whether these explanatory perspectives differ between immigrants and natives. The following section includes a detailed description of the sampling and data collection strategy.

Sampling and Data Collection

The analyses in this paper build on the IMGES II longitudinal survey conducted between April and November 2021.[1] The goal of the survey project is to observe and explain political participation among immigrant-origin and native voters comparatively during the course of a national election campaign. In order to maintain the comparability between analyses in the survey stages, I combine non- contact and refusal to participate as well as neutral losses, including the inability to respond, into one definition of unit nonresponse (for an overview of these dimensions, see Groves & Lyberg, 1988; Kalton, 1983). For panel attrition in the longitudinal survey stage, I also disregard the reasons, and I combine all forms of non-participation into one binary outcome variable.

In a first step, a simple random sample of 70,000 individuals was drawn from the population register of the City of Duisburg (see Appendix Figure A1 for an illustration of the survey design). This minimum sample size was the result of unit nonresponse and panel attrition estimations given the limited population size of Russian Germans known from official register data. From this initial sample, all Germans of Turkish descent, Russian Germans, and persons with any other possible immigrant origin with at least medium certainty, as well as 4,500 classified natives as a reference group, were drawn.

The sampled groups were pre-identified using an onomastic classification procedure implemented by a specialized company (Liebau et al., 2018). The method matches individuals' names against a database and uses additional information, such as birthplaces, to assign each unit a probability of belonging to the most likely origin group.

Before being able to verify results in the basic questionnaire in the postal screening wave, an onomastic classification outcome variable is used as an indicator of target persons' immigrant origin. For native Germans, the classification was 91.1% correct among those who answered the screening questions. Germans of Turkish descent were correctly identified at the level of 92.8%, Russian Germans at 80.3%, and Germans of any other immigrant origin at 65.9%. There are several reasons for the differences in these scores, such as the reliability of the underlying name data basis and recent changes in group compositions or marriages (see Liebau et al., 2018, for details). Most of those wrongly classified target persons from the latter group turned out to be natives under our applied definition of first- and second-generation immigrants.

In a second step, a postal screening wave was carried out to mobilize target persons into the three-wave CATI survey, along with a screening of their immigrant origin and basic questions using a short questionnaire. In-person con-

[1] The data collected in the fieldwork in conjunction with the context and survey data are not publicly accessible. The author will provide information on the future publication of the IMGES II data on request.

tacts among Russian Germans, Germans of Turkish descent, and a small group of natives were conducted as an alternative to the first of two postal reminder stages (Elis et al., 2024).

The CATI survey waves were conducted between June and November 2021 by an external specialized company with experience of surveying immigrant populations. Respondents received a 10 Euro (€) gift card incentive after each interview for which they were also given the opportunity to donate to a local food bank (Tafel e.V.).

Local Context and COVID-19 Restrictions

Several publications link contextual data to survey samples at the municipality (Wuyts et al., 2017) or neighborhood level (Lee et al., 2009) without finding clear associations with unit nonresponse. Other studies do find such correlations and trace them back to variables such as social composition and economic deprivation (Maclennan et al., 2012). The IMGES II study covers a metropolitan area of strong and visible socio-economic differences during an electoral campaign in times of a major crisis imposed by the COVID-19 pandemic. Given the characteristics described below, Duisburg is a typical Western European metropolis with visible and salient differences between its neighborhoods.

From the mobilization stage during a partial lockdown in April 2021 through a time of relatively low incidence rates until the final CATI wave in November 2021 after the German national election, the fieldwork of the IMGES II spanned very different phases of the COVID-19 pandemic. Negative consequences on response rates have been demonstrated in several studies in different fields (Brochu & Créchet, 2022; Koning et al., 2021) making it necessary to control for incidence rates.

The differences between the 46 neighborhoods of the city become most apparent in their share of foreign residents and in various measures of social deprivation. Neighborhoods form the smallest administrative unit (~ 11,000 inhabitants per neighborhood on average) with a wide range of available contextual data retrieved from the data repository of the City of Duisburg (Stadt Duisburg, 2021). In addition, the sampling design allows analyses at the neighborhood level with addresses available for the whole sampling frame based on the population register. “Neighborhood” is used as a term for the contextual variable perspective in the following analyses.

In Duisburg, there are 319,000 eligible voters in 2021, of whom 19.7% have a first- or second-generation immigrant origin. Persons of Turkish origin make up the largest immigrant-origin group, but German citizens of Turkish descent are only the second largest immigrant-origin group of eligible voters behind Russian Germans.

The unemployment rate in June 2021, during the fieldwork – which was influenced by the COVID-19 pandemic – was 12.3% compared with 7.4% in the state of North Rhine-Westphalia and 6.3% in Germany (Bundesagentur für Arbeit, 2021a, 2021b). This reflects the history of the metropolis being shaped by decades of economic decline, which had different effects on the nowadays socio-economically heterogeneous neighborhoods.

The immigrant-origin groups that are covered by the IMGES II sample are also distributed unequally across the city. Russian Germans are the largest group that can be defined by their migration history, because most of them were granted German citizenship status. Most Russian Germans immigrated to Germany after the 1990s as so-called 'resettlers' after generations before them had emigrated to Tsarist Russia from the eighteenth century onwards. The Russian German population of Duisburg is scattered over the whole city, with shares of the overall population ranging between 0.1 and 2.1% (M = 0.6%, SD = 0.4%). Clusters of the Russian German population formed right after immigration and still do.[2] The majority of Russian Germans eligible to vote in Germany and Duisburg belong to the first immigrant generation and thus have a migration experience themselves.

The second largest group of immigrant-origin voters are Germans of Turkish descent. Because of the partial concentration of this group in the industrial north of Duisburg, Germans of Turkish descent are distributed much differently over the city. They constitute up to 45% of the population in the industrial northern neighborhood of Marxloh and less than 2% of the population in Baerl (M for all neighborhoods = 13.2%, SD = 10.0%). In contrast to Russian Germans, the proportion of second-generation immigrants is over 60% in this group.

Persons with any other than a Turkish or Russian German origin in the first and second generation come from more than 60 origin countries. Figure 1 shows the frequencies of first-generation immigrants' countries of origin by continent of origin. More than 20% of all respondents in this group have origins from Western or Eastern Asia, another 20% from Africa, and more than half originate from the rest of Europe.[3]

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[2] One is the settlement Hagenshof in the northern neighborhood of Neumühl in Duisburg.

[3] Splitting up this sub-sample would be possible only after confirming the onomastic classification. Finding meaningful groupings with sufficient sample sizes for further analysis proved difficult, which is why the sample of target persons with another origin will be used as a category for analysis from the postal screening wave onwards

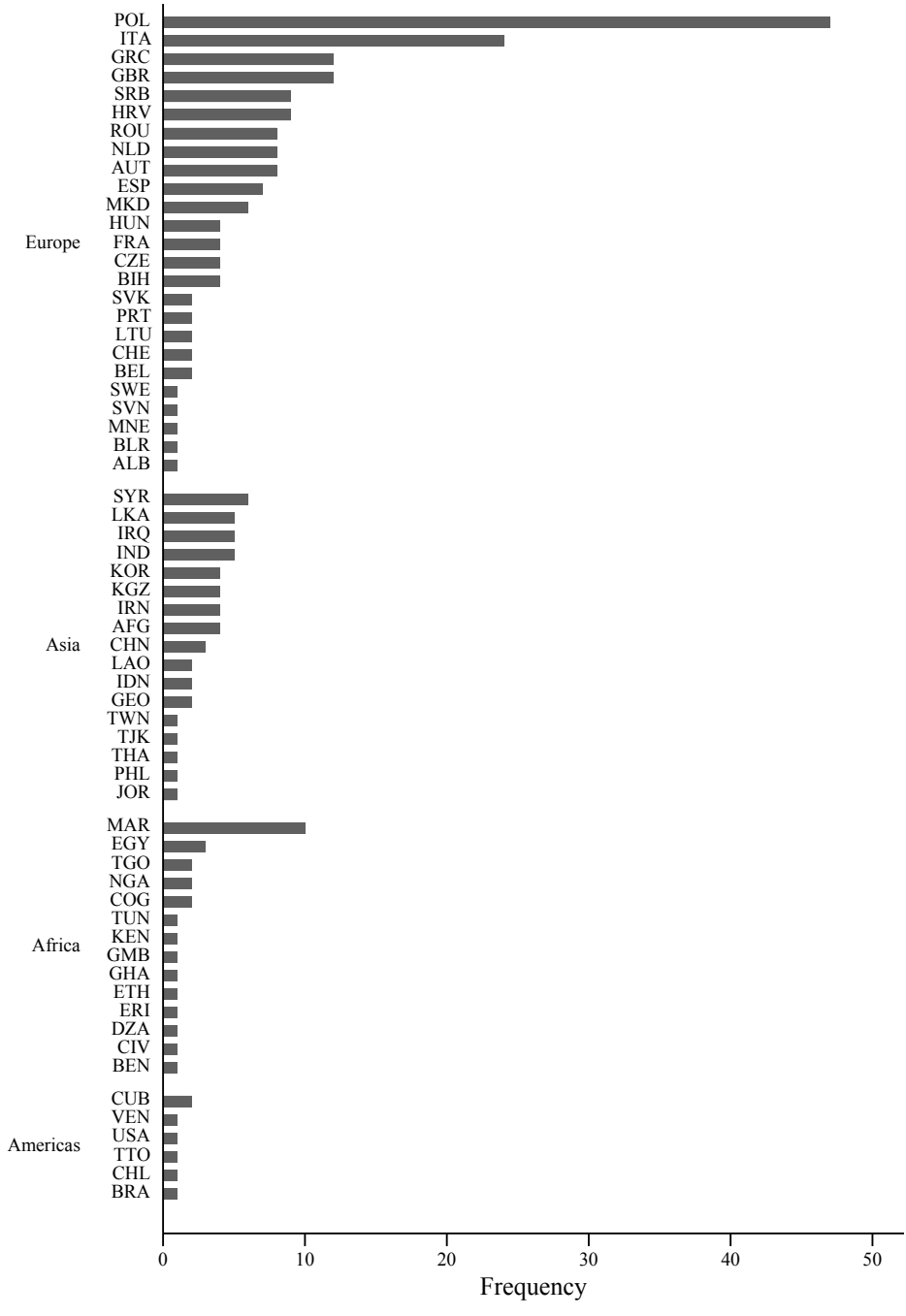


Figure 1 Frequency of Countries-of-Origin of Respondents with a First-Generation Migration Experience by Continents (ISO 3166 ALPHA-3 Codes) in the IMGES II CATI Wave 1 Sample

Empirical Analyses

Descriptive Results of Survey Participation

This section starts with descriptive results on the differences in response rates between natives and immigrant-origin groups throughout the study design. Response rates vary between onomastic target groups (see Appendix Table A1). In the postal screening wave, in which 20,066 individuals were drawn randomly into a stratified sample, natives (21%) and Russian Germans (24%) have the highest response rates, followed by Germans of any other immigrant origin (16%) and Germans of Turkish origin with the lowest response rate of 13%. This pattern remains after the mode and actual participation in CATI wave 1. Recall that the onomastic classification was confirmed in the postal screening wave with different errors between the sampled origin groups.

Let us now look at sample characteristics with full information available from the sampling frame. Table 1 shows the comparisons for age, binary gender, and individuals born in Germany for both respondents and non-respondents within the sampled onomastic strata. Information on these variables stems from the population register. Because the actual immigrant origin and migration generation of non-respondents cannot be verified at this stage, onomastic classification remains the only indicator for the sampled target groups.

Table 1 Comparison of Characteristics of Respondents and Non-Respondents by Sampled Onomastic Group in the Postal Screening Wave

Group	Age (mean)			Gender (% male)			Born in Germany (% yes)		
	NR	R	Δ NR – R	NR	R	Δ NR – R	NR	R	Δ NR – R
Natives	55.8	58.3	−2.5***	48.2	50.4	−2.2	100.0	100.0	0.00
Immigrant origin	41.4	44.6	−3.2***	47.5	44.5	3**	89.7	88.8	0.9
Turkish origin	37.3	38.5	−1.2**	50	48.5	1.5	95.2	94.8	0.4
Russian German	48.5	48.2	0.3*	46.2	42.4	3.8	84.6	84.1	0.5
Other origin	43.8	48.1	−4.3***	45.2	42.1	3.1	85.3	85.7	−0.4

Notes: NR = Non-respondents, R = Respondents, overall N = 20,066. The table reports differences in means between respondents (R) and non-respondents (NR). Significance levels are based on two-sided t-tests. $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Before moving to the observed differences between respondents and non-respondents on the three variables of interest, looking at the average age reveals notable differences in the group compositions. For native respondents, the average age of respondents is above 58 years compared to only above 41 years among

all immigrant-origin voters. Respondents from the Turkish origin group have an average age of just above 37 years. This difference in group compositions has to be considered as an explanation when we compare response outcomes between natives and immigrants. Appendix Table A2 shows the distributions of all variables used in the multivariate analyses for both sub-samples. On average, besides differences in demographics, natives are more politically interested and live in neighborhoods with fewer foreigners, higher turnout, and formally higher educated individuals. These differences in group compositions are an interesting point to start for the model comparisons below.

Overall, the differences between respondents and non-respondents in the postal screening wave are relatively small at least for two onomastic target groups, namely native Germans and Germans of Turkish descent. One of the largest discrepancies is found for age in the sampled group of other origins, in which respondents to the postal screening wave are, on average, more than four years older than non-respondents. In the sample of Russian Germans, only 42% of actual respondents are male compared to 46% among non-respondents. Despite the overall small differences, one can already see for these available variables with full information from the sampling frame that respondents' profiles differ slightly between natives and immigrants, as well as between the respective groups. For the more complex multivariate models below, R-indicator values (Schouten et al., 2009) are reported separately for natives and immigrants. They reflect the overall similarity between respondents and non-respondents given the variables considered in the presented model. I compute R-indicator values based on the same set of auxiliary variables for both samples.

Group Comparison of Multivariate Model

The independent variables investigated in this analysis reflect all individual-level and neighborhood context indicators available from the sampling data and survey response to the postal screening wave. The following group comparison in the two response models reveals whether the resulting coefficients show the same directions and levels of precision for immigrants and natives. Due to the oversampling of classified immigrants, the number of invited immigrant-origin target persons is about three times higher (4,500 natives versus 15,566 immigrant-origin voters).

I use a linear probability model with robust standard errors for each of the two samples. As described above, invited target persons live in 46 neighborhoods that are heterogeneous with regard to population size and demographic composition. A consideration of the multilevel structure of the data shows that the proportion of variance explained by the group variable neighborhoods is negligible (ICC values below 0.01).

For both transitions from the first contact into the postal screening wave followed by the mobilization into the first CATI interview, I start with a visual inspection of coefficient plots (see Figure 2 and Figure 3). This is followed by a group comparison of models in Table 2 and Table 3, where coefficients are tested against each other. Each model includes an indicator of whether a target person was treated with in-person contacts. Since this measure was implemented to reduce differences between respondents and non-respondents and explicitly targeted immigrant-origin groups, additional models can be found in Appendix Table A3 and Appendix Table A4 as a robustness check without this variable. No notable differences are observed as to the overall picture of coefficient directions and levels of precision.

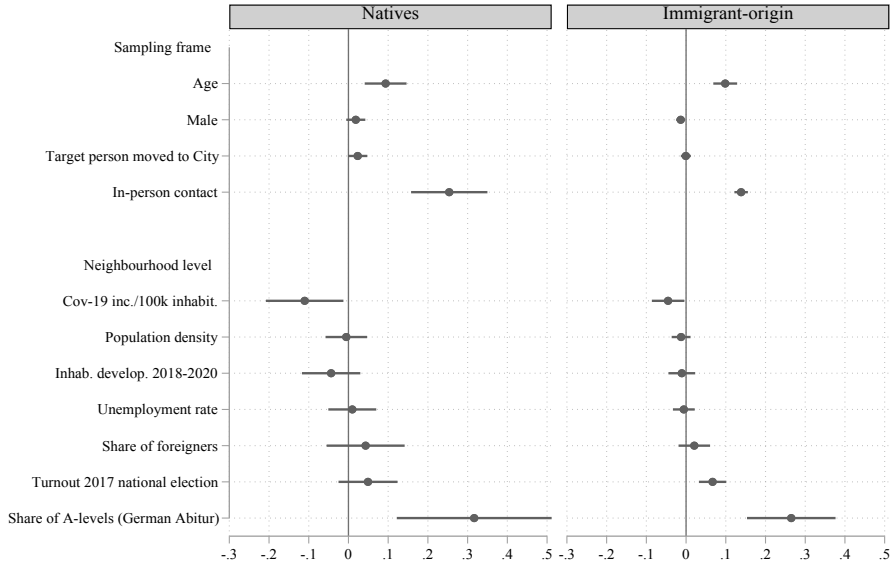


Figure 2 Coefficient Plots with Average Marginal Effects and Dependent Variable Participation in the IMGES II Postal Screening Wave. n = 4,500 native, n = 15,566 immigrant-origin, lines represent 95 % CIs, R-Indicator values: natives = 0.9 (95% CI [0.87, 0.92]), R-indicator value for immigrant-origin = 0.92 (95% CI [0.91, 0.93]).

A first visual inspection of the model for participation in the postal screening wave reveals a similar picture for the samples of classified natives and immigrant-origin voters (Figure 2). Recall that the onomastic classification described in the previous sections has not been verified at this stage but will be in the fol-

lowing postal screening. Also recall that there are some notable differences with regard to the composition of both sub-samples as can be seen in Table 1. The multivariate comparison of the models now helps us to understand whether the survey participation behavior in both groups is affected differently by these starting levels.

Except for age among the sampling frame and unemployment rate among the neighborhood-level variables, all coefficients point in the same direction. Age (+), in-person contact treatment (+), COVID-19 incidence rates (-), and the share of A-levels (+) are consistently and strongly associated with survey participation.

Moving on to the group comparison in Table 2, this impression finds support in overall high *p*-values for the test of group invariances of coefficients. Age ($p < .05$) is the only indicator with significantly different coefficients in the whole model. The overall explanatory power of both models for natives and immigrants is low with R^2 values below 2% of explained variance.

Table 2 OLS Regression with Dependent Variable Participation in the IMGES II Postal Screening Wave and Test for Group Invariance of Coefficients.

Independent Variable	Native	Immigrant-origin	Tests for group invariance of coefficients	
			Wald Test χ^2	Two-sided *p*-value
Sampling frame				
Age	0.09***	0.10***		
	(0.03)	(0.02)	0.06	.809
Male	0.02	−0.01*		
	(0.01)	(0.01)	5.24	.022
Target person moved to Duisburg	0.02	0.00		
	(0.01)	(0.01)	1.92	.166
Neighborhood level				
Cov-19 inc./100k inhabit.	−0.11*	−0.04*	1.44	.231
	(0.05)	(0.02)		
Population density	−0.01	−0.01	0.04	.849
	(0.03)	(0.01)		
Inhabitant development 2018-2020	−0.04	−0.01	0.70	.402
	(0.04)	(0.02)		
Unemployment rate	0.01	−0.00	0.24	.622
	(0.03)	(0.01)		
Share of foreigners	0.04	0.01	0.33	.569
	(0.05)	(0.02)		

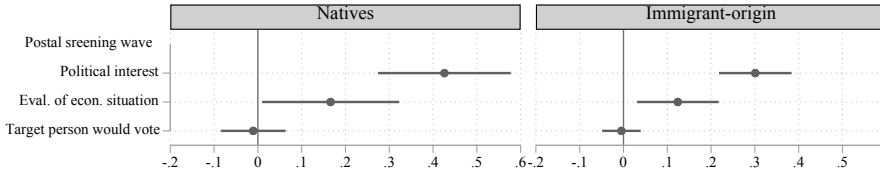
Independent Variable	Native	Immigrant-origin	Tests for group invariance of coefficients	
			Wald Test χ^2	Two-sided p-value
Turnout 2017 national election	0.05	0.06**	0.05	.833
	(0.04)	(0.02)		
Share of A-levels (German Abitur)	0.30**	0.24***	0.27	.602
	(0.10)	(0.06)		
Observations	4,500	15,566		
R^2	.01	.01		

Notes: Standard errors in parentheses, $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Intercept is not shown.

I next turn to the visualization of the model explaining participation in the first CATI wave after responding to the postal screening (Figure 3). Respondents went through a pre-selection process after their initial response to the postal screening. This results in smaller coefficients and larger confidence intervals for all variables that already had an impact on participation in the previous survey stage. The following Figure 3 and Table 3 include only the new variables resulting from the screening questionnaire.

The full regression table can be found in Appendix Table A5. Also note that the onomastic classification is now confirmed after target persons responded to questions on their own and their parent's countries of birth. Appendix Table A6 shows the same model for the target person's way from the sampling directly into the first CATI interview. Thus, skipping the postal screening makes no notable difference for the pattern of coefficient directions.

Figure 3 Coefficient Plots with Average Marginal Effects of Additional Variables from Postal Screening Wave and Dependent Variable Participation in the IMGES II CATI Wave 1. n = 963 native, n = 2,391 immigrant-origin, lines represent 95 % CIs, R-Indicator value for natives: 0.76 (95% CI [0.68, 0.79]), R-indicator value for immigrant-origin: 0.8 (95% CI [0.75, 0.82]). Full figure in Appendix Figure A2.



The new block of explanatory variables stems from basic questions asked in the postal interview. This includes political interest and evaluation of the respondent's perceived economic situation in Germany as well as prospective voting behavior. Political interest followed by the economic evaluation reveals a strong and precise positive effect on survey participation.

Again, there is no clear evidence that the two models differ notably between the immigrant and native sub-samples, as we can see in Table 3. Only the coefficients for the share of foreigners on the neighborhood level differ with precision below the 10%-level in the two-sided test. The overall explanatory power is still low but now reaches between 4% and up to almost 6%.

Table 3 OLS Regression with Dependent Variable Participation in IMGES II CATI Survey Wave 1 and Test for Group Invariance of Coefficients.

Independent variable	Native	Immigrant-origin	Tests for group invariance of coefficients	
			Wald Test χ^2	Two-sided p-value
Postal screening wave basic questions				
Political interest	0.43***	0.31***		
	(0.08)	(0.04)	1.71	.191
Evaluation of economic situation	0.17*	0.13**		
	(0.08)	(0.05)	0.18	.674
Target person would vote	−0.01	−0.00		
	(0.04)	(0.02)	0.03	.872
Observations	963	2,391		
R^2	.06	.04		

Notes: Full table with sampling frame and neighborhood level variables in Appendix Table A6, standard errors in parentheses, $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Intercept is not shown.

A visual inspection and formal comparison of the coefficients reveal no major evidence that standard explanatory models of survey participation differ between immigrant-origin and native voters. Besides this general finding, some explanatory variables reveal interesting effects regarding their impact and direction. The following section summarizes and discusses these results.

Discussion and Conclusion

This research is an analysis of patterns of unit nonresponse and panel attrition among immigrant-origin and native voters in a local electoral campaign survey.

The implementation of a postal screening wave in order to mobilize respondents into a longitudinal CATI survey and to verify their origins offers a rare chance to observe response behavior within the sampled groups at two survey stages and under the conditions of the COVID-19 pandemic in a heterogeneous urban environment.

Learning about explanations for systematically different response rates in sub-populations is important for several reasons. For one, expectations about the extent of non-participation can be assessed, and adjustments can be made to future strategies for sampling and survey designs. For another, previous studies have investigated survey participation behavior among immigrant populations (Deding et al., 2008; Feskens et al., 2006, 2007). This study adds insights about the comparison with natives, changes after a mode-switch, as well as effects of rarely available context variables.

First of all, this study once again reports a survey participation gap between natives and immigrant-origin target persons from three different groups. Mobilizing Germans of Turkish descent, Russian Germans, and a heterogeneous group of other origins into the postal screening wave and subsequent CATI panel survey is, on average, harder than it is for natives. In surveys of the general population, this situation can induce bias. If migrants are to be surveyed explicitly, low response rates can become a problem if the population size of a certain target group is small. These results provide a measure of expectations for similar survey projects.

Comparative multivariate analyses in this paper demonstrate that the investigated models of unit nonresponse and panel attrition over the two stages of mobilization into the survey are similar for natives and immigrant-origin groups. Point estimates of the coefficients mostly have the same directions with only a few exceptions, even though both sub-samples are composed differently with regard to socio-demographic characteristics. This is a first piece of evidence that differences in survey participation are due to levels of explanatory variables and not because explanations work differently between immigrants and natives. Similar results were found for electoral participation (see Spies et al., 2020).

Formal tests of group invariances of coefficients reveal that respondents' age as well as shares of foreigners on the neighborhood level have different effects on survey participation for natives and immigrants. The possible mechanisms behind this are currently unclear, but the result raises awareness for future surveys for which these variables are available in the sampling frame.

Furthermore, there are explanatory variables with significant effects on survey participation. The level of COVID-19 incidence rates in the neighborhood of target persons as well as higher unemployment rates as a measure of deprivation are associated with lower response rates, especially at the stage of postal mobilization into the CATI survey. Moreover, higher local turnout and higher

proportions of neighbors with a high formal education are positively associated with participation rates for both natives and immigrants. Once target persons from both groups consent to be re-interviewed and run through a selection process, these contextual explanations are replaced by individual-level predictors, among which political interest and a better evaluation of the economic situation reveal positive effects for both groups alike.

Some aspects of this study require critical reflection. It is worth noting that these analyses were made for a sample of eligible voters who all share the similarity of being German nationals over the age of 18 years. Formally less integrated populations might exhibit different participation behavior in surveys (see Amaya & Harring, 2017).

Furthermore, the particularities of the local context and the pandemic conditions require some caution for transferring to future survey projects. By controlling for COVID-19 prevalence at the neighborhood level, the best was done to adjust for this circumstance. The analyses in this paper are limited to variables available from the sampling frame of the study and linked data from a local municipal data source. This means that standard explanations for survey participation cannot be captured entirely (see Groves & Couper, 2012, for an overview of common explanatory models).

The methodological setup for this study thus has a number of particularities that may not occur in other studies. This includes the use of telephone interviews as an alternative to a face-to-face approach due to the pandemic as well as the geographical focus on one city. However, target persons from both strata of the sample were treated equally, and it is thus possible to compare survey participation behavior throughout the mobilization stage and panel survey. For further details of the survey-methodological methods used in the IMGES II in order to mobilize hard-to-survey populations and keep them in the panel, see Goerres et al. (2021).

The findings from this study can be used to optimize future survey designs. first, immigrant-origin individuals and natives react similarly to mobilization efforts and a mode-switch in the multi-stage survey design. The response rates found in this study can be used to model expectations of survey response in future studies using similar techniques and focusing on similar populations. Second, the multivariate models of panel attrition in the CATI surveys are similar among immigrants and natives. Wherever hard-to-survey populations are sampled, researchers should think about measures that may reduce such differences, such as incentive strategies, in-person contact (see Elis et al., 2024), interviewer matching, or questionnaire translations. All of the above vary in monetary cost and expected success, but in settings with limited cluster- or subpopulation strata sizes, they could become necessary to achieve the targeted sample size. Third, any information from sampling frames, linked supplementary data, or previous individual survey data can be used to improve weighting

procedures and to gain more knowledge about the investigated populations. Fourth, because in this and many other social science surveys, unit nonresponse is linked with political interest, invitation letters, visual designs, and forms of personal approach to target persons should be improved accordingly.

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Data Availability Statement

The data and replication material is available at https://doi.org/10.7910/DVN/7QOQ0H.

Conflict of Interest

The author declares no conflict of interest.

Ethics Statement

The Immigrant German Election Study II (IMGES II), from which this is study is part, was reviewed and approved by the Ethics Committee and Data Protection Offices of the University of Duisburg-Essen and the Heinrich-Heine-University Düsseldorf.

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Appendix

Table A1 Response and Panel Attrition Rates at Each Survey Stage

	Survey participation after sampling and first contact attempt (in %) Note: onomastic classification. unverified		Survey participation after consent provided to be re-interviewed in postal screening wave (in %) Note: onomastic classification verified		
Origin group	Sampling and first contact à Postal screening wave	Sampling and first contact à CATI wave 1	Postal screening wave à CATI wave 1	CATI wave 1 à CATI wave 2	CATI wave 1 à CATI wave 3
Natives	21	10	48	80	71
Turkish origin	13	5	37	69	50
Russian German	24	8	32	64	55
Other origin	16	7	42	79	68

Notes: Based on AAPOR (2023) ABS version 5.1 response rate calculations. Response to postal screening wave includes any response to the survey invitation where answers were given. Percentages can include respondents who answered and sent back the questionnaire, but did not give consent to be interviewed in CATI wave 1.

Table A2 Independent Variables with Data Source and Original Coding

Variable	Data origin	Coding	Mean or percentage	
			Native	Immigrant origin
Age of target person	Sampling frame	years	56	42
Gender: male	Sampling frame	0 (female), 1 (male)	49	47
Target person moved to Duisburg	Sampling frame	0 (no), 1 (yes)	52	62
Target person born in Germany	Sampling frame	0 (no), 1 (yes)	0	90
Treated with in-person contact	Fieldwork data	0 (no), 1 (yes)	2	13
Political interest	Postal screening	Scale between 1 'not at all interested' to 5 'very interested'	3.4	3.2
Evaluation of national economic situation	Postal screening	Scale between 1 'very bad' to 5 'very good	3.2	3.2
Target person would vote	Postal screening	0 (no or undecided), 1 (would vote)	18	11
COVID-19 two weeks incidence per 100k inhabitants in neighborhood	Contextual data (source: City of Duisburg)	Number of new infections per 100.000 inhabitants between April 4 and April 18 2021 as deviation from the mean in the City of Duisburg	−30	+25
Population density in neighborhood	Contextual data (source: City of Duisburg)	Number of inhabitants per square kilometer	−312	+57
Inhabitant development per neighborhood between 2018 and 2020	Contextual data (source: City of Duisburg)	Number of inhabitants per neighborhood in 2018 minus number in 2020	−163	−134

Variable	Data origin	Coding	Mean or percentage	
			Native	Immigrant origin
Unemployment rate	Contextual data (source: City of Duisburg)	Percent as deviation from the mean in the City of Duisburg	+1.1	+1.1
Share of foreigners	Contextual data (source: City of Duisburg)	Percent as deviation from the mean in the City of Duisburg	−6	+10
Turnout in the 2017 German federal election per polling station (380 within the city)	Contextual data (source: City of Duisburg)	Percent as deviation from the mean in the City of Duisburg	+0.5	−3
Share of A-levels in neighborhood	Contextual data (source: Microm)	Percent as deviation from the mean in the City of Duisburg	+19	+16

Notes: Means and percentages are unweighted results at the earliest available survey stage.

Table A3 OLS Regression with Dependent Variable Participation in the IMGES II Postal Screening Wave Without Independent Variable In-Person Canvassing Treatment

Independent variable	Native	Immigrant-origin
Sampling frame		
Age	0.09***	0.10***
	(0.03)	(0.02)
Male	0.02	−0.01*
	(0.01)	(0.01)
Target person moved to Duisburg	0.02	0.00
	(0.01)	(0.01)
Neighborhood level		
Cov-19 inc./100k inhabit.	−0.11*	−0.04*
	(0.05)	(0.02)
Population density	−0.01	−0.01
	(0.03)	(0.01)
Inhab. develop. 2018-2020	−0.04	−0.01
	(0.04)	(0.02)
Unemployment rate	0.01	−0.00
	(0.03)	(0.01)
Share of foreigners	0.04	0.01
	(0.05)	(0.02)
Turnout 2017 federal election	0.05	0.06**
	(0.04)	(0.02)
Share of A-levels (German Abitur)	0.30**	0.24***
	(0.10)	(0.06)
Constant	0.10*	0.08***
	(0.05)	(0.02)
Observations	4,500	15,566
R^2	0.01	0.01

Notes: Standard errors in parentheses, $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table A4 OLS Regression with Dependent Variable Participation in the IMGES II CATI Wave 1 Without Independent Variable In-Person Canvassing Treatment

Independent variable	Native	Immigrant-origin
Sampling frame		
Age	0.07	−0.07
	(0.07)	(0.05)
Male	0.00	0.01
	(0.03)	(0.02)
Target person moved to City	0.01	−0.02
	(0.03)	(0.02)
Neighborhood level		
Cov-19 inc./100k inhabit.	−0.07	0.01
	(0.14)	(0.07)
Population density	0.03	−0.04
	(0.07)	(0.04)
Inhab. develop. 2018-2020	0.08	0.02
	(0.10)	(0.06)
Unemployment rate	−0.16	−0.09
	(0.08)	(0.05)
Share of foreigners	0.15	−0.13
	(0.14)	(0.07)
Turnout 2017 federal election	0.15	−0.03
	(0.10)	(0.06)
Share of A-levels (German Abitur)	0.15	0.39*
	(0.25)	(0.18)
Political interest	0.43***	0.31***
	(0.08)	(0.04)
Eval. of econ. situation	0.17*	0.13**
	(0.08)	(0.05)
Target person would vote	−0.01	−0.00
	(0.04)	(0.02)
Constant	−0.02	0.25**
	(0.14)	(0.08)
Observations	963	2,391
R^2	.06	.04

Notes: Standard errors in parentheses, $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table A5 OLS Regression with Dependent Variable Participation in the IMGES II CATI Wave 1 for All Sampled Target Persons Before Onomastic Classification in the Postal Screening Wave

Independent variable	Native	Immigrant-origin
Sampling frame		
Age	0.07	−0.07
	(0.07)	(0.05)
Male	0.01	0.01
	(0.03)	(0.02)
Target person moved to City	0.01	−0.02
	(0.03)	(0.02)
In-person contact	−0.02	−0.05
	(0.09)	(0.02)
Neighborhood level		
Cov-19 inc./100k inhabit.	−0.07	0.02
	(0.14)	(0.07)
Population density	0.04	−0.04
	(0.07)	(0.04)
Inhab. develop. 2018-2020	0.08	0.01
	(0.10)	(0.06)
Unemployment rate	−0.16	−0.09
	(0.08)	(0.05)
Share of foreigners	0.15	−0.14
	(0.14)	(0.07)
Turnout 2017 federal election	0.15	−0.04
	(0.10)	(0.06)
Share of A-levels (German Abitur)	0.15	0.38*
	(0.25)	(0.18)
Political interest	0.43***	0.30***
	(0.08)	(0.04)
Eval. of econ. situation	0.17*	0.12**
	(0.08)	(0.05)
Target person would vote	−0.01	−0.00
	(0.04)	(0.02)
Constant	−0.02	0.28***
	(0.14)	(0.08)
Observations	963	2,391
R^2	.06	.04

Notes: Standard errors in parentheses, $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table A6 Full OLS Regression Table and Test for Group Invariance Between Coefficients with Dependent Variable Participation in CATI Survey Wave 1

Independent variable	Native	Immigrant-origin	Tests for group invariance of coefficients	
			Wald Test χ^2	Two-sided p-value
Sampling frame				
Age	0.07	−0.07		
	(0.07)	(0.05)	2.34	.126
Male	0.00	0.01		
	(0.03)	(0.02)	0.02	.893
Target person moved to Duisburg	0.01	−0.02		
	(0.03)	(0.02)	0.75	.387
Neighborhood level				
Cov-19 inc./100k inhabit.	−0.07	0.01	0.27	.604
	(0.14)	(0.07)		
Population density	0.03	−0.04	0.83	.361
	(0.07)	(0.04)		
Inhab. develop. 2018-2020	0.08	0.02	0.32	.570
	(0.10)	(0.06)		
Unemployment rate	−0.16	−0.09	0.50	.482
	(0.08)	(0.05)		
Share of foreigners	0.15	−0.13	3.16	.076
	(0.14)	(0.07)		
Turnout 2017 fed. election	0.15	−0.03	2.27	.132
	(0.10)	(0.06)		
Share of A-levels	0.15	0.39*	0.60	.441
	(0.25)	(0.18)		
Postal screening wave basic questions				
Political interest	0.43***	0.31***		
	(0.08)	(0.04)	1.71	.191
Eval. of econ. sit.	0.17*	0.13**		
	(0.08)	(0.05)	0.12	.674
Target person would vote	−0.01	−0.00		
	(0.04)	(0.02)	0.03	.872
Constant	−0.02	0.25**		
	(0.14)	(0.08)	2.75	.097
Observations	963	2,391		
R^2	.06	.04		

Notes: Standard errors in parentheses, $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

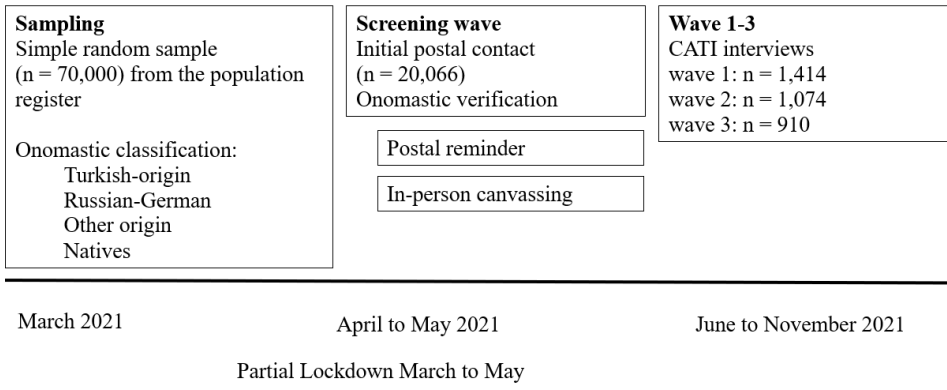

Figure A1 Visualization of the IMGES II Survey Design

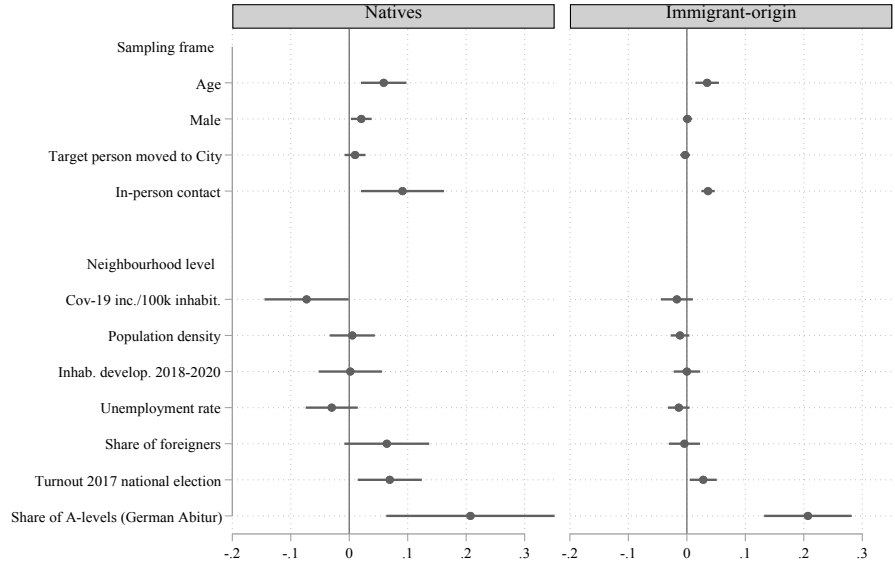

Figure A2 Coefficient Plots with Average Marginal Effects of Additional Variables from Postal Screening Wave and Dependent Variable Participation in the IMGES II CATI Wave 1

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