

Online appendix

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Online appendix A: Translation of the eight populist items

France

item number	Exact wording of the item
populism_1	Les hommes politiques qui constituent le Parlement français doivent suivre la volonté des gens
populism_2	Les gens, et non les hommes politiques, devraient prendre les décisions en ce qui concerne les mesures les plus importantes
populism_3	Les différences politiques qui existent entre l'élite et les gens sont plus grandes que les différences entre les gens
populism_4	Je préférerais être représentée par un(e) citoyen(ne) ordinaire que par un homme politique
populism_5	Les personnes élues à des postes officiels parlent trop et n'agissent pas assez
populism_6	Ce que les gens appellent un "compromis" en politique n'est en fait qu'une manière de trahir ses propres principes
populism_7	Les propres intérêts de la classe politique affectent de manière négative le bien-être des gens
populism_8	Les hommes politiques finissent toujours par se mettre d'accord lorsqu'il s'agit de protéger leurs privilèges

Germany

item number	Exact wording of the item
populism_1	Die Politiker im Deutschen Bundestag müssen sich nach dem Willen des Volkes richten
populism_2	Das Volk – und nicht die Politiker – sollte unsere wichtigsten politischen Entscheidungen fällen
populism_3	Die politischen Unterschiede zwischen der Elite und dem Volk sind größer als die Unterschiede innerhalb des Volkes
populism_4	Ich würde es vorziehen, von einem Bürger anstatt eines Berufspolitikers repräsentiert zu werden
populism_5	Mandatsträger reden zu viel und handeln zu wenig
populism_6	Was als "politischer Kompromiss" bezeichnet wird, ist im Grunde nur Verrat an den eigenen Grundsätzen
populism_7	Die spezifischen Interessen der politischen Klasse haben negative Auswirkungen auf das Wohlbefinden des Volkes
populism_8	Politiker stimmen letztendlich immer zu, wenn es um den Schutz ihrer Privilegien geht

Greece

item number	Exact wording of the item
populism_1	Oi politikoi sto ellinikó koinovoúlio prépei na akolouthoún ti voúlisi tou laou
populism_2	O laós, kai óchi oi politikoi, tha prépei na lamvánei tis simantikóteres apofáseis politikis
populism_3	Oi politikés diaforés anámesa stin elit kai ton laó einai megalýteres apó tis diaforés metaxý anthrópon tou laou
populism_4	Tha protimoúsa na me ekprosopei énas politis pará énas epangelmatías politikós
populism_5	Oi eklegménoi axiomatoúchoi miloún polý kai droun lígo
populism_6	Aftó pou oi ánthropoi onomázoun "symvivasmó" stin politikí einai stin pragmatikótita xepoúlima ton archón kápoiou
populism_7	Ta idiaítera symféronta tis politikis táxis epireázoun arnitiká tin evimería tou laou
populism_8	Oi politikoi pánta symfonoún sto télos an einai na prostatéfsoun ta pronómia tous

Italy

item number	Exact wording of the item
populism_1	I politici nel parlamento italiano hanno bisogno di seguire la volontà del popolo
populism_2	Le persone, e non i politici, dovrebbero prendere le nostre decisioni politiche più importanti
populism_3	Le differenze politiche fra l'élite e le persone comuni sono maggiori delle differenze fra le persone stesse
populism_4	Preferirei essere rappresentato/a da un cittadino piuttosto che da un politico specializzato
populism_5	I funzionari eletti parlano troppo e agiscono poco
populism_6	Quello che le persone chiamano "compromesso" in politica significa in realtà rinunciare ai propri principi
populism_7	Gli interessi particolari della classe politica hanno un effetto negativo sul benessere delle persone
populism_8	I politici finiscono sempre per mettersi tutti d'accordo quando si tratta di proteggere i propri privilegi

Poland

item number	Exact wording of the item
populism_1	Politycy w polskim parlamencie powinni działać zgodnie z wolą wyborców
populism_2	Obywatele, a nie politycy powinni podejmować najważniejsze decyzje
populism_3	Różnice pomiędzy elitami a przeciętnymi obywatelami są większe niż między samymi obywatelami
populism_4	Wolał(a)bym, aby reprezentował mnie zwykły obywatel, a nie polityk
populism_5	Wybrani przedstawiciele za dużo mówią, a za mało robią
populism_6	“Kompromis” w polityce oznacza w praktyce rezygnację z własnych poglądów
populism_7	Partykularne interesy klasy politycznej mają negatywny wpływ na dobro społeczeństwa
populism_8	Politycy zawsze dochodzą do porozumienia, gdy chodzi o ochronę ich przywilejów

Spain

item number	Exact wording of the item
populism_1	Los diputados deben seguir la voluntad del pueblo
populism_2	El pueblo, y no los políticos, debería tomar las decisiones políticas más importantes
populism_3	Las diferencias políticas entre la élite y la gente son mayores que las diferencias dentro de la misma gente
populism_4	Preferiría estar representado por un ciudadano que por un político profesional
populism_5	Los cargos electos hablan demasiado y hacen demasiado poco
populism_6	En política, se llama consenso a lo que realmente significa renunciar a los propios principios
populism_7	Los intereses particulares de la clase política afectan negativamente al bienestar del pueblo
populism_8	Los políticos siempre acaban poniéndose de acuerdo cuando se trata de proteger sus privilegios

Sweden

item number	Exact wording of the item
populism_1	Politikerna i Sveriges riksdag ska följa folkets vilja
populism_2	Det är folket, inte politikerna, som ska fatta de viktigaste politiska besluten
populism_3	De politiska skillnaderna mellan eliten och folket är större än skillnaderna inom folket
populism_4	Jag skulle hellre representeras av en medborgare än en renodlad politiker
populism_5	De beslutfattare i offentlig sektor pratar för mycket och agerar för lite
populism_6	Det folk kallar “kompromissa” inom politiken handlar snarare om att överge principer
populism_7	Den politiska elitens intressen har ett negativt inflytande på folkets välfärd
populism_8	Det slutar alltid med att politikerna kommer överens om det som gynnar

Switzerland – French

item number	Exact wording of the item
populism_1	Les hommes politiques qui constituent le Parlement suisse doivent suivre la volonté des gens
populism_2	Les gens, et non les hommes politiques, devraient prendre les décisions en ce qui concerne les mesures les plus importantes
populism_3	Les différences politiques qui existent entre l'élite et les gens sont plus grandes que les différences entre les gens
populism_4	Je préférerais être représentée par un(e) citoyen(ne) ordinaire que par un homme politique
populism_5	Les personnes élues à des postes officiels parlent trop et n'agissent pas assez
populism_6	Ce que les gens appellent un “compromis” en politique n'est en fait qu'une manière de trahir ses propres principes
populism_7	Les propres intérêts de la classe politique affectent de manière négative le bien-être des gens
populism_8	Les hommes politiques finissent toujours par se mettre d'accord lorsqu'il s'agit de protéger leurs privilèges

Switzerland – German

item number	Exact wording of the item
populism_1	Die Politiker im Schweizer Bundestag müssen sich nach dem Willen des Volkes richten
populism_2	Das Volk – und nicht die Politiker – sollte unsere wichtigsten politischen Entscheidungen fällen
populism_3	Die politischen Unterschiede zwischen der Elite und dem Volk sind größer als die Unterschiede innerhalb des Volkes
populism_4	Ich würde es vorziehen, von einem Bürger anstatt eines Berufspolitikers repräsentiert zu werden
populism_5	Mandatsträger reden zu viel und handeln zu wenig
populism_6	Was als “politischer Kompromiss” bezeichnet wird, ist im Grunde nur Verrat an den eigenen Grundsätzen
populism_7	Die spezifischen Interessen der politischen Klasse haben negative Auswirkungen auf das Wohlbefinden des Volkes
populism_8	Politiker stimmen letztendlich immer zu, wenn es um den Schutz ihrer Privilegien geht

United Kingdom

item number	Exact wording of the item
populism_1	The politicians in the UK parliament need to follow the will of the people
populism_2	The people, not the politicians, should make our most important policy decisions
populism_3	The political differences between the people and the elite are larger than the differences among the people
populism_4	I would rather be represented by an ordinary citizen than an experienced politician
populism_5	Elected officials talk too much and take too little action
populism_6	What people call “compromise” in politics is really just selling out on one’s principles
populism_7	The particular interests of the political class negatively affect the welfare of the people
populism_8	Politicians always end up agreeing when it comes to protecting their privileges

Online appendix B: Descriptive statistics

In this section, we provide some graphical representations and exploratory analyses of the populist items. First, we include visualisations and distributions of the proposed populist items. Then, we discuss a number of specific item properties. Altogether, this allows us to get initial insights into the characteristics of the populist items.

B.1 Distributions of populist items

Figure B1.1 illustrates the distribution of the populism scale (sum of all items), per country. It shows that the distribution of total scores, or the distribution of the populism scale, is very much skewed to the right, yielding a median/mean value of approximately 30. This indicates that few participants chose the lowest categories of the populist items, namely “disagree strongly” (value = 1) and “disagree” (value = 2). This results in a loss of statistical variance at the lower ends of the scales and typically indicates a ceiling effect, which occurs when there is a large concentration of responses at the upper limit of the scale’s potential responses.

Figure B1.1: Distribution of total summed scores per country

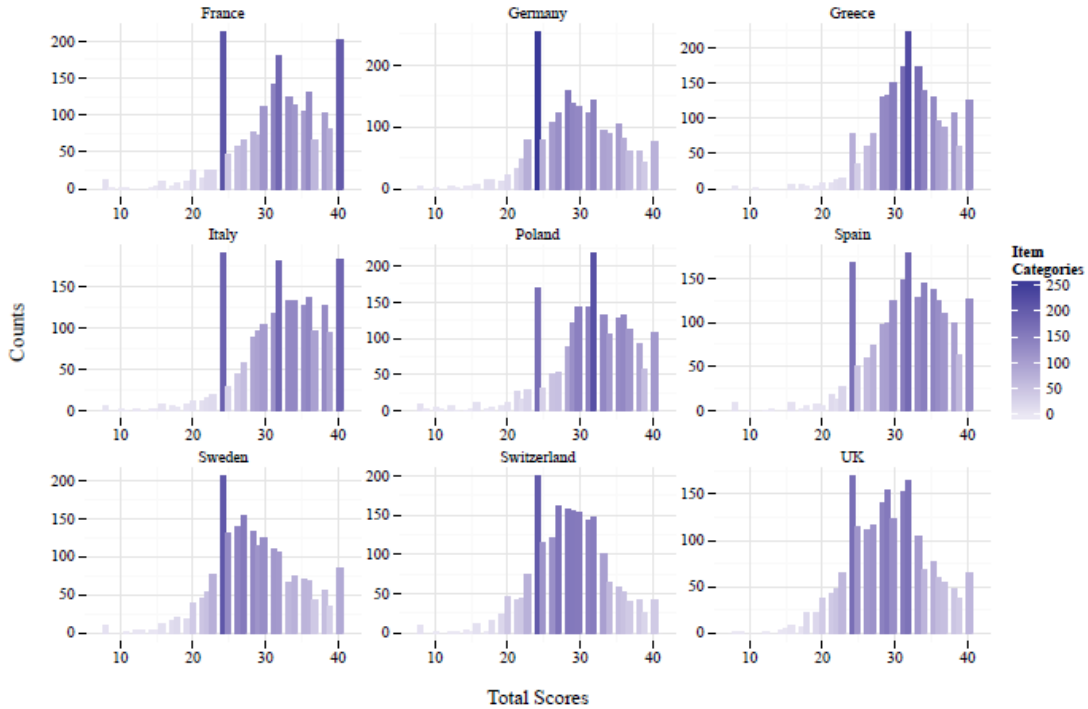


Figure B1.2 harmonises the above graphic representations and illustrates overlapping distributions of an additive populism scale. The graph is particularly insightful because it highlights country differences in a clear manner. For example, Greece and Italy seem to have the most left-skewed distributions of populist attitudes and hence show the highest values of populist attitudes, especially at the most extreme levels. Respondents in Switzerland, Sweden and the UK show relatively less affinity towards populist attitudes, as scores are concentrated at a lower range.

Figure B1.2: Distribution of total scores

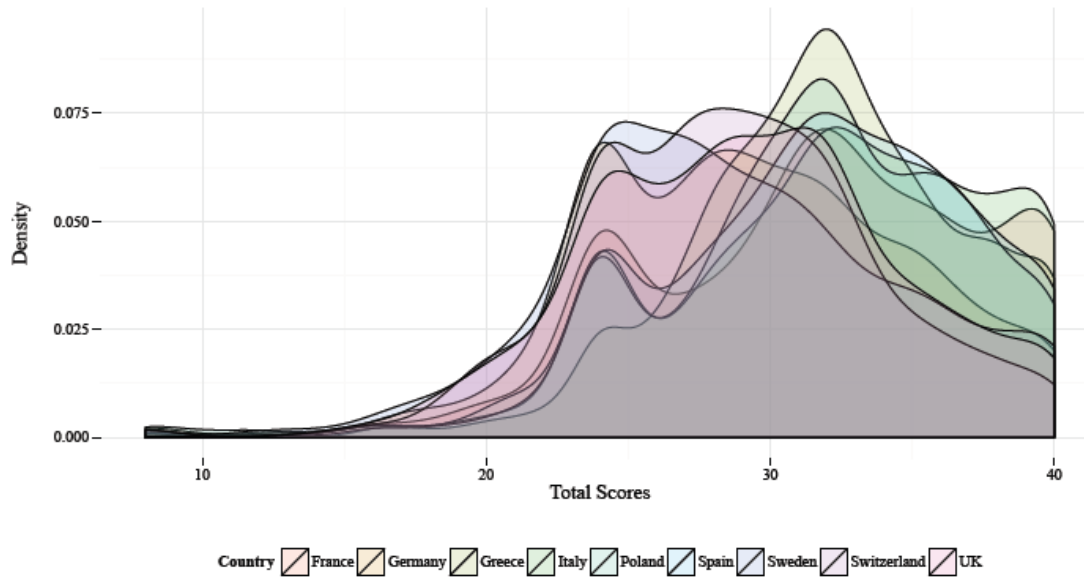
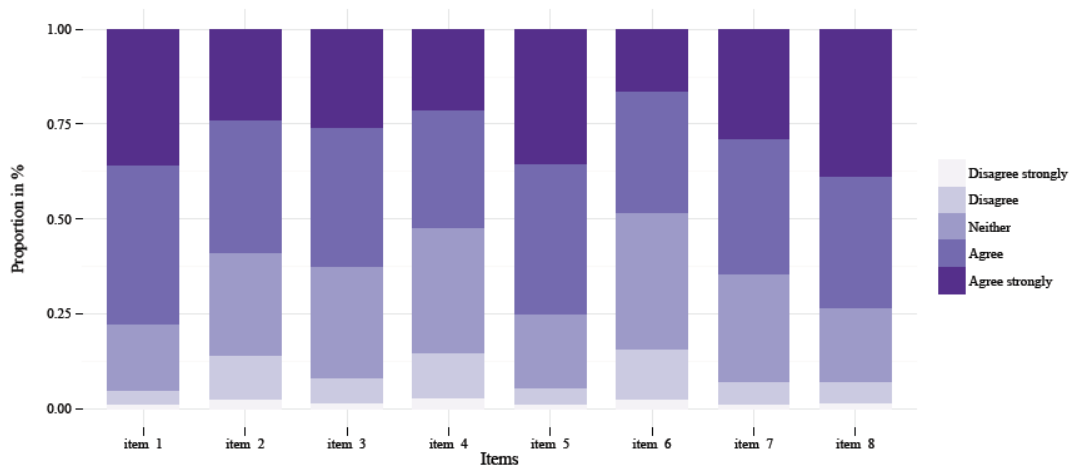


Figure B1.3 illustrates the cross-country distribution of responses per item (labelled item 1 = populism_1, item 2 = populism_2, etc.). It shows that fewer people were indifferent to items one, five and eight (and more agreement), while item 6 seems to elicit the opposite effect. Items two, four and six seem to draw the most disagreement across countries. Lastly, in line with Figure B1.2, it is clear that only a minimal number of respondents chose the category “disagree strongly” across countries.

Figure B1.3: Proportion of response categories, per item across countries



In Figures B1.4 and B1.5 we also include the distribution of the answer categories of individual items and the additive scale within each country, respectively.

Figure B1.4: Distribution of response categories, per item per country

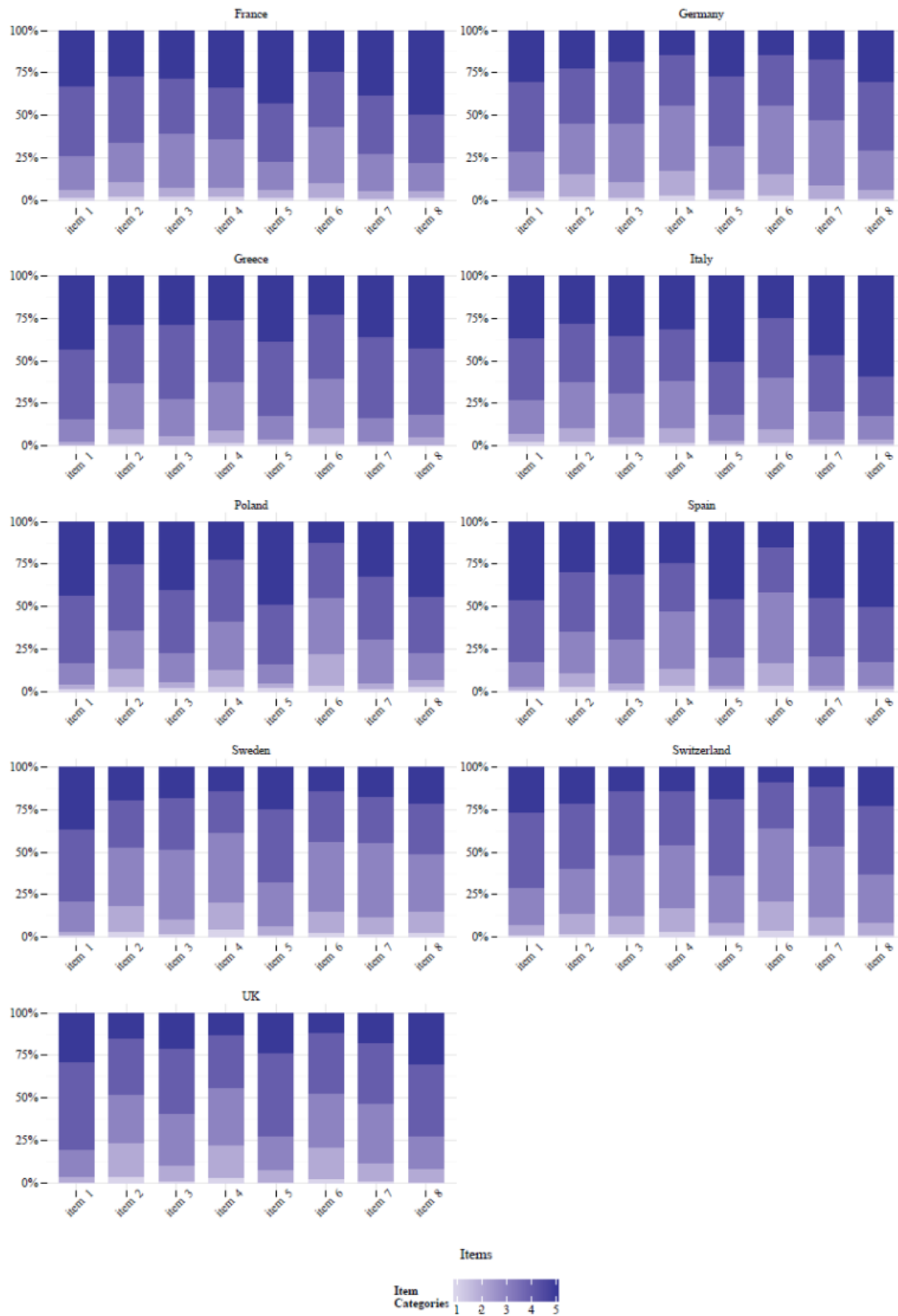
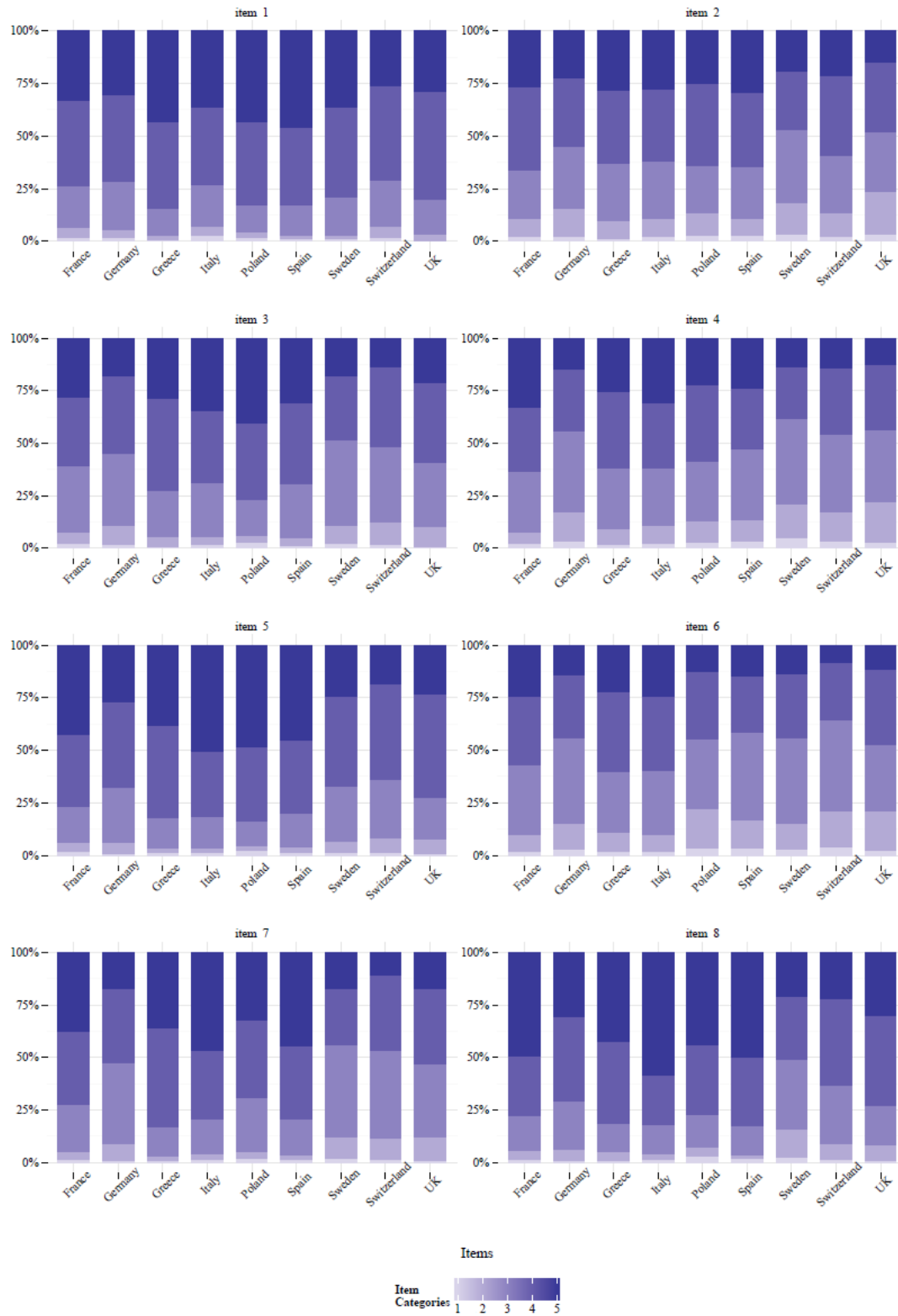


Figure B1.5: Distribution of response categories, per country across items



B.2 Item properties

We select a number of specific item properties that facilitate the introduction of and complement the main text’s IRT analysis. First, we include descriptive item-level response statistics to evaluate data quality and scaling evolution (i.e. appropriate use of response categories). We then include inter-item and item-to-total correlations to evaluate scaling assumptions (i.e. strength of relationships, local dependencies). We subsequently apply an exploratory factor analysis to evaluate dimensionality. Finally, we include several measures of internal consistency to evaluate reliability. We repeat the last three steps for all three scales in the text namely, the 8-item scale and the 6-item scale.

Data quality and scale evaluation

Table B2.1 provides the overall item-level descriptive statistics. These summaries inform how each particular item fairs across Europe. The results indicate a higher agreement on item one (Mean = 4.07, SD = 0.89), followed closely by items five and eight. The item that draws the least consensus is item six (Mean = 3.46, SD = 1.00), followed by item four. Moreover, for all items the median is four, which – on a scale ranging from one to five – is not desirable because it signals items generally tend to elicit agreement. Only item six passes this criterion (Median = 3).

The standard error (SE) for all items is extremely low, most likely due to a large sample size (+/- 20,000). Incidentally, the statistics related to location (skewness) and variability (kurtosis) of the items’ respective distributions present numerous challenges. The mean across items is relatively high (3.80), and has a moderate skew to the right (-0.41) and a moderate peak (0.26). This observation corroborates that – across items – agreement response categories are more likely to be chosen than the neutral and disagreement categories, which could indicate ceiling effects and a possible acquiescent bias.

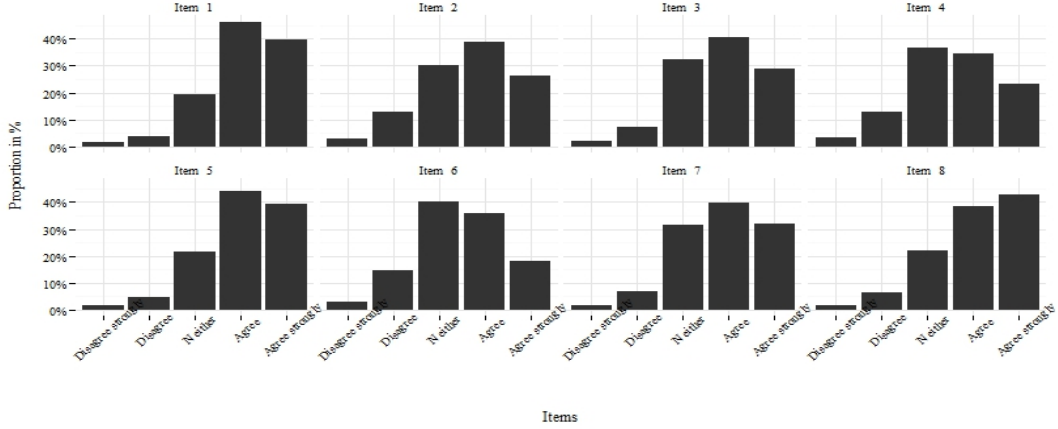
Table B2.1: Descriptive statistics of populist items across countries

	Mean	SD	Trimmed mean	Median	SE	Skewness	Kurtosis
populism_1	4.07	0.89	4.17	4	0.01	-0.91	0.77
populism_2	3.66	1.04	3.73	4	0.01	-0.44	-0.48
populism_3	3.78	0.96	3.85	4	0.01	-0.46	-0.21
populism_4	3.56	1.04	3.61	4	0.01	-0.31	-0.49
populism_5	4.03	0.92	4.13	4	0.01	-0.82	0.40
populism_6	3.46	1.00	3.48	3	0.01	-0.20	-0.44
populism_7	3.84	0.95	3.91	4	0.01	-0.48	-0.28
populism_8	4.03	0.97	4.15	4	0.01	-0.83	0.16
Total	3.80	0.71	3.82	4	0.01	-0.41	0.26

To that end, the histogram in Figure B2.1 displays the distribution of responses per item, aggregated across countries. It reveals that certain items have difficulties drawing disagreement. This is the case for populism_1, populism_3, populism_5, populism_7 and populism_8, thereby hinting at a ceiling effect. On average, only two per cent of respondents choose the category “disagree strongly” and five per cent “disagree”. Taken

together, these statistics indicate the populist items likely suffer from acquiescence bias. That is to say, respondents who are in doubt are more likely to agree than disagree, which is likely to be caused by respondents' perception of the items' formulation as truisms (Knowles and Nathan, 1997; Wright, 1975).

Figure B2.1: Histograms of response categories, per item



Scaling assumptions

In order to assess inter-item and item-to-total correlations, we use bootstrapped polychoric correlations. This method is a suitable tool to (i) evaluate the strength of inter-item relationships between normally distributed continuous latent variables when these are ordinal; (ii) consider the appropriateness of scoring them together on a single scale, and (iii) investigate local dependency.

Table B2.2: Bootstrapped polychoric correlations

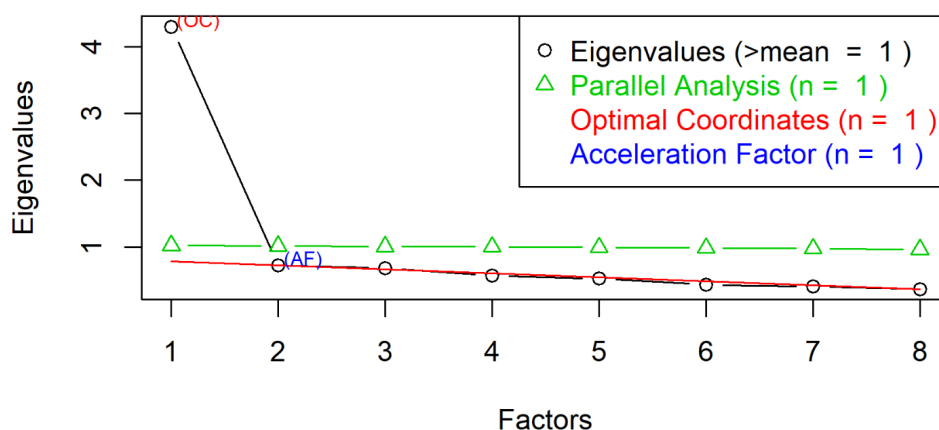
	populism_1	populism_2	populism_3	populism_4	populism_5	populism_6	populism_7	populism_8	Total
populism_1	1	0.56	0.51	0.47	0.57	0.40	0.52	0.54	0.74
populism_2	0	1	0.49	0.60	0.52	0.47	0.51	0.51	0.77
populism_3	0	0	1	0.49	0.59	0.46	0.62	0.60	0.78
populism_4	0	0	0	1	0.55	0.47	0.55	0.54	0.77
populism_5	0	0	0	0	1	0.52	0.66	0.71	0.85
populism_6	0	0	0	0	0	1	0.50	0.52	0.71
populism_7	0	0	0	0	0	0	1	0.70	0.84
populism_8	0	0	0	0	0	0	0	1	0.85
Total	0	0	0	0	0	0	0	0	1

Table B2.2 includes both inter-item and item-to-total association measures, with the upper diagonal part containing the correlation coefficient estimates and the lower diagonal part containing the corresponding p-values at $\alpha = 0.05$. All inter-item correlation coefficients are significant and below 0.80, which indicates they are positively, yet not too highly, correlated.

Dimensionality (8-item scale)

Psychometric theory shows that departures from single dimensionality have the potential to undermine the results of any approach whose foundations are grounded on this assumption (Kulas et al., 2008). For parametric analysis, a dominant factor is vital because one-dimensionality assures the estimation of trait levels is not affected by variance ensuing from minor factors. Accordingly, to test the assumptions of one-dimensionality and local independence, we conduct an exploratory factor analysis of the populist scale. We refrain from using principal component analysis (PCA), which is an analytical technique that extracts linear composites of observed variables and thereby only reduces complex correlated data into a smaller set of independent composite variables. A factor analysis, meanwhile, is a formal model that can predict observed variables from latent factors (Comrey, 1988).

Figure B2.2: Scree plot of the explanatory factor analysis (8-item scale)



In this analysis, we primarily rely on Eigenvalues to estimate the number of relevant factors. Figure B2.2 indicates there is one primary factor (EV = 4.33; 53 per cent explained variance) for the 8-item scale, which is further confirmed by four separate test criteria: optimal coordinates, acceleration factor, parallel analysis and the Kaiser rule. This is largely supported by the VSS criterion, which is 0.89 for one factor and 0.91 for two factors – thereby suggesting only a small, explanatory gain in fit by adopting a two-dimensional assumption. Also in line with this is the Velicer MAP indicator (0.03 with one factor), which is a particularly robust test to indicate one-dimensionality.¹ Altogether, these statistics suggest the assumption of a single underlying populist dimension is appropriate. Lastly, in further examining the EFA output, we find relatively equivalent factor loadings and reasonably uncorrelated error variances, as Table B2.3 shows.

Dimensionality (6-item scale)

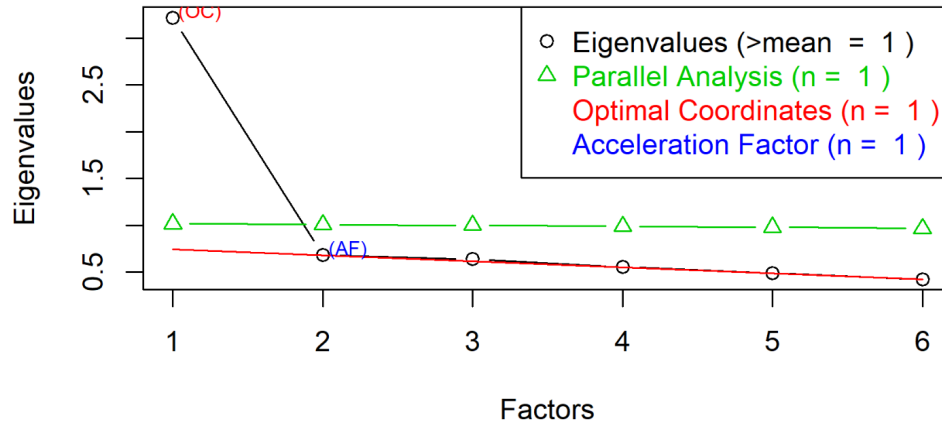
Similar to our tests of the 8-item scale, we have conducted a series of tests for the original Akkerman et al. (2014) 6-item scale.

¹Velicer MAP and Parallel Analysis are considered one of the most reliable approaches when deciding on the number of factors as their results are accurate and show little variation (Velicer, 1976; Henson and Roberts, 2006).

Table B2.3: Factor loadings – one factor solution (8-item scale)

	Factor loadings	Uniqueness	Mean correlations of error variance
populism_1	0.64	0.60	−0.12
populism_2	0.70	0.51	−0.11
populism_3	0.66	0.56	−0.12
populism_4	0.68	0.53	−0.12
populism_5	0.72	0.49	−0.13
populism_6	0.60	0.65	−0.12
populism_7	0.77	0.41	−0.13
populism_8	0.77	0.41	−0.14

Figure B2.3: Scree plot of the explanatory factor analysis (6-item scale)



Like for the 8-item scale, we find that there is one primary factor in the data. The VSS criterion is 0.84 for one factor and 0.07 for two factors – again suggesting only a small, explanatory gain in fit by adopting a two-dimensional assumption. The Velicer MAP indicator further supports this (0.05 with one factor). Table B2.4 shows the results from the factor analysis.

Reliability

Although very popular, Cronbach's alpha generally underestimates the reliability of a test and overestimates the first factor saturation. Moreover, Cronbach's alpha requires that the assessed instrument meets strict criteria in order for it to yield an accurate measure of test reliability, namely equivalent factor loadings (tau-equivalence), uncorrelated error variances and one-dimensionality. In view of that, we advocate for other (less demanding and) superior measures of reliability, which do not only relax the above assumptions but are also more reliable against departures from dimensionality. Hence, we report several reliability measures in Table B2.5.

Altogether, we show that the distribution of response categories is skewed and presents ceiling effects that could indicate acquiescence bias. Moreover, at the scale level, inter-item correlations and item-total correlations for both scales indicate it is appropriate

Table B2.4: Factor loadings – one factor solution (6-item scale)

	Factor loadings	Uniqueness
populism_1	0.64	0.60
populism_2	0.70	0.51
populism_3	0.66	0.56
populism_4	0.68	0.53
populism_5	0.72	0.49
populism_6	0.60	0.65

Table B2.5: Reliability measures for the 6-item and 8-item scales

Measure	6-item scale	8-item scale
Revelle's β	0.75	0.77
McDonald's ω H	0.80	0.78
Guttman's λ_6	0.80	0.87
Cronbach's α	0.83	0.88
Cronbach's α range	0.79 – 0.81	0.85 – 0.87
Inter-item correlations (mean)	0.44	0.47
Item-total correlations (mean)	0.73	0.73

to combine the items into a harmonised scale for our main analyses (see main text). Furthermore, we have also verified the scale's one-dimensionality, as well as its tau-equivalence and uncorrelated error variance. Lastly, the scales show internal consistency and robust reliability.

Online appendix C: Populist and non-populist parties

To distinguish between support for non-populist and populist parties, we used the prospective part support variable from the same dataset. Here, respondents were asked which party they would support if the election took place the day after the interview was conducted. We follow [van Kessel \(2015\)](#) and the subsequent expansion by [Van Hauwaert and van Kessel \(2018\)](#). Specifically, we consider a preference for the following parties as a preference for a populist party: Five Star Movement (M5S), Forza Italia (FI) and Northern League (LN) (Italy); Alternative for Germany (AfD) and the Left (Linke) (Germany); National Front/Rally (FN/RN) (France)²; Sweden Democrats (SD); Swiss People's Party (SVP); UK Independence Party (UKIP) and British National Party (BNP); Law and Justice (PiS) and Kukiz'15 (Poland); LAOS and SYRIZA (Greece), and Podemos (Spain).³ All other party choices are coded as non-populist parties. Table C1 includes an overview of the number of respondents who support a populist party in each country.

Table C1: Populist and non-populist party supporters, per country

	Non-populist party supporters	Populist party supporters	Total
France	1,186	392	1,578
Germany	1,377	377	1,754
Greece	1,044	858	1,902
Italy	860	880	1,740
Poland	903	874	1,777
Spain	1,402	423	1,825
Sweden	1,394	468	1,862
Switzerland	1,142	420	1,562
UK	1,673	230	1,903
Total	12,955	2,948	15,903

²While many argue France also has a left-wing populist party, the former *Front de Gauche*, currently *La France Insoumise*, the survey we use does not include this party as a possible answer category for the prospective vote question. We are thus unable to include it.

³While some might argue for the exclusion of certain parties from this populist classification, we confirm that all results remain substantively the same when excluding individual parties.

Online appendix D: Additional scale comparisons

In this section, we provide results from additional scale comparisons. Similar to relating populist attitudes to vote choice in the corpus of the paper, we compare the association between populist attitudes (using the IRT scores from the three different scales) and four additional variables: satisfaction with democracy, political interest, left-right self-placement, and trust in political parties. We show descriptive results (means and 95% confidence intervals) and report them in Figures D1 to D4.

Figure D1: Association of populist attitudes (IRT scores) and democratic satisfaction, by scale

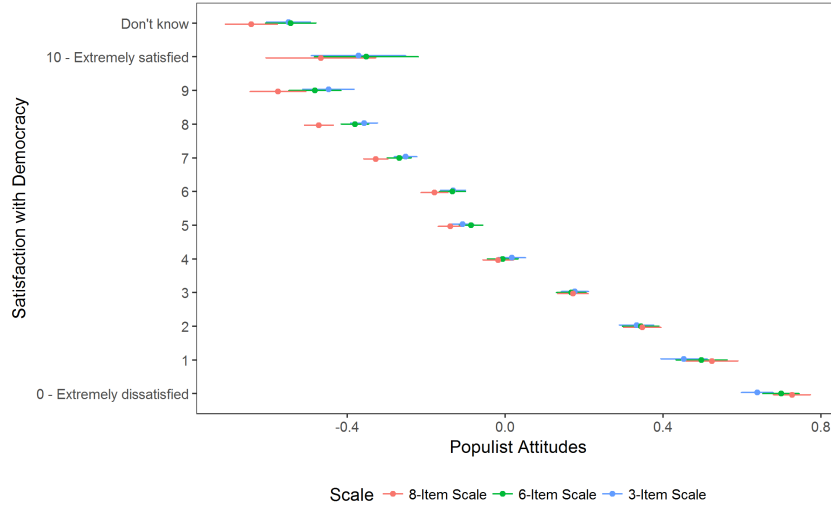
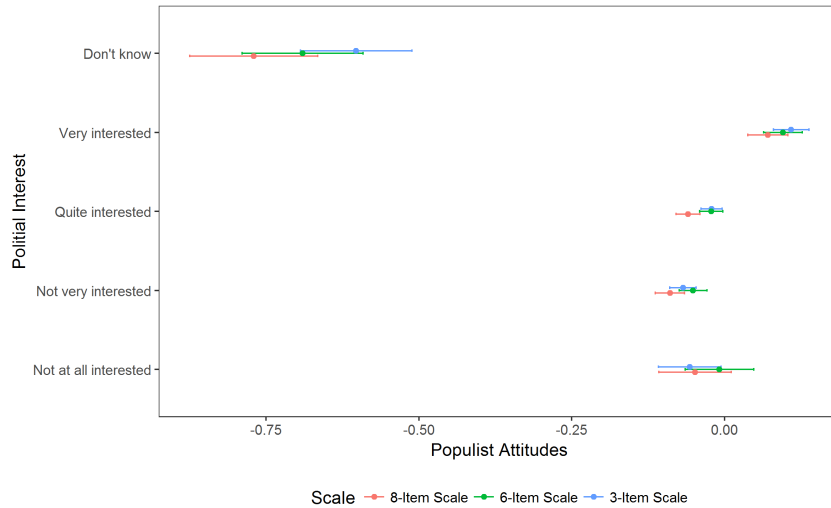


Figure D2: Association of populist attitudes (IRT scores) and political interest, by scale



The take-aways are homogeneous across the four Figures and confirms findings from earlier studies on populist attitudes. Figure D1 confirms the positive correlation between dissatisfaction of democracy and populist attitudes. Figure D2 suggests that those with higher populist attitudes are also more politically interested. And Figure D3 highlights the curvilinear relationship between left-right self-placement and populist attitudes,

Figure D3: Association of populist attitudes (IRT scores) and left-right self-placement, by scale

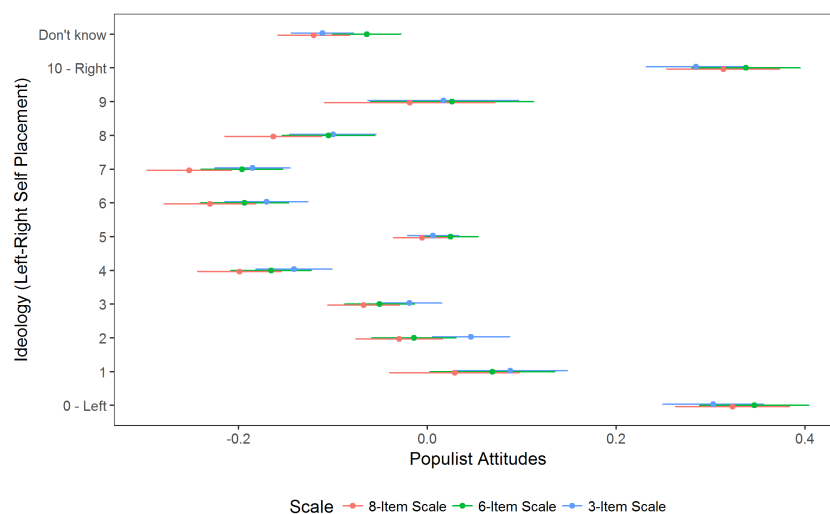
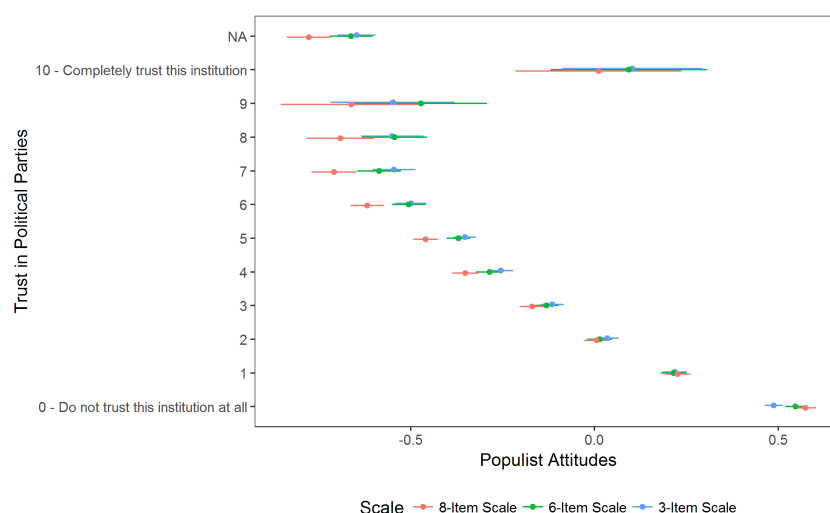


Figure D4: Association of populist attitudes (IRT scores) and trust in political parties, by scale



meaning populist attitudes are more prominent amongst those on the political extremes. Finally, Figure D4 suggests that populist attitudes relate positively to distrust in political institutions. In all Figures, substantive findings for the 3-item, 6-item and 8-item populist scales are nearly the same, indicating the similarity of these scales and their face validity relating to these four common correlates of populist attitudes.

Online appendix E: Invariance tests

To test for measurement invariance, we use multiple group CFA, proceeding in two steps. We first fit a configural model in which one CFA model is fit for each of the nine countries included in the dataset. The second step consists of fitting a model in which we force the factor loadings to be identical across the groups, i.e. the countries. If an item is invariant, the model should not be statistically significantly worse because the item would work similarly across countries. The goodness of fit is measured using the Chi-square statistic and models are compared using the Chi-square difference test (see also [Castanho Silva et al., 2019](#)).

Table E1 shows the results for each of the different scales. In all cases, the scale performs worse when forcing factor loadings to be the same across groups. The results indicate that neither of the three scales combining the items is invariant, especially the six and eight item scales (we report the results for three item scale here for completeness but acknowledge that comparing fits using a single, three-item scale is challenging). And while these results bear some implications for how the tests can be used empirically, it should be noted that establishing cross-country invariance is a general problem that extends to other scales as well (see [Davidov et al., 2014](#)).

Table E1: Testing the different Scales for Metric Invariance

Scale	Chi-square configural	Chi-square loadings	Chi-square diff. (df)	p-value
8-item	3112.3	3808.8	696.48 (56)	< 0.001
6-item	1429.1	1950.9	521.79 (40)	< 0.001
3-item	0	308.31	308.31 (16)	< 0.001

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