Citizens' Preferences for Multidimensional Representation – Appendix

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Appendices

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Appendix A Item battery development and wordings

To construct the batteries, we first formulated a large set of "candidate items" that we considered to tap into preferences for each conceptual dimension. While we aimed to create items that primarily relate to a single dimension and do not contain references potentially priming considerations about other dimensions, we faced some challenges in generating items with varying item difficulties. Mixing items with varying difficulty is important from a measurement perspective. To attain this, we also selected a few items that potentially make references to other dimensions to manipulate (indeed, benchmark) their difficulty. For instance, one of our personalization items is: "...focus on the priorities of their party, rather than those of their constituents." Another example on responsiveness is: "...not care about how they do at the next election, but just do what is right." In both cases, respondents could read these items as creating a tension between personalization/responsiveness and substantive representation, adjusting the difficulty of endorsing the conceptions of personalization/responsiveness in both instances. But both examples still clearly ask for the preference for the concept (e.g. "focus on the priorities of their party" and "not care about how they do at the next election"), just referencing some other aspects of representation to tailor the item difficulty.

We then reduced the pool of candidate items to smaller sets of items for each dimension based on our own assessment of how well the items should work with respondents (e.g. understandable, triggering wanted considerations). After that, we undertook an extensive pretesting process, in which we fielded the remaining items to relatively small samples in each country. In total, we conducted six pretest surveys with respondents sourced through the survey platform Prolific. We used the responses to these pretests to refine our item batteries in terms of wording and item selection. In particular, we used exploratory factor analysis to establish which of our items — which were intended to measure the same concepts — did indeed elicit correlated patterns of responses from our respondents. We also examined the response distributions of the items, and asked open-ended questions of our respondents to gauge the difficulty of the tasks.

Below we provide the English version of the final item batteries.

Substantive

Some people want their personal policy views to always be promoted by their political representative. Other people think their representative can also promote different views.

Think about what you would want from someone who acts and speaks for you in politics. To what extent do you agree or disagree with the following statements? This person should…

- …promote the policy views that I hold
- …speak in favour of the views and opinions that I hold on different political issues
- …promote policies that would benefit me, even on issues I am unfamiliar with
- …raise issues that are important to me

Descriptive

Some people want their political representative to "look like" them, in that they should share some common characteristics, while others want their representative to be different from them.

Think about what you would want from someone who acts and speaks for you in politics. Do you agree or disagree that this person should share your…

- Gender
- Ethnicity
- Education
- Class background
- Sexual orientation

Surrogation

In the UK, people are only able to cast a single vote for a parliamentary candidate in their constituency. Some people therefore view their constituency MP as their only political representative. Others think that different politicians can also act and speak for them in politics.

Think about what you would want from someone who acts and speaks for you in politics. Do you agree or disagree that this person…

- …needs to be the MP for your constituency
- …needs to be the person you voted for
- …needs to be from the party you voted for

Justification

Some people want their political representative to always justify their decisions by explaining how they will affect society as a whole. Other people want their representative to focus on explaining how policies affect people like them or specific groups.

Think about what you would want from someone who acts and speaks for you in politics. To what extent do you agree or disagree with the following statements? This person should…

- …explain how their policies matter to society as a whole rather than to people like me
- …justify their decisions on the basis of what is good for the whole of the UK, not what is good for particular groups
- …explain how their decisions help to promote the national interest rather than my personal interests
- …more often refer to society as a whole than to people like me

Personalization

Some people want their political representative to be a loyal member of a political party. Others want their representative to speak and act independently from their party.

Think about what you would want from someone who acts and speaks for you in politics. To what extent do you agree or disagree with the following statements? This person should…

- …always be loyal to their party and its leaders
- …focus on the priorities of their party, rather than those of their constituents
- …speak out and vote against their party leadership
- …present themselves as an independent politician rather than a member of a party

Responsiveness

Some people want their political representative to always pay attention to public opinion, and do what the public wants in order to win elections. Others want their representative to pay less attention to public opinion and not focus too much on elections.

Think about what you would want from someone who acts and speaks for you in politics. To what extent do you agree or disagree with the following statements? This person should…

- …not care about how they do at the next election, but just do what is right
- …always think about how they will fare in the next election
- …pay close attention to opinion polls to ensure voter support

Appendix B Conjoint experiment treatments

Substantive

UK	US	DE
supports/opposes reintroducing the death penalty for the crime of murder.	**supports/opposes** abolishing the death penalty for persons convicted of murder.	**befürwortet** die Abschaffung des Werbeverbots für Schwangerschaftsabbrüche./**lehnt** die Abschaffung des Werbeverbots für Schwangerschaftsabbrüche **ab**.
supports/opposes introducing more stringent measures to reduce immigration.	**supports/opposes** introducing more stringent measures to reduce immigration.	**befürwortet** die Einführung strengerer Maßnahmen zur Reduzierung der Einwanderung./**lehnt** die Einführung strengerer Maßnahmen zur Reduzierung der Einwanderung **ab**.
supports/opposes increasing the rate of tax on income over £50,000 to 45%.	**supports/opposes** increasing the federal tax rate on income over $510,000 to 40%.	**befürwortet** die Erhöhung des Steuersatzes auf Einkommen über 55.961 Euro auf 45%./**lehnt** die Erhöhung des Steuersatzes auf Einkommen über 55.961 Euro auf 45% **ab**.
supports/opposes increasing the Universal Credit grant.	**supports/opposes** increasing federal spending on welfare programs.	**befürwortet** die Erhöhung von Hartz IV./**lehnt** die Erhöhung von Hartz IV **ab**.
supports/opposes building HS2.	**supports/opposes** introducing a federal carbon tax.	**befürwortet** den Bau von Nord Stream 2./**lehnt** den Bau von Nord Stream 2 **ab**.
supports/opposes constructing thousands of new onshore wind turbines.	**supports/opposes** creating a federal school voucher program.	**befürwortet** die Erhöhung der Luftfahrtssteuer./**lehnt** die Erhöhung der Luftfahrtssteuer **ab**.

Note that we draw "supports" or "opposes" for each level with equal probability.

Descriptive

UK	US	DE
man	man	Mann
woman	woman	Frau
working class	lower class	Arbeiterschicht
middle class	working class	Mittelschicht
upper class	middle class	Oberschicht
Black	upper class	türkischen Migrationshintergrund
Asian	White	polnischen Migrationshintergrund
White	Black	russischen Migrationshintergrund
heterosexual	Asian	heterosexuell
homosexual	Hispanic	homosexuell
	heterosexual	
	homosexual	

Surrogation

UK	US	DE
the [PARTY] Member of Parliament **for your constituency**.	the [PARTY] congressman/congresswoman **for your congressional district**.	der [PARTY]-Bundestagsabgeordnete (Direktmandat) **für Ihren Wahlkreis**.
a [PARTY] Member of Parliament, **but not for your constituency**.	a [PARTY] congressman/congresswoman, **but not for your congressional district**.	ein [PARTY]-Bundestagsabgeordneter (Direktmandat) **für einen anderen Wahlkreis in Ihrem Bundesland**.
		ein [PARTY]-Bundestagsabgeordneter (Direktmandat) **für einen anderen Wahlkreis in einem anderen Bundesland**.

		ein [PARTY]-Bundestagsabgeordneter (Listenmandat) **für Ihr Bundesland**.
		ein [PARTY]-Bundestagsabgeordneter (Listenmandat) **für ein anderes Bundesland**.

Note that we draw [PARTY] with equal probabilities from the list of major parties in the country: US = "**Democratic**", "**Republican**"; UK = "**Labour**", "**Conservative**"; Germany = "**SPD**", "**Bündnis 90/Grüne**", "**CDU/CSU**". At the time of fieldwork in May/June 2021 the CDU/CSU was polling in front of the German Greens with the SPD in third position, with all three parties claiming the chancellorship. Hence, we included all three parties.

Justification

UK	US	DE
regularly emphasises the benefits of their political positions for **people like you**.	regularly emphasises the benefits of their political positions for **people like you**.	betont in der Regel die Vorteile seiner politischen Positionen für **Menschen wie Sie**.
regularly emphasises the benefits of their political positions for **society as a whole**.	regularly emphasises the benefits of their political positions for **society as a whole**.	betont in der Regel die Vorteile seiner politischen Positionen für **die gesamte Gesellschaft**.
regularly explains how their policies matter to **people like you**.	regularly explains how their policies matter to **people like you**.	erklärt in der Regel, wie sich seine Politik auf **Menschen wie Sie** auswirkt.
regularly explains how their policies matter to **society as a whole**.	regularly explains how their policies matter to **society as a whole**.	erklärt in der Regel, wie sich seine Politik auf **die gesamte Gesellschaft** auswirkt.
regularly justifies their decisions on the basis of what is good for **particular groups** in society.	regularly justifies their decisions on the basis of what is good for **particular groups** in society.	rechtfertigt seine Entscheidungen regelmäßig damit, was für **bestimmte Gruppen** in der Gesellschaft gut ist.

regularly justifies their decisions on the basis of what is good for **the whole of the UK**.	regularly justifies their decisions on the basis of what is good for **the whole of the US**.	rechtfertigt seine Entscheidungen regelmäßig damit, was für **ganz Deutschland** gut ist.
regularly explains how their decisions help to promote **the interests of people like you**.	regularly explains how their decisions help to promote **the interests of people like you**.	erklärt in der Regel, wie seine Entscheidungen **den Interessen von Menschen wie Ihnen** dienen.
regularly explains how their decisions help to promote **the national interest**.	regularly explains how their decisions help to promote **the national interest**.	erklärt in der Regel, wie seine Entscheidungen **den nationalen Interessen** dienen.

Personalization

UK	US	DE
frequently speaks out and votes **against their party leadership**.	**frequently** speaks out and votes **against their party leadership**.	kritisiert und stimmt **häufig gegen die Parteiführung und ihre Vorgaben**.
rarely speaks out and votes **against their party leadership**.	**rarely** speaks out and votes **against their party leadership**.	kritisiert und stimmt **selten gegen die Parteiführung und ihre Vorgaben**.
usually votes according to party instructions, even when that conflicts with the wishes of their constituents.	**usually votes according to party instructions**, even when that conflicts with the wishes of their constituents.	**stimmt in der Regel nach den Vorgaben der Partei ab**, selbst wenn dies mit den Wünschen seiner Wähler schwer vereinbar ist.
usually votes according to the wishes of their constituents, **even when that conflicts with party instructions**.	usually votes according to the wishes of their constituents, **even when that conflicts with party instructions**.	stimmt in der Regel nach den Wünschen seiner Wähler ab, **selbst wenn dies gegen die Vorgaben der Partei verstößt**.
usually votes according to party instructions, even when that conflicts with their own beliefs.	**usually votes according to party instructions**, even when that conflicts with their own beliefs.	**stimmt in der Regel nach den Vorgaben der Partei ab**, selbst wenn dies mit den eigenen Überzeugungen schwer vereinbar ist.

usually votes according to their own beliefs, **even when that conflicts with party instructions**.	usually votes according to their own beliefs, **even when that conflicts with party instructions**.	stimmt in der Regel nach eigener Überzeugung ab, **selbst wenn dies gegen die Vorgaben der Partei verstößt**.

Responsiveness

UK	US	DE
"I always **listen to voters' views**, because at the end of the day they get to choose whether to reelect me or not."	"I always **listen to voters' views**, because at the end of the day they get to choose whether to reelect me or not."	„Ich **höre** mir immer **die Meinung meiner Wähler an**, denn am Ende entscheiden sie, ob ich wiedergewählt werde oder nicht."
"Elections are important because they force me as a politician to **listen and respond to the views of voters**."	"Elections are important because they force me as a politician to **listen and respond to the views of voters**."	„Wahlen sind wichtig, weil sie mich als Politiker veranlassen, **auf die Wähler zu hören und auf sie einzugehen**."
"In a democracy, the voter has the last word. That is why I always **listen and respond to what voters want**."	"In a democracy, the voter has the last word. That is why I always **listen and respond to what voters want**."	„In einer Demokratie hat der Wähler das letzte Wort, deshalb versuche ich immer, **auf die Wünsche der Wähler einzugehen**."
"I can only change society if I am re-elected. So, I always make sure that I **address voters' most important concerns**."	"I can only change society if I am re-elected. So, I always make sure that I **address voters' most important concerns**."	„Ich kann die Gesellschaft nur verändern, wenn ich wiedergewählt werde. Deshalb stelle ich immer sicher, **mich um die größten Sorgen der Wähler zu kümmern**."
"I did not go into politics to win elections, but to **make this country a better place**."	"I did not go into politics to win elections, but to **make this country a better place**."	„Ich bin nicht in die Politik gegangen, um Wahlen zu gewinnen, sondern **um dieses Land zum Besseren zu verändern**."

"I don't care about making popular decisions to win elections, but about **standing up for my principles and values**."	"I don't care about making popular decisions to win elections, but about **standing up for my principles and values**."	„Ich möchte nicht einfach dem Wählerwillen folgen, um wiedergewählt zu werden, sondern **für meine Prinzipien und Werte einstehen**."
"If I **lose an election** doing what I think is right, then **so be it**."	"If I **lose an election** doing what I think is right, then **so be it**."	"Wenn ich **eine Wahl verliere**, weil ich das Richtige getan habe, dann **sei es drum**."
"I went into politics to **implement good ideas, not popular ones** that win elections."	"I went into politics to **implement good ideas, not popular ones** that win elections."	„Ich bin in die Politik gegangen, **um gute Ideen zu verwirklichen, nicht bloß populäre Ideen,** mit denen man Wahlen gewinnt."

Appendix C Survey randomization

We used randomizations throughout the survey, not only in the conjoint experiment. First, we randomized the order in which respondents see our item batteries or the conjoint experiment. This allows us to evaluate consistency effects in the distribution of conjoint responses.[1] Second, we randomized three question orders: the order of the six issues on which we asked respondents to provide their policy preferences; the order of the six batteries tapping the dimensions of representation that are our main conceptions of interest; within the item batteries, the order of the items presented to respondents.

Table A7 below shows the randomization distribution for our descriptive representation attributes in the conjoint. For ethnicity, migratory background, and sexuality, we deviated from a uniform distribution to better fit reality, where only a small fraction of politicians are from ethnic minorities, for instance. Our randomization distributions for these attributes roughly correspond to official statistics of how these characteristics are distributed in the citizen population.

Table A7: Randomization distribution for descriptive representation attributes in the conjoint

Attribute	UK	US	DE
Gender	{Male, Female}, equal probability	{Male, Female}, equal probability	{Male, Female}, equal probability
Class	{Working, Middle, Upper}, equal probability	{Lower, Working, Middle, Upper}, equal probability	{Arbeiterschicht, Mittelschicht, Oberschicht}, equal probability
Ethnicity	{Black, Asian, White}, $P(Black) = .065$ $P(Asian) = .075$ $P(White) = .86$	{Black, Asian, White, Hispanic}, $P(Black) = .13$ $P(Asian) = .06$ $P(White) = .63$ $P(Hisp) = .18$	NA
Migratory background	NA	NA	{None, polnischen, türkischen, russischen} $P(None) = .8$ $P(polnischen) = .066$ $P(turkischen) = .066$ $P(russischen) = .066$
Sexuality	Heterosexual, Homosexual $P(Hetero) = .9$ $P(Homo) = .1$	Heterosexual, Homosexual $P(Hetero) = .9$ $P(Homo) = .1$	Heterosexual, Homosexual $P(Hetero) = .9$ $P(Homo) = .1$

[1] A series of unreported models reveals that our estimates are insensitive to the ordering of the batteries and the conjoint tasks.

Appendix D Item batteries: Exploratory factor analysis

To assess whether our item batteries measure *distinct* preferences over the dimensions of representation that we hypothesize, we report results from an exploratory factor analysis of *all* items from each of the six batteries in our survey, where we use an oblique rotation ("oblimin") to allow the factors to be correlated. Table A8 presents results from an analysis in which we pool responses from all three country samples.

The results from this exercise provide reassuring evidence on the validity of our item batteries. The factor analysis results in six factors, each of which corresponds broadly to one of our six dimensions of representation. Our items load together as predicted with regard to four of our six dimensions of representation. For example, all five of the descriptive representation items load positively on the first dimension, and all four substantive representation and justification items load positively on the second and third factors, respectively. The same is true for the three items of the surrogation battery, all of which are associated with the fourth factor. Across these first four factors, there is no significant cross-loading of any item on any other dimension. This suggests that these items tap into distinct preferences on the citizens' side with regard to each conception of representation.

Our items for the responsiveness and the personalization dimensions, by contrast, partially cross-load together on the fifth and sixth factor. On factor five, the three strongest loadings are for the personalization items "always be loyal to their party and its leaders" and "focus on the priorities of their party rather than those of their constituents" as well as the responsiveness item "always think about how they will fare in the next election." The two personalization items worded in favor of party independence "speak out and vote against their party leadership" and "present themselves as an independent politician rather than a member of a party" define the sixth factor.

On the one hand, this may indicate that responsiveness and personalization are more closely linked in the minds of voters. Voters may see party independence as an opportunity to realize responsiveness to electoral sanctions. On the other hand, it is noteworthy that the personalization battery items are distributed on the two dimensions according to the direction of their wording (those loading on factor five are in favor of party loyalty, those on factor six are in favor of party independence), which might point to an issue with how these items are understood or the possibility of less coherent preferences on the citizen side.

We also performed factor analyses with the same specifications as above by country (results are available upon request). The results for the US and the UK largely resemble the overall patterns across countries (only the size of the eigenvalues and thereby the ordering of the factors is a bit different in the US, but the same items load significantly on the same dimensions together). However, we find some deviation for German respondents, where descriptive representation is split up into two factors — one focusing on social background (class, education) and one focusing on resemblance regarding gender, ethnicity and sexual orientation. This suggests that Germans make a difference with regard to whether they want their representative to resemble them on their social background as opposed to on these other characteristics, whereas preferences for descriptive representation are unidimensional in the other two countries. Such cross-country differences in the dimensionality of preferences could be investigated in more depth in future work.[2]

[2] As we enforce the six-factor solution, the two-dimensionality of descriptive representation preferences in Germany also results in one change on the other factors: the personalization items loading on Factor 6 in the UK and the US

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Substantive 1	0.02	-0.02	0.77	0.01	0.01	-0.01
Substantive 2	0.03	-0.02	0.74	0.01	0.03	0.02
Substantive 3	0.01	-0.02	0.60	-0.02	0.05	0.01
Substantive 4	-0.05	0.05	0.71	-0.01	-0.04	0.02
Surrogation 1	0.02	0.04	-0.05	0.64	0.01	0.01
Surrogation 2	0.00	-0.02	-0.01	0.85	-0.02	0.04
Surrogation 3	0.00	0.00	0.07	0.64	0.08	-0.07
Descriptive 1	0.83	0.00	-0.06	-0.01	0.06	0.01
Descriptive 2	0.77	-0.02	0.02	0.01	-0.02	0.01
Descriptive 3	0.64	0.04	0.06	-0.01	-0.02	0.03
Descriptive 4	0.72	-0.01	0.08	0.01	-0.02	0.02
Descriptive 5	0.80	0.00	-0.04	0.01	0.00	-0.05
Justification 1	-0.01	0.78	0.01	-0.01	0.00	-0.01
Justification 2	0.02	0.70	0.05	0.05	-0.09	-0.03
Justification 3	0.00	0.72	-0.01	0.00	-0.01	0.00
Justification 4	0.00	0.72	-0.06	-0.02	0.12	0.06
Personalization 1	0.02	0.06	0.12	0.09	0.58	-0.20
Personalization 2	0.05	0.02	-0.02	0.00	0.64	0.01
Personalization 3	-0.01	0.00	0.01	0.00	0.03	0.73
Personalization 4	0.06	0.02	0.05	0.03	-0.05	0.56
Responsiveness 1	0.00	0.16	0.23	0.06	-0.37	0.10
Responsiveness 2	0.03	0.00	-0.01	0.03	0.70	0.09
Responsiveness 3	0.02	0.03	0.20	0.05	0.36	0.07
Eigenvalue	4.84	3.06	2.20	1.91	1.27	1.17

Table A8: Factor loadings. Sample size = 6,431 (pooled across countries).

Appendix E Item batteries: Cronbach's alpha by dimension, by country

In general, we observe good test score reliabilities of our scales, which are reported in table A9 below. In the pooled sample, Cronbach's alpha is 0.86 for the substantive representation scale, 0.89 for the descriptive representation scale, 0.86 for justification and 0.8 for surrogation. For personalization we are at the lower end of the acceptable range with 0.54 and the responsiveness scale lacks in internal consistency with an alpha of 0.45. These figures vary modestly by county, and are higher on average in the US and UK samples than in the German sample.[3] Taken together, these analyses suggest that, in general, four of our six item batteries have high levels of internal consistency, and measure distinct preferences over the different dimensions of representation.

Table A9: Cronbach's alphas by dimension and sample. Sample sizes: UK = 2,204; US = 2,178; DE = 2,049; Combined = 6,431.

Dimension	UK	US	DE	Combined
Substantive	0.85	0.85	0.88	0.86
Descriptive	0.92	0.91	0.83	0.89
Justification	0.88	0.87	0.84	0.86
Personalization	0.54	0.57	0.52	0.54
Responsiveness	0.47	0.54	0.32	0.45
Surrogation	0.84	0.81	0.76	0.80

now load on Factor 4 together with other personalization and responsiveness items in Germany. This may again suggest that these two conceptions of representation are less clearly delineated in the minds of citizens than they are from a theoretical-conceptual perspective.

[3] This may be an issue of sample quality, as Germany is the market where we also had the highest share of respondents failing our attention check.

Appendix F Item batteries: Correlation between dimensions

Figure A1 shows the Pearson correlations between the factor scores for each of our dimensions (note that these are factor scores from separate models for each dimension). Positive correlations between preferences on a given pair of dimensions are displayed in purple, and negative correlations are displayed in green.

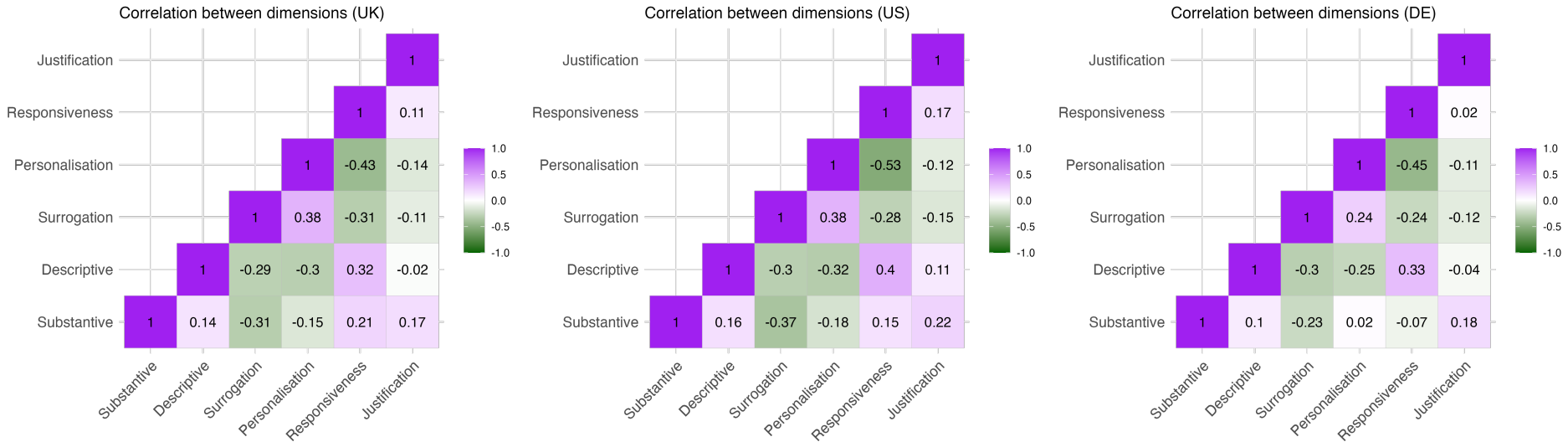

Figure A1: Correlation between factor score dimensions

Appendix G Conjoint: Mapping of respondent and politician descriptive characteristics

Some of the descriptive attribute levels we use in the conjoint design are necessarily less extensive than the options available to respondents in the survey. This is especially true for the race/ethnicity categorization, where we use question wordings and options from existing surveys. In order to code descriptive congruence between survey respondents and hypothetical politicians, we map respondents self-categorizations of race/ethnicity to a smaller number of categories that we include in the conjoint. For the UK, we use a wording from the British Election Study and use the following mapping:

- **White:** White British; Any other white background
- **Black:** Black African; Black Caribbean; White and Black Caribbean; Any other black background
- **Asian:** Pakistani; Indian; Chinese; Bangladeshi; Any other Asian background; White and Asian
- Other (not included in conjoint profiles): Any other mixed background; Other ethnic group

In the US we use question wordings from the Cooperative Congressional Election Study (CCES) and we use the following mapping:

- **White:** White
- **Black:** Black
- **Hispanic:** Hispanic
- **Asian:** Asian
- Other (not included in conjoint profiles): Middle Eastern; Mixed; Native American

Additionally, the CCES asks two questions to assess respondents' race/ethnicity. The first asks respondents to select the race or ethnicity that best describes them, and the second asks specifically if the respondent is of Spanish, Latino, or Hispanic origin or descent. We ask both questions of our respondents, and code the respondents as "Hispanic" if they indicate this in their responses to *either* of the questions.

In Germany, we use a customized question for migratory background, since all existing questions on migratory background are very complex (e.g. eliciting family migration history of parents). We use a simple question that taps into the respondent's self-perceived migratory status, arguably the most relevant concept for preferences over descriptive representation. Our mapping is:

- **None:** Nein
- **Türkischen:** Ja, türkischer Migrationshintergrund
- **Polnischen:** Ja, polnischer Migrationshintergrund
- **Russischen:** Ja, russischer Migrationshintergrund
- Other (not included in conjoint profiles): Ja, anderer Migrationshintergrund; Keine Angabe

We note that, for all countries, we do not drop the characteristics mapped to the "Other" category in the conjoint analysis. Instead, we code these respondents as being non-congruent with all hypothetical politicians on the relevant dimension.

For sexuality, we ask respondents to select from response options of "Heterosexual", "Homosexual", "Bisexual", "Other", and "Prefer not to say". In the conjoint, we include only "Heterosexual" and "Homosexual" as attributes of politicians, and so respondents who provide "Bisexual" or "Other" responses are coded as non-congruent with all hypothetical politicians on this characteristic ("Prefer not to say" responses are dropped before the analysis).

The exact question wordings for all questions mentioned are included in the pre-analysis plan that contains the questionnaires for all countries.

Appendix H Conjoint: Analysis strategy

To analyze our data, we stack it such that each observation, i, is the rating of a politician in a given pairwise comparison of two politicians considered by a given respondent. We index politicians with j and respondents with r. For each respondent, in each country, we have two observations per choice task, and each respondent completed five such tasks. This equates to 22040, 21780 and 20490 observations for the UK, US, and Germany data, respectively. Consistent with the decisions we pre-registered in our pre-analysis plan, we drop all responses by respondents who fail to give information on their sexuality, class, ethnicity, or past vote — information that we need to derive their descriptive representation and partisan surrogation – and who are assigned politicians with these characteristics in the conjoint.[4] After dropping these observations, we are left with 21266 observations for the UK conjoint analysis, 21382 for the US analysis, and 19268 for the German analysis.

We identify the AMCE through an OLS model, in which the outcome variable is equal to "1" if the respondent selected the politician as being the better representative, and "0" otherwise. We cluster standard errors at the respondent level to account for the non-independence of the choices of each respondent. We use models of the following form:

$$\begin{aligned} Y_{i(j,r)} = \; & \alpha + \beta_1 PartialDescriptiveCongruence_{j,r} \\ & + \beta_2 FullDescriptiveCongruence_{j,r} \\ & + \beta_3 SubstantiveCongruence_{j,r} \\ & + \beta_4 RepublicanJustification_j \\ & + \beta_5 HighPersonalization_j \\ & + \beta_6 HighResponsiveness_j \\ & + \beta_7 TerritorialSurrogation_j \\ & + \beta_8 PartisanSurrogation_{j,r} + \epsilon_{i(j,r)} \end{aligned} \tag{A1}$$

In a traditional conjoint analysis, the researcher directly randomizes the treatment attributes and then simply defines a model where the levels of each attribute are converted into a matrix of dummy variables (with one level of each attribute excluded as a reference category). The analysis proceeds by regressing the outcome on that set of indicator variables. Here, however, several of our treatment

[4] Note that in slight deviation from the pre-analysis plan, we keep observations from respondents who did not provide information on a charateristic for those comparisons where this characeristic was not shown. Excluding such observations has little justification. This deviation does not affect any results.

variables are defined by the *combination* of respondent and politician characteristics. For instance, we operationalize substantive representation by measuring the congruence in issue positions between the respondent and each hypothetical politician. As we measure binary issue positions on six issues for each respondent prior to the conjoint, and then randomly assign each politician to have a position on one of these issues, we can define $SubstantiveCongruence_{j,r}$ to be equal to "1" when the respondent holds the same issue position as that attributed to the politician in the vignette.[5]

Similarly, we operationalize descriptive representation by considering the congruence between politician and respondent characteristics. We code two dummy variables which measure "partial" and "full" congruence between the descriptive characteristics drawn in the conjoint for a given politician and those reported by the respondent prior to the experiment. $PartialDescriptiveCongruence_{j,r}$ is equal to "1" when the respondent shares one descriptive characteristic (gender, ethnicity, class, or sexuality) in common with politician j, and $FullDescriptiveCongruence_{j,r}$ is equal to "1" when the respondent shares *both* descriptive characteristics in common with politician j. For instance, if a female, middle class respondent was to be presented with a female, working class politician, then $PartialDescriptiveCongruence_{j,r} = 1$ and $FullDescriptiveCongruence_{j,r} = 0$. By contrast, a White male respondent presented with a White male politician would have $PartialDescriptiveCongruence_{j,r} = 0$ and $FullDescriptiveCongruence_{j,r} = 1$. The baseline, when both these variables are equal to zero, represents the case where the respondent differs from the politician with respect to *both* of the descriptive attributes included in the vignette. Note that we cannot define this measure of descriptive representation for those respondents that answered "Don't know" or "Prefer not to say" with respect to their class, sexuality, or ethnicity. Hence, we drop these observations from our analysis of the conjoint.

We also operationalize partisan surrogation by measuring whether the party of a hypothetical politician is the same as the party supported by the respondent. Here, $PartisanSurrogation_{j,r}$ is equal to "1" when politician j is from a party other than the one respondent r reports having voted for in the previous election.[6] Note that the politicians in the profiles always came from the major parties in each country (e.g. Democrat vs. Republican in the US, Labour vs. Conservative in the UK), as shown in appendix section B. For Germany we used the SPD, CDU/CSU and Bündnis 90/Grüne. Hence, for some voters of smaller parties, the variable is always "1." By contrast, we operationalize territorial surrogation directly by stating whether the hypothetical politician is the politician "for your constituency/district" ($TerritorialSurrogation_j = 0$), or is a politician "but not for your constituency/district" ($TerritorialSurrogation_j = 1$).[7] Where we use several text implementations for an attribute level (i.e., responsiveness, personalization, and justification), these are assigned at random in the conjoint, and we then code a binary indicator for each dimension – $HighResponsiveness_j$, $HighPersonalization_j$, $RepublicanJustification_j$ – which captures which type of text a respondent received.

Given these definitions of our conjoint treatments, the β coefficients from equation A1 provide estimates of the AMCE for each value of the politicians' attributes, see Hainmueller et al. (2014).

[5] See Leeper and Robison (2020) (Appendix OA6) for a similar approach.

[6] Respondents who were not eligible to vote, or who did not vote in the previous election, are coded as "1" on this variable.

[7] In Germany's mixed electoral system, there are various levels of surrogation, depending on whether a politician was directly elected in another district in the respondent's Land or in another Land; or on a party list in the respondent's or another Land.

Appendix I Conjoint: "Stability and no carryover effects" assumption

A central identifying assumption for stated-preference experiments that allows the pooling of data across choice tasks is that the potential outcomes remain stable across choice tasks, see Hainmueller et al. (2014). We can test this assumption by plotting our AMCEs for each choice task separately. The results are presented in figure A2. We find very limited heterogeneity in the AMCEs across choice tasks. One outlier is the first choice task in the UK, where the estimate for substantive representation is significantly smaller than in the other choice tasks. Moreover, there is a small visible pattern that the attratctiveness of republican justification in swaying opinion among US citizens in favor of a representative develops gradually over the course of choice tasks. This may indicate that citizens just become aware of the potential value of this dimension of representation when engaging in more thoughts about representation or that they use this dimension as a cue when they have to make more choices (or other potential explanations). However, in total, given the multiple comparisons we look at here (e.g. more than 100 AMCEs), the few significant differences we observe have still a relatively high probability to have occurred by chance.

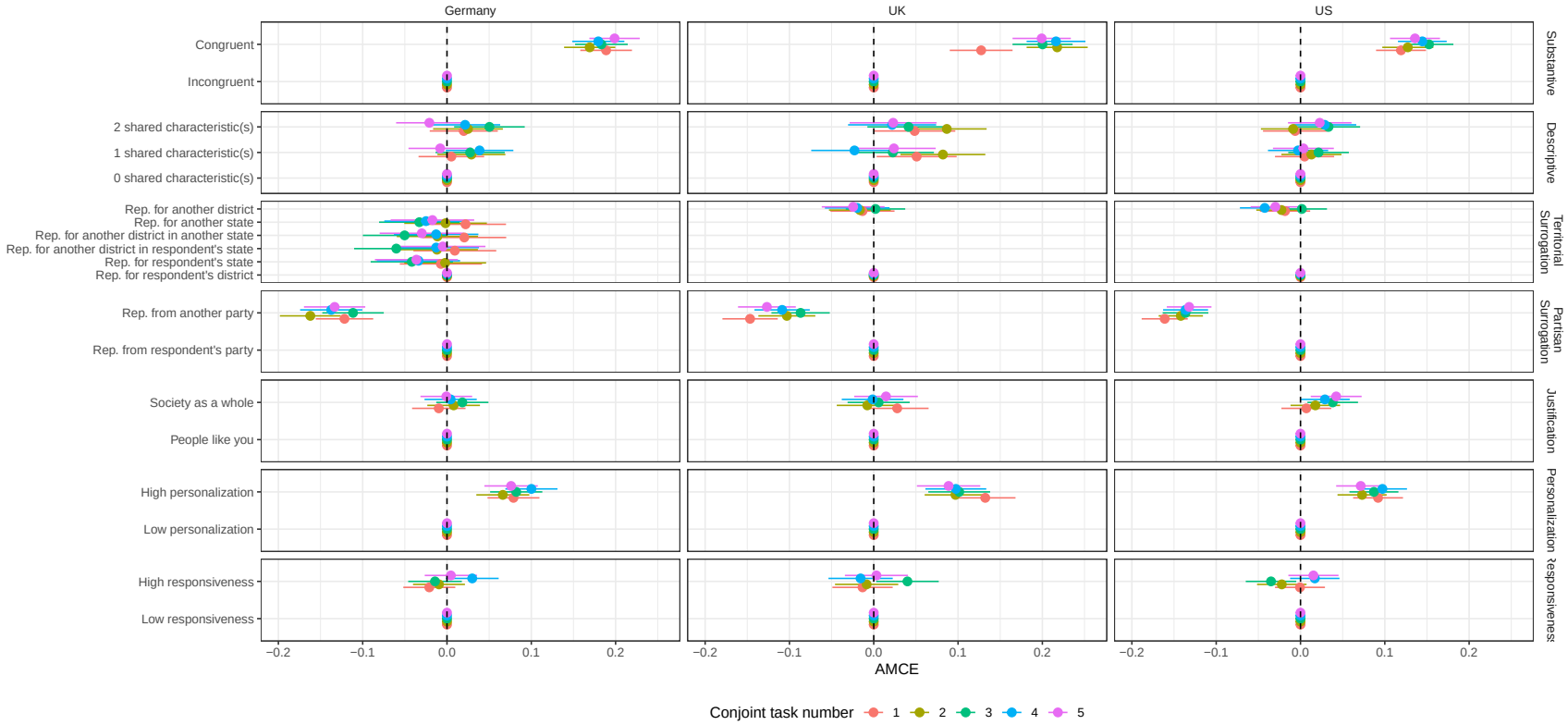

Figure A2: Main conjoint results, by choice task.

Appendix J Conjoint: Conditional AMCE estimates

Figure A3 shows estimates conditional on whether a given politician in the conjoint has policy views that are congruent or incongruent with those of the respondent on a given issue. That is, we ask whether, conditional on the substantive representation offered by a politician, there are differences in the effects of the other dimensions of representation. We find no evidence for this. Similarly, figure A4 conducts the same analysis, but here conditioning on whether a given politician is from the respondent's preferred party or not.

In general, we find that the AMCEs associated with each dimension are largely consistent irrespective of the conditioning variable. We find some evidence of heterogeneity when we interact the $SubstantiveCongruence_{i,j}$ indicator with a variable measuring the self-reported salience of each issue to our respondents.[8] As figure A5 shows, we find that the positive effect of substantive congruence on the selection of politicians is increasing in how salient the issue is to the respondent making the choice (this moderation effect is more pronounced in the UK and Germany compared to the US).

We also find some treatment-effect heterogeneity when we condition the estimates on various descriptive characteristics of our respondents. Importantly, although we find relatively small effects of descriptive representation across all voters, we do uncover some evidence that descriptive representation is more important to certain subsets of voters. For instance, figure A7 shows that shared descriptive characteristics are more important for voters of color (in the UK and US) and voters from migrant backgrounds (in Germany) than for white voters and voters from non-migrant backgrounds. Similarly, we find that female voters see descriptive congruence as a more important feature of their representatives than male voters do (figure A6), but this pattern is not replicated for voters who report different sexualities (figure A8).

Appendix K Cross-validation of item batteries and conjoint

The combination of the item batteries and the conjoint also allows us to cross-validate the two instruments. Specifically, we can test whether the item batteries have predictive validity for people's choices in the conjoint. If the factor scores of individuals on each representation dimension capture meaningful variation in respondent preferences over representation, then we would expect respondents with different scores to be differentially responsive to variation in the relevant attributes in the conjoint. For instance, if our descriptive representation battery is effective at distinguishing respondents with greater and lesser demands for descriptive representation, then we should observe respondents with high factor scores from that battery being more sensitive to descriptive congruence with hypothetical politicians in the conjoint than is the case for respondents with lower factor scores. Accordingly, we hypothesize that there will be an interaction effect between respondents' factor scores on a given dimension and the attributes levels on that dimension in the conjoint.

To evaluate this idea, we use the factor scores to predict respondents' choices between politicians in the conjoint experiment. Collecting respondents' factor scores on each of the six dimensions into

[8] We asked each respondent to report how important each issue we included in the experiment was to them on a 7-point scale from "Not at all" to "Very" important. We code these responses such that categories 1 and 2 correspond to "Low" salience issues, categories 3 to 5 are "Mid" salience issues, and categories 6 and 7 are "High" salience issues.

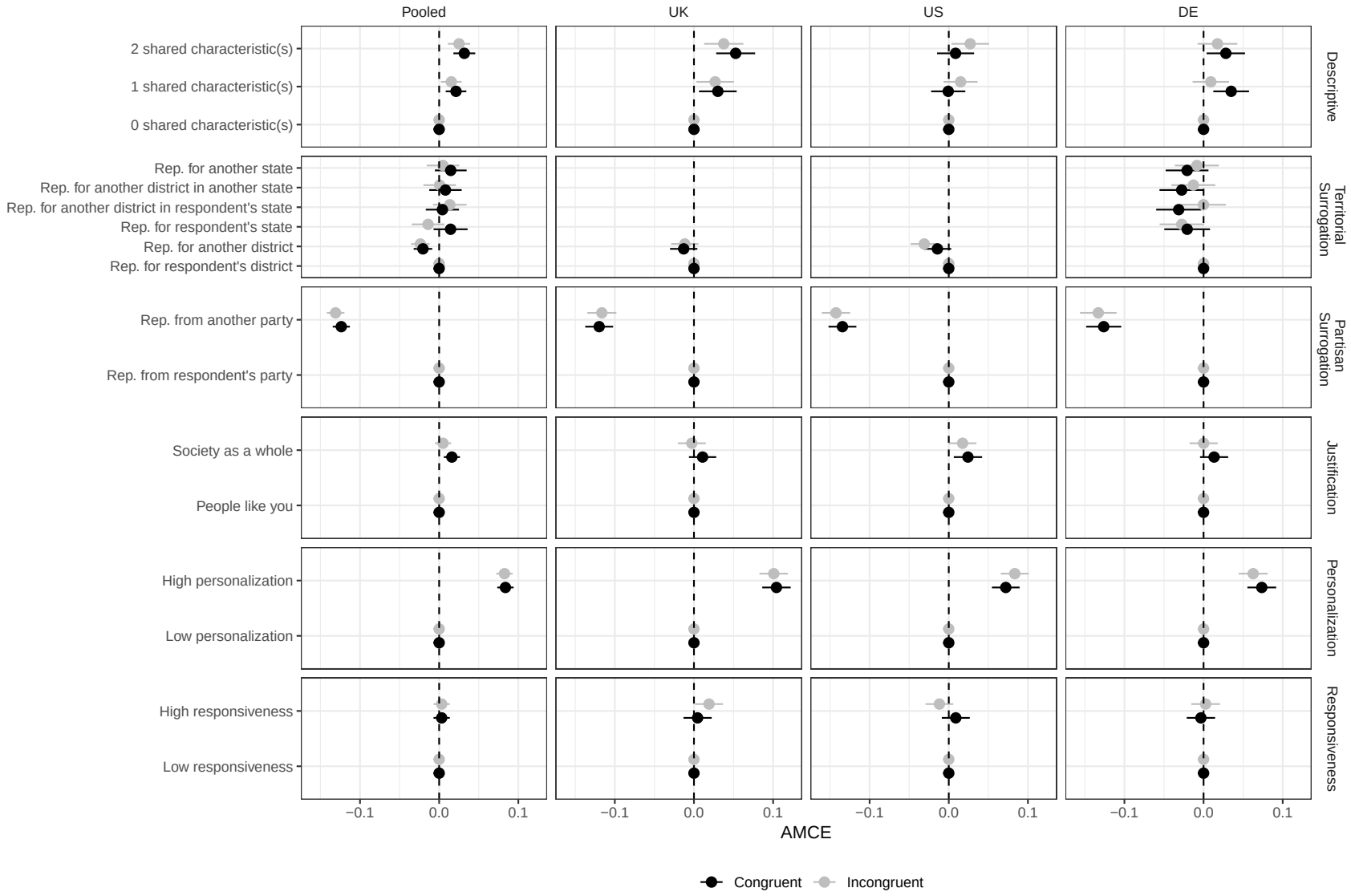

Figure A3: Average Marginal Component Effects By Substantive Representation.

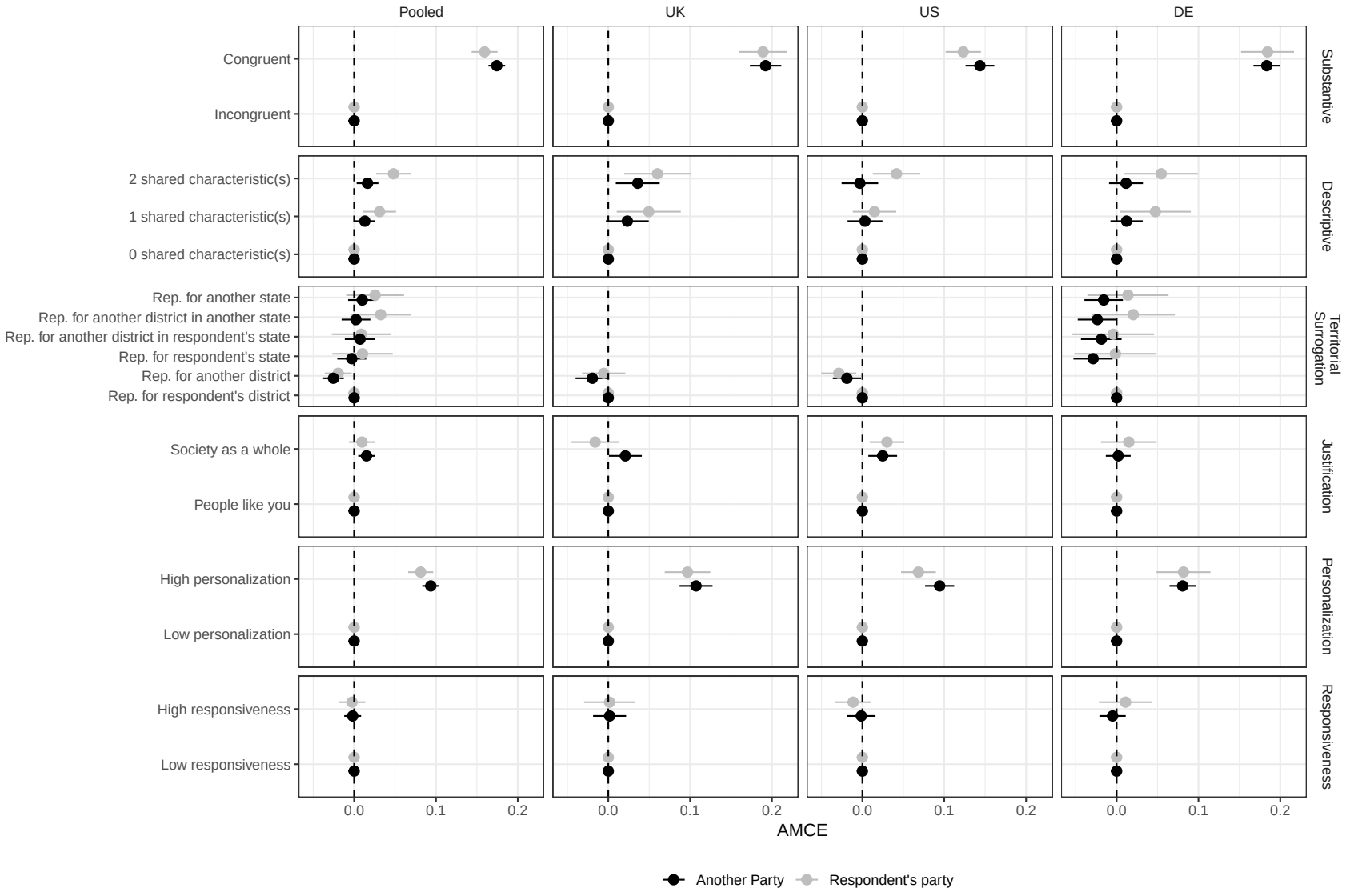

Figure A4: Average Marginal Component Effects By Partisan Surrogation.

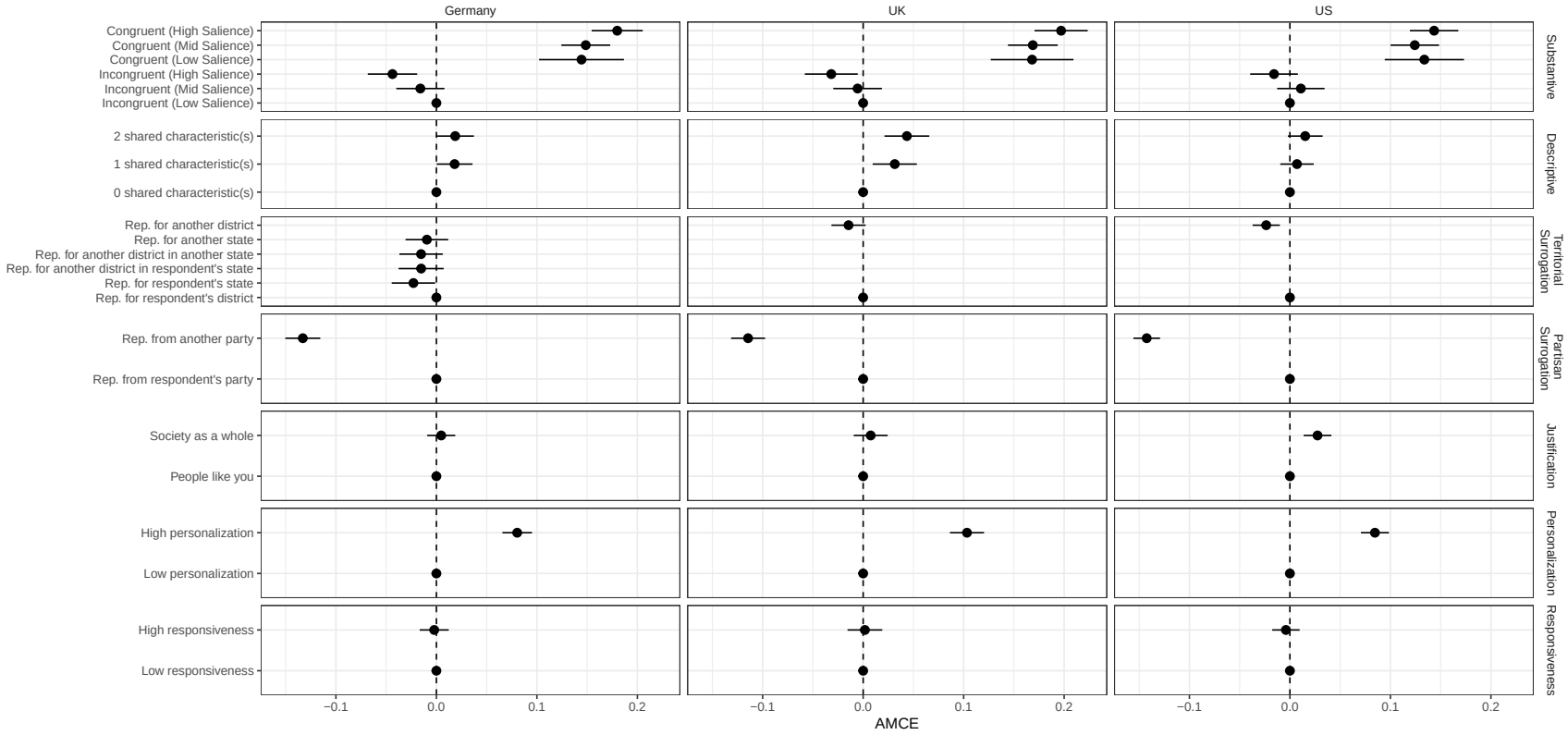

Figure A5: Average Marginal Component Effects by Issue Salience.

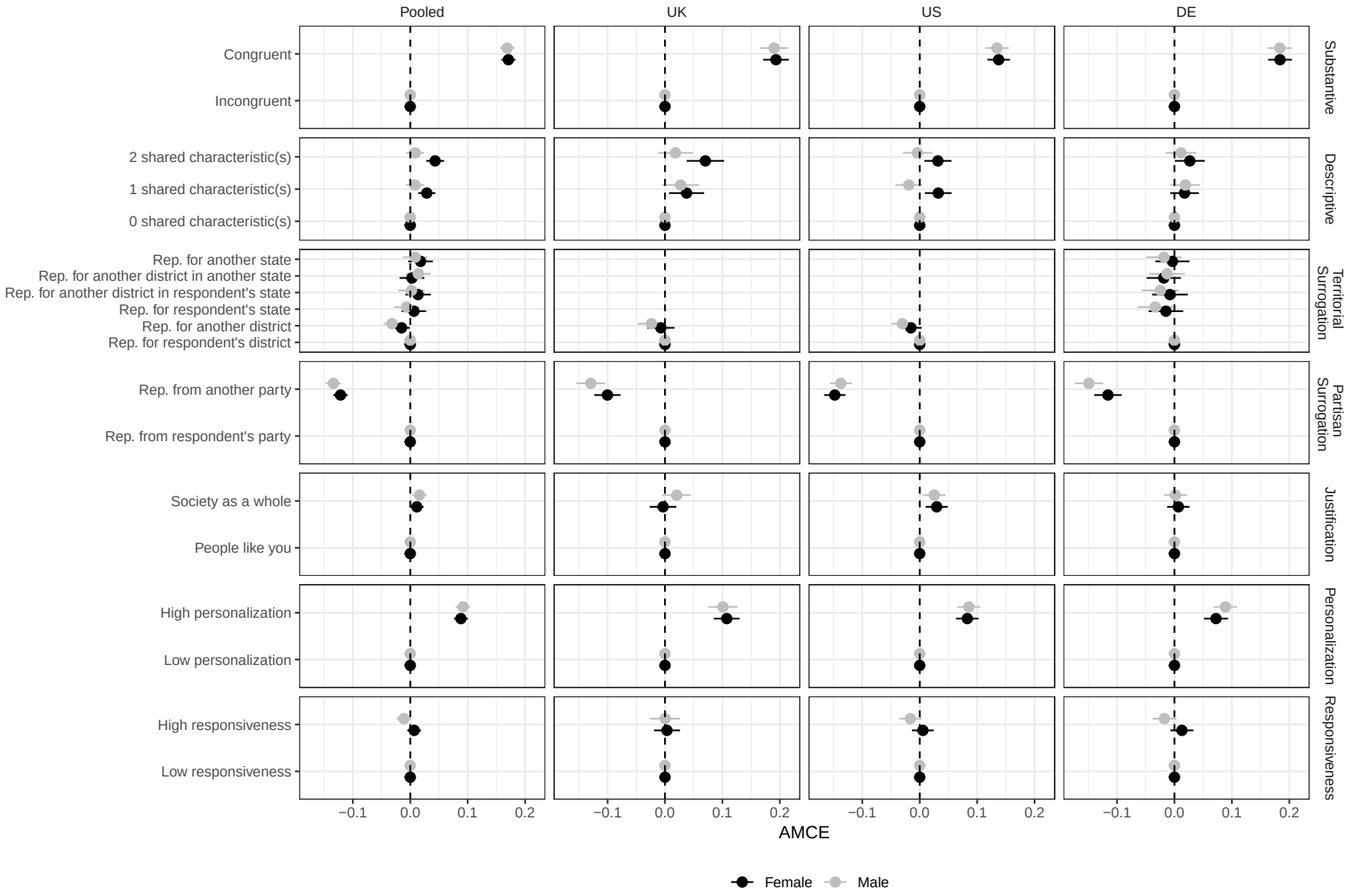

Figure A6: Average Marginal Component Effects by Respondent Gender.

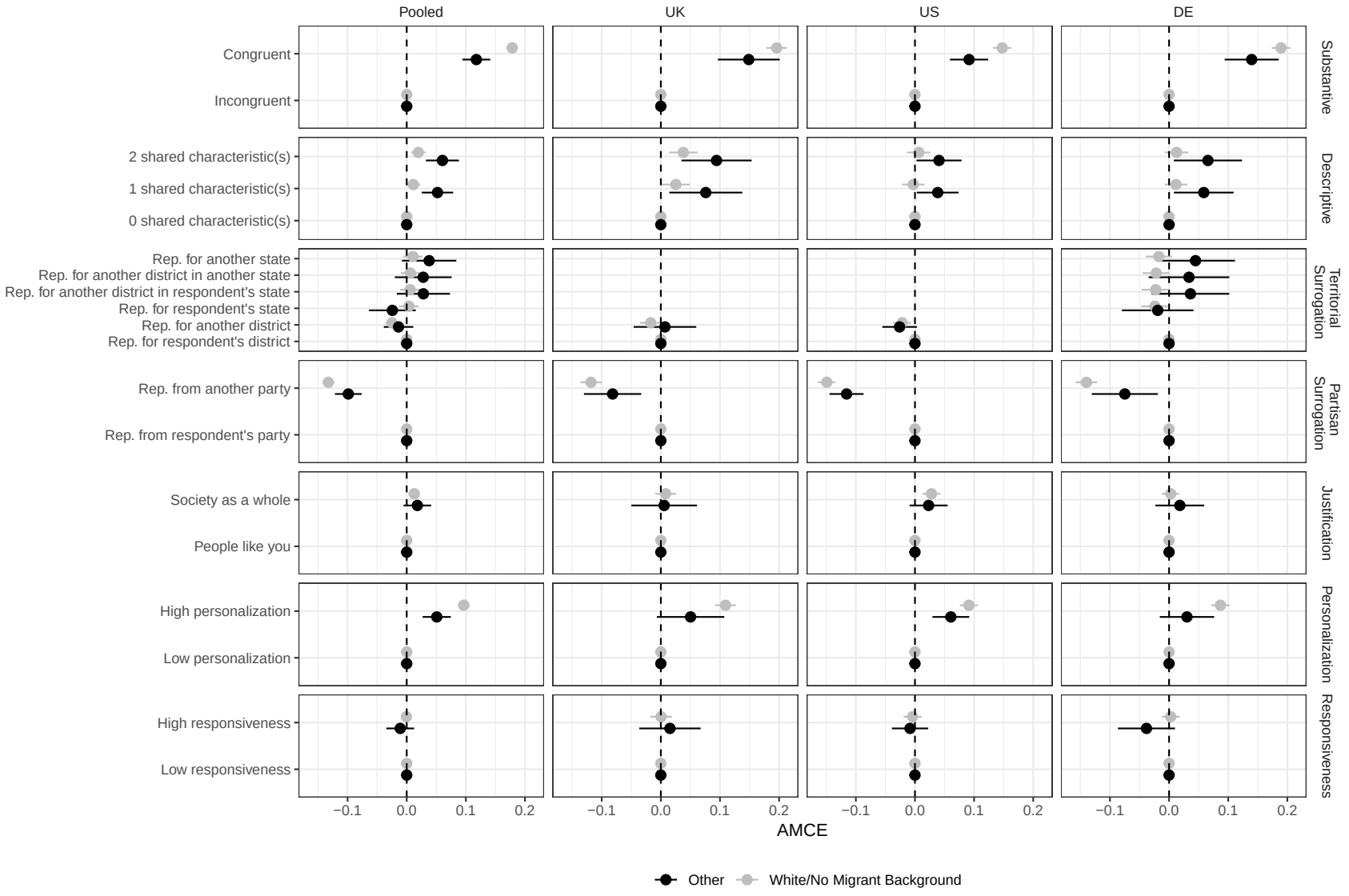

Figure A7: Average Marginal Component Effects by Respondent Race/Ethnicity/Migratory Background.

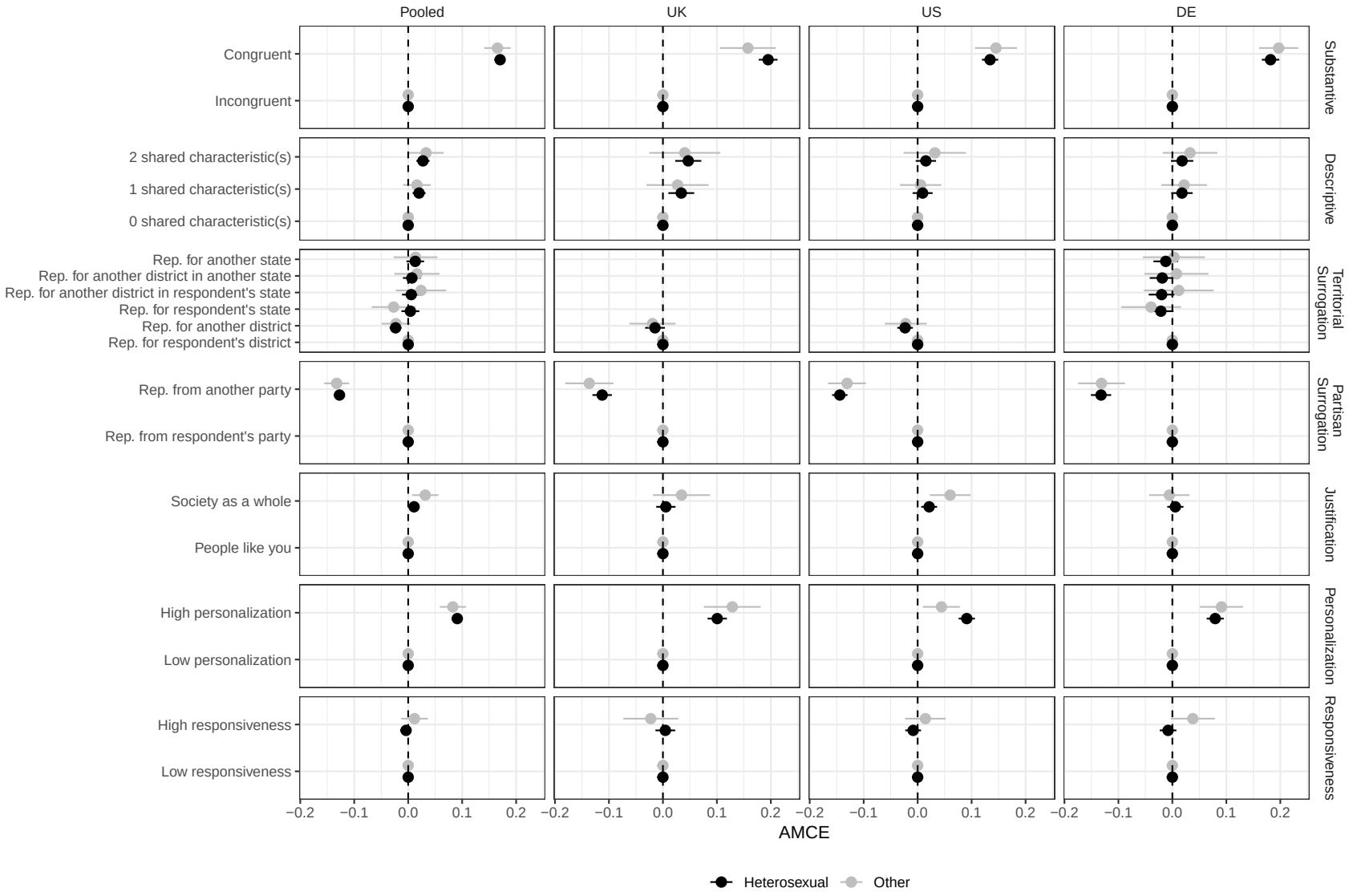

Figure A8: Average Marginal Component Effects by Respondent Sexuality.

a matrix, X, we estimate regressions of the following form:

$$
\begin{aligned}
Y_{i(j,r)} \quad = \quad & \alpha + \beta_1 PartialDescriptiveCongruence_{j,r} \\
& + \gamma_1 (DescriptiveScore_r \cdot PartialDescriptiveCongruence_{j,r}) \\
& + \beta_2 FullDescriptiveCongruence_{j,r} \\
& + \gamma_2 (DescriptiveScore_r \cdot FullDescriptiveCongruence_{j,r}) \\
& + \beta_3 SubstantiveCongruence_{j,r} \\
& + \gamma_3 (SubstantiveScore_r \cdot SubstantiveCongruence_{j,r}) \\
& + \beta_4 RepublicanJustification_j \\
& + \gamma_4 (JustificationScore_r \cdot RepublicanJustification_{j,r}) \\
& + \beta_5 HighPersonalization_j \\
& + \gamma_5 (PersonalizationScore_r \cdot HighPersonalization_{j,r}) \\
& + \beta_6 HighResponsiveness_j \\
& + \gamma_6 (ResponsivenessScore_r \cdot HighResponsiveness_{j,r}) \\
& + \beta_7 TerritorialSurrogation_j \\
& + \gamma_7 (SurrogationScore_r \cdot TerritorialSurrogation_{j,r}) \\
& + \beta_8 PartisanSurrogation_{j,r} \\
& + \gamma_8 (SurrogationScore_r \cdot PartisanSurrogation_{j,r}) \\
& + \sum_{d=1}^{6} \delta_d X_{r,d} + \epsilon_{i(j,r)}
\end{aligned}
\tag{A2}
$$

The interaction terms (γ) allow our estimates of interest to vary according to the preferences that we estimate for our respondents from the application of the factor analyses models to our item batteries. The implication of the preceding discussion is that we expect all of the interaction coefficients to be positive. A positive interaction effect implies that a change in an attribute value on a given dimension of representation will have a larger causal effect on the probability of selecting a politician for respondents who express higher *a priori* demands for representation on that dimension in the item batteries.

One concern with equation A2 is that it assumes a linear interaction effect in which the AMCE of the various attributes changes at a constant rate with each of the modifier variables. This is a strong assumption, as we might think, for example, that the effect of increasing descriptive congruence on politician selection probability will be very large among respondents who have *a priori* declared that they see descriptive representation as important, but much smaller among respondents with moderate or low $DescriptiveScore_r$ values. Given this, we additionally adopt the approach proposed by Hainmueller et al. (2019) and estimate separate AMCEs for binned groups of each of our factor analysis score variables. Specifically, we partition each of our factor analysis score variables into three equally sized groups – Low, Mid, and High – and then substitute the dummies for the Mid and High categories into equation A2 in place of the existing score variables. As before, our expectation is that the AMCEs for respondents in the higher groups will be larger than those for respondents in the lower

groups on each dimension. As this analysis involves comparing preferences across subgroups defined by the factor scores, we also report marginal means as suggested in Leeper et al. (2020) to measure the degree to which differences in subgroup-level AMCEs are driven by differences in preferences for the various reference categories.

The criteria we will use for adjudicating the success of our validation test are the sign and significance of the interaction terms described in equation A2, and the equivalent interactions on the categorical transformations of our factor score variables defined above. For the model described in equation A2, we judge the validation of each battery to be successful when the coefficient on the relevant interaction is positive and significantly different from zero at the 95% confidence level.[9] For the categorical transformations, we conduct F-tests that compare models with and without the interaction terms for each dimension, and judge the validation for a given dimension a success if the interaction effects for that dimension are not jointly equal to zero (and at least one of the interaction coefficients for that dimension is positive). As stated in our pre-analysis plan, given that the categorical specification makes weaker assumptions about the functional form of the effect sizes, if the results of these tests conflict with each other, we base our final evaluations of the validity of our measures on the categorical specification of the factor score variables.

Finally, the analyses described here involve two sources of estimation uncertainty: in the estimation of the factor scores, and the estimation of equation A2. To ensure that we do not ignore the estimation uncertainty from the first stage factor analysis, we bootstrap the entire procedure, resampling (at the respondent level) 2,000 times from the data with replacement and estimating the factor scores and AMCEs on each iteration. We then calculate and present 95% bootstrapped confidence intervals from the resulting estimates.

We present the results of this procedure in figures A9 and A10. These figures reveal partial, though incomplete, support for our measurement strategy. In particular, for some dimensions we find that respondents' answers to the item batteries clearly predict the choices they make in the paired-comparison task. For instance, we find that respondents who are more supportive of personalized representational styles are more likely to positively process indicators of personalization in the conjoint task. Similarly, we find significant and positive interactions for partisan surrogation, justification, responsiveness and — to some extent — descriptive representation in most instances, though the magnitudes of these interactions differ and they are inconsistent across groups of respondents. By contrast, we find very little evidence that being more supportive of either territorial surrogation or substantive representation is correlated with viewing these attribute levels more positively in the choice task.

Taken together, we view these findings as supportive of our measurement approach, as they indicate that — for the majority of the dimensions we study — the item batteries we constructed do appear to capture respondents' attitudes that are predictive of the ways in which they make judgements of hypothetical representatives.

[9] For those dimensions where we have multiple coefficients relating to attributes in the conjoint (i.e. for descriptive representation, and for surrogation in the German example), we consider the validation of the battery to be successful if *any* of the coefficients on the relevant interactions are positive and significantly different from zero.

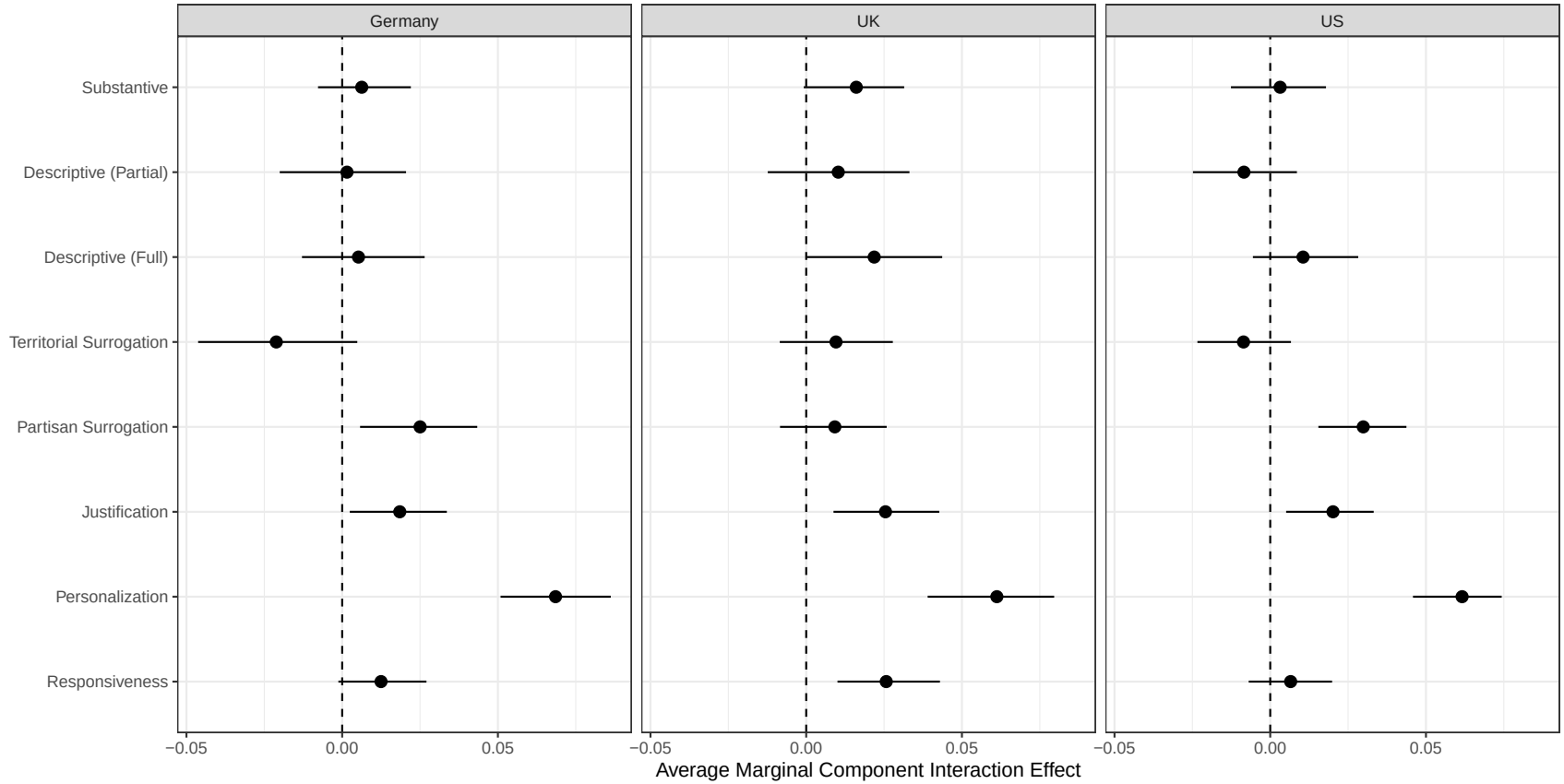

Figure A9: Average Marginal Component Interaction Effects: The plot shows the interaction terms (γ) from equation A2 which allow our estimates of politician characteristics to vary according to the preferences that we estimate for our respondents from the factor analyses. We expect these interaction coefficients to be positive, implying that a change in an attribute value on a given dimension of representation will have a larger causal effect for respondents who express higher *a priori* demands for representation on that dimension.

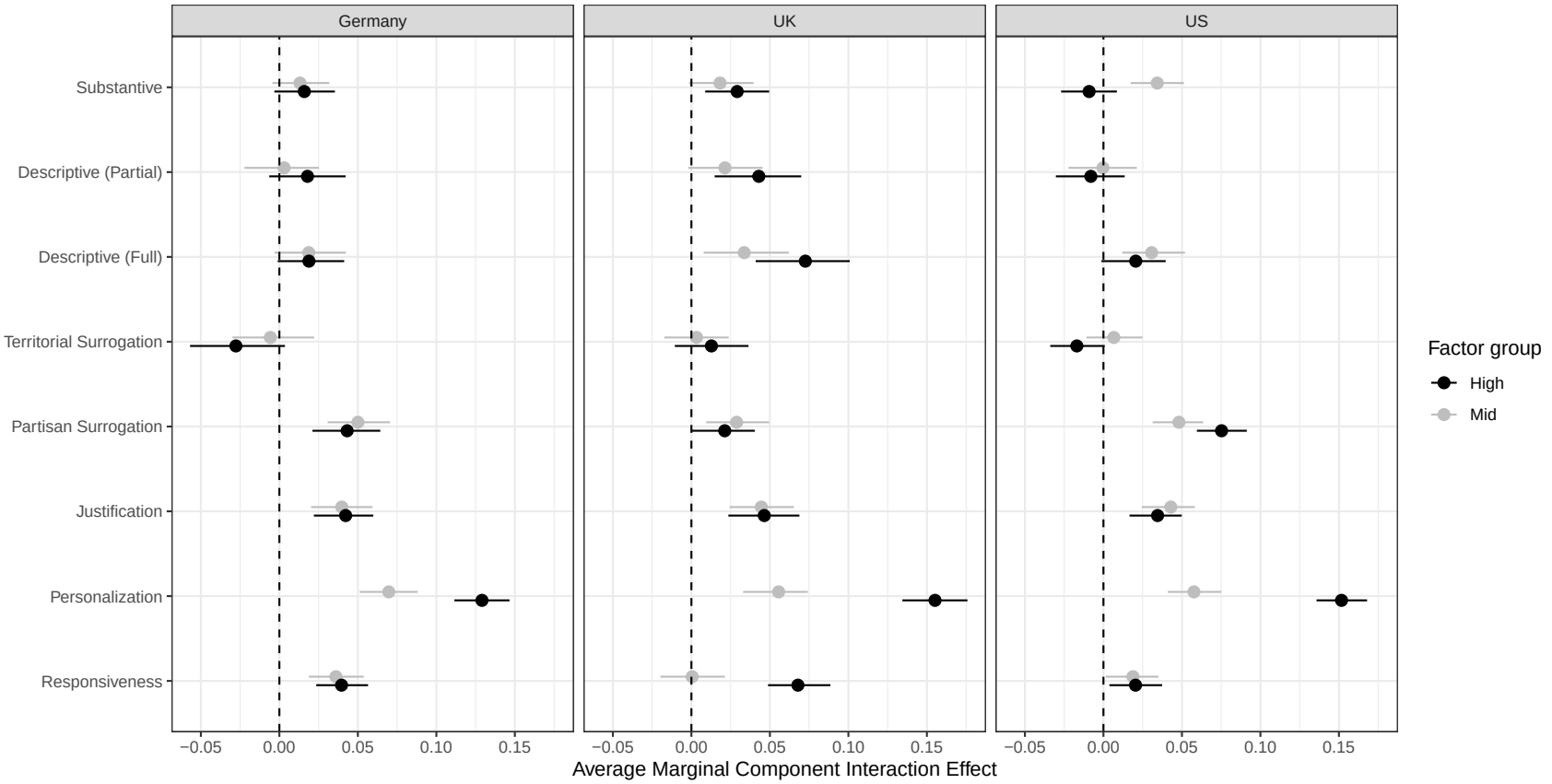

Figure A10: Average Marginal Component Interaction Effects: The plot shows the interaction terms (γ) from between politician characteristics on each dimension and the indicators for the binned groups of respondents' factor scores on each dimension. These effects allow our estimates of politician characteristics to vary according to the preferences that we estimate for our respondents from the factor analyses, but relaxing the assumption of linear effects maintained in figure A9. Again, we expect these interaction coefficients to be positive, implying that a change in an attribute value on a given dimension of representation will have a larger causal effect for respondents who express higher *a priori* demands for representation on that dimension.

Appendix L Item batteries and conjoint results from full sample

As we describe in the main body of the paper, a non-trivial fraction of our respondents failed the attention check that we included in our survey. In the paper, we estimate all quantities of interest using the sample of respondents who passed the attention check, and use post-stratification weights to obtain nationally representative estimates. In this section, as a robustness check on our strategy, we replicate all the analyses presented in the main body of the paper using the full sample of respondents, including those who failed the attention checks, and without any post-stratification weights. As these analysis demonstrate, there are very few substantive differences in the estimates derived from the full and the restricted samples.

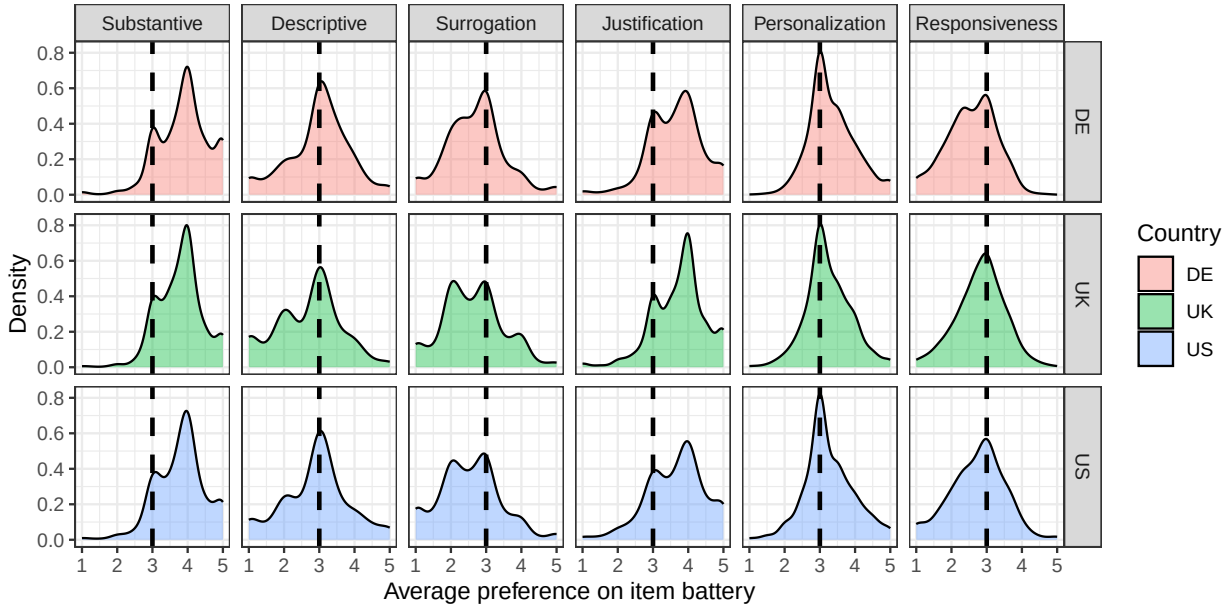

Figure A11: Densities of preferences on each dimension – Full sample

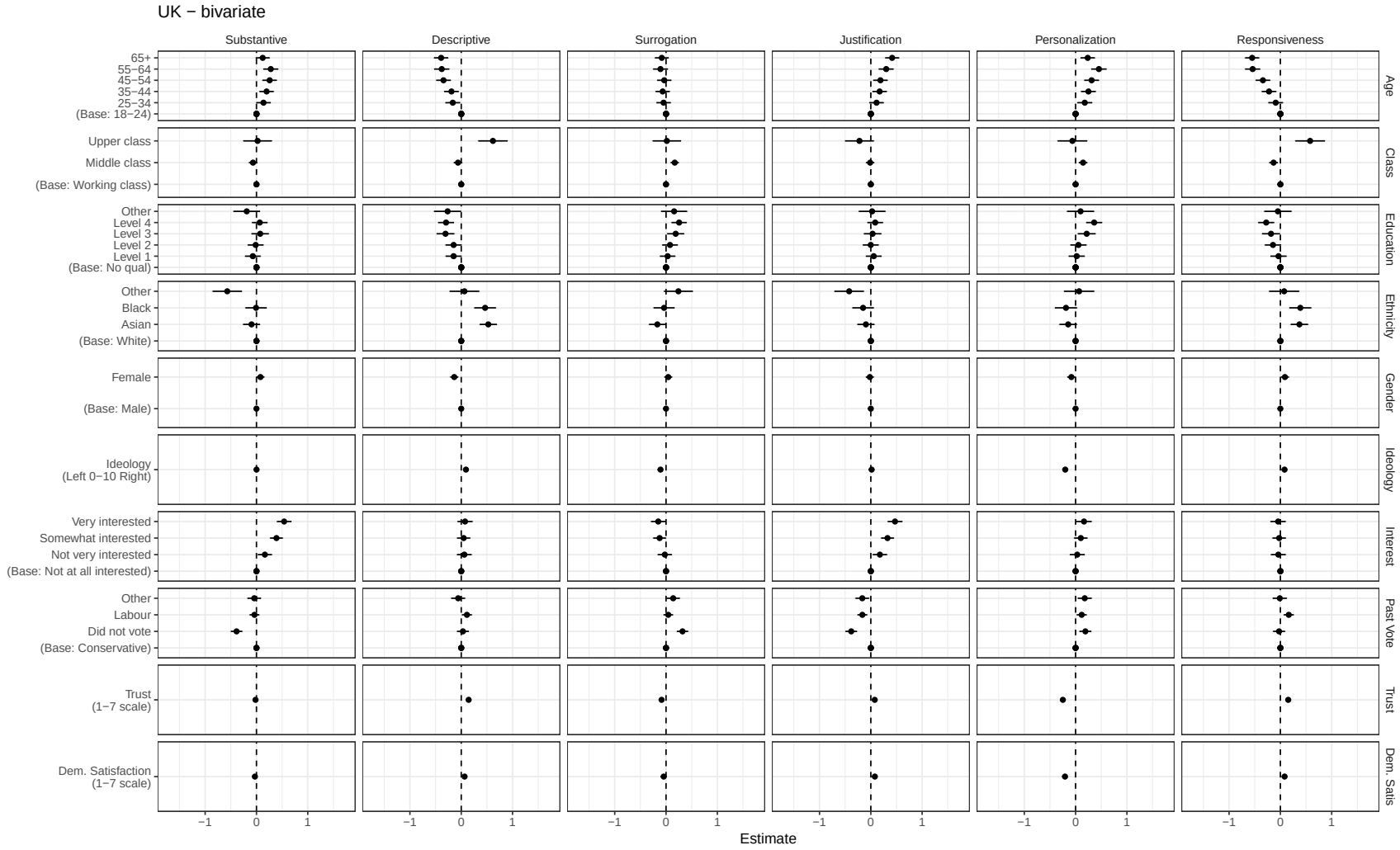

Figure A12: Correlates of factor scores: Full UK sample.

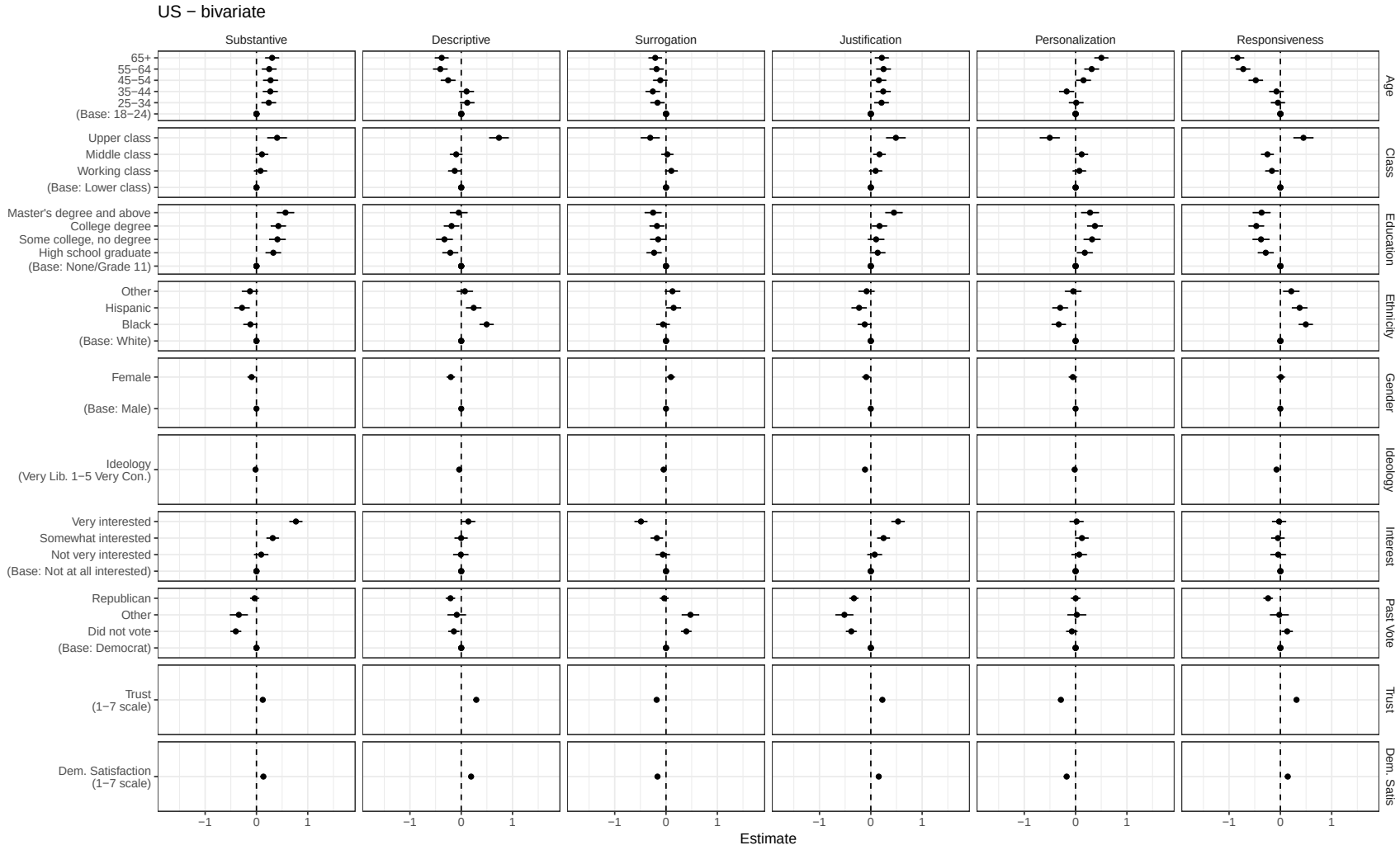

Figure A13: Correlates of factor scores: Full US sample.

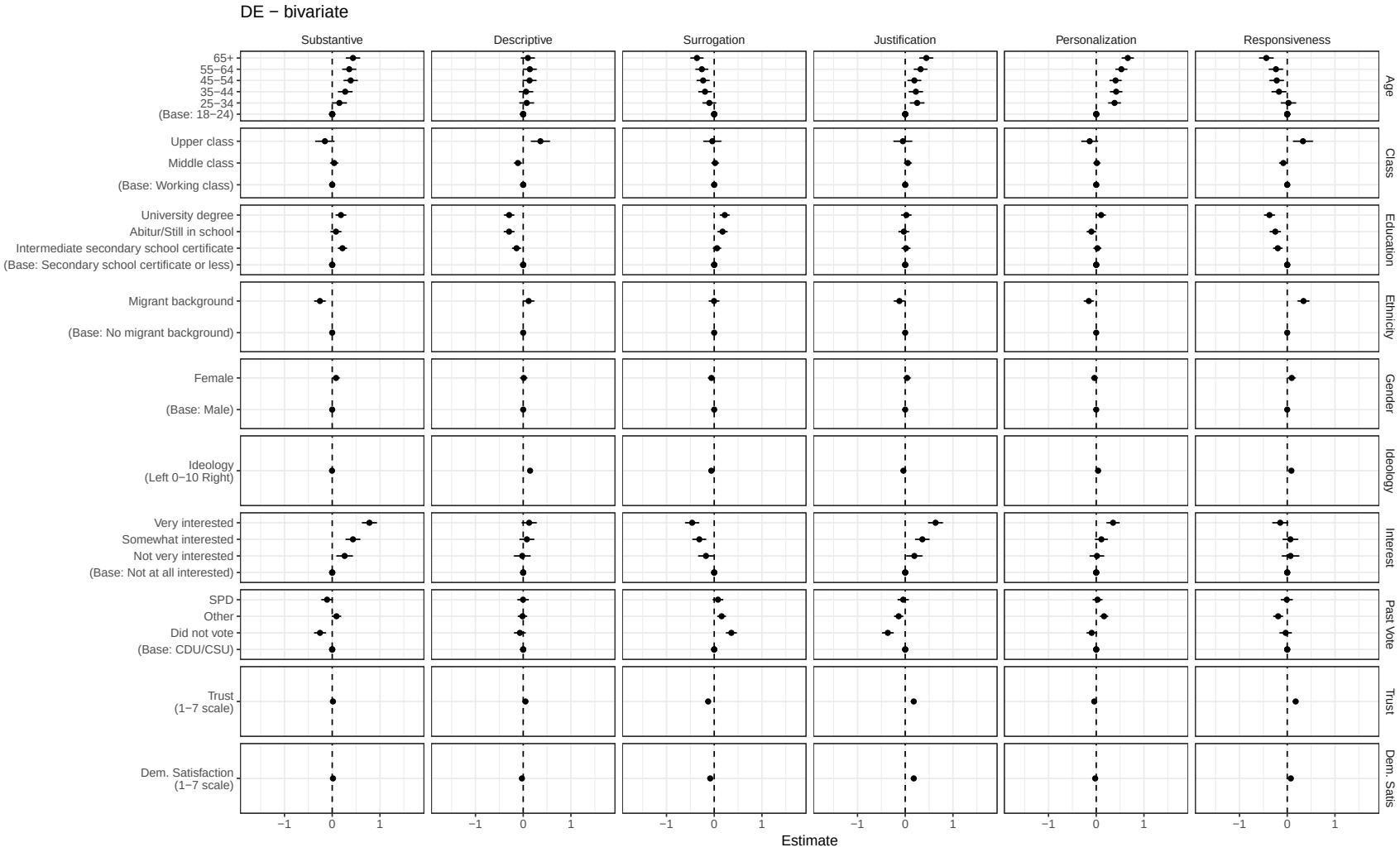

Figure A14: Correlates of factor scores: Full German sample.

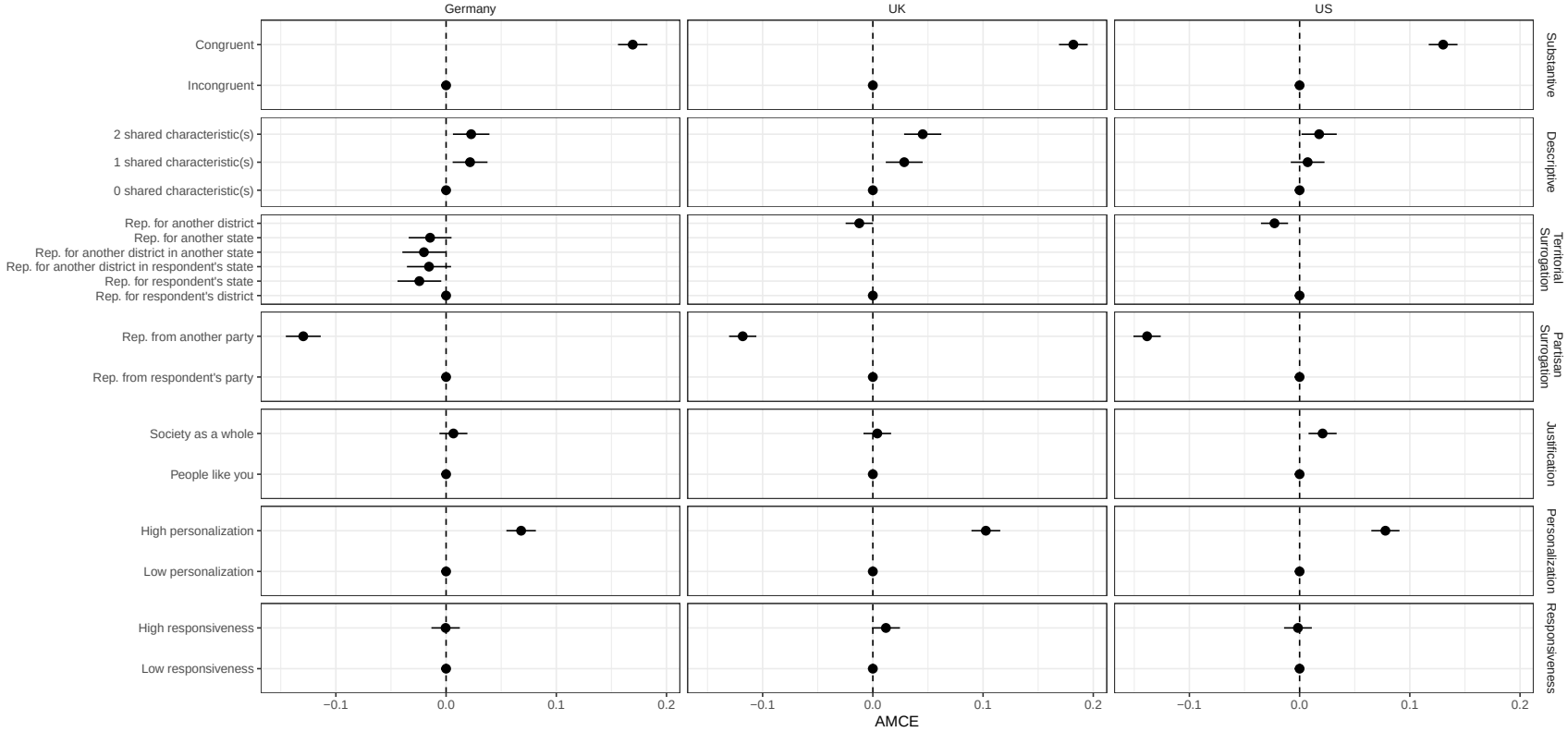

Figure A15: Average Marginal Component Effects – Full Sample.

Appendix M Correcting for multiple comparisons

Figures A17, A18, A19, and A16 replicate the main results from the paper but additionally indicate the significance of each estimate at the 95% confidence level after adjusting the estimated p-values for multiple comparisons. In particular, we apply a separate Benjamini and Hochberg (1995) correction to the estimates presented in each figure. Estimates for which the adjusted p-values are smaller than 0.05 are presented in black, while all other estimates are presented in grey.

The results of these analyses are substantively very similar to those presented in the main body of the paper. For instance, in the results of our conjoint analysis displayed in figure A16, only two coefficients that were significant at the 95% in the unadjusted analysis – the descriptive representation attributes and one of the territorial surrogation levels, all in the German data – are no longer significant at the 95% level after adjusting for multiple comparisons (they all remain significant at the 90% confidence level). Similarly, with respect to the analyses in which we estimate the relationships between the six dimensions of representation and various respondent covariates (figures A17, A18, A19), although there are some instances in which the unadjusted and adjusted p-values are somewhat different, these small differences do not affect any of the patterns that we draw attention to in section 6 of the paper.

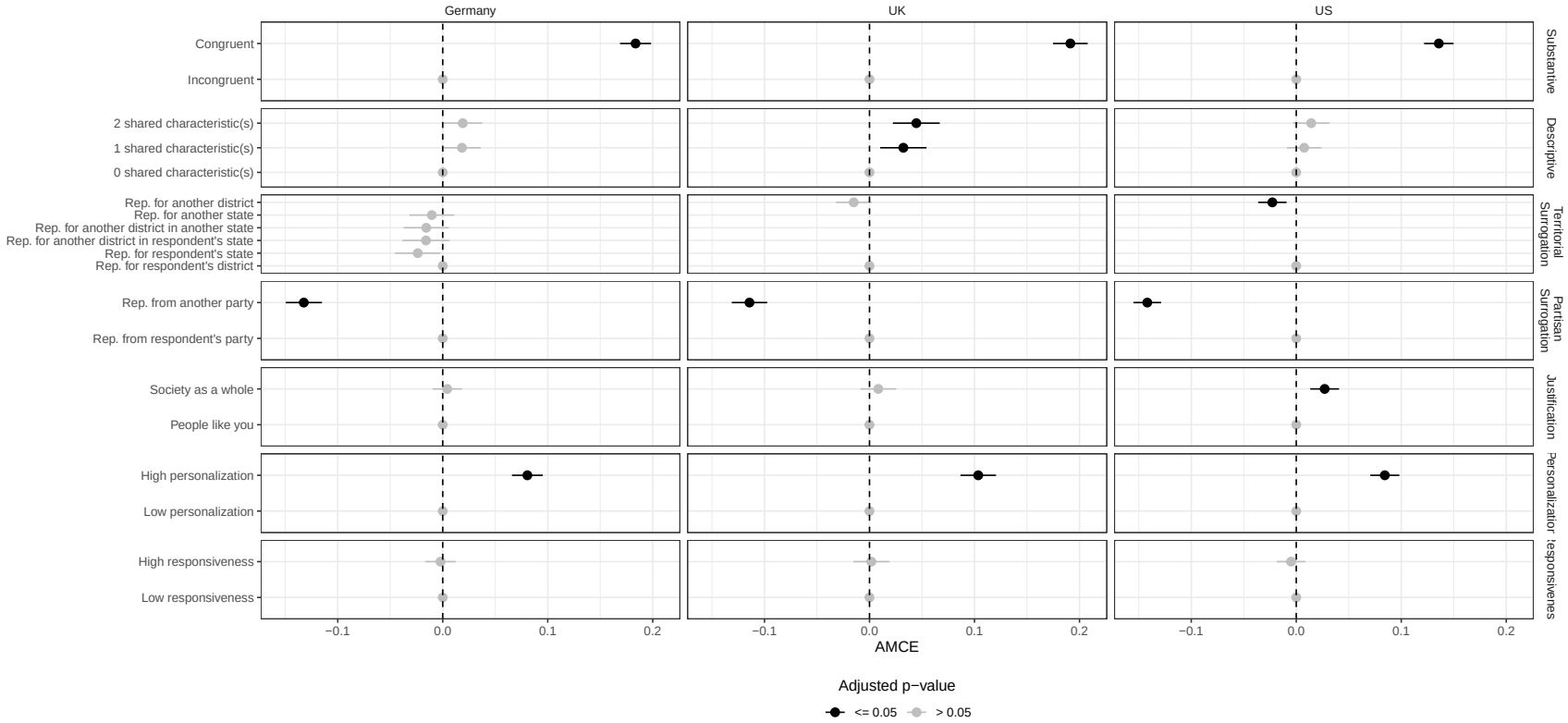

Figure A16: Average Marginal Component Effects.

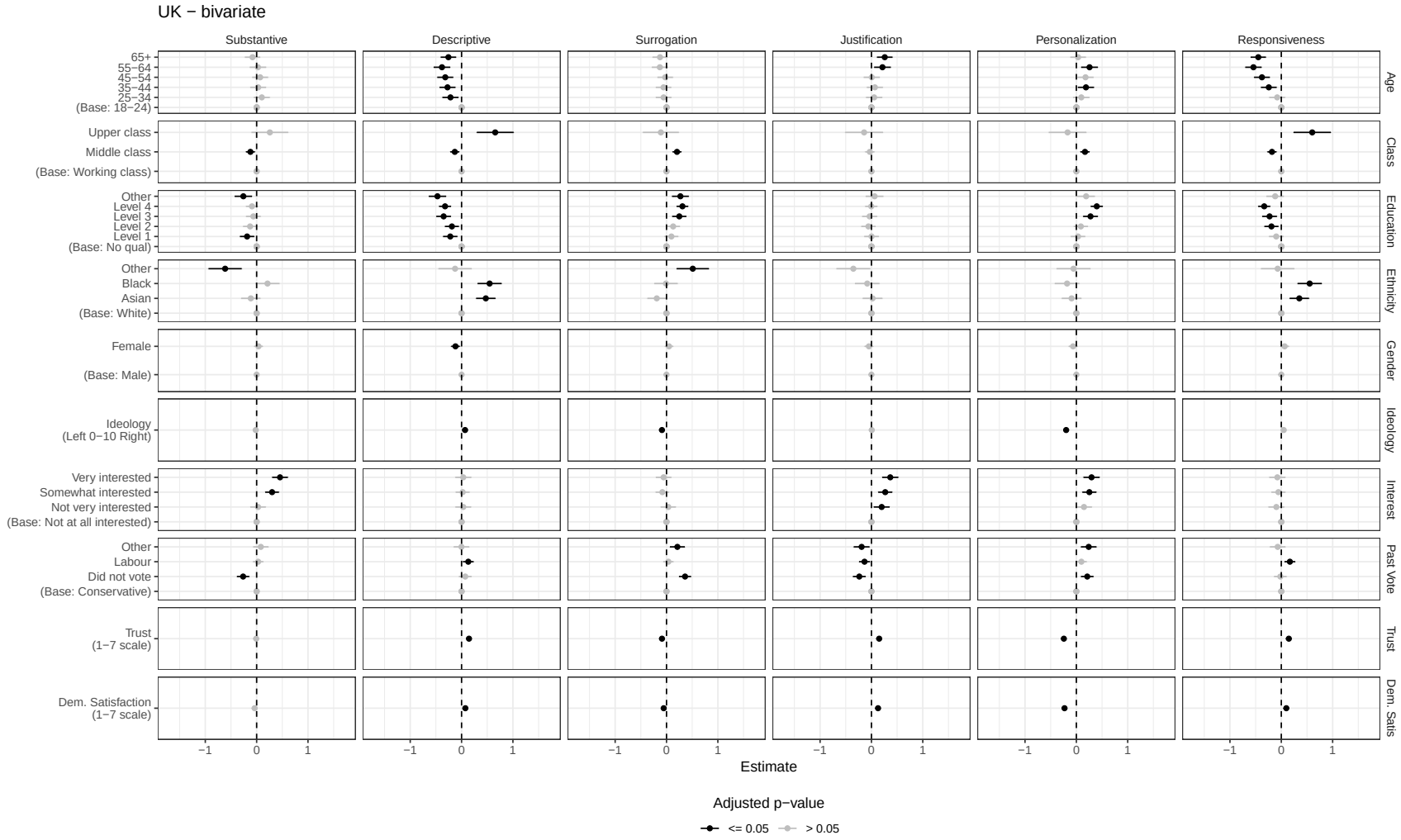

Figure A17: Correlates of factor scores: UK sample.

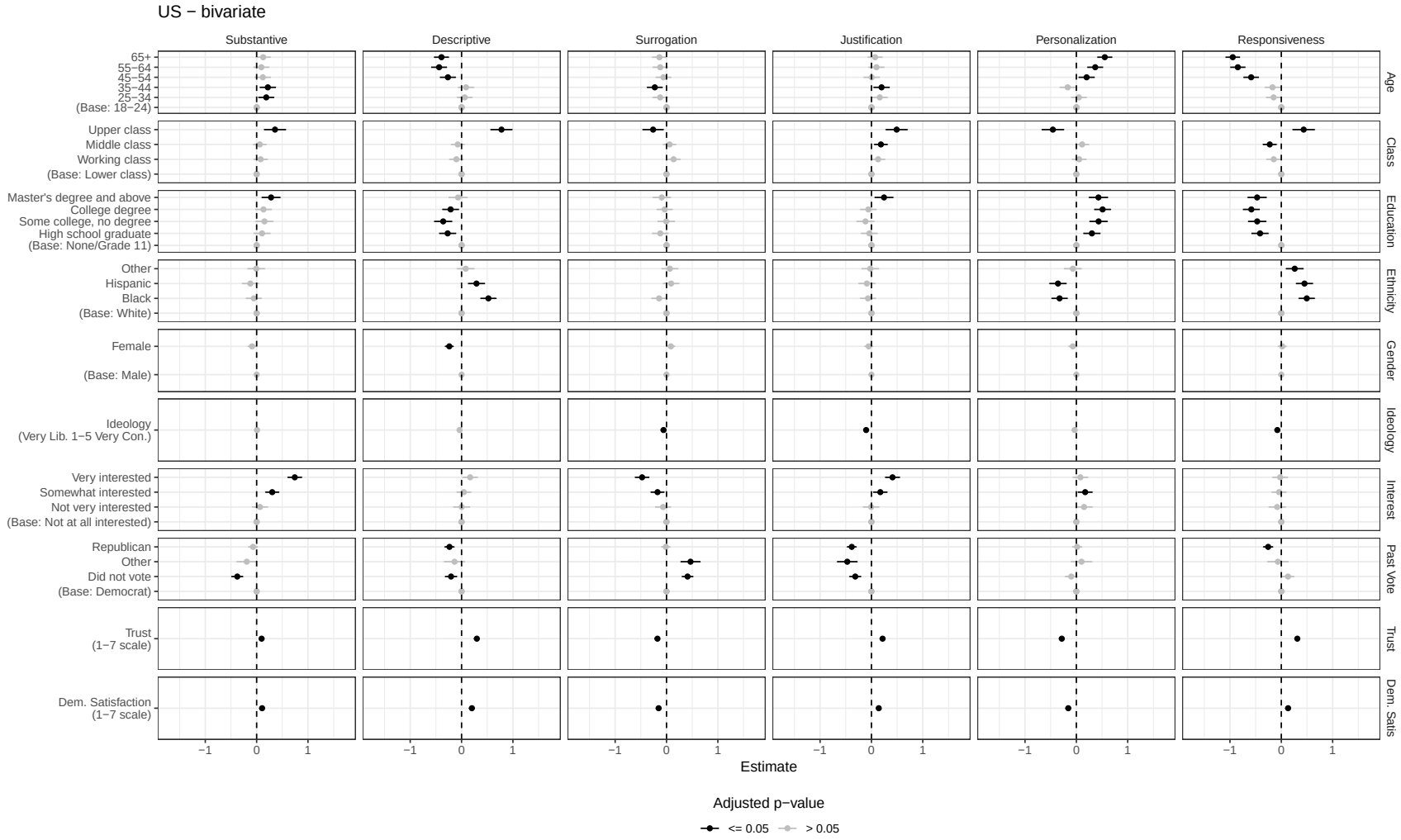

Figure A18: Correlates of factor scores: US sample.

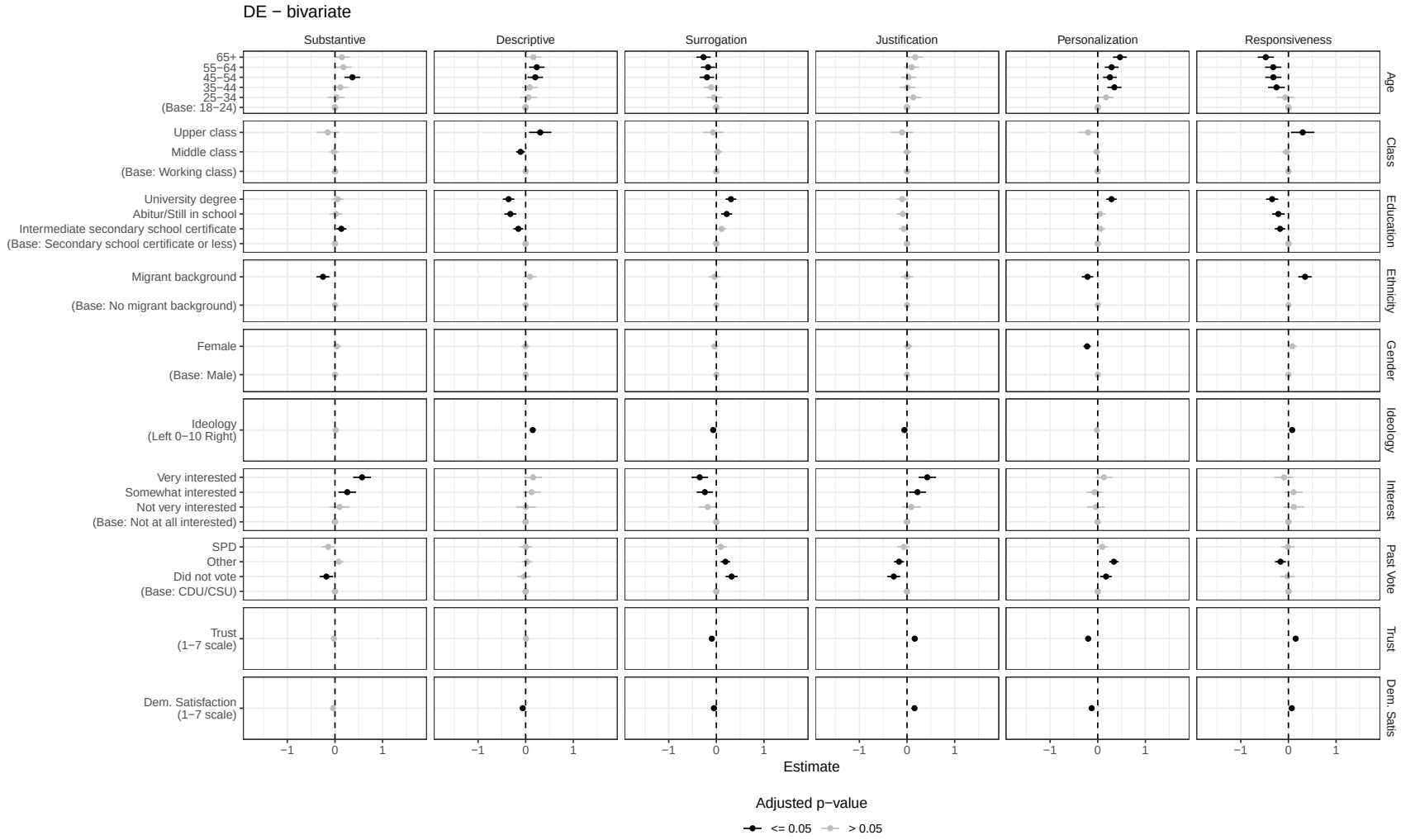

Figure A19: Correlates of factor scores: German sample.

Appendix N Article analysis for country case selection

In this section, we analyze which countries are commonly covered in studies of political representation to identify cases of high interest to scholars of representation. This analysis is based on re-analyzing the random sample of 246 empirical articles on political representation published between 2013 and 2019 in seven leading political science journals that Wolkenstein and Wratil (2021) initially collected to characterize the state of how empirical scholars enegage with political theory. This sample is representative of the wider population of articles published on representation in seven English language journals with high impact factors and reputation: *American Journal of Political Science, American Political Science Review, Journal of Politics, Comparative Political Studies, British Journal of Political Science, European Journal of Political Research* and *West European Politics*. The details of how this sample was constructed can be found in the supporting information of Wolkenstein and Wratil (2021).

We draw on the authors' replication files and checked the data used by each article in their sample, recording all countries from which data was analyzed in each article (e.g. some are single-country studies, some draw on several countries). Our analysis excludes two articles for which we were unable to find out the whole set of countries covered by the data from either the article or the supplementary information as well as 15 articles that included data from a very large amoung of countries (i.e., >40), thereby providing little information about which countries are studied comparatively more often.

Table A10 shows how often a country is covered in the remaining sample of 229 articles. Table A11 shows how often a country is covered as a single case in the articles (i.e., it subsets on articles that only cover data from one country). We can clearly see that the US, Germany and the UK are the most studied cases in recent empirical representation research in these journals. On single-country studies, the US is clearly ahead, but overall across single- and multi-country studies, the frequency of coverage of all three countries is similar.

Appendix O Research ethics

According to the rules of the relevant author's institution this research was exempted from special ethics review under two exemption categories: 1) It is a purely observational (non-invasive and non-interactive) study that poses no risk of harm, stigma or prosecution, given that all participants are residing in advanced liberal democracies providing full freedom to express different preferences on representation. 2) We use a non-sensitive, completely anonymous interview procedure and exclude vulnerable participants (e.g. minors). The applicability of these exemptions was confirmed by the departmental ethics advisor according to the department's ethics review process.

We obtained informed consent from all survey respondents upon entering the survey. The specific consent statement reads as follows: "I consent to participate in this study which will involve questions on my political opinions. I understand that all data will be kept confidential by the researchers. My personal information will not be stored with the data. I am free to withdraw from the study at any time without giving a reason. I consent to the publication of study results as long as the information is anonymous so that no participant can be identified." The survey was terminated for respondents withholding their consent to participate in the research.

As the participant recruitment for the survey was carried out by the survey company Luc.id, which draws on a variety of suppliers to create representative samples, incentive and compensation schemes

Rank	Country	Number of articles
1.	USA	88
2.	Germany	65
3.	UK	62
4.	Netherlands	51
5.	Sweden	48
6.	Spain	41
	Denmark	
7.	Finland	39
8.	France	38
	Austria	
9.	Ireland	36
	Italy	
10.	Portugal	33
	Belgium	
11.	Greece	28
12.	Norway	26
13.	Switzerland	23
14.	Hungary	22
	Poland	
15.	Czech Republic	20

Table A10: Number of articles covering data from different countries

Rank	Country	Number of articles
1.	USA	74
2.	Germany	11
3.	UK	10
4.	Sweden	7
	India	7
5.	Brazil	4
	Norway	4
6.	Switzerland	3
7.	Mexico	2
	Netherlands	2

Table A11: Number of single-country articles covering data from different countries

for participation may have varied widely, depending through which supplier a participant enters the survey. Compensation schemes by Luc.id suppliers include, among others, providing loyalty reward points, gift cards, or cash payments. Given that we paid 0.90 euro per US respondent and 1.00 euro per UK or German respondent to Luc.id, the monetary value of any compensation granted to participants must have been very limited. This limited compensation of participants corresponds to the very limited effort participants had to invest in research participation (i.e., median response time was 11 minutes). Granting more substantial compensation to participants could have compromised their ability to freely provide or withhold their consent to participate in the research.

Note that we avoid deception in the conjoint experiment by telling respondents before the first choice task that we will show them *hypothetical* MPs/congressmen/congresswomen.

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