Marginal Component Effects in Conjoint Experiments Provide Valid Measures of Preferences: Evidence from Individual-Level Analyses

Kirill Zhirkov[1], Fabian G. Neuner[2], and Melle Scholten[3]

[1] University of Virginia

[2] Arizona State University

[3] University of Twente

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Abstract

Marginal component effects (MCEs) are the most common quantities used to present results from conjoint survey experiments, but recent scholarship has questioned whether they provide accurate measures of preferences. Much of this debate ultimately concerns the validity of MCEs, which thus far has only been explored indirectly using aggregate-level data. In this paper, we contribute to this literature by estimating MCEs and investigating their validity at the individual level. Our evidence comes from two studies, one in the United States and one in Germany, in which respondents both rate hypothetical candidates in conjoint experiments and report their support for real-world parties in separate questions. Using these data, we demonstrate that respondents' issue preferences measured via individual MCEs in conjoint experiments strongly and consistently predict real-world party support in the expected directions. Our findings demonstrate that MCEs obtained from conjoint experiments are valid measures of preferences.

Keywords: conjoint experiments, marginal component effects, nomological validity, preferences

Conjoint experiments are a class of survey experiments designed to study multidimensional choices (Bansak, Hainmueller, et al. 2021). In a conjoint task, respondents are presented with hypothetical options described in terms of several attributes with randomized values and asked to choose among these options, to rate them, or both. The main benefit of the conjoint-experimental design is the ability to independently estimate and compare the effects of multiple considerations or factors on people's choices. Conjoint tasks also have other beneficial properties, such as resilience to satisficing and the capacity to at least partially mitigate social desirability bias (Bansak et al. 2018; Horiuchi et al. 2022). The power and flexibility of conjoint experiments have thus quickly made them a popular tool in the empirical study of politics.[1]

The most common quantities used to present results of conjoint experiments are known as marginal component effects (MCEs): differences in choice probabilities or rating scores if attribute values change. Originally, these quantities were introduced to political science as causal estimands conceptually similar to treatment effects in standard survey experiments (Hainmueller et al. 2014). However, the practical application of conjoint experiments—and thus MCEs—in the literature primarily concerns the measurement of preferences. For instance, a widely cited conjoint study has found that Americans prefer high-skilled immigrants over low-skilled ones and that these preferences are stronger than those regarding immigrants' countries of origin (Hainmueller and Hopkins 2015).

While conjoint experiments' ability to provide causal estimates is a point of consensus among political methodologists, the use of MCEs as measures of preferences has increasingly come under scrutiny. Issues raised in the literature include potential confusion in interpretation (Leeper et al. 2020), estimation issues in forced-choice designs (Ganter 2023), and the possibility of incorrectly capturing majority preferences (Abramson et al.

[1] We were able to identify at least 44 papers published between 2015 and 2023 in the three general interest political science journals—the *American Political Science Review*, *American Journal of Political Science*, and the *Journal of Politics*—that employed conjoint experiments.

2022). While there is some evidence indicating that MCEs are valid measures of preferences (Bansak et al. 2022; Hainmueller et al. 2015; Jenke et al. 2021), it comes from aggregate or indirect results and does not address nomological validity at the individual level. For instance, do people who prefer candidates promising to deport immigrants in conjoint experiments also support anti-immigration parties in real life? Given the hypothetical nature of conjoint tasks, this question is important—but it remains unanswered due to the absence of individual-level evidence.

We address this gap by exploring whether individual preferences revealed in conjoint experiments predict real-world outcomes. Our test focuses on one of the most popular applications of conjoint experiments in political science: measuring preferences regarding attributes of candidates (Carnes and Lupu 2016; Costa 2021; Hanretty et al. 2020). We use conjoint tasks to estimate individual MCEs, which provide respondents' preferences toward candidates' demographic traits and issue positions (Zhirkov 2022). The resulting quantities are then used in regression analyses as predictors of respondents' party affect and vote intentions. Our data come from two studies, one in the United States and one in Germany, that differ in terms of sampling, manipulated attributes, and predicted covariates. In both studies, we find that issue preferences measured through conjoint experiments strongly and consistently predict real-world party support in the expected directions.

Our analyses also address recent criticisms of conjoint MCEs as measures of preferences as well as those of forced-choice conjoint designs. First, we explore empirical distributions of individual MCEs and demonstrate that they are symmetric and unimodal with extremely close means and medians, thus showing that they accurately capture majority preferences. Second, we estimate individual MCEs using both rating and choice outcomes and show that they predict the relevant individual-level covariates of interest equally. Overall, our findings demonstrate that MCEs obtained from conjoint experiments

are valid measures of preferences. We also provide clarification on some existing guidelines for the estimation of individual MCEs in applied political research.

Conjoint MCEs as Causal Estimands and Measures of Preferences

The MCE, the fundamental and most popular causal estimand in conjoint experiments, represents the effect of a single attribute value (component) on the choice probability or rating score against the baseline value of the same attribute. For instance, how does support for a hypothetical candidate change if they are a woman rather than a man. There is, however, an important difference that distinguishes the estimation of the MCE from the estimation of the treatment effect in a standard survey experiment. Calculation of the MCE requires marginalizing over the joint distribution of all other attributes included in the conjoint-experimental design—but when values are randomized independently across attributes, this procedure is trivial. MCEs can be defined at the population or aggregate level (Hainmueller et al. 2014), at the level of individual respondents (Zhirkov 2022), or even at the level of specific observations or profiles (Robinson and Duch 2024).

The original introduction of conjoint analysis and MCEs to political science methodology focused on its survey-experimental character and causal interpretation of estimated effects (Hainmueller et al. 2014). Due to researchers' control over the manipulation of attributes in conjoint experiments, they naturally adhere to the potential outcomes framework also known as the Neyman–Rubin causal model (Holland 1986). Under only a few assumptions, some of which hold trivially by design, MCEs obtained from conjoint-experimental data have a direct causal interpretation. This claim remains uncontroversial in the literature.

However, the practical application of conjoint analysis in the discipline mostly concerns the measurement of preferences. Examples include conjoint experiments on candidate choice (Carnes and Lupu 2016; Costa 2021; Hanretty et al. 2020), policy proposals (Ballard-Rosa et al. 2017; Bansak, Bechtel, et al. 2021), immigrant admission

(Hainmueller and Hopkins 2015), news sources (Mummolo 2016), residential choices (Mummolo and Nall 2017), and many others. In such applications, conjoint MCEs are interpreted as measures of both respondents' preferences regarding attribute values (i.e., which attribute values make options more attractive) and relative importance of different attributes (i.e., which attributes play larger roles in respondents' choices).

Consider this formal illustration that concerns the version of the MCE most widely used in the literature, the AMCE that averages the effect of interest across observations. In practice, AMCEs are nonparametrically estimated using OLS regression models with categorical predictors corresponding to attribute values (with one value serving as the baseline). In a conjoint experiment, respondents indexed $i \in \{1, \ldots, I\}$ are asked to rate profiles of hypothetical candidates indexed $j \in \{1, \ldots, J\}$. Let a candidate's position on immigrants be one of the attributes with two possible values, "Admit" and "Deport," randomized independently from other attributes. Then, the AMCE can be estimated using the following equation:

$$\text{rating}_{ij} = \alpha + \beta[\text{Immigrants} = \text{Deport}]_{ij} + \varepsilon_{ij}, \tag{1}$$

where α is the expected rating score for a hypothetical candidate who would admit immigrants (the baseline) and β is the AMCE estimator. In this case, the AMCE is the expected difference in rating scores between the baseline and a candidate who would deport immigrants. A positive AMCE means that voters, on average, prefer candidates who would deport immigrants over those who would admit them, and vice versa. The AMCE's magnitude, in turn, represents the intensity of that preference in the population. In other words, the AMCE—or any conjoint MCE for that matter—is simultaneously a causal quantity and a measure of preference.

Conjoint MCEs as Measures of Preferences: The Debate

While the causal interpretation of MCEs is universally accepted, their usage as measures of preferences is currently a point of debate in the methodological literature.[2] Some concerns are related to interpretation and presentation. MCEs measure relative preferences against the baseline (e.g., candidates who would deport immigrants as opposed to ones who would admit them), but they are often (and incorrectly) interpreted in absolute terms. For the same reason, exclusive reliance on MCEs can lead to erroneous conclusions when the goal is the comparison of preferences across subpopulations (Leeper et al. 2020).

Other methodological studies address the potential impact of experimental design on MCE estimation. Since the calculation of the MCE for a specific attribute value involves marginalization over all other manipulated attributes, the result critically depends on the distributions of all attribute values. If the true distributions of attributes are not independent and uniform, which is contrary to the assumptions commonly made in conjoint designs, then estimated MCEs can differ from what one would observe in the real world (De la Cuesta et al. 2022). For instance, due to dissimilar gender distributions of candidates who tend to be nominated by the Democratic Party and the Republican Party, estimated preferences for female Democratic and female Republican candidates are different. Another consequential aspect of the conjoint design is the outcome. In forced-choice conjoint experiments where respondents are required to choose between pairs of options, the presence of ties—that is, profile pairs for which the attribute of interest has the same value—may bias MCEs toward zero (Ganter 2023). A somewhat related concern has to do with respondents' inability to "abstain" in forced-choice conjoint tasks, while this option is available in real-world elections (Miller and Ziegler 2024).

[2] These criticisms have been expressed specifically against AMCEs, but substantively they are applicable to all kinds of conjoint MCEs regardless of the level of aggregation.

Finally, there is a broader conceptual argument that concerns the measurement of preferences more generally. Since MCEs incorporate intensity of preferences in addition to direction, individuals with extremely strong preference can unduly influence the averages. As a result, an AMCE can have a sign that is opposite to the majority preference—whereas the latter usually decides an election (Abramson et al. 2022). This would happen in the presence of a minority with very intense preferences, if the majority preferences are relatively weak. The contributions cited above consider different aspects of MCE presentation, estimation, and interpretation. Nevertheless, they suggest that—depending on the method of aggregation, the experimental design, and the distribution of tastes in the population—conjoint MCEs may return biased estimates of preferences.

It is necessary to emphasize that other contributions counter these arguments and defend the validity of conjoint MCEs as measures of preferences. For instance, AMCEs obtained from conjoint experiments are reasonably close to the real-world outcomes, such as observed vote results in Swiss naturalization referenda (Hainmueller et al. 2015). The importance of different attributes estimated from conjoint experiments corresponds to respondents' attention to the same attributes assessed via eye-tracking (Jenke et al. 2021). Furthermore, there exist formal derivations that demonstrate the importance of incorporating intensity in the aggregate measures of preferences like AMCEs obtained from conjoint experiments (Bansak et al. 2022).

Conjoint MCEs as Measures of Preferences: The Validity Question

Much of the current methodological debate on conjoint experiments ultimately boils down to the question of validity: do MCE scores meaningfully capture preferences, which is the concept they are intended to measure?[3] In political science, measurement validity is usually discussed in terms of three components: content, convergent, and nomological

[3] A separate question concerns the reliability of preference estimates obtained from conjoint experiments or the degree to which they are affected by measurement error (Clayton et al. 2023). In this paper, we focus on validity and address reliability only briefly.

(Adcock and Collier 2001). Content validity concerns coverage of the underlying concept, convergent validity is assessed through correlations with alternative measures of the same concept, and nomological validity is found when the measure replicates well-studied and theoretically motivated relationships with measures of other concepts.

Since any conjoint MCE is estimated as the expected difference in scores between the baseline and an option that possesses the attribute value of interest, claiming its content validity as a measure of corresponding preference is rather straightforward. There are also results suggesting that conjoint MCEs have some degree of convergent validity—for instance, existing studies demonstrate their associations with eye-tracking measures (Jenke et al. 2021). At the same time, there is no evidence of the nomological validity of conjoint MCEs at the individual level. To show the latter, respondents' preferences revealed via hypothetical choices made in conjoint experiments (e.g., position on a political issue) should predict relevant real-world outcomes (e.g., support for a party with the same issue position).

The nomological validity of conjoint MCEs as measures of preferences has not been demonstrated to date, because the literature focuses on AMCEs and analyzes the data from conjoint experiments almost exclusively in the aggregate. As a result, the distributions of preferences in the population cannot be explored, and the relationship between MCEs and individual-level covariates of interest—such as real-world party support—cannot be estimated. These goals can only be achieved when MCEs are estimated at the individual level.

Assessing MCE Validity at the Individual Level

Fortunately, respondent-level preferences in conjoint experiments can be estimated in the form of individual MCEs or IMCEs (Zhirkov 2022). Their estimation does not require any additional assumptions vis-a-vis AMCEs and uses the same method: OLS regression. Consider the same example with a candidate conjoint experiment and position on

immigrants as the attribute. Assume that each respondent is asked to rate multiple profiles, which is the standard in modern conjoint tasks. To obtain IMCEs, one should simply take the same expression as presented in Equation 1 and estimate it independently for each respondent:

$$\text{rating}_{ij} = \alpha_i + \beta_i[\text{Immigrants} = \text{Deport}]_{ij} + \varepsilon_{ij}. \tag{2}$$

In this equation, α_i is the individual (respondent-specific) expected rating score for a candidate who would admit immigrants, and β_i is the IMCE estimator. The sign and magnutude of the IMCE have the same interpretations as those of the AMCE: in this context, it measures the direction and strength of a relative preference for a candidate who would deport immigrants over one who would admit—but does so for each individual.

Originally, IMCEs have been proposed as a method to explore the heterogeneity of preferences in the population that does not rely on a priori categorizations. However, it can be straightforwardly used to test nomological validity of conjoint MCEs at the individual level. In survey studies that include both the conjoint component (e.g., hypothetical candidate choice) and questions about relevant attitudes and behaviors (e.g., real-world party support), IMCEs can be used to predict the attitudinal and behavioral variables of interest. This setup shares similarities with the method of using predicted responses from list experiments as explanatory variables in regression models (Imai et al. 2015).

Consider the estimate of the IMCE for the value "Deport" of the attribute "Position on immigrants" in the candidate conjoint experiment from Equation 2. It reflects the direction and intensity of a respondent's preference for candidates who would deport immigrants over those who would admit them (higher positive values of the IMCE indicate stronger preference for "Deport," and vice versa). Assume that the survey data also includes a question on respondents' support for the leading anti-immigration party in an

upcoming real-world election. Then, IMCE estimates can be used as predictors of this support in a regression:

$$\text{support}_i = \gamma + \delta(\text{IMCE: Immigrants, deport})_i + u_i. \tag{3}$$

Parameter γ is the constant, or the expected support toward the real-world anti-immigration party for a voter with the IMCE of zero (i.e., perfect indifference between admitting and deporting immigrants). Parameter δ represents the estimated association between support for a real-world anti-immigration party and preference for hypothetical candidates who would deport immigrants in a conjoint experiment. Positive and significant values of δ indicate that MCEs have nomological validity as measures of preferences.

Main Study: United States

Data

We fielded an original online survey with a conjoint-experimental component in June 2024.[4] Respondents were recruited using Cint Theorem, a popular source of convenience samples with demographics close to national benchmarks (formerly Lucid; Coppock and McClellan 2019). A total of 825 respondents completed the survey.[5]

In the conjoint-experimental task, respondents were presented with nine paired profiles of hypothetical politicians described as "potential House candidates." The last pair was an exact copy of the first one and not used in the main analyses (Clayton et al. 2023), so the number of unique profiles was 16 per respondent. Respondents were asked to both indicate which of the candidates from a pair they preferred (forced choice) and to rate each candidate on a scale from 0 = *Definitely would not consider voting for* to 10 = *Definitely would consider voting for*. The candidates were described in terms of six attributes with

[4] The study was pre-registered on OSF. Anonymized link: https://osf.io/mzjfc/?view_only=4e90292eb74c4c3bbb5762294dd97268.

[5] 21 respondents did not have variation in profile rating scores and were excluded from the analysis.

Table 1. Candidates' attributes, U.S. study

Attribute	Values
Age	*Younger:* 30–49
	Older: 50–69
Gender	Male
	Female
Race	White
	Black
	Hispanic
	Asian
Size of government	Government should provide more services and raise taxes
	Government should provide fewer services and cut taxes
Abortion	A woman should be able to obtain an abortion
	Abortion should not be permitted
Unauthorized immigrants	Allow unauthorized immigrants to remain in the United States
	Send unauthorized immigrants back to their home countries

randomized values: three demographic traits (age, gender, and race) and three issue positions (size of government, abortion, and unauthorized immigrants). Demographic traits were always presented before issue positions in the conjoint table. The order of attributes within these two subgroups was randomized between respondents. See Table 1 for potential values of the six attributes. All attribute values were independently randomized with uniform distributions. See Section A of Supporting Information for an example of candidate profiles as presented to the respondents.

After the conjoint task, respondents were also asked about party support, vote intention, and issue positions. Affect toward the Democratic Party and the Republican Party was measured using standard feeling thermometer scales ranging from 0 = *Very cold* to 100 = *Very warm*. We included both a question on respondents' 2024 presidential vote intention (Biden vs. Trump) and a generic congressional ballot question (Democrat vs. Republican).[6] Self-reported issue positions corresponded to the ones included in the

[6] When we fielded the survey, Joe Biden was still the Democratic presidential nominee.

conjoint experiment: size of government, abortion, and unauthorized immigrants. See Section B of Supporting Information for exact questions and response options Respondents' demographic information was provided by the panel.

Validity Tests

We use respondents' issue preferences measured via conjoint IMCEs to predict feelings toward the two parties, real-life vote intentions, and self-reported issue positions. Given the ideological positioning of the two parties and their presidential candidates in the 2024 election, we interpret the following associations as evidence in favor of nomological validity:

- Conjoint-estimated preferences for smaller (as opposed to bigger) government should be positively associated with affect toward the Republican Party, intentions to vote for Donald Trump and a Republican congressional candidate, and self-reported preference for smaller government; they should be negatively associated with affect toward the Democratic Party.
- Conjoint-estimated preferences for abortion to be illegal (as opposed to legal) should be positively associated with affect toward the Republican Party, intentions to vote for Donald Trump and a Republican congressional candidate, and self-reported preference for abortion to be illegal; they should be negatively associated with affect toward the Democratic Party.
- Conjoint-estimated preferences for deporting unauthorized immigrants (as opposed to allowing them to remain) should be positively associated with affect toward the Republican Party, intentions to vote for Donald Trump and a Republican congressional candidate, and self-reported preferences for deporting unauthorized immigrants; they should be negatively associated with affect toward the Democratic Party.

We do not have strong expectations regarding the relationships between preferences on demographic attributes and the predicted political covariates.

Results

Mean and median preferences

We start by estimating AMCEs, or average preferences regarding the six manipulated attributes. The results are presented in Figure 1. They demonstrate that, on average, U.S. respondents oppose reducing the size of government and making abortion illegal—but support deporting unauthorized immigrants.[7] At the same time, the results show indifference toward candidates' demographic traits: age, gender, and race.

Recall that one criticism of AMCEs is that they have the potential to lead to incorrect conclusions about the direction of majority preferences in the presence of a minority with highly intense preferences on a certain issue (Abramson et al. 2022). For instance, the positive AMCE for deporting unauthorized immigrants can indicate either that the majority of respondents prefer that position—or that deportations are favored by a minority whose preferences are nevertheless extremely intense. But is this possibility realized in the data? This is exactly the kind of question that IMCEs can help to answer. Specifically, one can use them to calculate and compare the mean IMCE (which is equivalent to the AMCE) and the median IMCE (which is equivalent to the majority preference) to see whether they are substantially different from each other.

Therefore, we estimate IMCEs and explore their distributions. Here, we focus on the distributions of preferences on the three issues: size of government, abortion, and unauthorized immigrants.[8] We use liberal preferences as the baselines and calculate IMCEs for conservative preferences: small government, making abortion illegal, and deporting

[7] Results broken down by respondents' partisanship (with leaners treated as partisans and true independents excluded) are presented in Section C of Supporting Information. These show that Democrats oppose candidates with conservative positions on spending, abortion, and immigration. Republicans prefer candidates who would deport unauthorized immigrants, and that is the only issue out of these three they care about.

[8] For the distributions of preferences on candidates' demographic attributes, see Section D of Supporting Information.

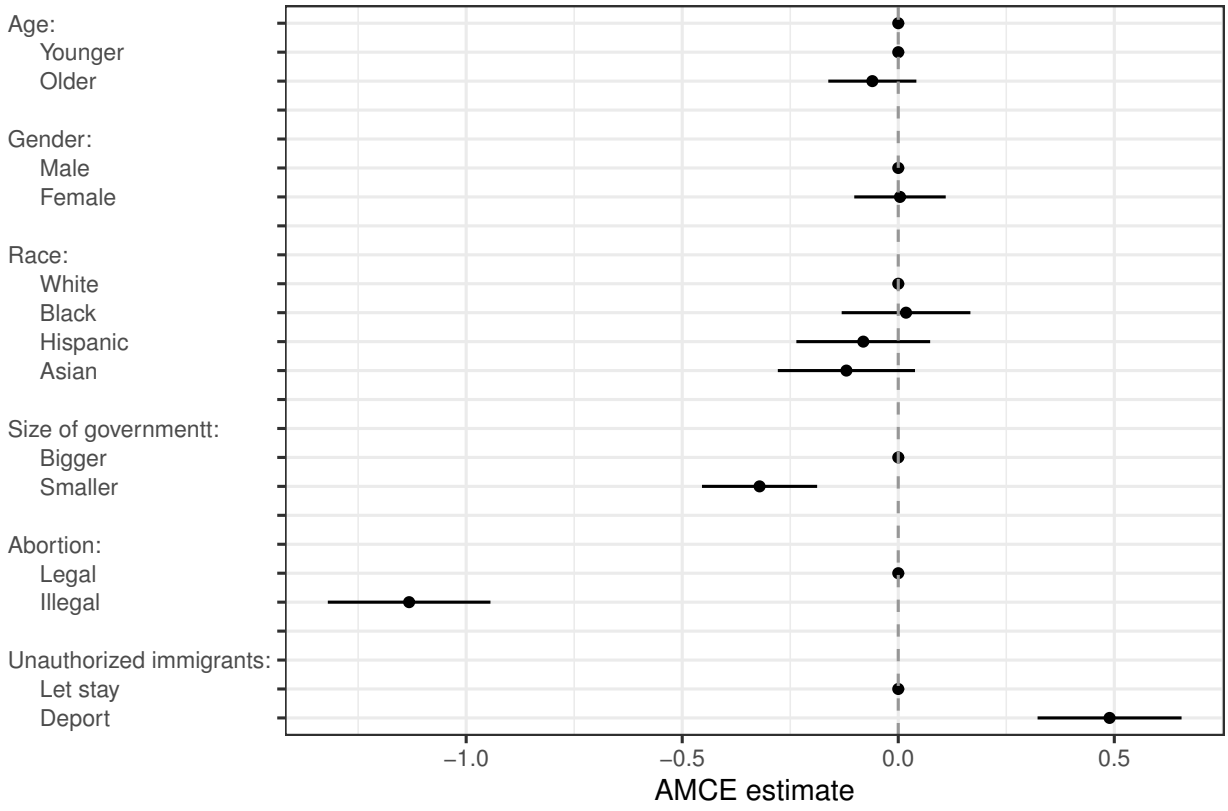

Figure 1. The effects of candidates' attributes on rating scores, U.S. study

Note. Point estimates with 95% confidence intervals.

unauthorized immigrants. The corresponding empirical densities together with their estimated means and medians are presented in Figure 2. The theoretical extreme values for all IMCEs are −10 (profiles with the attribute value always get the minimum possible rating score of 0 and profiles without it always get the maximum possible rating score of 10) and 10 (profiles with the attribute value always get the maximum possible rating score of 10 and profiles without it always get the minimum possible rating score of 0), but the observed ranges are approximately between −8 and 8. Densities for all four IMCEs are symmetric, unimodal, and without any visible irregularities. As a result, mean (i.e., AMCE) and median (i.e., majority preference) estimates have the same signs and are not reliably different from each other in all three cases. AMCEs are slightly greater in magnitude due to the properties of the mean as a measure of central tendency, but we do not find evidence that AMCEs misrepresent majority preferences.

Validity tests

We proceed with predicting party affect and vote intentions with IMCE-measured preferences regarding candidates' demographics and issue positions. The results are presented in Figure 3. They show that preferences regarding demographic traits—age, gender, and race—are mostly inconsequential. Interestingly, preferences regarding the size of government show relatively weak associations with both party affect and vote intentions. Preferences toward abortion and immigration, however, have reliable coefficients in the expected directions: respondents who prefer making abortion illegal and deporting unauthorized immigrants feel warmer toward the Republican Party and colder toward the Democratic Party. IMCE-measured preferences also predict intent to vote for both Trump in the presidential election and a Republican in a generic congressional ballot.[9]

[9] We replicate these results with a different U.S. sample recruited on CloudResearch. See Section E of Supporting Information.

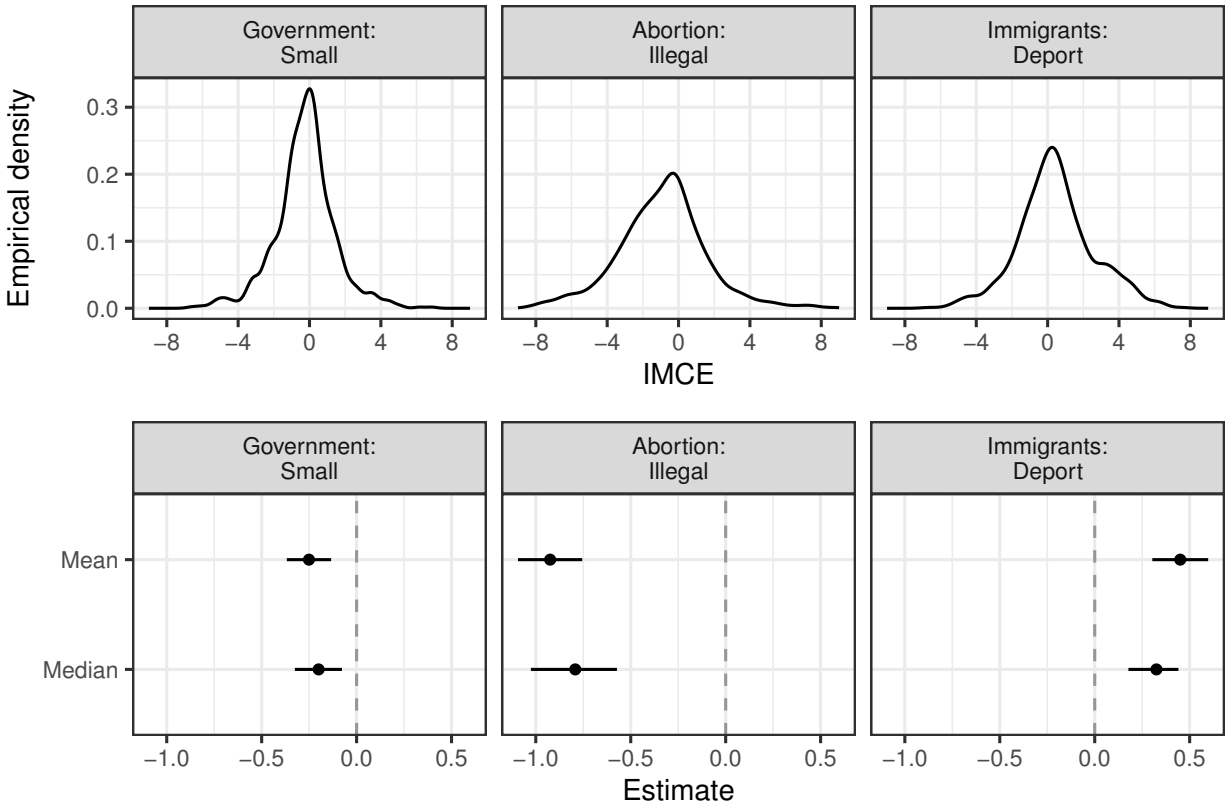

Figure 2. Empirical densities of IMCEs for the three issue positions with the corresponding means (AMCEs) and medians (majority preferences), U.S. study
Note. Densities estimated using Gaussian kernels. Means and medians are point estimates with 95% confidence intervals.

Figure 4 demonstrates that, in addition to being statistically reliable, the associations between preferences measured through the conjoint experiment and partisan affect are substantial in terms of magnitude. It uses preferences on the immigration issue and party affect as the example. A respondent with the strongest observed IMCE-measured preference against deporting unauthorized immigrants (or in favor of letting them stay in the United States) is predicted to report very cold feelings toward the Republican Party (15 degrees on the 0–100 scale) and very warm feelings toward the Democratic Party (90 degrees on the 0–100 scale). For those with the strongest observed preference in favor of deporting unauthorized immigrants (or against letting them stay) the

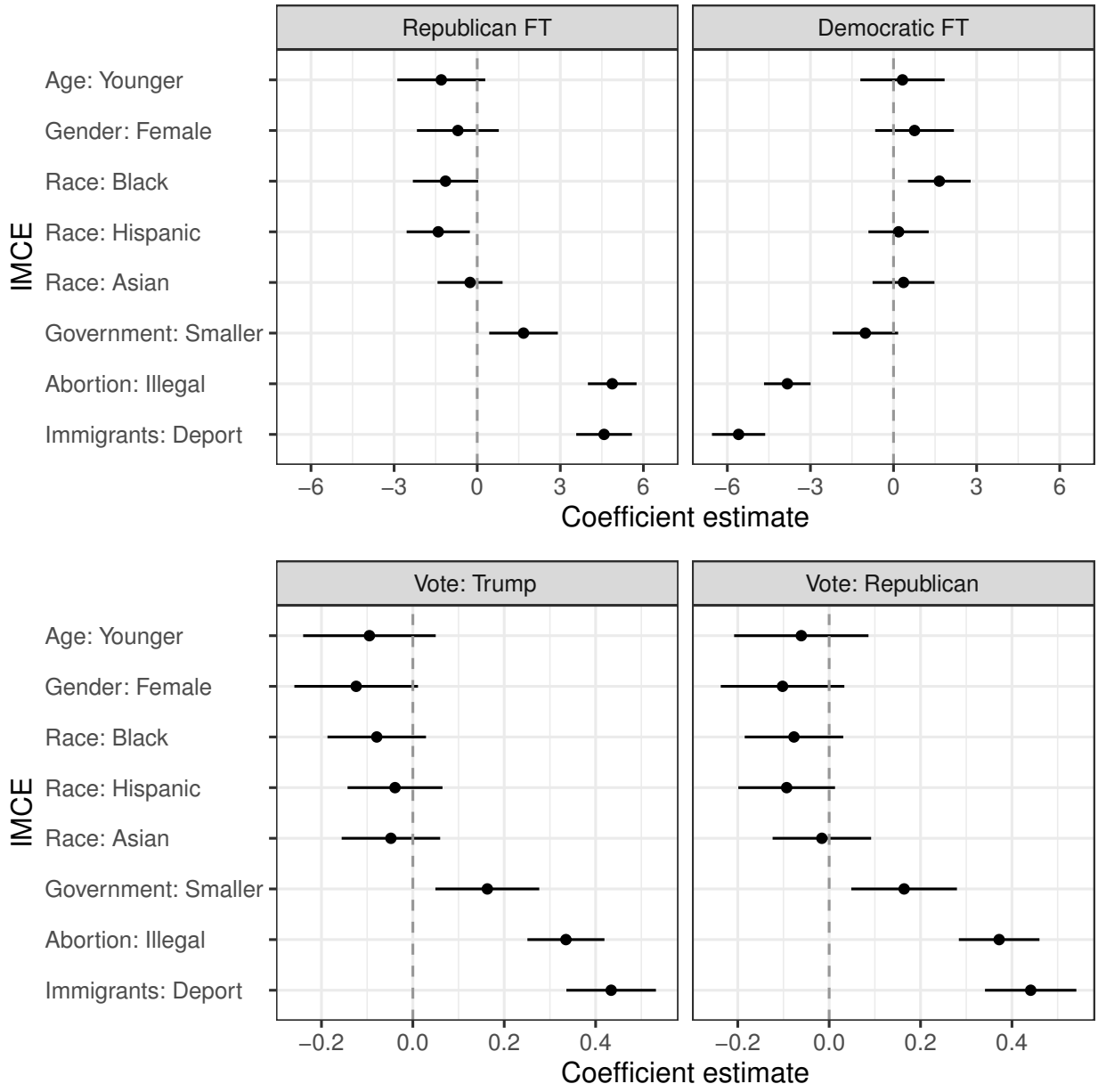

Figure 3. Conjoint IMCEs as predictors of party affect (OLS regressions) and vote intentions (logistic regressions), U.S. study

Note. Point estimates with 95% confidence intervals.

picture is opposite: the regression model predicts feelings of about 80 degrees to the Republican Party and about 15 degrees to the Democratic Party.

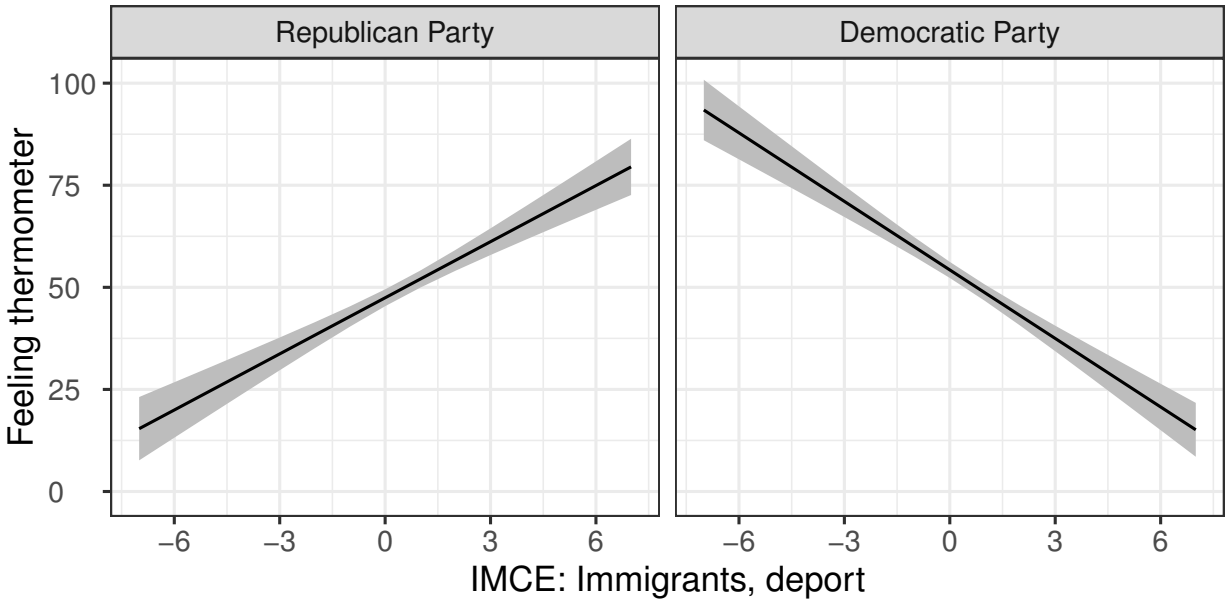

Figure 4. Predicted affect toward the Republican Party and the Democratic Party depending on IMCE-measured immigration policy preference, U.S. study
Note. Shaded areas are 95% confidence intervals.

As a final validity test, we explore how well conjoint-estimated positions on political issues predict self-reported positions on the same issues. To start, they replicate at the aggregate level. Recall that judging by conjoint AMCEs, U.S. respondents in our sample prefer candidates who support bigger government, legal abortion, and deportation of unauthorized immigrants (see Figure 1). The same positions are chosen by clear majorities when respondents are asked to report their views on these issues directly: the corresponding shares are 71.8%, 66.4%, and 63.4% respectively. A more interesting question concerns the associations between the conjoint and the self-reported measures of individual issue preferences. They are presented in Figure 5 as predicted probabilities of taking a conservative position on a self-reported question depending on the corresponding conjoint IMCE. These associations show an extremely close correspondence between the conjoint measures and the self-reported measures. For abortion and immigration, very high IMCE scores indicating conservative preferences virtually guarantee self-reported conservative

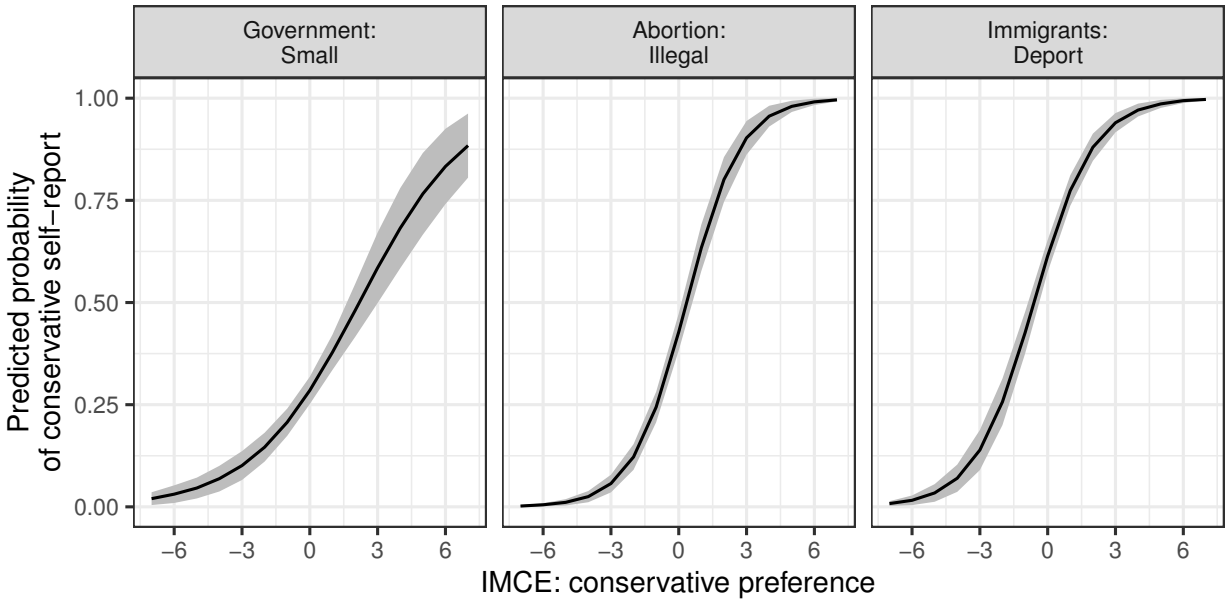

Figure 5. Predicted probabilities of taking conservative positions on the three issues depending on IMCE-measured conservative preferences, U.S. study
Note. Shaded areas are 95% confidence intervals.

positions. The association is a little less pronounced for the size of government, but this may be a result of smaller variance in self-reported answers for that issue.

Rating vs. choice outcome

Recall that another criticism of conjoint experiments concerns the use of forced-choice outcome measures. Indeed, MCE estimates in forced choice designs may be biased toward zero due to the presence of ties, or profiles that share the same value for a certain attribute (Ganter 2023). Rating outcomes, in turn, are not subject to this bias. But how substantively consequential is this? One way to answer this question is by turning to nomological validity once again and assessing how well IMCEs calculated from rating and choice outcomes predict individual covariates of interest. Importantly, regression-based IMCE estimation has thus far been applied only to rating outcomes, but nothing about the method prevents it from being applied to choice outcomes.

To implement the comparison, we estimate three sets of IMCEs for each of the three issues: size of government, abortion, and unauthorized immigrants. The first set is made up of standard IMCEs calculated from rating outcomes using OLS regressions similar to the ones used in the validity tests above. The second set contains IMCEs calculated from choice outcomes, and it also uses OLS regressions as the estimation method. Finally, IMCEs in the third set are calculated from choice outcomes using logistic regressions. Section F of Supporting Information provides formal statements of estimation models for IMCEs based on choice outcomes.

Then, we use the three sets of IMCEs to predict the same outcomes as in the validity tests above: party affect and vote intentions. The results are presented in Figure 6 using R^2 (for OLS regressions) and McFadden's pseudo-R^2 (for logistic regressions) statistics with bootstrapped 95% confidence intervals as the measures of prediction quality. They show that OLS-estimated IMCEs, based on either rating or choice outcomes, clearly outperform those estimated with logistic regressions. At the same time, there is almost no difference in prediction quality between IMCEs estimated from rating and choice outcomes (as long as estimated using OLS).

Finally, since our conjoint design included a repeated pair of profiles in the end (Clayton et al. 2023), we can assess reliability of both choice and rating outcomes. The share of consistent choices is 78.9%, which is comparable to the results reported previously. The rating score correlations are 0.66 and 0.61 for the two repeated profiles in the pair.

Additional Validity Test: Germany

Data

Our additional validity test leverages the replication data for an online survey with a conjoint experiment fielded on a national sample in Germany in 2017 (Neuner and Wratil 2022).[10] The conjoint-experimental part of the survey presented respondents with ten

[10] This study analyzes secondary data and was not pre-registered.

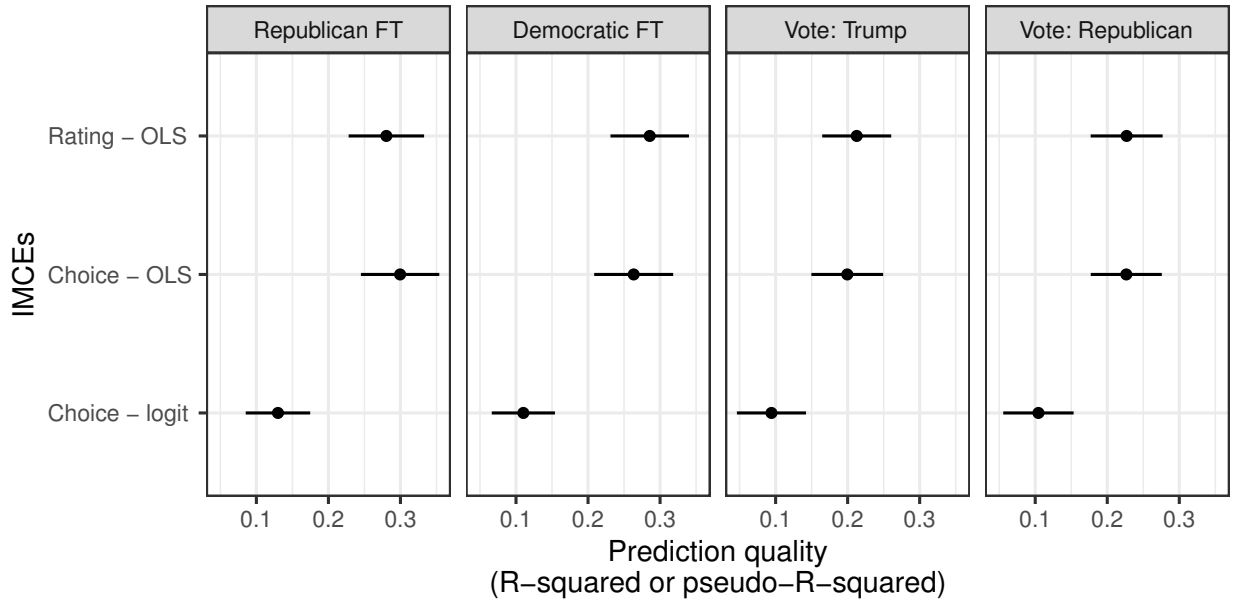

Figure 6. Prediction quality for party affect and vote intentions depending on IMCE estimation method, U.S. study

Note. Point estimates with bootstrapped 95% confidence intervals.

profiles of hypothetical candidates in five pairs. Respondents were asked to rate each profile on a scale from 1 = *Cannot imagine voting for this candidate* to 7 = *Can easily imagine voting for this candidate*. Candidates were described in terms of their positions on four issues: two left–right issues (taxing the rich and refugee admission) and two mainstream–populist issues (globalization and the European Union). Each issue attribute had four potential values, but we collapsed them into two values per issue to be able to estimate IMCEs with only ten profiles per respondent. When collapsing, we preserved the direction of preferences. For instance, we collapsed positions "For the admission of some new refugees" and "For the admission of a great many new refugees" ("Admit") versus "For the deportation of some refugees" and "For the deportation of a great many refugees" ("Deport"). Issue positions and the way they were coded are presented in Table 2. All attribute values were independently randomized with uniform distributions.

Table 2. Candidates' issue positions, German study

Issue	Collapsed	Original
Taxes on the rich	Higher	Much higher taxes on the rich
		Somewhat higher taxes on the rich
	Lower	Somewhat lower taxes on the rich
		Much lower taxes on the rich
Refugees	Admit	Admit a great many new refugees
		Admit some new refugees
	Deport	Deport some refugees
		Deport a great many refugees
Free trade	More	Much more globalization
		Somewhat more globalization
	Less	Much less globalization
		Somewhat less globalization
The European Union	Integrate	Develop the EU into a common state
		Stronger cooperation within the EU
	Withdraw	Weaker cooperation within the EU
		Germany's withdrawal from the EU

Table 3. Parties included in the analysis, German study

	Title	Family
AfD	Alternative for Germany	Right-wing, populist
CDU/CSU	Christian Democratic Union / Christian Social Union	Right-wing, mainstream
Die Linke	The Left	Left-wing, populist
SPD	Social Democratic Party of Germany	Left-wing, mainstream

In addition to completing the conjoint task, each respondent was asked which party they would vote for if the next election happened the following Sunday. In this paper, we focus on voting for four larger German parties. Table 3 lists those parties' German abbreviations, English translations of their names, and their positioning on both left–right and mainstream–populist dimensions. The analyzed sample included 1,640 respondents.

Validity Tests

We use policy preferences measured via conjoint IMCEs to predict respondents' real-world vote intentions. Given the parties' positions as classified in Table 3, the following results can be interpreted as evidence in favor of nomological validity:

- Conjoint-estimated preferences for lower taxes for the rich and for deporting refugees should be positively associated with the probability of voting for AfD and CDU (right-wing and center-right parties) and negatively associated with the probability of voting for Die Linke and SPD (left-wing and center-left parties).
- Conjoint-estimated preferences for less globalization and for withdrawal from the European Union should be positively associated with the probability of voting for AfD and Die Linke (populist parties) and negatively associated with the probability of voting for CDU and SPD (mainstream parties).

Results

Because of the dependent variable (intended vote in a multiparty system), we use multinomial logistic regression to predict respondents' vote intentions with IMCE-estimated issue preferences.[11] SPD is the party with most intended votes in the data, so it serves as the baseline outcome. Results presented in Figure 7 show reliable effects in the expected directions. When compared to the mainstream left SPD, respondents who prefer to deport refugees are more likely to vote for the populist right AfD and less likely to vote for the populist left Die Linke. Those who prefer lower taxes for the rich and oppose European integration are also substantially more likely to vote for the right-wing parties (AfD and CDU) than for left-wing SPD.

Since coefficients from multinomial logistic regressions are difficult to interpret directly, we also present the results in terms of the key quantity of interest: predicted

[11] See Section G of the Supporting Information for the empirical distributions of estimated IMCEs in the German study.

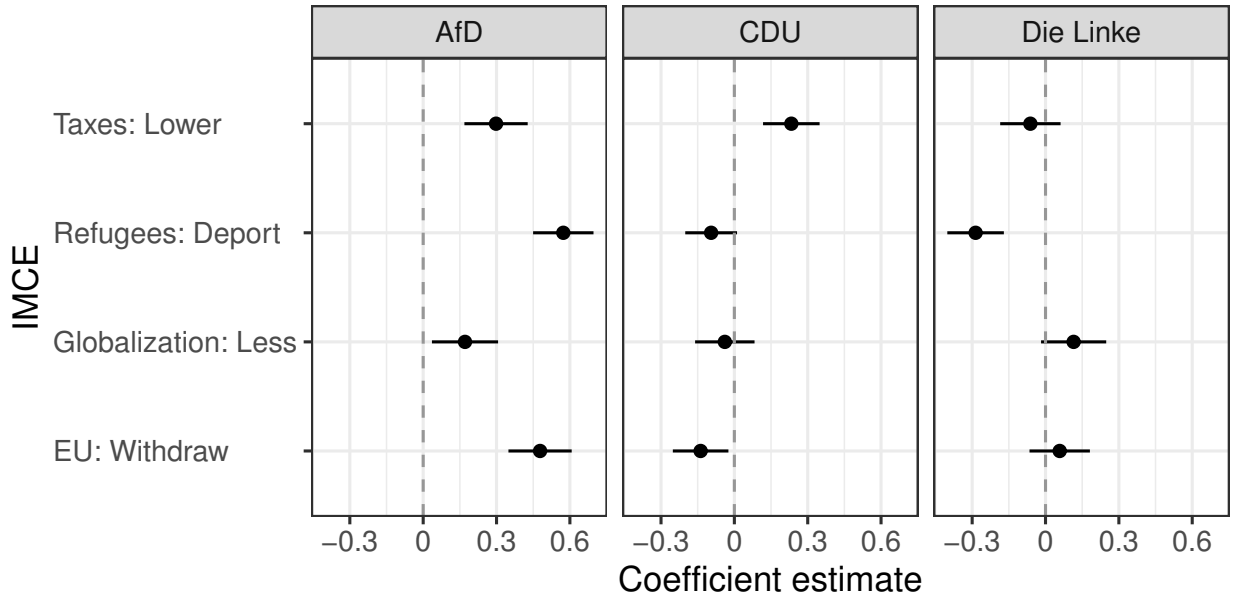

Figure 7. Conjoint IMCEs as predictors of vote intention: coefficients from the multinomial logistic regression, German study
Note. SPD is the baseline. Point estimates with 95% confidence intervals.

probabilities. Figure 8 shows how IMCE-measured preferences to deport refugees predict probabilities of voting for Die Linke and AfD. Specifically, a person with the strongest preferences against deportation (or in favor of admission) has almost zero chance to vote for AfD and approximately 50% chance to vote for Die Linke. For those with the strongest preference for deportation (or against admission), the picture is opposite: they have less than 5% chance to vote for Die Linke and more than 70% chance to vote for AfD.

Discussion and Conclusion

In this paper, we contribute to the ongoing debate in the methodological literature on whether MCEs estimated from conjoint experiments constitute valid measures of preferences. The MCE—the effect of an attribute value vis-a-vis the corresponding baseline value—is the most widely used causal estimand in conjoint-experimental studies (Hainmueller et al. 2014). However, the suitability of MCEs as measures of preferences has recently been questioned on conceptual, computational, and presentational grounds

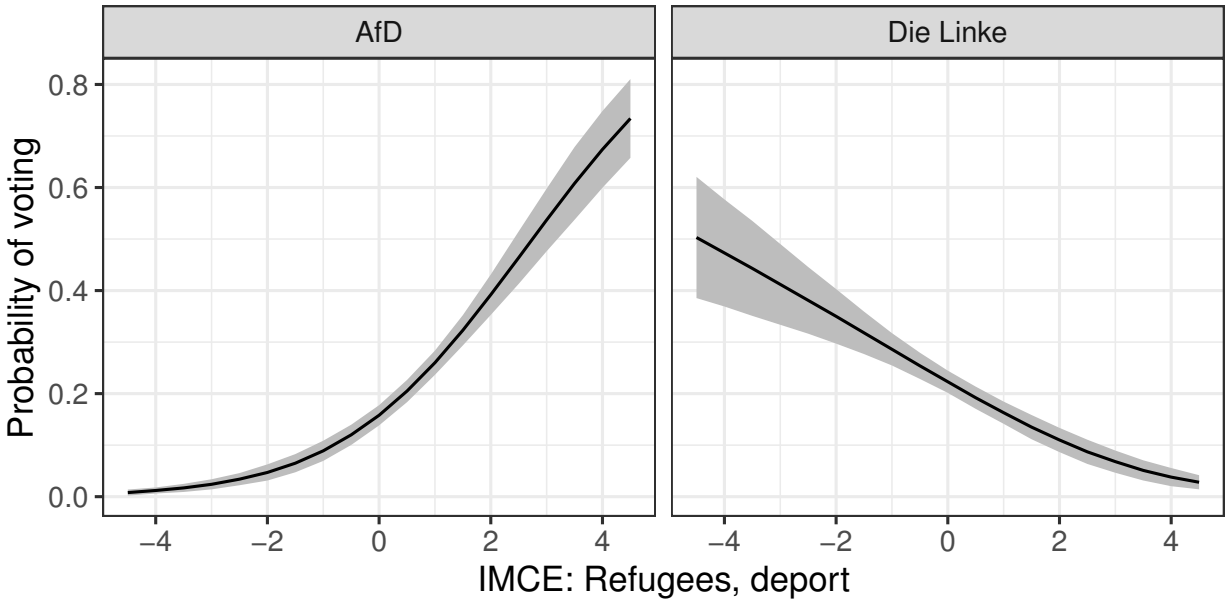

Figure 8. Predicted probabilities of voting for Die Linke and AfD by IMCE-measured refugee policy preference, German sample
Note. Point estimates with 95% confidence intervals.

(Abramson et al. 2022; Ganter 2023; Leeper et al. 2020). Even though there are both empirical and formal contributions in favor of using conjoint experiments to measure preferences (Bansak et al. 2022; Hainmueller et al. 2015; Jenke et al. 2021), they are mostly carried out in the aggregate, so that the nomological validity of MCEs on the individual level remains unexplored. We address this gap by estimating individual MCEs in two candidate conjoint experiments, one in the United States and one in Germany, and assessing their validity as predictors of respondents' real-world party support.

In both studies, we find that issue preferences measured via conjoint IMCEs strongly and reliably predict real-world outcomes. In the U.S. study, those who prefer hypothetical candidates with conservative positions on abortion and immigration report warmer feelings toward the Republican Party and colder feelings toward the Democratic Party as well as intentions to vote for Trump in the 2024 presidential election and for a Republican in a generic congressional ballot. Preferences revealed in conjoint experiments

also predict similar self-reported preferences on the same political issues. In the German study, respondents who prefer lowering taxes, deporting refugees, slowing down globalization, and withdrawing from the European Union are more likely to vote for the AfD (populist right party) than the SPD (mainstream left party). Besides being statistically reliable, the associations between conjoint-measured issue preferences and real-world party support are substantial in terms of size. Overall, we find strong support for the nomological validity of conjoint MCEs as measures of individual preferences.

In addition to demonstrating nomological validity of conjoint MCEs at the individual level, our results make a few additional methodological contributions. One of them concerns the external validity of survey experiments more broadly, which has been a prominent concern in the literature (Barabas and Jerit 2010; Findley et al. 2017). Importantly, the fact that respondents in conjoint tasks are asked to choose from or rate hypothetical profiles can exacerbate the external validity problem. However, we demonstrate that individual-level issue preferences estimated from rating hypothetical candidates in conjoint experiments predict support for real-world parties. These results suggest that treatment effects in survey experiments—of which conjoint MCEs are a subclass—capture valuable information about the world, and that survey-experimental methods are a useful method in the political science toolkit.

Findings reported in this paper also address some criticisms directed, respectively, at AMCEs as measures of majority preferences and at using forced choices in conjoint designs (Abramson et al. 2022; Ganter 2023). Our results demonstrate that in practice, AMCEs accurately describe majority preferences: the distributions of conjoint-measured preferences for all analyzed attributes are symmetric and unimodal, the signs of AMCEs and median preferences are the same, and their magnitudes are extremely close. Regarding conjoint outcomes, we show that IMCEs calculated from rating and choice outcomes

predict relevant respondent-level covariates equally well—but only when both are estimated through OLS regression.

Finally, we make a couple of narrower contributions to the practice of IMCE estimation. First, feasible estimation of IMCEs requires minimizing the number of values per attribute, and this can be done at either the design or analysis stage. We use design-stage dichotomization of attribute values in the U.S. study and analysis-stage dichotomization in the German study, and both studies return meaningful results at both aggregate and individual levels. This means that in practice, minimization of values per attribute can be done at either stage. Second, we have been able to estimate IMCEs with choice outcomes and—in the German study—with only ten rated profiles per respondent. Both are counter to current recommendations (Zhirkov 2022), but our results suggest that those guidelines may be too restrictive and that IMCEs can be reliably estimated for a broader set of conjoint designs than previously thought.

Taken together, our results are encouraging for conjoint methodology in political science. We demonstrate that MCEs—the main causal estimands in conjoint analysis—are valid measures of preferences at the individual level. We would like to emphasize that our findings do not imply that researchers should not refine both interpretation and estimation of conjoint MCEs. Recent examples of such refinements include adjustments for the real-world distributions of attributes (De la Cuesta et al. 2022), accounting for the presence of ties in forced-choice designs (Ganter 2023), and Bayesian estimation of IMCEs based on machine learning (Robinson and Duch 2024). Still, even unadjusted MCEs estimated via OLS regression, which are the quantities reported in most applied studies in the discipline, remain useful measures of preferences.

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Supporting Information

Section A. Sample candidate profiles in the conjoint task, U.S. study

Pair 1 of 9

Please carefully review the information about the candidates presented below, then answer the questions.

	Candidate 1	Candidate 2
Race	Asian	Hispanic
Gender	Female	Male
Age	63	64
Position on unauthorized immigrants	Send unauthorized immigrants back to their home countries	Allow unauthorized immigrants to remain in the United States
Position on the size of government	Government should provide more services in areas like health and education, even if it means raising taxes	Government should provide fewer services in areas like health and education to reduce spending and cut taxes
Position on abortion	Abortion should not be permitted	A woman should be able to obtain an abortion

Which of the two candidates would you rather vote for?

Candidate 1

Candidate 2

On a scale from 0 to 10 where 0 means that you definitely would not consider voting for the candidate and 10 means that you definitely would consider voting for the candidate, how would you rate Candidate 1 and Candidate 2?

Definitely would not consider voting for — Definitely would consider voting for

0 1 2 3 4 5 6 7 8 9 10

Candidate 1

Candidate 2

Section B. Survey questions, U.S. study

Feeling thermometers
We would like to get your feelings toward the two main political parties using something we call the feeling thermometer. Ratings between 50 degrees and 100 degrees mean that you feel favorable and warm toward the party. Ratings between 0 degrees and 50 degrees mean that you do not feel favorable toward the party and that you do not care too much for that party. You would rate the party at the 50 degree mark if you do not feel particularly warm or cold toward the party.

- Democratic Party
- Republican Party

Presidential vote intention
Thinking about the 2024 presidential election, are you more likely to vote for:

- Joe Biden, the presumptive Democratic nominee
- Donald Trump, the presumptive Republican nominee

Generic congressional ballot
Thinking about voting in your congressional district, are you more likely to vote for:

- A Democratic candidate
- A Republican candidate

Position on the size of government
Some people think the government should provide fewer services even in areas such as health and education in order to reduce spending and cut taxes. Other people feel it is important for the government to provide many more services even if it means an increase in taxes. What is your opinion?

- Government should provide fewer services
- Government should provide more services

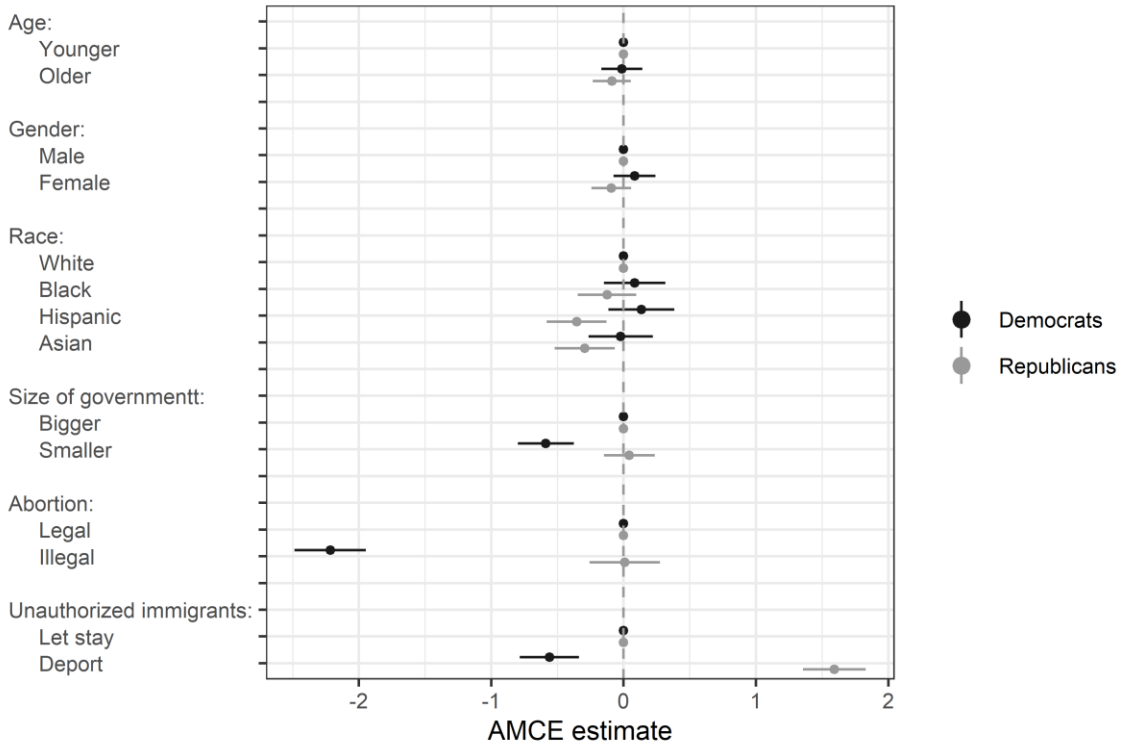
Position on abortion
There has been some discussion about abortion in recent years. Which of the following opinions comes closest to your view?

- In most cases, abortion should not be permitted
- In most cases, a woman should be able to obtain an abortion

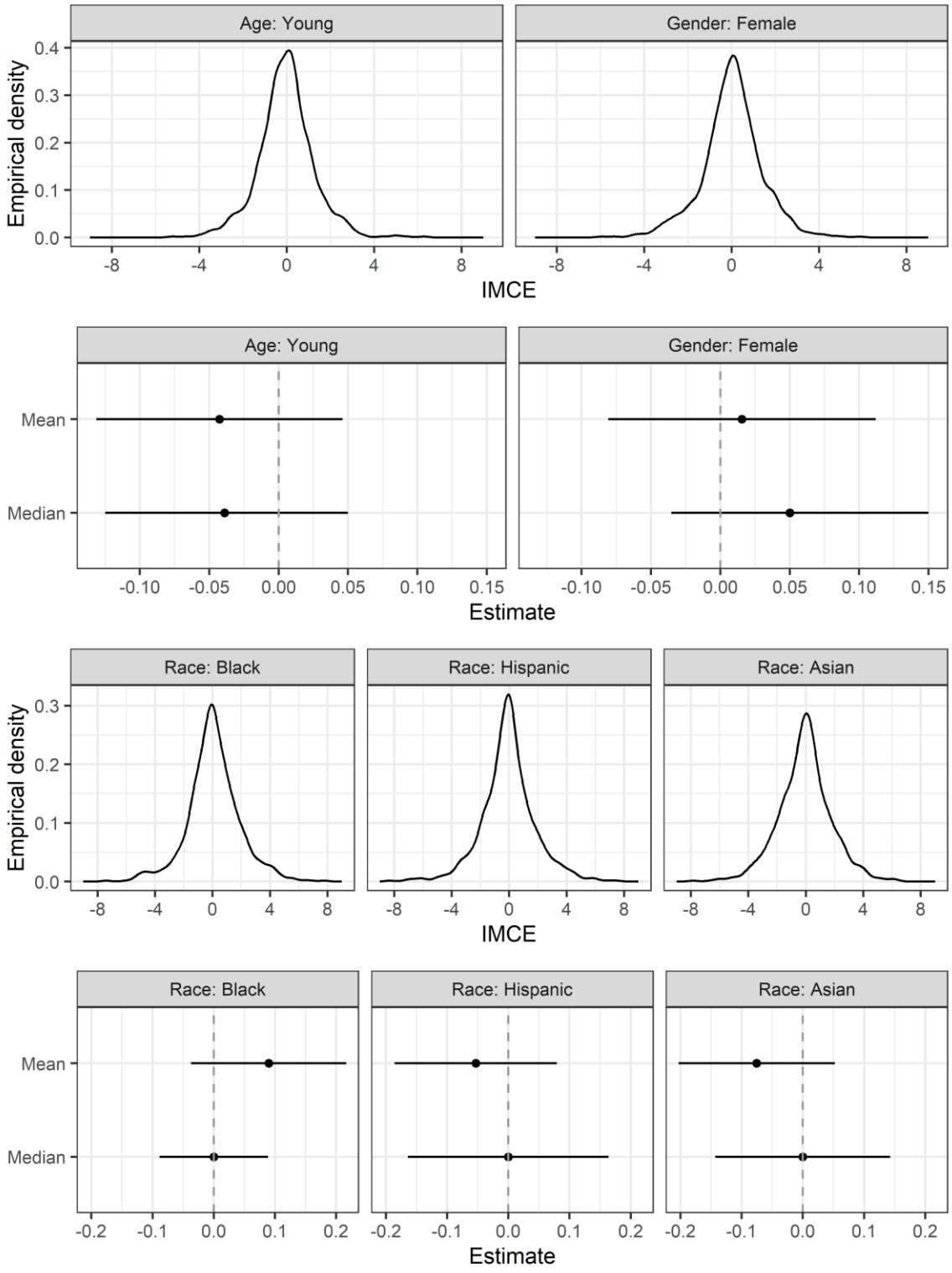
Position on unauthorized immigrants
Which comes closest to your view about what government policy should be toward unauthorized immigrants now living in the United States?

- Send unauthorized immigrants back to their home countries
- Allow unauthorized immigrants to remain in the United States

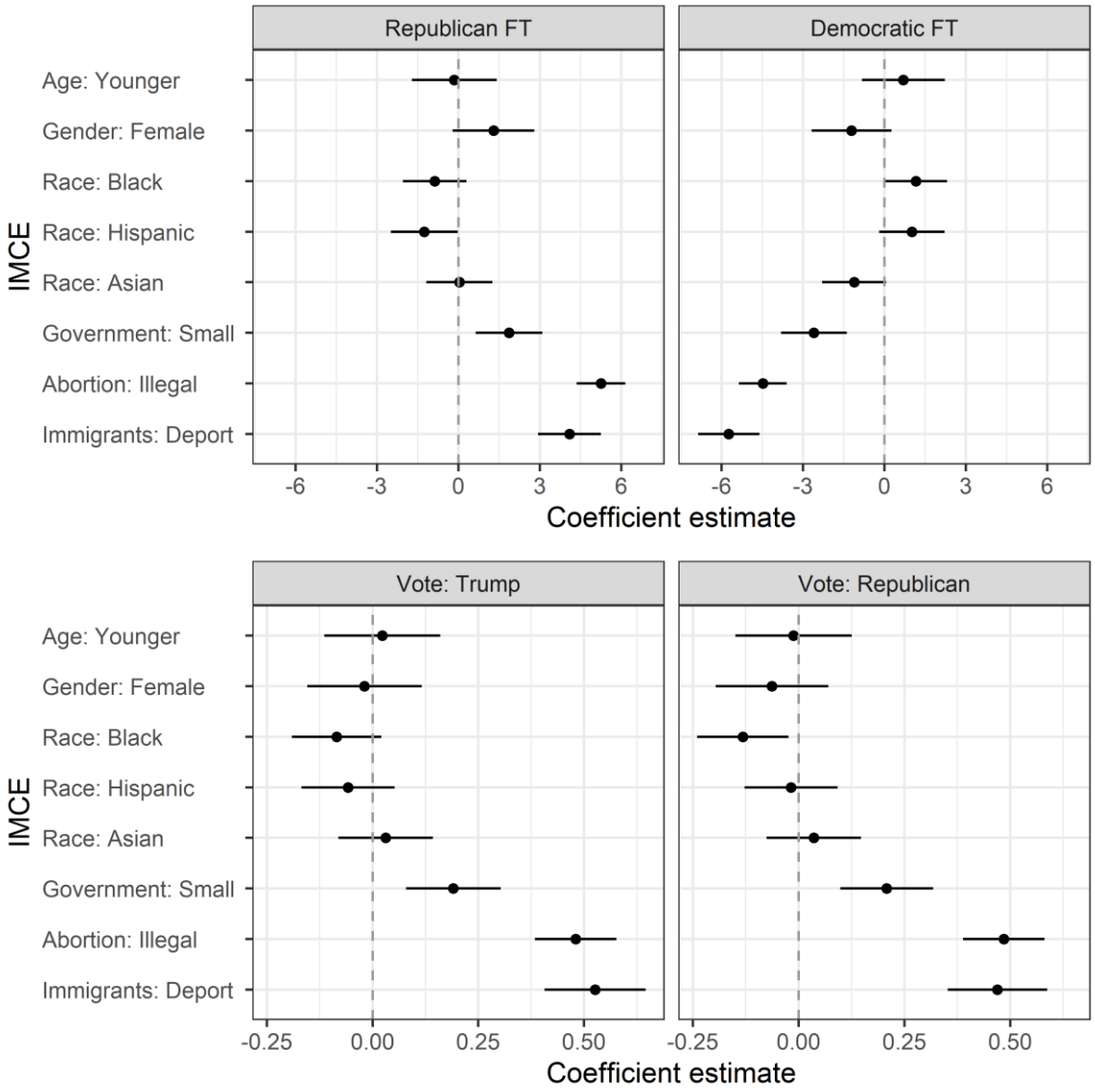
Section C. AMCEs by respondents' partisanship, U.S. study



Section D. IMCE distributions for candidates' demographic attributes, U.S. study



Section E. Validity results from a parallel sample, U.S. study



Section F. IMCE estimation models for choice outcomes

Consider the same example as used for Equations 1 and 2 in the paper. In a conjoint experiment, respondents indexed $i \in \{1, \ldots, I\}$ are asked to choose from pairs of profiles of hypothetical candidates indexed $j \in \{1, \ldots, J\}$. A candidate's position on immigrants is a manipulated attribute with two possible values, "Admit" and "Deport." Each respondent makes multiple choices in the conjoint task. IMCE for the choice outcome can be estimated by running an OLS regression for each individual respondent:

$$\text{choice}_{ij} = \alpha_i + \beta_i^{\text{OLS}}[\text{Immigrants} = \text{Deport}]_{ij} + \varepsilon_{ij}.$$

In this equation, β_i^{OLS} is the IMCE estimator for the choice outcome under the OLS specification. Alternatively, IMCE for the choice outcome can be estimated by running a logistic regression for each individual respondent:

$$\Pr\left(\text{choice}_{ij} = 1\right) = \frac{1}{1+e^{-\left(\alpha_i + \beta_i^{\text{logit}}[\text{Immigrants} = \text{Deport}]_{ij}\right)}}.$$

β_i^{logit} is the IMCE estimator for the choice outcome under the logit specification.

Section G. IMCE distributions, German study