

Supplementary Files: When the Whole is Greater Than the Sum of its Parts: On the Conceptualization and Measurement of Populist Attitudes and Other Multi-dimensional Constructs

Shiny Web Application

This study comes with an interactive web application. Providing a simple graphical user interface, the application allows readers to conduct analyses on the data that underlie this study. Specifically, the Shiny Web Application enables users to:

- Calculate the share of populists living in a country according to the Sartori approach, showing the sensitivity of the estimated share of populists to various thresholds
- Calculate the correlation of the Bollen and Goertz populism scores with substantive variables of interest (e.g., political interest, satisfaction with democracy) in multiple countries with multiple populism scales, showing the sensitivity of the estimated correlations to operationalization strategies.
- Show the internal structure of multiple populism scales (distribution and correlation of subdimensions and composite scores) in various countries.

The web application can be accessed at: <http://populism.alexander-wuttke.de>

Reproduction Material

All data that underlie this study and the analytical code with the data was analyzed can be accessed at: <https://doi.org/10.7910/DVN/KPS1KY>

Navigating the Supplementary Files

This study comes with extensive Supplementary Files (see Table of Content below).

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Supplement 1: Overview of operationalization strategies in the literature on populist attitudes

Table S1-1 provides a systematic overview of the concept structures of populist attitudes as employed in existing studies on the topic. We list the concept components according to how the concept components were reported in each study, adopting the authors' original labels. Quantifier, qualifier, and aggregation method represent our reading of the respective operationalization procedure. Note that the list is not necessarily an exhaustive list of all studies that have been published on populism at the mass level.

Three regularities stand out: First, most studies treat populist attitudes as a continuous concept. Second, implicitly or explicitly, most studies specify populism at the mass level as a set of ideas, that is: as an attitudinal syndrome with noncompensatory core components. Third, some kind of (exploratory or confirmatory) factor analysis is the most common aggregation method that scholars use to derive individual populism scores.

Table S1-1. **Overview of literature on populist attitudes**

<i>Study</i>	<i>Components</i>	<i>Qualifier (Concept Specification)</i>	<i>Quantifier</i>	<i>Aggregation method</i>
Akkerman, Mudde, and Zaslove (2014)	anti-elitism, people-centrism, sovereignty, Manichean division of good and evil	necessity ("set of ideas", p.1328), necessary and sufficient condition (p. 1326)	continuous	PCA
Andreadis, Stavrakakis, and Katsambekis (2016)	dealignment, anti-establishment, people-centrism, antagonism between people and elites	the "exact content of this (thin-centered) ideology depends on secondary elements that may be combined with such an (anti-establishment) appeal" (p.2)	continuous (p.4, 17)	Factor analysis
Elchardus and Spruyt (2016)	anti-elitism, antagonism ordinary people - politicians, people-centrism	necessity ("one component is always present..." "elements [...] that are always present", p. 113)	continuous	Factor analysis
Hameleers, Bos, and Vreese (2017)	anti-establishment, people-centrism, exclusionism	homogeneity as a necessary attribute (p. 483), but also: different emphases, indicating substitutability (p. 482)	continuous, but not aggregated	Factor analysis
Hawkins and Riding (2010)	Manichean outlook, people-centrism, anti-elitism	necessity ("set of ideas", p.1, 2)	continuous (p.12)	

Hawkins, Riding, and Mudde (2012)	Manichean outlook, reified popular will, (stealth attitudes)	necessity ("set of ideas", p. 3)	continuous (p. 14f)	Factor analysis
Hobolt and Tilley (2016)	anti-establishment, people-centrism, dissatisfaction of traditional parties, rejection of pluralism	"glorification of the people and anti-elitism (...) heart of populism" (p. 5) - implies necessity		
Mohrenberg, Huber, and Freyburg (2019)	anti-elitism, people-centrism	necessity "As Hawkins et al. (forthcoming) argue, so to classify an individual as having populist attitudes, both the dimensions 'anti-elitism' and 'people-centrism' need to be shared, albeit possibly to different degrees (cf. Castanho Silva et al. forthcoming). Only if an individual rejects the political elite as corrupt and self-serving (anti-elitism) and also perceives the people as homogeneous and morally superior (people-centrism), she can be called populist (cf. Rooduijn, de Lange, and Van Der Brug 2014, 567)."	continuous (p. 16)	EFA, geometric mean (p. 16)
Oliver and Rahn (2016)	anti-elitism, national affiliation, mistrust experts	not specified	no populism score derived	no populism score derived
Rico, Guinjoan, and Anduiza (2017)	two homogenous groups, praise of people, anti-elitism, sovereignty	necessity ("four distinct but interrelated constitutive elements ";p.4)	continuous (p.7)	Summary score
Schulz et al. (2018)	Anti-Elitism attitudes, people's sovereignty, belief in a homogenous and virtuous people	necessity ("set of ideas", p.2)	continuous (p. 5)	Factor analysis
Castanho Silva et al. (2018)	Homogeneity, Anti-Elitism, Manichean Outlook	"we suggest that populism sits at the intersection of these three broader kinds of discourse"		Factor analysis
Spierings and Zaslove (2017)	people-centrism, anti-elitism, manichean antagonism between people and establishment, notion of general will	"core characteristics of populism" (p. 824f) "this notion of populism is what unifies populist radical left and populist radical right parties ..." (p.825)	continuous (p. 831, 832)	Factor analysis
Spruyt, Keppens, and van Droogenbroeck (2016)	Manichean Outlook, Anti-Elitism, people-centrism, sovereignty	necessity ("combination"; "set of ideas" p.336; "it is their combination that constitutes the specific populist logic", p. 340)	continuous (p. 340)	Factor analysis
Stanley (2011)	anti-elitism, people-centrism, people's sovereignty (nationalism)	necessity "four core concepts the combination of which is characteristic of all manifestations of populism" (p.258)	continuous (p.263)	Factor analysis
Steiner and Landwehr (2018)	Anti-Elitism, illiberal democracy, anti-pluralist skepticism,	Necessary condition of anti-elitism as the core of populism "Anti-Elitismus [...] in Verbindung mit" (p. 5);	continuous (p. 13, (p.16)	Factor analysis

	majoritarianism, trustee model of political representation		
van Hauwaert and van Kessel (2018)	dissatisfaction of people, anti-elitism, Manichean distinction between virtuous people and evil elites	implicitly necessary conditions of anti-elitism and people-centrism but different levels etc. (p.70) "These characteristics do not constitute elements of populism per se, but can be linked back to the ideational properties of populism (...) antagonistic position vis-a-vis elites and its appeal to the common people."	continuous (p.76) Factor analysis
Vehrkamp and Wratil (2017)	Anti-Establishment, Anti-Pluralism, Popular Sovereignty	necessity	dichotomous (and ordinal with three categories, p. 16) Thresholds

Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs

The analysis in the main text focuses on operationalization techniques in research on populist attitudes. Yet the study's general argument is applicable to various social science concepts, namely those positioned at the intersection of the concept components, thus requiring operationalization techniques that account for this concept property. As mentioned in the main text, democracy is one illustrative political science example that also features necessary conditions on the level of the concept attributes: high levels of minority protection do not compensate for low levels of electoral fairness because both components constitute necessary elements of liberal democracies (Møller and Skaaning 2012, 135). Cognitive competencies may be considered as another example from a different scientific discipline (Chalmers and Flora 2014, 341): Imagine a task such as math word tests that require both arithmetic knowledge and text comprehension skills. Any measure used to reliably predict a person's success at that task warrants an operationalization strategy that takes into account that the presence of both competence components constitutes a necessary condition for solving math word problems.

Considering the prevalence of multi-dimensional concepts with necessary conditions in the social sciences, this supplement aims at providing guidance for researchers from diverse disciplinary backgrounds on the appropriate operationalization of multi-dimensional concepts. In an attempt to make the description accessible, we distinguish several steps in a sequence of decisions that may help scholars to arrive at deliberate and well-justified choices when operationalizing multi-dimensional constructs (for further reading, see Alkire and Foster 2011b; Goertz 2006).¹ In the following, we do not consider strategies for developing new measures for multi-dimensional concepts. Instead, we discuss the proper operationalization of multi-dimensional concepts using existing measures.

#1 Defining the concept essence: Dimensionality of the concept

The dimensionality of a concept is not always obvious, neither concerning the number nor the specific content of the subdimensions. The following arguments only apply to 1) multi-dimensional concepts and require 2) that it is possible to identify clearly specified concept subdimensions.

¹ Note that the following discussion assumes equal relevance of the concept dimensions. For the operationalization of concepts for which this assumption is violated, see, for instance, Alkire and Foster (2011a).

Questions to answer to choose the appropriate operationalization strategy:

- ✓ Has the concept two or more concept subdimensions?
- ✓ What are the concept subdimensions?

#2 Qualifier: Relationship of the concept components

The relationship between concept components can be characterized by varying degrees of interchangeability between the concept components, ranging from non-compensatory to fully interchangeable (qualifier). Which qualifier corresponds to a given concept can only be derived from the theoretical propositions associated with the essence of a concept. When determining the numerical value of a target concept, the question is whether high values on one concept component (partly) compensate low values on another concept component. When measuring democracy, for instance, whether we consider the rule of law an indispensable element of democracy (or whether its absence can be compensated for by, for instance, extensive participatory rights for the public in political or judicial decision-making processes) reflects the researcher's reasoning of what democracy is in its essence.

If the concept's subdimensions are considered non-compensatory, then the presence of all subdimensions constitute necessary conditions. If the lack of one concept component can be fully compensated by another concept component, then each concept component is fully interchangeable by another. In addition to these extreme cases, there are degrees of interchangeability. For example, very high values on one dimension cannot fully compensate for very low values on another subdimension, but partly make up for those very low values.

Determining the degree of interchangeability among the concept components is an integral element of devising a proper operationalization procedure. Practically, the specification of a concept qualifier establishes the aggregation function that is to be used for aggregating multiple concept components into a composite score (see [#5](#) aggregation function).

Questions to answer to choose the appropriate operationalization strategy:

- ✓ **Interchangeability:** Do the theoretical propositions toward the essence of the concept consider each concept component as necessary, or can values on one concept component compensate values on another concept component?
- ✓ If concept components are not necessary, to which degree (e.g., partly or fully) are the concept components interchangeable?

#3 Quantifier: Scale of the target concept

A concept may be dichotomous, continuous, or something in between (quantifier). Again, which quantifier corresponds to a given concept is to be derived primarily from the theoretical propositions associated with the essence of a concept. The question is whether the concept has clear membership boundaries (and, if so, how many) or whether the concept entails grey space between the poles. For instance, whether we consider ‘gender’ a dichotomous, polytomous or continuous concept reflects our reasoning of what gender is in its essence.

In some instances, however, practical considerations may also play a role when determining the scale of the target concept. Precisely, the concept essence may imply a continuous quantifier (‘temperature’), but researchers may still revert to a dichotomous quantifier (‘warm’) for simplicity. Concepts with a dichotomous quantifier may simplify the analysis and the reporting of results. However, these advantages come at the expense of overlooking potentially meaningful variation that the concept exhibits empirically or theoretically. Hence, opting for a dichotomous quantifier in light of an originally continuous concept entails a trade-off between simplicity and precision. In any case, specifying a concept quantifier must flow from theoretical reasoning about which quantifier is suitable for the concept essence.

Questions to answer to choose the appropriate operationalization strategy:

- ✓ **Interchangeability:** Do the theoretical propositions about the essence of the concept consider clear membership boundaries (and, if so, how many), or does the concept entail grey space between the poles?

#4 Typology of Concept Structures

Having identified the dimensionality of a concept (step #1), the decisions at steps #2 and #3 establish the concept structure for a given multi-dimensional concept.

Copying a table from the main text, Table S2-1 provides an overview of prototypical concept structures. Table S2-1 may be helpful to situate one’s concept in the universe of potential concept structures. Having a clear understanding of the concept structure is vital because each concept structure has different practical implications for the decisions in the following steps (step #5: aggregation function; step #6 standardization).

Note that Table S2-1 reports ideal types. As stated above, both the qualifier and the quantifier offer more than two options, whereas, for the sake of simplicity, the table only shows four combinations of quantifiers and qualifiers.

Questions to answer to choose the appropriate operationalization strategy:

- ✓ Where does the concept fall on the continuums of concept qualifier and concept quantifier?
- ✓ Does the combination of quantifier and qualifier of a given concept correspond to any of the prototypical concept structures?

Table S2-1. Prototypical concept structures

Qualifier of Concept Structure	Quantifier of concept structure	
	<i>Dichotomous</i>	<i>Continuous</i>
<i>Non-compensatory</i>	Sartori	Goertz
<i>Compensatory</i>	Residual	Bollen

Note: Table S2-1 maps prototypical concept structures, but in practice, quantifier and qualifier have more than two manifestations. Here, the qualifier contrasts no substitutability (necessity conditions) with medium substitutability, but higher and lower degrees of substitutability are also conceivable. Likewise, this table compares two prototypical quantifiers, although ordinal quantifiers are also conceivable.

#5 Aggregation Function

To ensure that the mathematical structure of a measure and the theoretical structure of the concept do not fall apart (cf. Goertz 2006, 125), the aggregation function for computing the target measure needs to correspond to the theoretically derived concept structure. Because social science concepts consist of a basic level (the concept essence), a second level (the concept components or subdimensions) and a third level (the indicators at the measurement level), we need to distinguish operationalization strategies for aggregating indicators at the concept's third level and for aggregating concept components at the concept's second level. The following discussion does not concern the aggregation of multiple indicators of a concept component into a summary score.² Instead, it deals with the aggregation of the concept components to derive an aggregate score for the target concept.

² In principle, the general line of reasoning would apply. In practice, in most cases the Bollen concept structure may be most appropriate to aggregate indicators at the concept's third level.

First, we discuss aggregation functions for the prototypical concept structures, as depicted in Table S2-1. Then, we discuss aggregation functions for other concept structures. At the end of the section, we provide a simple mathematical example to compare aggregate scores as computed with each of the aggregation functions presented below.

Bollen

The Bollen structure is a widely employed operationalization strategy both in the literature on populist attitudes and beyond. Therefore, techniques for computing a Bollen concept structure are well known in the social sciences (e.g., Bollen and Lennox 1991; Bollen and Pearl 2013; Kaplan 2008). These techniques include any operational procedure that sums the values of the concept components, including weighted or unweighted summary indexes, predicted scores using the factor scores derived from exploratory factor analysis or structural equation modeling.

$$Bollen := \sum_{i=1}^n Weight_i * Component_i$$

Goertz

According to the Goertz concept structure, the resulting target concept is located at the intersection of the concept components. Hence, the operationalization of the Goertz concept structure requires an aggregation function that treats the concept components as non-compensatory. The mathematical equivalent to the theoretical tenet that ‘a chain is only as strong as its weakest link’ is the minimum function. Using the minimum function ensures that two individuals with identical values on the lowest concept components do not differ in the derived aggregate score, regardless of the values on the remaining concept components. Other aggregation functions are conceivable if no strict non-substitutability is assumed; see *Qualifier: In-between (partly compensatory)*.

$$Goertz := \min |Component_1, \dots, Component_n|$$

Sartori

The Sartori concept structure entails crisp membership boundaries and considers entities as members of the concept if and only if all concept components are jointly present. The necessary conditions are met if all concept components surpass a pre-specified threshold.

$$Sartori := \begin{cases} 1 & \text{if } Component_1, \dots, Component_n > Threshold \\ 0 & \text{else} \end{cases}$$

The challenge in operationalizing the Sartori concept structure is to specify a substantively meaningful, non-arbitrary threshold (Alkire and Foster 2011a, 482).³ One option for setting a threshold is letting the data decide. Such data-driven methods can be carried out manually or automatically. Manually, one could set thresholds at a certain percentile of the distribution (e.g., upper half, top 10 percent). A manual data-driven approach entails a membership classification procedure that depends on the sample distribution. Because such manual data-driven procedures do not assign membership by absolute properties of the concept essence, individuals may surpass the classification threshold in one sample but not in a different sample where the component is distributed differently (see #6 *Normalization: Comparing raw or transformed concept subdimensions?*).

An automated data-driven approach, in contrast, would rely on algorithmic classification, and examples are methods such as latent class analysis or latent profile analysis (Collins and Lanza 2010). Automated data-driven techniques for class selection are somewhat more common in the literature than manual techniques (e.g., Bonikowski and DiMaggio 2016). However, with regard to any data-driven approach, one might argue that “*such purely data-driven calibration strategies are fundamentally flawed [...]. Measures like the mean or median are properties of the data at hand and, as such, void of any substantive meaning vis-à-vis the concept that one aims to capture with a set*” (Schneider and Wagemann 2012, 33).

In order to set thresholds based on substantive arguments, one might consider the scales of the measures that underlie the concept components. Given dichotomous concept components, the choice of a cut-off point is obvious.⁴ When the concept components are measured on a scale with more than two categories, the choice of a cut-off point is often not straightforward. In these cases, setting a cut-off point is most intuitive when the concept components are measured on a meaningful scale as such scales may offer thresholds with informational value. For instance, surpassing the mid-point of a scale may denote a meaningful step that could serve to discriminate membership

³ One response to the challenge of threshold selection may also involve robustness tests using specification curves or other means of transparent reporting various analytical options, see Wuttke 2019, 11.

⁴ Note that research on the measurement of poverty has suggested more complex, two-stage thresholds, see Alkire and Foster (2011a; 2011b).

boundaries. Concept components that were measured on Likert-scales could also provide opportunities for meaningful cut-off points. In the Shiny Web Applet ('How many populists?'), we provide examples of meaningful cut-off points using various Likert-scale survey items on populist attitudes.

Residual (Qualifier: Compensatory, Quantifier: Dichotomous)

Operationalizing a concept with a dichotomous scale with interchangeable concept components draws on both the operationalization techniques used for the Sartori and the Bollen concept structures. First, the concept scores are derived using any weighted or unweighted summation technique for operationalizing Bollen concept structures. Akin to the technique for the operationalization of Sartori concept structures, a meaningful threshold is then chosen to delineate crisp membership boundaries. In practical terms, this approach differs from the Sartori operationalization as dichotomization is conducted at the level of the derived target concept and not on the level of the concept components (Alkire and Foster 2011a, 478). Substantively, therefore, the resulting concept is dichotomous, but unlike the Sartori concept structure, it does not represent the conjunction of the concept components.

Quantifier: In-between (Ordinal)

In case the concept at hand does not fall under any of the prototypical concept structures discussed above but entails an ordinal scale, the operationalization strategies for dichotomous quantifiers may be applied separately for each category of the concept.

Qualifier: In-between (partly compensatory)

The Goertz and Sartori concept structures entail strict non-substitutability on the level of the concept components. However, it is conceivable that concept components are partly interchangeable. Various aggregation strategies are conceivable that differ in technical details. Which aggregation function fits best a given concept, therefore, depends on the assumptions about the degree of substitutability of the concept components. In the following, we present a short description of selected aggregation functions for concepts with partial interchangeability. For further information readers may resort to details provided in Alkire et al. 2015; Alkire and Foster

2011a; Atkinson 2003; Goertz 2006, 111ff; Greco et al. 2019; Mazziotta and Pareto 2016; Møller and Skaaning 2012, 122ff; Munck 2009, 48ff:

- *Multiplication:* Multiplying all concept subdimensions implements partial interchangeability at the advantage of being easy to use and to comprehend. How multiplication implements non-substitutability becomes apparent when one concept component equals zero. In that case, the function is fully non-compensatory because the aggregate score equals zero regardless of the values of the other concept components. Note that multiplication introduces a non-linear function between the values of the concept components and the aggregate score, exacerbating differences between individuals.
- *Weighted arithmetic mean:* In contrast to the arithmetic mean (used in the main text to operationalize the Bollen approach), which weighs all components equally, the weighted arithmetic mean allows unequal weights. To implement a certain degree of non-interchangeability, one might place a higher weight on the term with the lowest value. In this vein, the minimum can be understood as a special case of the weighted arithmetic mean which puts all the weight on the term with the lowest value.
- *Geometric mean:* The geometric mean is the n th root of the product of n concept components. The geometric mean resembles the arithmetic mean, but it multiplies the concept components instead of adding them. The geometric mean is occasionally used in existing research to account for partly non-compensatory relationships among concept components. For instance, in 2010, the United Nations Human Development Index introduced the geometric mean because “*low achievement in one dimension is not linearly compensated for [...] by high achievement in another dimension. The geometric mean reduces the level of substitutability between dimensions and at the same time ensures that a 1 per cent decline in the index of, say, life expectancy has the same impact on the HDI as a 1 per cent decline in the education or income index*” (United Nations 2019).
- *Counting approach and two-level thresholds:* Various other sophisticated methods in operationalizing varying degrees of substitutability for multi-dimensional concepts with a dichotomous quantifier were recently proposed in poverty research. These proposals include counting the number of dimensions on which an observational unit did (not) surpass a threshold and the use of two thresholds, see Alkire et al. 2015; Alkire and Foster 2011a; 2011b; Atkinson 2003; Mazziotta and Pareto 2016.

The discussion above considers operationalization strategies for concepts which are constituted by varying degrees of necessary conditions on the level of the concept components. However, at the other end of the substitutability-continuum (qualifier), sufficient conditions are conceivable as well

(Goertz 2006). Scholars in socio-economic topics, for instance, discuss sufficient conditions using set-theoretic terms as *union* (as opposed to an *intersection*, representing necessary conditions). In this vein, for classifying a person as deprived, it is sufficient to fall below the threshold on only one of the multiple achievement dimensions. For further reading and operationalization strategies, see Alkire et al. 2015; Alkire and Foster 2011a; 2011b; Atkinson 2003; Greco et al. 2019; Mazziotta and Pareto 2016.

Example

For a hypothetical distribution of data among three observational units (e.g., respondents, countries), Table S2-I shows the resulting aggregate scores for a hypothetical concept with three concept components when different aggregation functions are employed. Similar to the calculations conducted in the Shiny Web Application, Table S2-I shows the sensitivity of resulting aggregate scores to the employed aggregation function. In addition to the aggregate score, Table S2-I also reports how each observational unit ranks compared to the other observational units with respect to these scores. Even though the values of the concept components remain unchanged, the rank order of observational units is not consistent across aggregation functions. This observation underscores the importance of carefully choosing the aggregation function that corresponds to the concept's essence.

Table S2-I. Illustrative computation of aggregate scores using different aggregation functions

	Observational unit 1			Observational unit 2			Observational unit 3		
	Compo- nent 1	Compo- nent 2	Compo- nent 3	Compo- nent 1	Compo- nent 2	Compo- nent 3	Compo- nent 1	Compo- nent 2	Compo- nent 3
	0.2	0.2	0.3	0.2	0.5	1	0.3	0.3	0.6
	<i>Score</i>	<i>Rank</i>		<i>Score</i>	<i>Rank</i>		<i>Score</i>	<i>Rank</i>	
<i>Goertz</i> [Minimum]	0.2	2		0.2	2		0.3	1	
<i>Bollen</i> [Unweighted Mean]	0.23	3		0.5	1		0.4	2	
<i>Sartori</i> [Threshold at 0.75]	0	1		0	1		0	1	
<i>Multiplication</i> <i>Weighted</i> <i>Average</i>	0.01	3		0.1	1		0.05	2	
<i>Mean</i> [Low 0.5 Mid: 0.3; High: 0.2]	0.07	3		0.45	1		0.27	2	
<i>Geometric mean</i>	0.23	2		0.23	2		0.38	1	

#6 Normalization: Comparing raw or transformed concept subdimensions?

Regardless of which concept structures a given concept amounts to when combining multiple dimensions into an aggregate score, all dimensions must be measured on a common or on a comparable scale (Edwards 2009, 519ff). Implicitly, all aggregation functions discussed in the previous section assume scale comparability. The minimum function, for instance, rests on the assumption that the value 0.5 has the same meaning on different concept components. In an ideal case, scale comparability was already considered during scale development. When using existing scales, however, one must judge their comparability even if they were not developed for the purpose of aggregation.

If scales are not comparable on their raw metric, one option is to use standardized transformations of the concept components (e.g., using z-score transformations). However, this procedure has the drawback of substantively changing the meaning of the scales on which the concept components are measured. Specifically, high or low levels on one concept dimension were then to be interpreted only in reference to the distribution within a given population. Consequently, scores in one population cannot necessarily be compared with scores on the same concept in a different population (or a different point in time).

Hence, the issue of scale comparability is cumbersome and often does not offer satisfactory options. Qualitative researchers have a long tradition of dealing with ‘calibration’ (Goertz 2006;

Schneider and Wagemann 2012, 32ff). In the quantitative social science research culture, ‘equating’ and ‘scaling’ are now being discussed particularly in the realm of Item Response Theory (Edwards 2009, 518ff; Kolen and Brennan 2004, 198ff). Recent methodological developments in Item Response Theory also consider noncompensatory multi-dimensional constructs (Babcock 2011; Bolt and Lall 2003; Chalmers 2012; 2018; Chalmers and Flora 2014; DeMars 2016; Liu and Chalmers 2018). Even though the proposed methods are complex, computationally demanding, and require a large number of measurements for each concept dimension (Babcock 2011; Bolt and Lall 2003; Liu and Chalmers 2018), further methodological developments may prove helpful for solving scaling issues concerning both compensatory and noncompensatory concept structures.

- ✓ Are the scales of the subdimensions comparable, and, if not, what techniques will be employed to ensure comparability?

Supplement 3: Discrepancies between original and adopted Schulz et al. populism scale

In the main text, we report evidence on the Akkerman et al., Schulz et al., and the Castanho Silva et al. populism scale. Yet the analysis of the Schulz et al. populism scale that is reported in the main text uses data from the GLES campaign panel, which did not employ the original Schulz et al. populism scale but a modified version of the scale. The GLES version of the scale only contains nine items whereas the original Schulz et al. scale consists of 12 items. In addition, differences occur with respect to the wording of one item of the anti-elitism subdimensions and a systematic disparity in translating the homogeneity items from English to German (see Table S3-1).

The discrepancy in the anti-elitism subdimension concerns the item “*Politicians are not really interested in what people like me think*”, which was originally included in the Schulz et al. scale’s 15-item long version but the item was dropped during scale validation and was not included in the final list of twelve items. Nonetheless, the principal investigators of the German Longitudinal Election Study’s (GLES) Campaign Panel included a modified version of that item (“*Politicians care about what ordinary people think*”) because the long-running GLES survey program already contained a similar item. As an additional discrepancy, the respective item is positively worded in the adapted version of the GLES Campaign Panel (high agreement with the item indicates lower agreement with the tenets of populism) whereas the item in the original Schulz et al. scales is negatively worded (in the same direction as all other scale items). Because goodness of fit was a reason for the original scale authors to drop the respective item (Schulz et al. 2018, 322) and because the adapted version of the item is in reverse compared to the other items of the anti-elitism subdimension, it is possible that the anti-elitism subdimension as measured in the GLES Campaign Survey exhibits a lower degree of internal consistency compared to survey data that uses the original items on the anti-elitism subdimension.

Another discrepancy concerns the homogeneity dimension, namely the translation of ‘ordinary people’ in the German question-wording. Originally, the term was translated into German as ‘einfache Leute’ which could be back-translated as ‘simple people’. In contrast, the adapted scale as used in the GLES Campaign Panel refers to ‘normale Bürger’ which could be back-translated as ‘normal citizens’. Altogether, the wording in the GLES Campaign Panel may be understood as a more positive description of the respective group, potentially eliciting more people

to identify with the respective group. Consequently, due to these wording discrepancies between the original and the adapted scale, the level of agreement with the homogeneity items may be higher for the adapted scale compared to the original version.⁵

As argued above, it is conceivable that these issues affect the empirical properties of the Schulz et al. populism scale as it is measured in the GLES Campaign Panel. Specifically, it could be the case that the internal consistency of the anti-elitism subdimension and the level of agreement with the homogeneity subdimensions would differ if the original instrument was employed. While these issues should be kept in mind for anyone who intends to use the GLES data, it is not clear that these issues necessarily affect the estimands of this study. If we understand the primary estimand of the main text as the difference between the Bollen and Goertz populism scores, then the issues discussed above do not have apparent ramifications for the reported findings. Different levels of agreement with the homogeneity indicators, for instance, would affect the comparison of Bollen and Goertz scores only if the discussed issues regarding item translation affected a person’s homogeneity scores differentially, depending on the scores on other subdimensions.

Table S3-1. Question wordings in the original Schulz et al. scale and the adapted scale in GLES Campaign Panel

<i>Adapted scale</i>	<i>Original version</i>	<i>Difference</i>
<i>Anti-elitism</i>		
Politicians talk too much and take too little action.	Politicians talk too much and take too little action.	Identical
The differences between the people and the so-called elite are greater than within the people.	The differences between people and the ruling elite are much greater than the differences between ordinary people.	Identical
[Politicians care about what ordinary people think.]	Politicians are not really interested in what people like me think.	Reverse 'Ordinary people' vs 'people like me'
<i>Homogeneity</i>		
Ordinary people are of good and honest character.	Ordinary people are of good and honest character	Different translation of 'ordinary people'
Ordinary people all pull together.	Ordinary people all pull together	Different translation of 'ordinary people'
Ordinary people share the same values and interests.	Ordinary people share the same values and interests.	Different translation of 'ordinary people'
<i>Sovereignty</i>		

⁵ Note that Hieda, Zenkyo, and Nishikawa (2019) also found low correlations between the homogeneity subdimensions and the other subdimensions in a Japanese sample of respondents using the Schulz et al. (2018) scale.

The people should have the final say on the most important political issues by voting on them directly in referendums.	The people should have the final say on the most important political issues by voting on them directly in referendums.	Identical
The people, not the politicians, should make our most important policy decisions.	The people, not the politicians, should make our most important policy decisions.	Identical
The politicians in Parliament need to follow the will of the people.	The politicians in Parliament need to follow the will of the people.	Identical

Figures S3-1 through FS3-10 provide suggestive empirical evidence on whether the discrepancies between the original Schulz et al. scale and the adapted version might have affected the results that are reported in the main text. Figure S3-1 (below) was also plotted in the main text and shows the empirical properties of the adapted Schulz et al. populism scale in the GLES Campaign Panel. We can compare the results in Figure S3-1 with evidence using the original scale items as they were measured in various countries in the Castanho Silva et al. dataset (Figure S3-2 through Figure S3-10).⁶ When comparing these results, however, we should keep in mind that the reported findings in all of these plots do not only differ in whether the adapted or the original scale was used but also differ in the employed samples (survey firm, country). Nonetheless, despite variation in the general strength of the association in each sample, we see similar patterns when comparing findings with the adapted and the original scale: Above all, the homogeneity subdimension behaves distinctly even when the original scale is used, exhibiting lower correlations than the other two subdimensions.

⁶ Note that Castanho Silva et al. employed the Schulz et al. populism scale in a reduced version as well.

Figure S3-1. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Germany, adapted Schulz et al. populism scale)

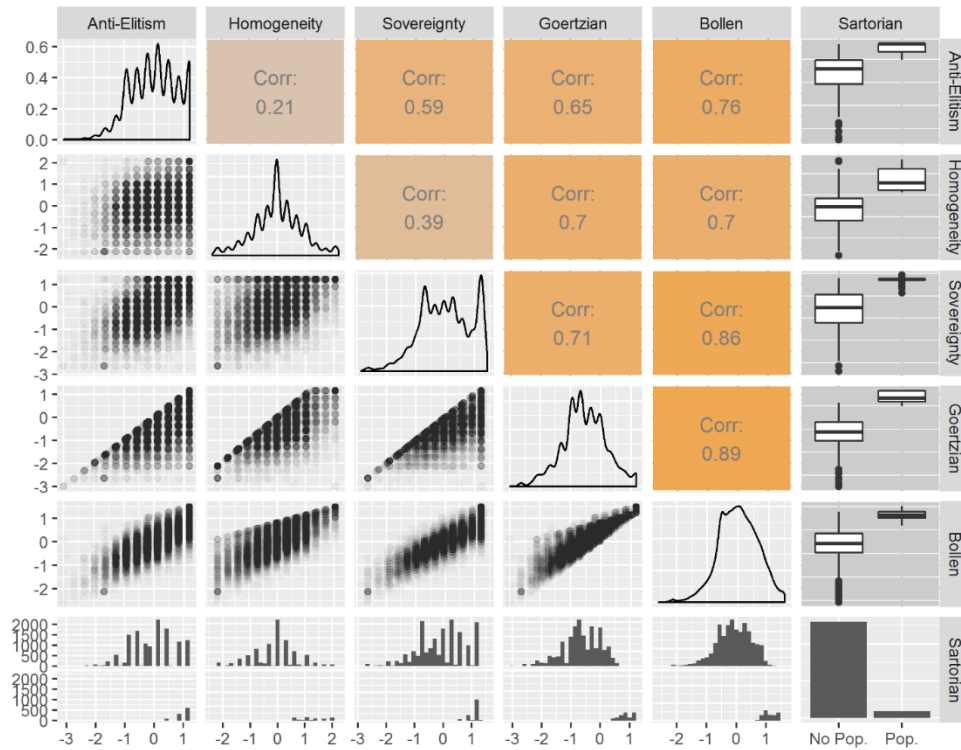


Figure S3-2. Distribution of and correlations between concept structures of populist attitudes and concept attributes (US, original Schulz et al. populism scale)

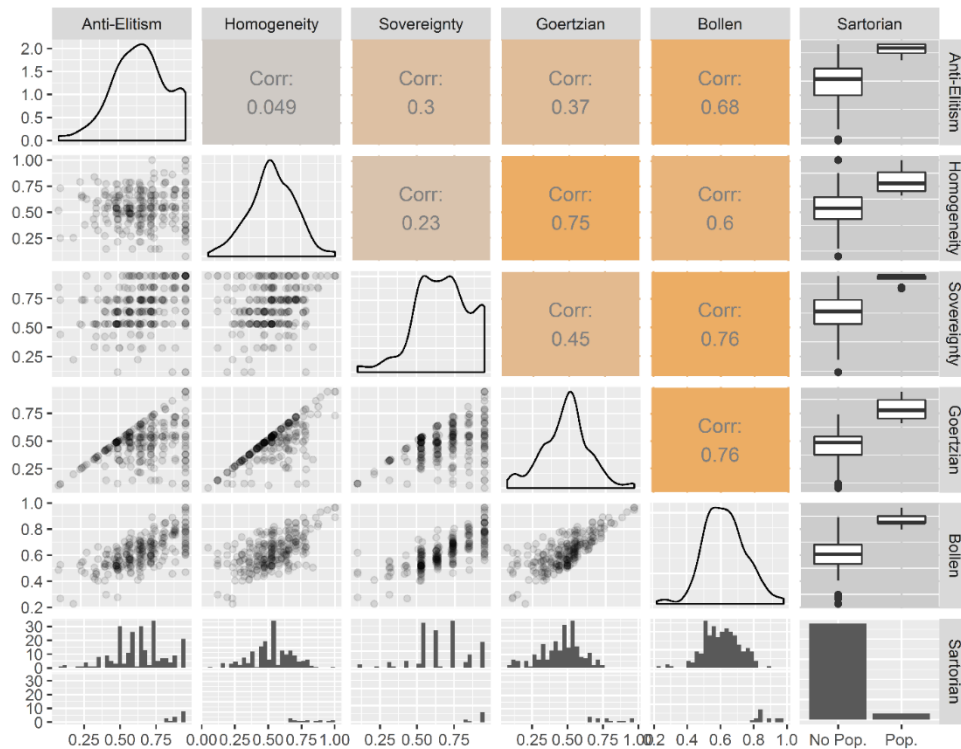


Figure S3-3. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Ireland, original Schulz et al. populism scale)

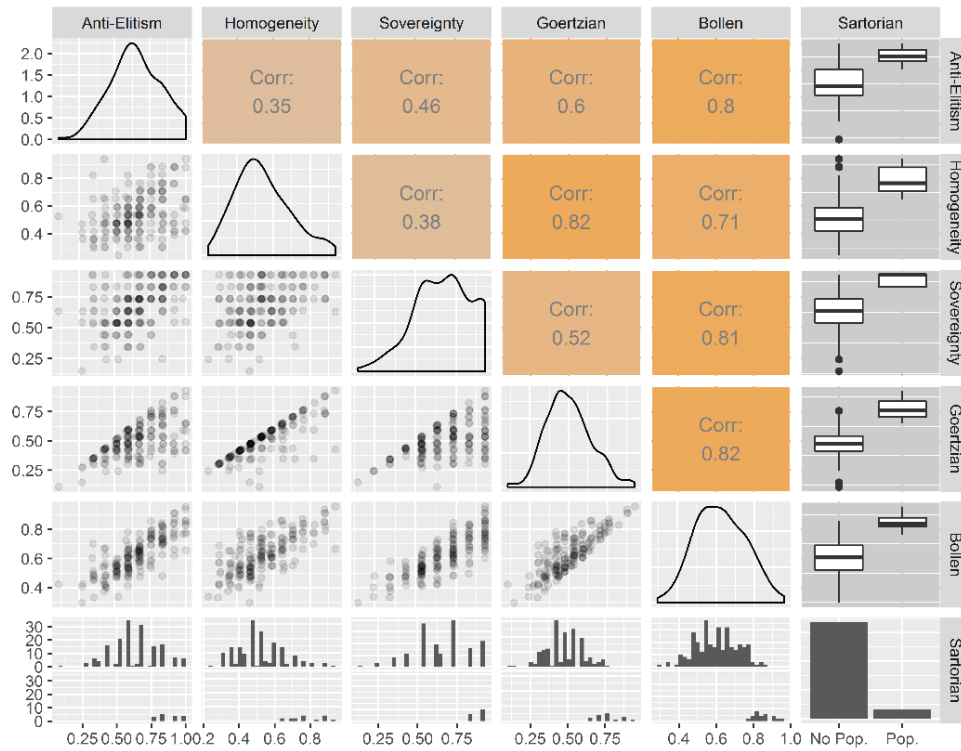


Figure S3-4. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Italy, original Schulz et al. populism scale)

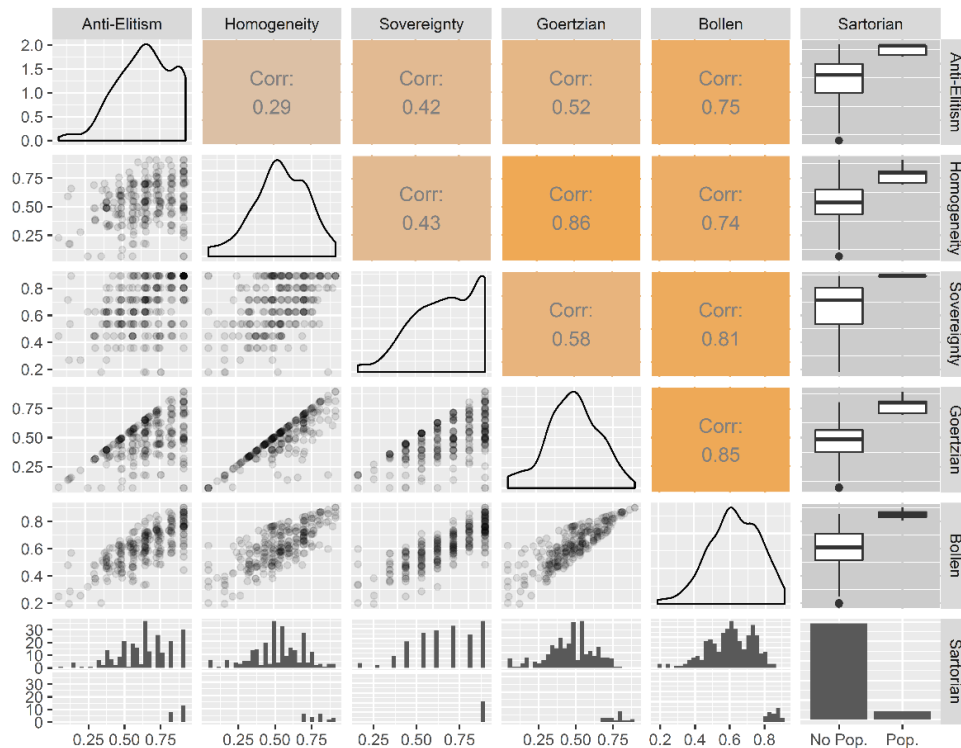


Figure S3-5. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Mexico, original Schulz et al. populism scale)

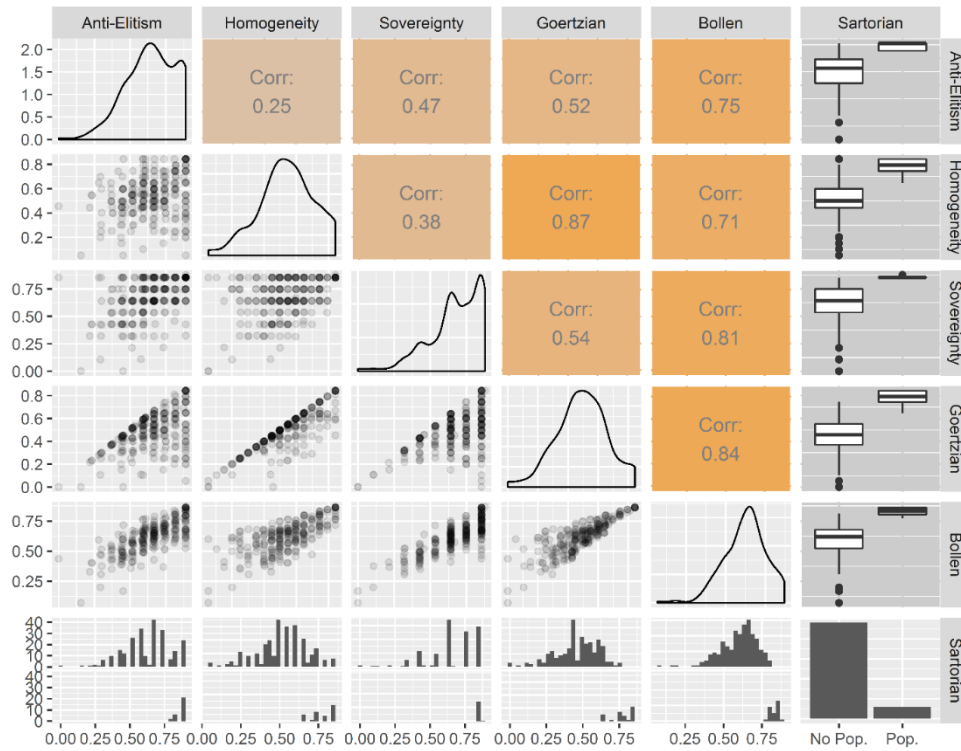


Figure S3-6. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Greece, original Schulz et al. populism scale)

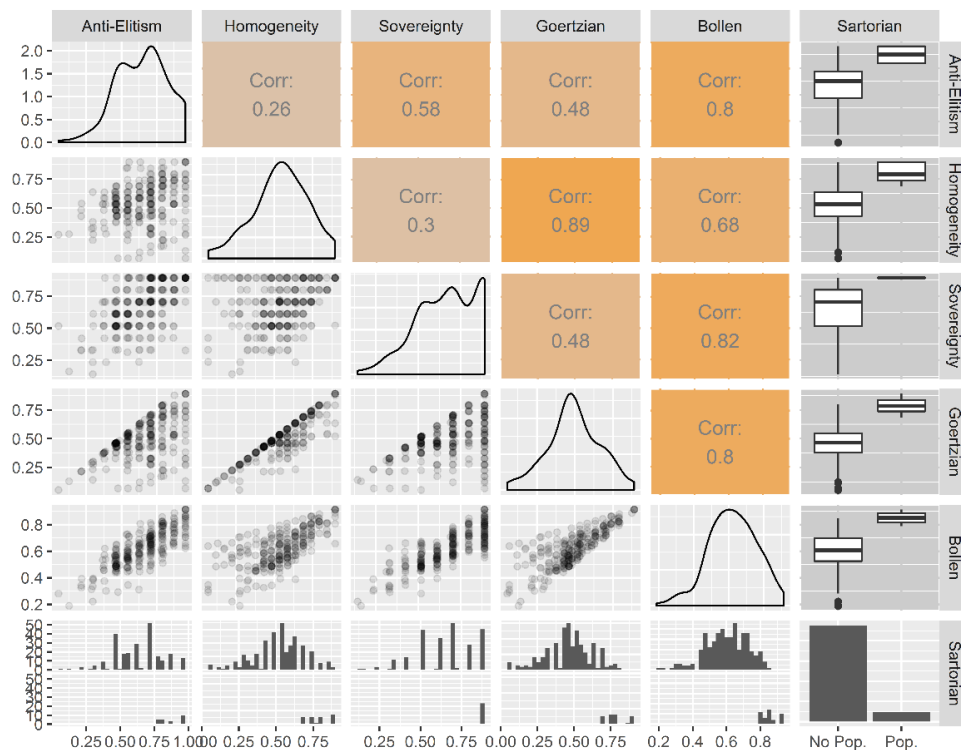


Figure S3-7. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Spain, original Schulz et al. populism scale)

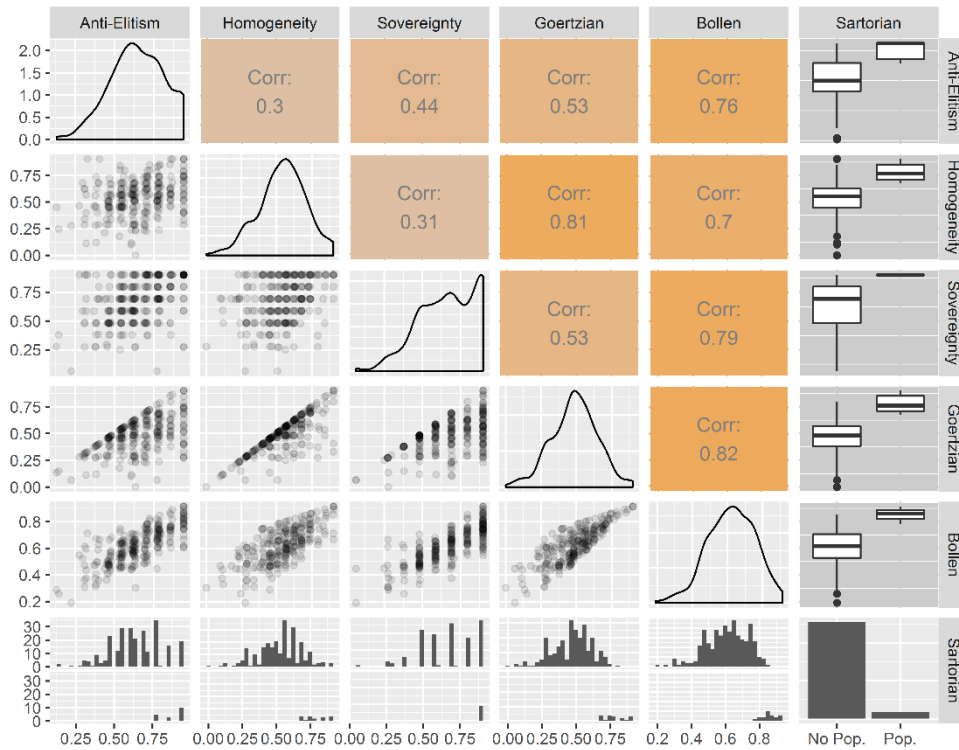


Figure S3-8. Distribution of and correlations between concept structures of populist attitudes and concept attributes (UK, original Schulz et al. populism scale)

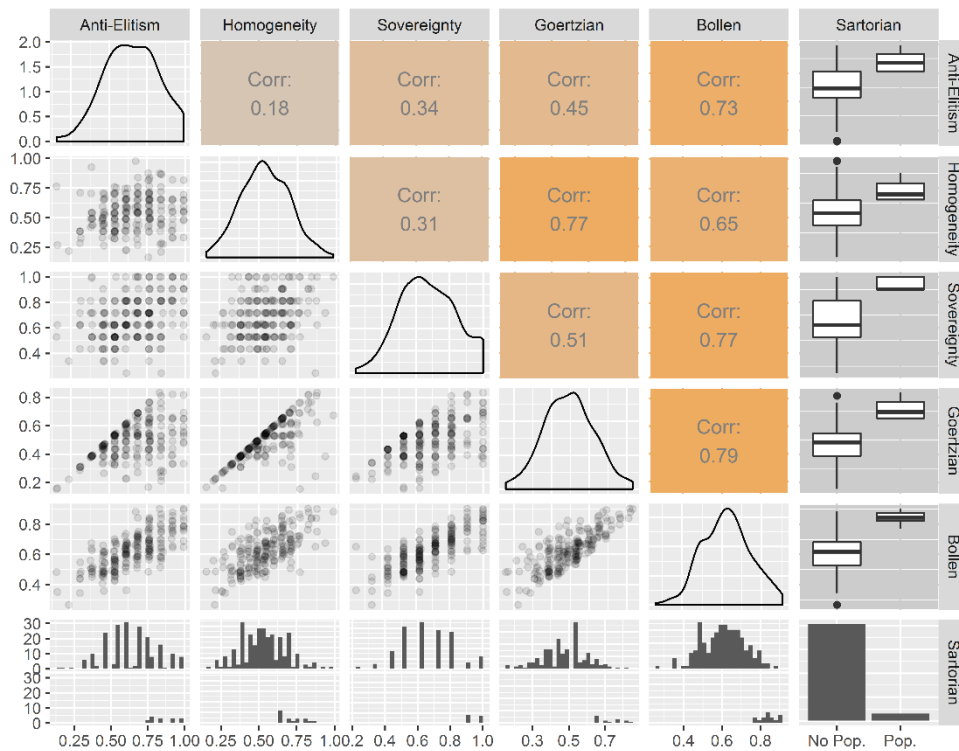


Figure S3-9. Distribution of and correlations between concept structures of populist attitudes and concept attributes (France, original Schulz et al. populism scale)

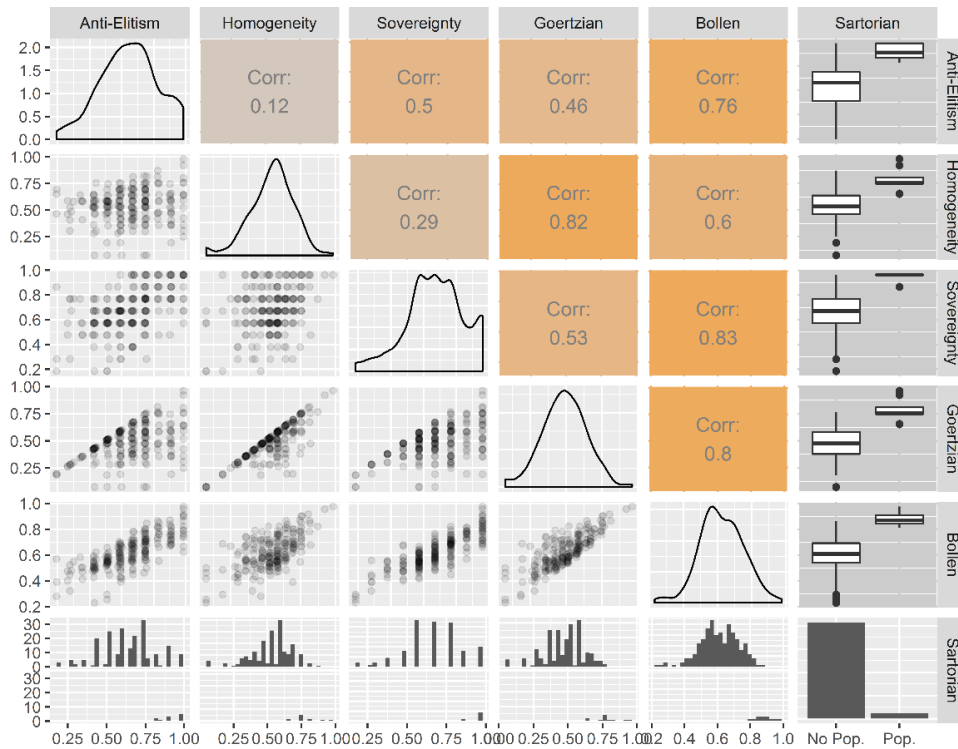
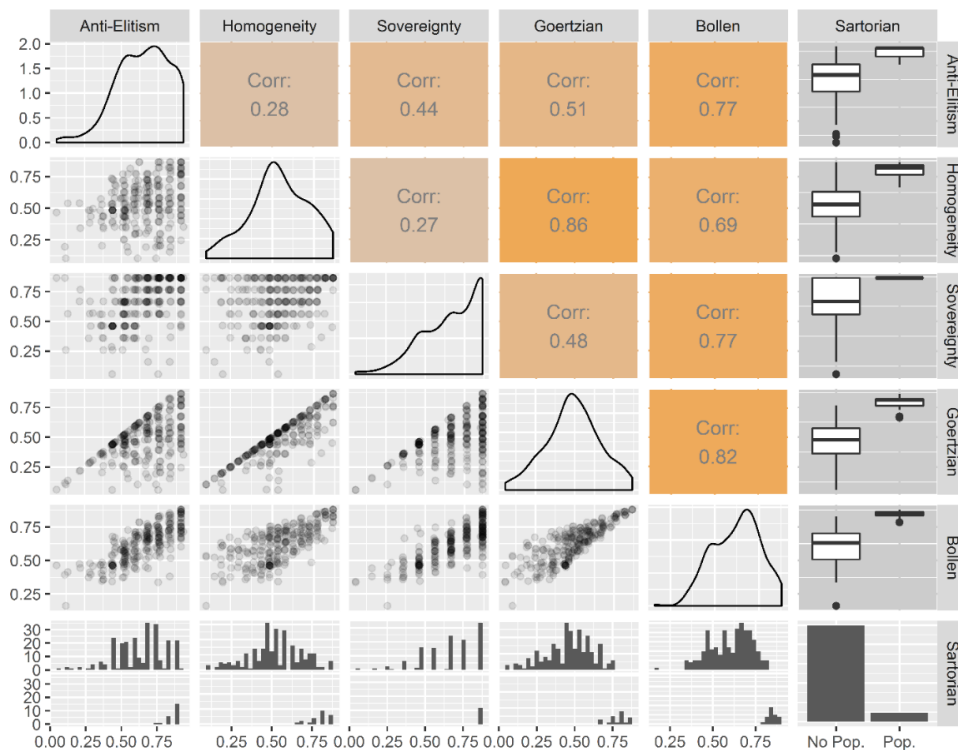


Figure S3-10. Distribution of and correlations between concept structures of populist attitudes and concept attributes (Brazil, original Schulz et al. populism scale)



Supplement 4: Questionnaires

This supplement reports the wordings of the questions of the items for measuring populist attitudes. See *Supplement 6: Handling existing scales of populist attitudes* for a discussion on operationalizing existing scales of populist attitudes.

Intro = introductory sentences
QT = question text
RO = response options

Dataset: German Longitudinal Election Study, Campaign Panel 2017

Note that the Campaign Panel contains an adapted version of the original Schulz et al. populism scale.

Schulz et al. (2018)

Intro: *Hier sind weitere Meinungen über Politik und Gesellschaft, denen manche Menschen zustimmen und andere nicht.*

QT: *Geben Sie bitte an, ob Sie diesen Meinungen zustimmen oder nicht.*

(A) *Politiker reden zu viel und handeln zu wenig.* [Anti-Elitism]

(B) *Die normalen Bürger verbindet ein guter und ehrlicher Charakter.* [Homogeneity]

(C) *Das Volk sollte bei wichtigen politischen Sachfragen mittels Volksabstimmung das letzte Wort haben.* [Sovereignty]

(D) *Die normalen Bürger ziehen an einem Strang.* [Homogeneity]

(E) *Die Unterschiede zwischen dem Volk und der sogenannten Elite sind viel größer als die Unterschiede innerhalb des Volkes.* [Anti-Elitism]

(F) *Das Volk und nicht die Politiker sollten die wichtigsten politischen Entscheidungen treffen.* [Sovereignty]

(G) *Die Politiker im Parlament müssen dem Willen des Volkes folgen.* [Sovereignty]

(H) *Die normalen Bürger teilen die gleichen Werte und Interessen.* [Homogeneity]

RO: (1) *stimme überhaupt nicht zu;* (2) *stimme eher nicht zu;* (3) *teils/teils;* (4) *stimme eher zu;* (5) *stimme voll und ganz zu.*

Intro: *In the following is a series of opinions on politics and society that people agree or disagree with.*

QT: *Please indicate how much you agree or disagree with the following statements:*

(A) *Politicians talk too much and take too little action.* [Anti-Elitism]

(B) *Ordinary people are of good and honest character.* [Homogeneity]

(C) *The people should have the final say on the most important political issues by voting on them directly in referendums.* [Sovereignty]

(D) *Ordinary people all pull together.* [Homogeneity]

(E) *The differences between the people and the so-called elite are greater than within the people.* [Anti-Elitism]

(F) *The people, not the politicians, should make our most important policy decisions.* [Sovereignty]

(G) *The politicians in Parliament need to follow the will of the people.* [Sovereignty]

(H) *Ordinary people share the same values and interests.* [Homogeneity]

RO: (1) *strongly disagree;* (2) *tend to disagree;* (3) *neither agree nor disagree;* (4) *tend to agree;* (5) *strongly agree.*

EFFICACY [USED AS THIRD ANTI-ELITISM ITEM]

Intro: *Hier ist eine Reihe von häufig gehörten Meinungen über Politik und Gesellschaft.*

QT: *Geben Sie bitte an, ob sie diesen Aussagen zustimmen oder nicht:*

(A) *Die Politiker kümmern sich darum, was einfache Leute denken.*

[remaining items of this battery are not used]

RO: *(1) stimme überhaupt nicht zu; (2) stimme eher nicht zu; (3) teils/teils; (4) stimme eher zu; (5) stimme voll und ganz zu.*

Intro: *In the following is a series of frequently expressed opinions on politics and society.*

QT: *Please indicate how much you agree or disagree with the following statements:*

(A) *Politicians care about what ordinary people think.*

[remaning items of this battery are not used]

RO: *(1) strongly disagree; (2) tend to disagree; (3) neither agree nor disagree; (4) tend to agree; (5) strongly agree.*

Dataset: Castanho Silva et al. (2018) replication data set

Castanho Silva et al. (2016)

ANTI-ELITISM

QT:

- *The government is pretty much run by a few big interests looking out for themselves.*
- *Government officials use their power to try to improve people's lives.*
- *Quite a few of the people running the government are crooked.*

RO: *(1) strongly disagree; (2), (3); (4) neither agree nor disagree; (5); (6); (7) strongly agree.*

PEOPLE CENTRISM

QT:

- *Politicians should always listen closely to the problems of the people.*
- *Politicians don't have to spend time among ordinary people to do a good job.*
- *The will of the people should be the highest principle in this country's politics.*

RO: *(1) strongly disagree; (2), (3); (4) neither agree nor disagree; (5); (6); (7) strongly agree.*

MANICHEAN OUTLOOK

QT:

- *You can tell if a person is good or bad if you know their politics.*
- *The people I disagree with politically are not evil.*
- *The people I disagree with politically are just misinformed.*

RO: *(1) strongly disagree; (2), (3); (4) neither agree nor disagree; (5); (6); (7) strongly agree.*

Oliver/Rahn (2016)

ANTI-ELITISM

QT:

- *The government is pretty much run by a few big interests looking out for themselves.*
- *Government officials use their power to try to improve people's lives.*
- *Quite a few of the people running the government are crooked.*

- *It doesn't really matter who you vote for because the rich control both political parties.*
RO: (1) strongly disagree; (2); (3); neither agree nor disagree; (4); (5) strongly agree.

QT: *People at the top usually get there ...*
RO: (0) because they have more talent and work harder; (1) from some unfair advantage

MISTRUST IN EXPERTS

QT:
- *I'd rather put my trust in the wisdom of ordinary people than the opinions of experts and intellectuals*
- *When it comes to really important questions, scientific facts don't help very much.*
- *Ordinary people can really use the help of experts to understand complicated things like science and health.*
RO: (1) strongly disagree; (2); (3) neither agree nor disagree; (4); (5) strongly agree.

NATIONAL AFFILIATION (HOMOGENEITY)

QT: *Trust in citizens on complex political issues*
RO: (0) It would be unwise to trust the judgments of the citizens for today's complicated issues.; (1) I generally trust the collective judgments of the citizens, even for complex political issues.

QT: *Different or alike compared to most [nationality]*
RO: (0) different than most [nationality]; (1) like most other [nationality]

QT: *How important is being [nationality] to you?*
RO: (1) not important at all; (2); (3); (4) don't know; (5); (6); (7) very important

Akkerman et al. (2014)

ANTI-ELITISM

QT: *Please indicate how much you disagree or agree with each statement.*
- *Political differences are larger between the elite and the people than they are among the people.*
- *Elected officials talk too much and take too little action.*
RO: (1) strongly disagree; (2); (3); (4); (5) strongly agree

SOVEREIGNTY

QT: *Please indicate how much you disagree or agree with each statement.*
- *The politicians in the [NATIONAL] Parliament need to follow the will of the people*
- *The people and not politicians should make our most important policy decisions.*
- *I would rather be represented by a citizen than by a specialized politician.*
RO: (1) strongly disagree; (2); (3); (4); (5) strongly agree

MANICHEAN OUTLOOK

QT: *Please indicate how much you disagree or agree with each statement.*
- *What people call "compromise" in politics is really just selling out on one's principles.*
RO: (1) strongly disagree; (2); (3); (4); (5) strongly agree

Schulz et al. (2018)

ANTI-ELITISM

QT:
- *MPs in Parliament very quickly lose touch with ordinary people.*
- *The differences between ordinary people and the ruling elite are much greater than the differences between ordinary people.*
- *People like me have no influence on what the government does.*

RO: (1) strongly disagree; (2); (3) neither agree nor disagree; (4); (5) strongly agree.

SOVEREIGNTY

QT:

- *The people should have the final say on the most important political issues by voting on them directly in referendums.*
- *The people should be asked whenever important decisions are taken.*

RO: (1) strongly disagree; (2); (3) neither agree nor disagree; (4); (5) strongly agree.

HOMOGENEITY

QT:

- *Ordinary people are of good and honest character.*
- *Ordinary people all pull together.*
- *Although the British are very different from each other, when it comes down to it they all think the same.*
- *Ordinary people share the same values and interests.*

RO: (1) strongly disagree; (2); (3) neither agree nor disagree; (4); (5) strongly agree.

Dataset: LISS

Akkerman et al. (2014)

We make use of data of the LISS (Longitudinal Internet Studies for the Social sciences) panel administered by CentERdata (Tilburg University, The Netherlands). Survey wave: Election Survey Ukraine referendum Measurement 3, datafile mj16a.

Please note that these are the English translations of the Dutch questionnaire provided by LISS panel. These translations differ slightly from the original English questionnaire of the Akkerman et al. scale, see *Supplement 6: Handling existing scales of populist attitudes*.⁷

QT: *Now we have some questions about your opinion on various political and societal themes. Please indicate to what extent you agree with the following statements.*

(E) Politicians in the House of Representatives should heed the opinion of the people.

[Politici in de Tweede Kamer moeten zich laten leiden door de mening van het volk.]

[Sovereignty]

(F) The most important political decisions should be made by the people and not by politicians.

[De belangrijkste politieke beslissingen zouden gemaakt moeten worden door het volk en niet door politici.]

[Sovereignty]

(G) I would rather be represented by an everyday citizen than by a professional politician.

[Ik word liever vertegenwoordigd door een gewone burger dan door een beroeps politicus.]

[Sovereignty]

(E) The political divisions are greater between the elite and everyday citizens than between citizens.

[De politieke tegenstellingen zijn groter tussen de elite en gewone burgers dan tussen burgers onderling.]

[Anti-Elitism]

(F) Politicians talk too much and do too little.

[Politici praten te veel en doen te weinig.]

⁷ For a different translation of the Dutch items into English, see Jacobs, Akkerman, and Zaslove 2018.

[Anti-Elitism]

(G) *In politics, reaching a compromise is often another way of describing a betrayal of principles.*

[In de politiek is het sluiten van compromissen vaak een ander woord voor het verraden van je principes.]

[Manichean Outlook]

RO: (1) *disagree completely*; (2) *disagree*; (3) *neither agree nor disagree*; (4) *agree*; (5) *agree completely*; (6) *no opinion*

Dataset: National Election Survey with CSES module

Because the questionnaire is supposed to be identical across national survey, we paste the survey instrument as described in “CSES Planning Committee Module 5 Final Report” (Hobolt et al. 2016).

QT: *Do you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree with the following statements?*

(A) *What people call compromise in politics is really just selling out one's principles.*

[Challenges to representative democracy]

(B) *Most politicians do not care about the people.*

[Anti-Elitism]

(C) *Most politicians are trustworthy*

[Anti-Elitism]

(D) *Politicians are the main problem in [COUNTRY]*

[Anti-Elitism]

(E) *Having a strong leader in government is good for [COUNTRY] even if the leader bends the rules to get things done.*

[Anti-Elitism]

(F) *The people, and not politicians, should make our most important policy decisions.*

[Challenges to representative democracy]

(G) *Most politicians care only about the interests of the rich and powerful.*

[Anti-Elitism]

QT: *Now thinking about minorities. Do you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree with the following statements?*

(B) *The will of the majority should always prevail even over the rights of minorities..*

[Challenges to representative democracy]

QT: *How widespread do you think corruption, such as bribe taking, is amongst politicians in [COUNTRY]:*

very widespread, quite widespread, not very widespread, it hardly happens at all?

[Anti-Elitism]

Supplement 5: Choice of scales on populist attitudes

In the main text, this study focuses on three scales of populist attitudes by Akkerman, Mudde, and Zaslove (2014), Castanho Silva et al. (2019), and Schulz et al. (2018). We selected the Akkerman et al. scale due to its prominence in the literature, and we selected the Castanho Silva et al. scale and the Schulz et al. scale because the respective studies conceptualize populist attitudes as multi-dimensional, they clearly specify the dimensional structure of the scale and its items, and both scales underwent psychometric validation during scale development.

However, there are various other scales on populist attitudes available that are also worth examining. We report additional evidence on two other scales in the [Shiny Web Application](#): the populism scales by Oliver and Rahn (2016) as well as the scale which is included in the Comparative Study of Electoral Systems (CSES) Wave 5 Core Questionnaire (Hobolt et al. 2016). We selected the Oliver/Rahn scale for its multi-dimensional structure as it complements the evidence on the two scales in the main text, which are also constituted by three discrete dimensions. In addition, we selected the CSES scale for its (anticipated) relevance in the field of public opinion research. *Supplement 6: Handling existing scales of populist attitudes* provides specific information on the operationalization of each scale.

Supplement 6: Handling existing scales of populist attitudes

This supplement discusses operationalizing existing scales of populist attitudes as multi-dimensional concepts with non-compensatory subdimensions. The following reflections may provide guidance when operationalizing populist attitudes as an attitudinal syndrome. However, at times, the scale documentation provided in the original studies was not sufficient for unambiguous data processing. Above all, the logical structure of populist attitudes and the delimitation of the concept's subdimensions was not always evident (Castanho Silva et al. 2019, 3). While we did our best to carefully weigh the various options to process the available survey items and to transparently outline our reasoning behind the decisions, the reported approaches represent our subjective interpretations. Others may arrive at different conclusions.

In this discussion, we focus on the dimensionality and properties of the following scales to measure populist attitudes:

- *Akkerman et al. scale*
- *CSES Wave 5 scale*
-
-
- *Castanho Silva et al. scale*
- *Schulz et al. scale*
- *Oliver / Rahn scale*

Akkerman et al. scale

At the moment of writing, the instrument developed by Akkerman, Mudde, and Zaslove (2014) to measure populist attitudes was the most frequently used scale of populism on the individual level. In line with the argument of the present study, Akkerman et al. explicitly specify populist attitudes as a “*set of ideas*” (Akkerman, Mudde, and Zaslove 2014, 1328), comprised of “*necessary and sufficient conditions*” (Akkerman, Mudde, and Zaslove 2014, 1326). Specifically, the authors state that “*the focus of the questions [of the scale] is on the three core features of populism: sovereignty of the people, opposition to the elite, and the Manichean division between “good” and “evil.”*”

(Akkerman, Mudde, and Zaslove 2014, 1330f).⁸ In other words, the authors conceptualize populist attitudes as a multi-dimensional concept, constituted by three non-compensatory concept components: Sovereignty of the people, anti-elitism, Manichean outlook.

Although the conceptual underpinnings of the Akkerman et al. scale thus mirror the present study's conceptualization of individual-level populism as an attitudinal syndrome, operationalizing the Akkerman et al. scale along the strategies discussed in the present study is not straightforward. These difficulties arise because the scale dimensionality is clear on the conceptual level, but it is less clear how to implement the multidimensionality operationally.

In the original study, Akkerman et al. „perform[ed] a *principal component analysis (PCA)* to investigate whether it is possible to identify a populist dimension [underscoring not in the original text]” (Akkerman, Mudde, and Zaslove 2014, 1326). In this vein, the authors then proceed to extract *one* dimension of populist attitudes from a longer battery of attitudinal items. It was in response to the scale's seeming uni-dimensionality that other scholars have developed new measures of populist attitudes with an explicitly multi-dimensional structure (e.g., Schulz et al. 2018, 318). As discussed in greater detail below, the concurrence of the multi-dimensional conceptual specification that underlies the scale and its usage as a one-dimensional measure (e.g., van Hauwaert and van Kessel 2018) is due to the fact that some items of the Akkerman et al. scale tap into multiple concept components at once. However, the logical structure of the scale is not always unambiguous (Castanho Silva et al. 2019, 3). Therefore, more than one approach to operationalize the scale is conceivable. Because each approach has distinct advantages and disadvantages, we discuss two strategies to operationalize the Akkerman et al. scale as an attitudinal syndrome with multiple concept components.

Scales may already account for the non-compensatory relationship between concept components at the stage of measurement by combining all concept components in each measure. More than is the case for the remaining scales examined in this study, the indicators of the Akkerman et al. scale can be understood as intended to measure not only one concept subdimension but as incorporating multiple concept components into each survey items (Akkerman, Mudde, and

⁸ See the following similar quote on the dimensionality of the Akkerman et al. scale: “*The survey questions are designed to capture the full ideology of populism and its conception of democracy, in particular the will of the people (their sovereignty) and the distinction between the people and the elite. The Manichean nature of the distinction between the people and the elites is also a feature of our survey questions*” (Akkerman, Mudde, and Zaslove 2014, 1331).

Zaslave 2014, 1332; Castanho Silva et al. 2019, 2). In this vein, some items of the Akkerman et al. scale are worded in a way so that respondents only agree with a statement if respondents concurrently agree with the tenets of multiple subdimensions (e.g., “*The people, and not politicians, should make our most important policy decisions*” which taps into sovereignty orientations and anti-elitist orientations, see Table S6-1 for an overview of the scale items). Indeed, if all items were measuring the intersection of all concept components, then it would be unnecessary to account for the dimensions’ non-compensatory relationship in the aggregation procedure. Under these circumstances, aggregating the items with simple averages - as if they reflected one dimension - would be feasible; the composite score would still assess populist attitudes as an attitudinal syndrome because the necessary conditions were already accounted for at the stage of measurement (see *Supplement 14: Assessing non-compensatory multi-dimensional concepts already at the stage of measurement* (Akkerman et al. scale) for a discussion of other vices and virtues of this approach).

In the case of the Akkerman et al. scale, however, these conditions are not met. Some indicators tap into two components simultaneously, but it is unclear whether all items are inherently multi-dimensional or whether they are linked more or less clearly to one subdimension (e.g., “*What people call “compromise” in politics is really just selling out on one’s principles*” may reflect Manichean Outlook only). More importantly, not all items appear to measure all concept components simultaneously (e.g., “*Elected officials talk too much and take too little action*” seems not to reflect orientations towards popular sovereignty). Hence, because one cannot take for granted that the multi-dimensionality of the entire concept as already incorporated in each survey item, we need to examine the dimensionality of the scale more closely before combining the scale subdimensions according to non-compensatory operationalization strategies.

Table S6-1. Items and subdimensions of Akkerman et al. populism scale

Code	Item	Strategy 1 Subdimension	Strategy 2 Subdimension
POP 1	The politicians in the [NATIONAL] Parliament need to follow the will of the people	Anti-elitism and sovereignty	Sovereignty
POP 2	The people, and not politicians, should make our most important policy decisions	Anti-elitism and sovereignty	Sovereignty
POP 3	The political differences between the elite and the people are larger than the differences among the people	Anti-elitism and sovereignty	Anti-elitism
POP 4	I would rather be represented by a citizen than by a specialized politician	Anti-elitism and sovereignty	Sovereignty

POP 5	Elected officials talk too much and take too little action	Anti-elitism and Manichean outlook	Anti-elitism
POP 7	What people call “compromise” in politics is really just selling out on one’s principles	Anti-elitism and Manichean outlook	Manichean outlook

Note: To ease comparison with the original study, the numbering of the items follows that of the original authors (Akkerman, Mudde, and Zaslove 2014, 1333). Strategy 2 was used in this study for the empirical analysis of the scale.

Strategy 1 generally acknowledges the inherent multidimensionality of the scale items and associates individual items with multiple concept components (see Table S6-1). Strategy 1 thus requires to examine how many and which subdimensions an item captures. Strategy 2, on the other hand, approximates the more classical approach to multi-dimensional concepts by understanding one survey item as reflective of one concept subdimension. Strategy 2 thus requires to identify the concept subdimension that is dominant in an item even when the item may tap into multiple subdimensions.

1) Strategy 1: Multi-dimensional items

According to the authors, the first four items [POP1-POP4] “reflect ideas about representative government, reflecting the ideas that there is a division between the people and the politicians (the elite) and that politicians do not represent the true will of the people” (Akkerman, Mudde, and Zaslove 2014, 1332). Because it is not always clear that those items also tap into the Manichean dimension (e.g., “*The politicians in the [NATIONAL] Parliament need to follow the will of the people*”), these items are understood as tapping into both the sovereignty and the anti-elitist dimensions. More specifically, one may interpret this battery of items as capturing the conjunction of anti-elitist and sovereignty-supporting attitudes.

According to the original authors, “*the Manichean dimension, that is, the tension between “good” and “evil,” is captured in the questions POP5 through POP7*” (Akkerman, Mudde, and Zaslove 2014, 1334). While this sentence implies that POP5 (“*Elected officials talk too much and take too little action*”) and POP7 (“*What people call “compromise” in politics is really just selling out on one’s principles*”, POP6 is not included in the final scale) measure the Manichean subdimension, a Manichean outlook in the context of populism is inherently linked with anti-elitist orientations because the evil is impersonated by the corrupted elite in the populist worldview (see also Akkerman, Mudde, and Zaslove 2014, 1331). Reflecting this link between anti-elitism and a

Manichean outlook, the authors posit that “*statements POP5, POP6 [not included in the final scale], and POP7 are intended to emphasize that the distinction between the people and the elite is a battle between good and evil*” (Akkerman, Mudde, and Zaslove 2014, 1331). Hence, the items POP5 and POP7 may be understood as tapping into two subdimensions: anti-elitism and Manicheanism.

Having discussed all indicators of the Akkerman et al. populism scale, Table S6-1 documents our interpretation based on the authors’ original description of the subdimensions that each indicator taps into. Based on this overview, it is possible to apply the Goertz or Sartori operationalization strategy to derive a composite populism score using the items of the Akkerman et al. scale. Specifically, using weighted or unweighted summary scores, one would first aggregate POP1 through POP4 into a composite index to reflect the conjunct acceptance of anti-elitist and sovereignty-supporting views. The second index of POP5 and POP7 would reflect a person’s conjunct acceptance of anti-elitist and of Manichean orientations. Both indexes would then be combined using the Goertz or the Sartori operationalization strategy to derive a composite index of populist attitudes.

2) Strategy 2: One-dimensional items

While some statements of the original authors can be interpreted as suggesting that all scale items are inherently multi-dimensional, a different interpretation of the original study and, thus, a different strategy for operationalization is also conceivable. Moreover, inherently multi-dimensional items are not widespread in public opinion research where each item is usually intended to measure one substantive orientation (see Supplement 14: Assessing non-compensatory multi-dimensional concepts already at the stage of measurement (Akkerman et al. scale) for a critical discussion). Another option to operationalize the Akkerman et al. scale would thus be to follow the standard practices in public opinion research by grouping items by the subdimensions that each item is supposed to reflect, assuming that each indicator is reflective of one subdimension. Applying this approach to the Akkerman et al. scale thus requires to identify the concept subdimension that is dominant in an item even when the item may tap into multiple subdimensions.

As POP1, POP2, POP4 all relate to the distribution of political power –more specifically to the tenet of transferring power from the elites to the people– we understand these items as measuring one’s support for popular sovereignty as the items’ most salient facet and thus grouped

these items to the respective sovereignty dimension. POP3 (“*The political differences between the elite and the people are larger than the differences among the people*”), in contrast, assesses differences between the elite and the people and refers to popular sovereignty only indirectly, and we thus grouped this item in the anti-elitism dimension. We also grouped POP5 (“Elected officials talk too much and take too little action”) in the anti-elitist dimension in line with the Schulz et al. populism scale which also uses the item in indicator of anti-elitist orientation. Finally, as POP7 (“*What people call “compromise” in politics is really just selling out on one’s principles*”) refers to elites only indirectly but assesses one’s general outlook on political issues, we interpreted it as mainly reflecting the Manichean dimension.

Based on this strategy, one can aggregate the items of the Akkerman et al. scale into three distinctive subdimensions (for instance, by calculating average scores). Then, these subdimensions may be aggregated into individual-level populism scores according to the Goertz or Sartori operationalization strategy (see main text and *Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs*).

3) Conclusion

Both of the strategies for operationalizing the Akkerman et al. scale presented above are feasible options for using the scale items in a way that ensures to assign high populism to an individual only if the individual agrees with all subdimensions of the concept. In our empirical analysis, we opted to use Strategy 2 as it is more in line with the operationalization procedures of the other populism scales discussed in this article.

Notably, both of these strategies differ from the operationalization procedure performed by the original authors, which, mathematically, would amount to the Bollen procedure. However, even though we have argued that the Akkerman et al. scale does not fully incorporate all of the concepts’ necessary conditions already on the measurement stage, various scale items can be understood as tapping into the conjunction of at least two concept components. Because the scale accounts for the non-compensatory relationship between concept components at least to a certain extent already at the measurement stage, whether a non-compensatory or a compensatory operationalization procedure is employed is less consequential in this case. In other words, whether the Bollen or the Goertz operationalization strategy is performed should make less of a difference compared to scales in which all items are clearly one-dimensional (see Shiny Web Application to compare scales in

various samples). Indeed, our findings demonstrate that the Akkerman et al. scale is fairly robust to choices in operationalization strategies.

CSES Wave 5 scale

Operationalizing the CSES populism scale is not straightforward. As part of the module “People, Politicians and the Politics of Populism”, CSES wave 5 provides various survey items that are more or less directly associated with populism at the mass level (Hobolt et al. 2016). According to the documentation, the CSES Wave 5 Module measures three “core themes” (Hobolt et al. 2016, 5): attitudes toward political elites, attitudes toward representative democracy and majority rule, attitudes toward out-groups. When intending to use the CSES Module 5 for research on populist attitudes, the main question at the conceptual level is whether all of these “core themes” constitute essential elements of populist attitudes. At the indicator level then the question is which of the survey questions in CSES Module 5 tap into the concept of populism and whether some indicators measure related but different concepts.

The CSES documentation suggests that populism at the mass level is to be understood as a multi-dimensional concept (Hobolt et al. 2016, 4). However, it does not explicitly specify which items and concepts denote essential concept characteristics of populist attitudes and which denote collateral concepts. Therefore, we engaged in a close reading of the Planning Committee’s Report on Module 5 to derive a coherent operationalization of populist attitudes that is consistent with the specification of the concept, as suggested by the original authors in the report (Hobolt et al. 2016). As a general rule, we decided only to include items and concepts which unequivocally constitute essential elements of populism at the mass level. Consequently, according to our interpretation, the CSES Module 5 item battery is comprised of two types of measures: those that tap into essential core elements of populist attitudes and those that indicate certain varieties of populism which do not necessarily capture core elements of the concept (e.g. authoritarian orientations). Based on these general considerations, we discuss our subjective interpretation of how CSES Module 5 data may be used to operationalize populist attitudes as a multi-dimensional concept.

According to the CSES documentation, “*the belief that political elites and the people have contrasting and incompatible interests is at the heart of populism*” (Hobolt et al. 2016, 4). Later, the authors re-iterate that “*the core aspect of populism is the notion of a clear distinction between the (good) people and the (evil) elite (Pappas 2012; Woods 2014). The antagonism between elites*

and the people is at the heart of populism (Mudde and Kaltwasser 2014)” (Hobolt et al. 2016, 5). Therefore, the concept specification suggests considering anti-elitist orientations as the essential component of populist attitudes that the authors intend to measure with the CSES scale. Consequently, we included all items that were suggested by the authors to measure anti-elitist orientations: Q4 (b, c, d) and Q7. (The battery contains yet another anti-elitism item –Q4G – which we have not included in the scale as it only taps into a specific kind of populism according to the official documentation.⁹)

According to the CSES documentation, “[p]opulism [...] encompasses a rejection of pluralism and opposition to the protection of minorities” (Hobolt et al. 2016, 4). In other words, the CSES planning committee conceptualizes attitudes toward principles and procedures of governing as an essential element of populist orientations. This proposition is shared by many, albeit not all scholars of populism (e.g., Pappas 2016; Plattner 2010; Urbinati 2014). Thus, the concept specification suggests that attitudes toward democracy and pluralism can be considered as an essential component of populist attitudes that is to be measured with the CSES scale. Yet, it is less clear which items to include for measuring this concept component.

The CSES report does not specify the dimensionality of the concept dimensions, nor does it clearly state the intended usage of the various items that are listed in the respective section on democracy-related attitudes. Items Q4e and Q4f are introduced as “*frequently voiced alternatives to the ‘corrupted’ representative system*” (Hobolt et al. 2016, 7). Considering that they are ‘frequently voiced’ implies that they may often go along with populism but do not necessarily constitute essential elements of populist attitudes. It is important to remember that populist attitudes are a form of thin ideology which can be linked to various host ideologies (Mudde 2017). One of these host ideologies can be but does not have to be authoritarianism. Therefore, we decided not to consider Q4e (“*Having a strong leader in government is good for [COUNTRY] even if the leader bends the rules to get things done*”) as measuring an essential aspect of populism on the mass level as Q4e apparently taps into support for authoritarian regime preferences. Q4f (“*The people, and not politicians, should make our most important policy decisions*”), in contrast, taps into support for popular sovereignty, which authors of other populism scales also recognize as an essential

⁹ According to the authors the item Q4G (“Most politicians care only about the interests of the rich and powerful.”) would measure left-wing populism: “Also, leftwing populists in particular often portray the elite as representative of the rich, the economically advantaged, and large financial corporations in opposition to the ordinary economically and socially disadvantaged people (captured in items Q4g).” Hobolt et al. (2016, 7).

component of populism at the mass level. Hence, we retained that item. We also kept Q4a (“*What people call compromise in politics is really just selling out one’s principles*”) which is an established item for measuring populism at the mass level and has been adopted from the Akkerman et al. scale. Q5b (“*The will of the majority should always prevail even over the rights of minorities*”) was also retained as it is intended to measure attitudes towards the democratic process with respect to minority rights which the authors have established as a constituent element of populism (see above and: “*populism tends to give priority to majority rule as a means to reach decisions, therefore leaving minority rights in a secondary place. This is captured in question Q5b*” (Hobolt et al. 2016, 7)).

Altogether, inspecting the available measures and their respective description in the CSES documentation leaves us with three indicators to measure the component on “Challenges to representative democracy.” Arguably, this component is internally less consistent than the anti-elitist subdimension as the items for that component tap into notions of anti-pluralism and sovereignty. Anti-pluralism and support for popular sovereignty are substantively linked but still represent distinct aspects of democracy-related attitudes. Nonetheless, due to their theoretical nexus and because the CSES documentation subsumes these items under the common label of “Challenges to representative democracy”, we also combine these items in one concept component for the purpose of this paper.

Finally, the CSES Module 5 offers additional survey items related to out-groups. While these survey questions help determine attitudes to which host ideology populist orientations are linked in specific populations, these orientations represent potential kinds but not essential elements of populism. Therefore, we did not include any of these here.

Table S6-2 provides an overview of the scale items and the concept subdimensions that they correspond to according to the option discussed above. After aggregating the items within each subdimension (for instance, by calculating average scores), all concept components may be aggregated into individual-level populism scores according to the Goertz or Sartori operationalization strategy (see main text and *Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs*).

Table S6-2. Items and subdimensions, CSES populism scale

Code	Item	Subdimension
Q4b	Most politicians do not care about the people	Anti-elitism

<i>Q4c</i>	Most politicians are trustworthy*	Anti-elitism
<i>Q4d</i>	Politicians are the main problem in [COUNTRY]	Anti-elitism
<i>Q7</i>	How widespread do you think corruption, such as bribe-taking, is amongst politicians in [COUNTRY]: very widespread, quite widespread, not very widespread, it hardly happens at all?	Anti-elitism
<i>Q4a</i>	What people call compromise in politics is really just selling out one's principles.	Challenges to representative democracy
<i>Q4f</i>	The people, and not politicians, should make our most important policy decisions.	Challenges to representative democracy
<i>Q5b</i>	The will of the majority should always prevail even over the rights of minorities.	Challenges to representative democracy
CSES Module 5 Survey items which are not included in the populism measure		
<i>Q4g</i>	Most politicians care only about the interests of the rich and powerful.	Left-wing Anti-elitism
<i>Q4e</i>	Having a strong leader in government is good for [COUNTRY] even if the leader bends the rules to get things done.	Authoritarian Regime Preferences

Note: Asterisks indicate reverse coded items.

Castanho Silva et al. scale

Operationalizing the scale of populist attitudes by Castanho Silva et al. is straightforward. The original study (Castanho Silva et al. 2018) clearly specifies scale dimensionality and the association between item and subdimensions (Table S6-3). After aggregating the items within each subdimension (for instance, by calculating average scores), all concept components may be aggregated into individual-level populism scores according to the Goertz or Sartori operationalization strategy (see main text and *Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs*).

Table S6-3: Items and subdimensions, Silva et al. populism scale

Code	Item	Subdimension
<i>Ppl 1</i>	Politicians should always listen closely to the problems of the people.	People-centrism
<i>Ppl 2</i>	Politicians don't have to spend time among ordinary people to do a good job.*	People-centrism
<i>Ppl 3</i>	The will of the people should be the highest principle in this country's politics	People-centrism
<i>Ant 1</i>	The government is pretty much run by a few big interests looking out for themselves.	Anti-elitism
<i>Ant 2</i>	Government officials use their power to try to improve people's lives.*	Anti-elitism
<i>Ant 3</i>	Quite a few of the people running the government are crooked.	Anti-elitism
<i>Man1</i>	You can tell if a person is good or bad if you know their politics.	Manichean outlook
<i>Man 2</i>	The people I disagree with politically are not evil.*	Manichean outlook
<i>Man 3</i>	The people I disagree with politically are just misinformed.	Manichean outlook

Note: Asterisks indicate reverse coded items.

Schulz et al. scale

Operationalizing the scale of populist attitudes by Schulz et al. is straightforward. The original study (Schulz et al. 2018) clearly specifies scale dimensionality and the association between item and subdimensions (Table S6-4). After aggregating the items within each subdimension (for instance, by calculating average scores), all concept components may be aggregated into individual-level populism scores according to the Goertz or Sartori operationalization strategy (see main text and *Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs*).

Table S6-4: **Items and subdimensions, Schulz et al. populism scale**

Code	Item	Subdimension
<i>Ant 1</i>	MPs in Parliament very quickly lose touch with ordinary people.	Anti-elitism
<i>Ant 2</i>	The differences between ordinary people and the ruling elite are much greater than the differences between ordinary people.	Anti-elitism
<i>Ant 3</i>	People like me have no influence on what the government does.	Anti-elitism
<i>Ant 4</i>	Politicians talk too much and take too little action.	Anti-elitism
<i>Sov 1</i>	The people should have the final say on the most important political issues by voting on them directly in referendums.	Sovereignty
<i>Sov 2</i>	The people should be asked whenever important decisions are taken.	Sovereignty
<i>Sov 3</i>	The people, not the politicians, should make our most important policy decisions.	Sovereignty
<i>Sov 4</i>	The politicians in Parliament need to follow the will of the people.	Sovereignty
<i>Hom 1</i>	Ordinary people all pull together.	Homogeneity
<i>Hom 2</i>	Ordinary people are of good and honest character.	Homogeneity
<i>Hom 3</i>	Ordinary people share the same values and interests.	Homogeneity
<i>Hom 4</i>	Although the Swiss are very different from each other, when it comes down to it they all think the same.	Homogeneity

Note: This table shows the original scale items. The analysis in the main text uses an adapted scale with slightly different wording. See Supplement 10: Various operationalizations of the Sartori concept structure.

Oliver / Rahn scale

Operationalizing the scale of populist attitudes by Oliver/Rahn is straightforward. The original study (Oliver and Rahn 2016) clearly specifies scale dimensionality and the association between item and subdimensions (Table S6-5).¹⁰ After aggregating the items within each subdimension (for instance, by calculating average scores), all concept components may be aggregated into individual-level populism scores according to the Goertz or Sartori

¹⁰ The Oliver/Rahn scale contains a discrete subdimension on national identity whereas we did not include items related to national identity as essential items of the CSES scale. We follow a different strategy due to the primacy of the original authors' concept specification over our interpretation of a scale. The original author' concept specification is clearly documented in the case of the Oliver/Rahn scale but required our interpretation in the case of the CSES scale.

operationalization strategy (see main text and *Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs*).

Table S6-5. Items and subdimensions, Oliver/Rahn populism scale

<i>Code</i>	<i>Item</i>	<i>Subdimension</i>
<i>Ppl 1</i>	Trust in citizens on complex political issues (dichotomous).	National Affiliation
<i>Ppl 2</i>	Similarity with other fellow citizens (dichotomous)	National Affiliation
<i>Ppl 3</i>	How important is being [nationality] to you?	National Affiliation
<i>Ant 1</i>	The government is pretty much run by a few big interests looking out for themselves	Anti-elitism
<i>Ant 2</i>	Government officials use their power to try to improve people's lives.	Anti-elitism
<i>Ant 3</i>	Quite a few of the people running the government are crooked.	Anti-elitism
<i>Ant 4</i>	It doesn't really matter who you vote for because the rich control both political parties	Anti-elitism
<i>Mis 1</i>	I'd rather put my trust in the wisdom of ordinary people than the opinions of experts and intellectuals	Mistrust in Experts
<i>Mis 2</i>	I'd rather put my trust in the wisdom of ordinary people than the opinions of experts and intellectuals	Mistrust in Experts
<i>Mis 3</i>	Ordinary people can really use the help of experts to understand complicated things like science and health.	Mistrust in Experts

Supplement 7: Descriptive statistics

Table S7-1 shows the distribution of socio-demographic variables in the GLES Campaign Panel, as it was used in the main analysis (excluding respondents with missing values on the populism variables from survey wave 5). Tables S7-2 through Table S7-5 shows the distribution of socio-demographic variables in the Castanho Silva et al. replication data set, separated by countries.

Table S7-1. Sample composition in German Longitudinal Election Study, Campaign Panel 2017

	<i>Total</i> (N = 13998)
<i>Age</i>	
Mean (SD)	48.73 (14.7)
<i>Gender</i>	
Male	6844 (48.9%)
Female	7154 (51.1%)
<i>Education</i>	
School student (“Schüler”)	60 (0.4%)
Left school without a certificate (“ohne Abschluss”)	96 (0.7%)
Certificate of Secondary Education (“Hauptschulabschluss”)	2362 (16.9%)
Intermediate school-leaving certificate (“Mittlere Reife”)	3905 (27.9%)
Advanced technical college certificate (“Fachhochschulreife”)	1009 (7.2%)
Advanced school-leaving certificate (“Abitur”)	3186 (22.8%)

Notes: **Education**: current/highest completed school degree. Surveyed at wave 5.

Table S7-2. **Sample composition in Castanho Silva et al. (2018) replication data set**

	<i>U.S.</i> (N = 505)	<i>Brazil</i> (N = 281)	<i>France</i> (N = 274)	<i>Greece</i> (N = 275)	<i>Ireland</i> (N = 269)	<i>Italy</i> (N = 219)	<i>Mexico</i> (N = 221)	<i>Spain</i> (N = 280)	<i>UK</i> (N = 186)
<i>Age</i>									
Mean (SD)	35.0 (10.6)	29.5 (8.5)	29.7 (8.4)	34.0 (8.7)	37.8 (11.3)	35.4 (11.0)	33.1 (9.3)	32.2 (9.1)	34.0 (10.6)
<i>Education</i>									
Mean (SD)	4.1 (1.3)	14.4 (4.2)	16.3 (4.3)	17.0 (5.1)	15.0 (3.9)	14.3 (5.2)	14.1 (4.9)	14.5 (4.9)	14.4 (5.2)
<i>Income</i>									
Mean (SD)	5.8 (3.1)	4.0 (1.5)	6.3 (2.9)	5.7 (2.6)	4.8 (2.4)	4.6 (2.5)	4.6 (2.7)	3.6 (2.5)	4.4 (2.5)
<i>Ideology</i>									
Mean (SD)	4.2 (2.3)	5.5 (2.1)	4.9 (1.8)	4.4 (2.2)	5.1 (2.3)	5.1 (1.9)	5.5 (1.9)	5.2 (1.9)	5.4 (1.8)
<i>Gender</i>									
Male	223 (44.7%)	219 (81.1%)	206 (76.6%)	195 (73.6%)	142 (53.2%)	125 (59.5%)	152 (72.4%)	185 (73.7%)	106 (59.2%)
Female	276 (55.3%)	51 (18.9%)	63 (23.4%)	70 (26.4%)	125 (46.8%)	85 (40.5%)	58 (27.6%)	66 (26.3%)	73 (40.8%)

Notes: **Age**: mean age; **Education**: for American sample, mean of the highest degree achieved. For the others, mean number of years completed of formal education; **Income**: mean income decile; **Ideology**: mean left-right self-placement on a 1-9 scale, where 1 is left.

Table S7-3. Schulz et al. populism scale in German Longitudinal Election Study, Campaign Panel 2017

	<i>Total</i> (N = 13998)
<i>Populism (Goertz)</i>	
Mean (SD)	-0.54 (0.73)
<i>Populism (Bollen)</i>	
Mean (SD)	-0.01 (0.65)
<i>Anti-Elitism</i>	
Mean (SD)	-0.01 (0.79)
<i>Manichean Outlook</i>	
Mean (SD)	0.00 (0.84)
<i>People-Centrism</i>	
Mean (SD)	0.00 (0.85)
<i>Populism (Sartori)</i>	
0	12966 (93.0%)
1	969 (7.0%)

Table S7-4. Populism scales (Castanho Silva et al. 2016) in Castanho Silva et al. (2018) replication data set

	<i>U.S.</i> (N = 505)	<i>Brazil</i> (N = 281)	<i>France</i> (N = 274)	<i>Greece</i> (N = 275)	<i>Ireland</i> (N = 269)	<i>Italy</i> (N = 219)	<i>Mexico</i> (N = 221)	<i>Spain</i> (N = 280)	<i>UK</i> (N = 186)
<i>Populism (Goertz)</i>									
Mean (SD)	0.36 (0.16)	0.37 (0.14)	0.37 (0.14)	0.35 (0.15)	0.36 (0.16)	0.36 (0.15)	0.35 (0.16)	0.37 (0.15)	0.37 (0.15)
<i>Populism (Bollen)</i>									
Mean (SD)	0.53 (0.12)	0.53 (0.10)	0.53 (0.10)	0.53 (0.10)	0.53 (0.11)	0.53 (0.11)	0.53 (0.10)	0.53 (0.10)	0.53 (0.11)
<i>Anti-Elitism</i>									
Mean (SD)	0.61 (0.19)	0.61 (0.17)	0.61 (0.17)	0.61 (0.18)	0.61 (0.19)	0.61 (0.17)	0.61 (0.18)	0.61 (0.16)	0.61 (0.16)
<i>Manichean Outlook</i>									
Mean (SD)	0.40 (0.19)	0.40 (0.16)	0.40 (0.15)	0.40 (0.19)	0.40 (0.17)	0.40 (0.18)	0.40 (0.19)	0.40 (0.17)	0.40 (0.17)
<i>People-Centrism</i>									
Mean (SD)	0.59 (0.17)	0.59 (0.15)	0.59 (0.15)	0.59 (0.15)	0.59 (0.15)	0.59 (0.16)	0.59 (0.15)	0.59 (0.15)	0.59 (0.17)
<i>Populism (Sartori)</i>									
0	471 (93.3%)	271 (96.4%)	264 (96.4%)	266 (96.7%)	245 (91.1%)	207 (94.5%)	216 (97.7%)	270 (96.4%)	181 (97.3%)
1	34 (6.7%)	10 (3.6%)	10 (3.6%)	9 (3.3%)	24 (8.9%)	12 (5.5%)	5 (2.3%)	10 (3.6%)	5 (2.7%)

Table S7-5. Populism scales (Oliver/Rahn 2016) in Castanho Silva et al. (2018) replication data set

	<i>U.S.</i> (N = 505)	<i>Brazil</i> (N = 281)	<i>France</i> (N = 274)	<i>Greece</i> (N = 275)	<i>Ireland</i> (N = 269)	<i>Italy</i> (N = 219)	<i>Mexico</i> (N = 221)	<i>Spain</i> (N = 280)	<i>UK</i> (N = 186)
<i>Goertz (Oliver/Rahn)</i>									
Mean (SD)	0.41 (0.15)	0.43 (0.14)	0.42 (0.14)	0.42 (0.14)	0.43 (0.15)	0.42 (0.14)	0.42 (0.14)	0.42 (0.15)	0.42 (0.15)
<i>Bollen (Oliver/Rahn)</i>									
Mean (SD)	0.58 (0.11)	0.58 (0.11)	0.58 (0.11)	0.58 (0.10)	0.58 (0.12)	0.58 (0.11)	0.58 (0.11)	0.58 (0.11)	0.58 (0.11)
<i>Anti-Elitism</i>									
Mean (SD)	0.57 (0.20)	0.58 (0.17)	0.57 (0.18)	0.57 (0.18)	0.57 (0.20)	0.57 (0.19)	0.57 (0.19)	0.57 (0.19)	0.57 (0.18)
<i>National Affiliation (Homogeneity)</i>									
Mean (SD)	0.48 (0.18)	0.48 (0.16)	0.48 (0.16)	0.48 (0.15)	0.48 (0.15)	0.48 (0.17)	0.48 (0.16)	0.48 (0.16)	0.48 (0.17)
<i>Mistrust in Experts</i>									
Mean (SD)	0.69 (0.15)	0.69 (0.18)	0.69 (0.17)	0.69 (0.17)	0.69 (0.17)	0.69 (0.17)	0.69 (0.16)	0.69 (0.16)	0.69 (0.16)
<i>Sartori (Oliver/Rahn)</i>									
0	250 (98.0%)	264 (96.4%)	258 (95.6%)	268 (98.5%)	258 (96.6%)	211 (96.8%)	211 (97.2%)	258 (98.5%)	179 (96.8%)
1	5 (2.0%)	10 (3.6%)	12 (4.4%)	4 (1.5%)	9 (3.4%)	7 (3.2%)	6 (2.8%)	4 (1.5%)	6 (3.2%)

Table S7-6. Populism scales (Schulz 2018) in Castanho Silva et al. (2018) replication data set

	<i>U.S.</i> (N = 505)	<i>Brazil</i> (N = 281)	<i>France</i> (N = 274)	<i>Greece</i> (N = 275)	<i>Ireland</i> (N = 269)	<i>Italy</i> (N = 219)	<i>Mexico</i> (N = 221)	<i>Spain</i> (N = 280)	<i>UK</i> (N = 186)
<i>Goertz (Schulz)</i>									
Mean (SD)	0.48 (0.16)	0.49 (0.17)	0.49 (0.17)	0.49 (0.16)	0.49 (0.17)	0.49 (0.13)	0.49 (0.16)	0.49 (0.17)	0.50 (0.15)
<i>Bollen (Schulz)</i>									
Mean (SD)	0.62 (0.12)	0.62 (0.13)	0.62 (0.13)	0.62 (0.13)	0.62 (0.14)	0.62 (0.12)	0.62 (0.13)	0.62 (0.14)	0.62 (0.13)
<i>Anti-Elitism</i>									
Mean (SD)	0.65 (0.19)	0.65 (0.18)	0.65 (0.17)	0.65 (0.17)	0.65 (0.19)	0.65 (0.18)	0.65 (0.18)	0.65 (0.18)	0.65 (0.18)
<i>Homogeneity</i>									
Mean (SD)	0.68 (0.18)	0.68 (0.18)	0.68 (0.18)	0.68 (0.19)	0.68 (0.18)	0.68 (0.17)	0.68 (0.18)	0.68 (0.18)	0.68 (0.18)
<i>Sovereignty</i>									
Mean (SD)	0.54 (0.17)	0.54 (0.18)	0.54 (0.17)	0.54 (0.17)	0.54 (0.18)	0.54 (0.15)	0.54 (0.16)	0.54 (0.18)	0.54 (0.15)
<i>Sartori (Schulz)</i>									
0	239 (93.7%)	249 (91.5%)	240 (89.2%)	254 (93.4%)	246 (92.1%)	203 (93.1%)	207 (95.0%)	238 (91.2%)	168 (91.3%)
1	16 (6.3%)	23 (8.5%)	29 (10.8%)	18 (6.6%)	21 (7.9%)	15 (6.9%)	11 (5.0%)	23 (8.8%)	16 (8.7%)

Supplement 8: Non-probability and probability-based survey data

The analyses reported in the main text do not make use of probability-based samples of the general population. Instead, the analysis relies on non-probability samples, all of which were collected online. Specifically, the study uses the Campaign Panel of the German Longitudinal Election Study (GLES), which is a heterogeneous sample of respondents who were recruited and surveyed online. Even though GLES employs socio-demographic quotas to create a sample that closely resembles the German voting age population, the sample cannot be considered representative of the German population. Above all, the sample is restricted to individuals with Internet access. In addition, the sample exhibits moderate biases with respect to social characteristics such as formal education and political characteristics such as voting behavior (Mader and Schoen 2019).

The second data source underlying the analyses in the main text, the Castanho Silva et al. replication dataset, is also subject to sampling biases. The samples contained in the Castanho Silva et al. dataset were drawn from two crowd worker services, Crowdfunder and MTurk. It is well known that the composition of respondents on these platforms do not resemble the general population and that the political attitudes measured on the platforms do not mirror the attitudes of the general population (Berinsky, Huber, and Lenz 2012).

Against the backdrop of these sampling errors that may affect the distribution of political attitudes, we are cautious not to draw inferences from these samples about the distribution of populist attitudes in the general population. Instead, for inferences about the distribution of single attitudes, we make use of probability-based samples in which the measured distribution of attitudes usually resembles that of the general population more closely (Berinsky, Huber, and Lenz 2012). In particular, in the [Shiny Web Application](#) where we use the Sartori operationalization strategy to report the share of populist citizens in various populations we only calculate the estimates using probability-based samples.

However, even though survey-methodological research shows that the distribution of attitudes in non-probability-based samples may differ compared with probability-samples or the general population, previous research has also shown that treatment effects (e.g., Mullinix et al. 2015) and the functional relationship between variables (e.g., Bieber and Bytzek 2012) are often not biased or not strongly biased in non-probability samples. Hence, if we understand the primary estimand of the main text as the difference between the Bollen and Goertz populism

scores, then this study’s main interest also concerns functional relationships between variables, providing some confidence regarding the credibility of the estimates.

Even though there is thus more reason to be confident about the generalizability of the main estimand, we have conducted additional robustness tests to assess this claim. Specifically, we conducted analyses to compare the correlation between Bollen and Goertz populism scores between probability-based and non-probability-based samples. Unfortunately, the only scale for which we have access to both probability-based and non-probability-based samples is the Akkerman et al. populism scale. This is unfortunate because the Akkerman et al. scale exhibits strong robustness to operationalization strategies, that is a strong association between Goertz and Bollen composite scores. These strong correlations can give rise to floor effects, which may lead to an underestimation of the sensitivity of the scale to sample characteristics such as non-probability and probability-based samples. With this caveat in mind, there are no meaningful differences in the internal structure of the Akkerman et al. scale between probability-based samples (Figure S8-1, Figure S8-2) and non-probability samples (Figure S8-3, Figure S8-4). While not definitive evidence, these findings can be read as supporting the proposition that disparities between probability-based and non-probability samples may occur under very specific conditions that are not likely to be met in the context of this research question.

Figure S8-1. Internal Structure of Akkerman et al. populism scale (Germany, GLES Face-to-face Cross-Section Survey)

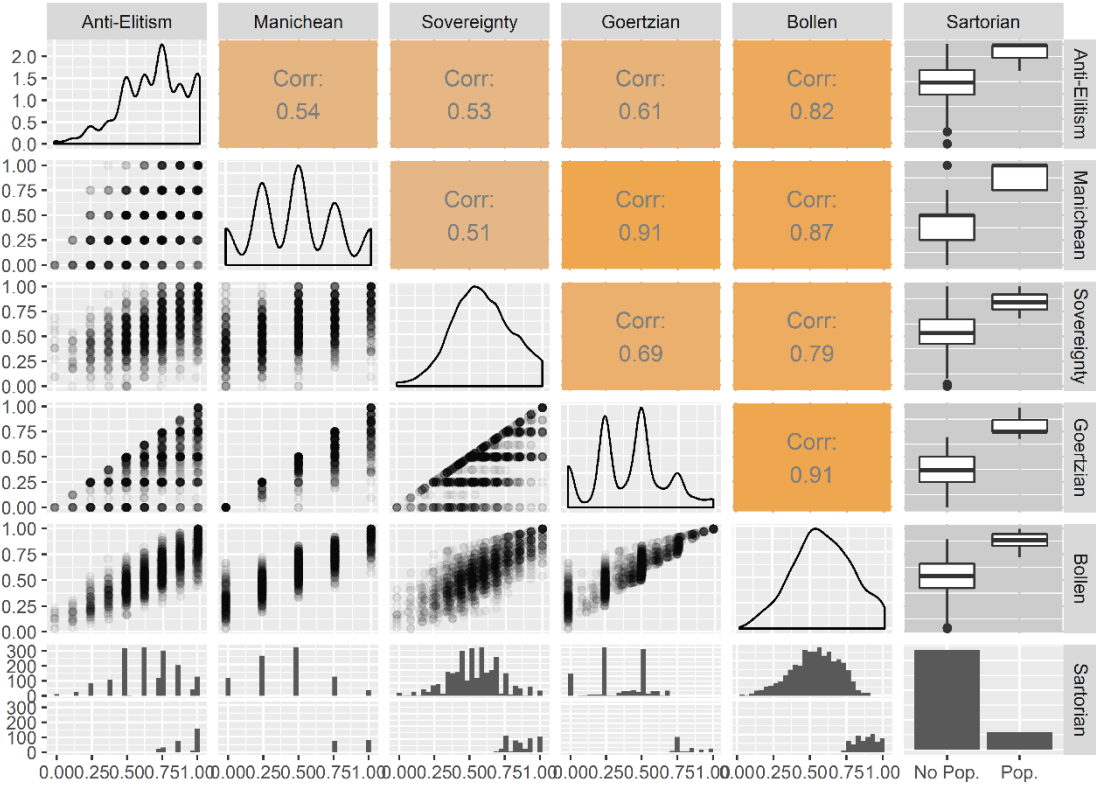


Figure S8-2. Internal Structure of Akkerman et al. populism scale (Netherlands, LISS probability-based panel)

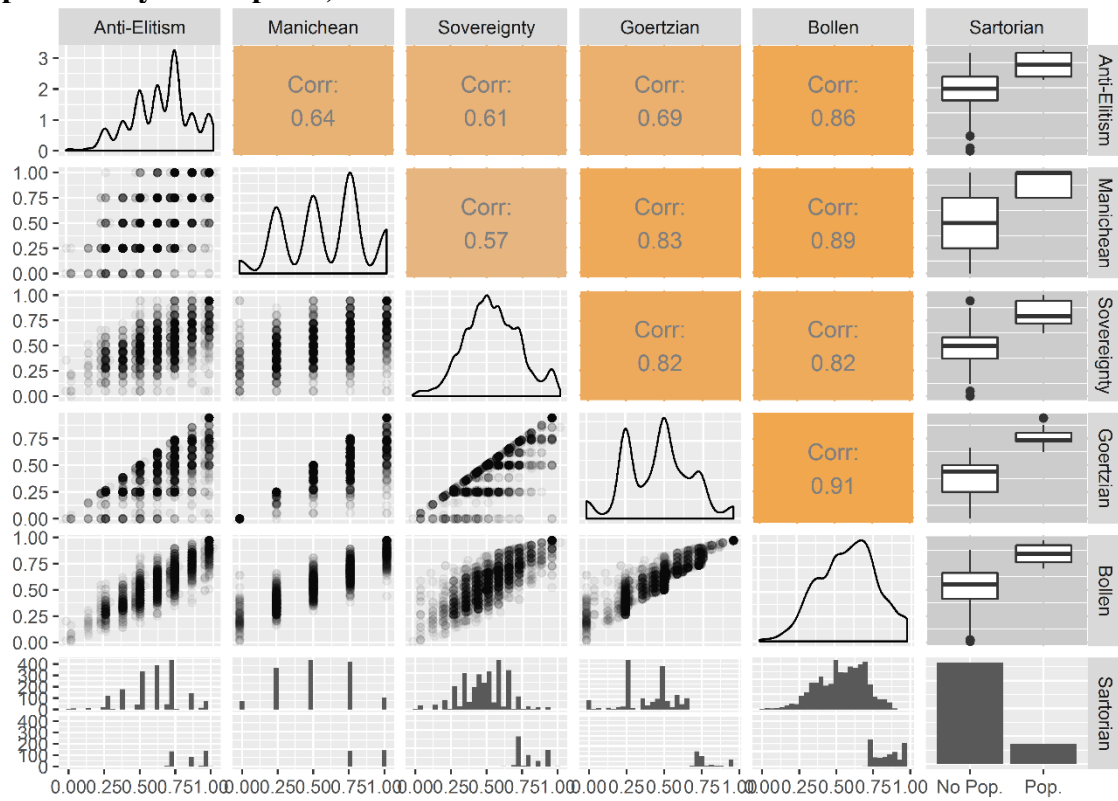


Figure S8-3. Internal Structure of Akkerman et al. populism scale (United Kingdom, Crowdflower non-probability panel)

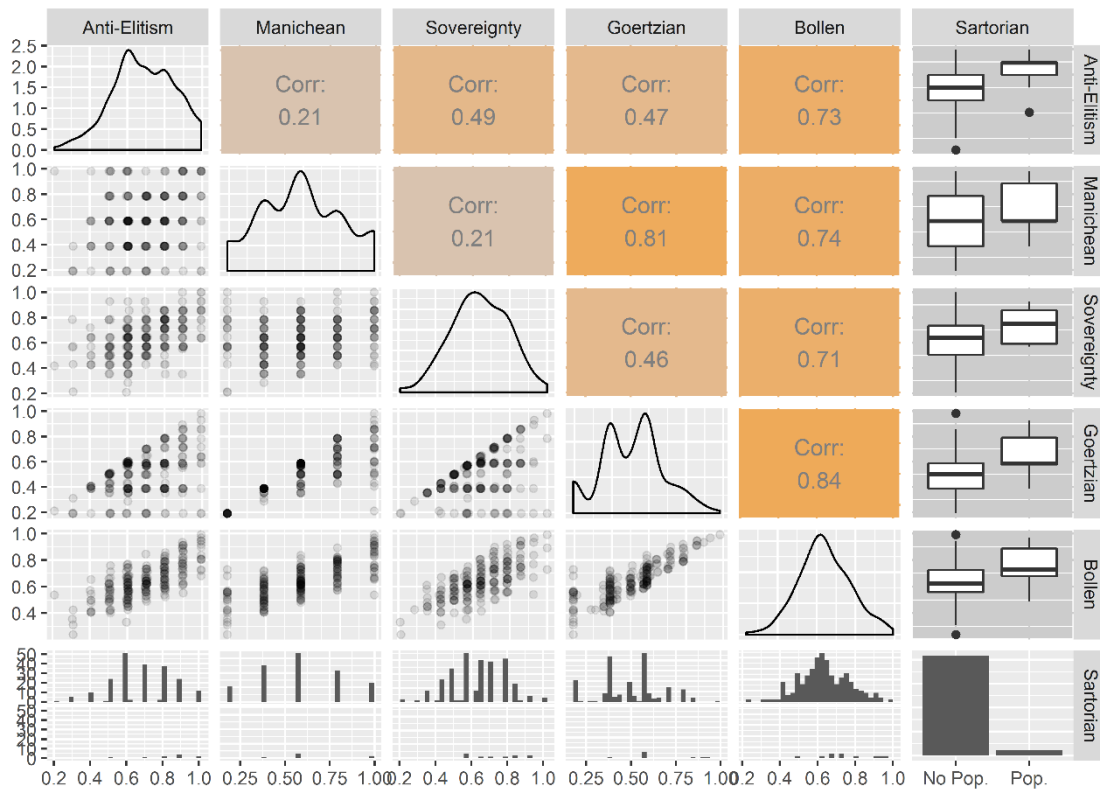
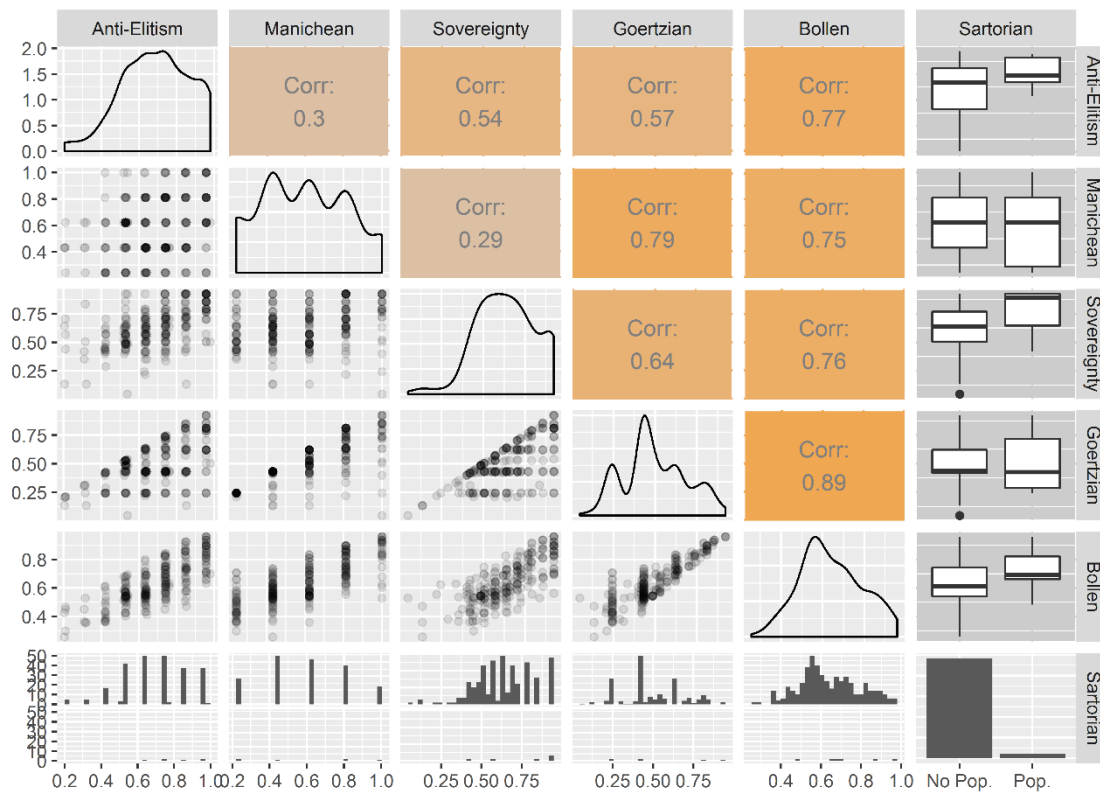


Figure S8-4. Internal Structure of Akkerman et al. populism scale (USA, Crowdflower non-probability panel)



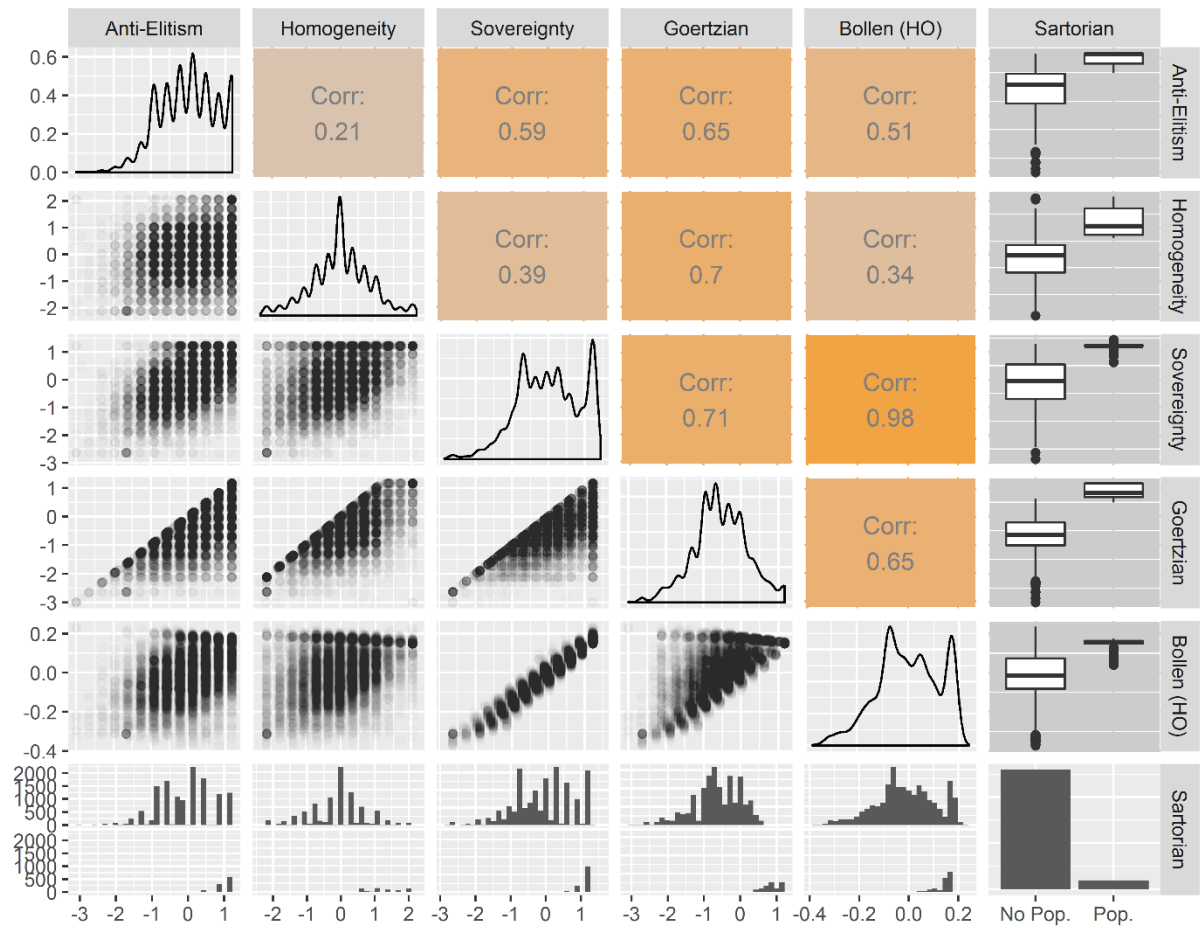
Supplement 9: Higher-order factor model

Because populist attitudes represent a multi-level construct with dimensions at the second level and indicators at the third level, many different operationalization techniques are conceivable. The main text focuses on the discussion of aggregation rules for the second level. For the aggregation of indicators into composite scores, we opted for a simple and transparent technique: unweighted summary scores. Yet, more sophisticated methods for aggregating indicators into dimensions are available. In particular, several validation studies of populism scales employ methods that are more technically advanced than the simple aggregation methods used in the main text of this study. Therefore, we replicated the analysis reported in Figure 2 of the main text, using the original authors' own methods. Specifically, following Schulz et al. (2018) we employed structural equation modeling to operationalize populist attitudes as a latent higher-order construct. That is, populist attitudes are modeled as a latent factor at the first level. The sub-dimensions are modeled as latent factors at the second level loading on the manifest indicators at the third level. In general, such a method can be subsumed under the Bollen approach because it treats the subdimensions as compensatory. Comparing the results reported in Figure S9-1 below with Figure 2 from the main text underscores the study's main finding: composite scores of populist attitudes do not yield identical results when the Goertz or Bollen operationalization strategies are applied. What is more, the discrepancy between the Goertz and the Bollen concept structure is even larger when we employ structural equation modeling to compute Bollen populism scores.

However, it should be noted that replicating the methods used by Schulz et al. (2018) on the Schulz et al. populism scale in the GLES dataset was not straightforward. The model did not converge using Stata 15.1 but it did converge using the R-lavaan package. Maybe the higher-order factor model is not well suited for the adapted Schulz et al. scale that was used in the German Campaign panel, which could explain the very strong correlation between the Bollen populism score and the sovereignty dimension.¹¹

¹¹ Note that Hieda, Zenkyo and Nishikawa (2019) were also unable to reproduce a higher-order factor model in a sample of Japanese respondents based on the Schulz et al. scale.

Figure S9-1. Internal structure of Schulz et al. populism scale using a Higher-Order Factor Model (GLES, Schulz et al. populism scale)



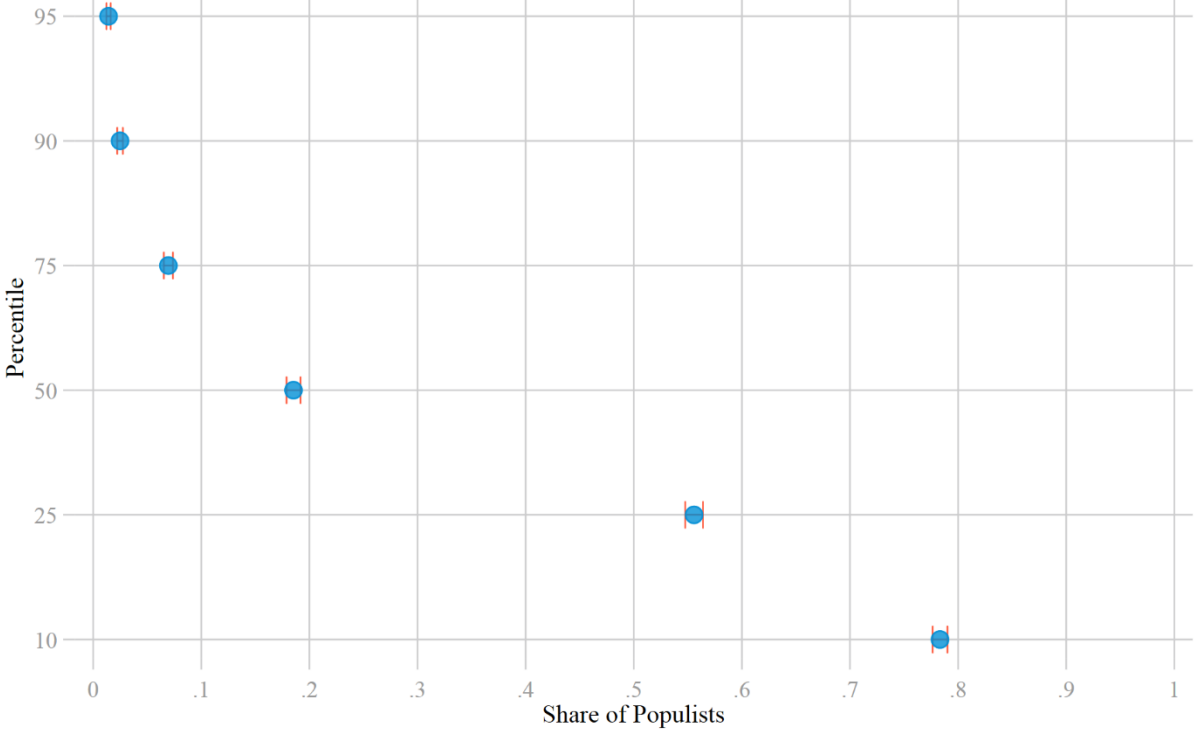
Supplement 10: Various operationalizations of the Sartori concept structure

To operationalize populist attitudes, according to the Sartori concept structure, we relied on the 75th percentile as a threshold for the classification of populist attitudes in the main text. According to this specification, individuals were classified as populists if, on each of the three populism subdimensions, they agree more strongly with the components of populism than the bottom 75% of respondents. Arguably, other thresholds are also plausible. Figure S10-1 demonstrates the empirical relationship between the threshold set on the subdimensions and the share of respondents who are classified as populists in a given survey sample. The results in Figure S10-1 are based on the Schulz et al. populism scale in the German campaign survey. Among other things, the plot shows the non-linear relationship between the threshold and the share of respondents who are classified as populists. For instance, using the 75th percentile instead of the 90th percentile as threshold multiplies the share of respondents who are classified as populists.

The plot visualizes the data structure of the German campaign survey and is intended to demonstrate the share of populists at various thresholds. However, it should be noted that theoretical reasoning about the essence of populist attitudes must guide the decisions regarding the adequate threshold.

Following the analyses in the main text, the results in Figure S10-1 rely on standardized indicators. As discussed in the main text, it is also possible to operationalize the Sartori concept structure using unstandardized indicators. Setting a meaningful threshold with unstandardized indicators requires to consider the scale of the indicators. The Schulz et al. populism scale, as it is used in the German Campaign Panel, provides three indicators for each of the three subdimensions of populist attitudes. The response scale of the indicators has the following values: strongly disagree; tend to disagree; neither agree nor disagree; tend to agree; strongly agree.

Figure S10-1. Share of populists in the German Campaign Survey, by threshold



We report results for the Sartori concept structure using unstandardized indicators based on two different thresholds. The more liberal threshold requires all individuals to “agree” or “strongly agree” with all indicators on all dimensions for the classification as populists. Applying this threshold, 4.5% of the respondents in the German campaign panel are categorized as populists. In other words, 4.5% of respondents agree with all components of populist attitudes.

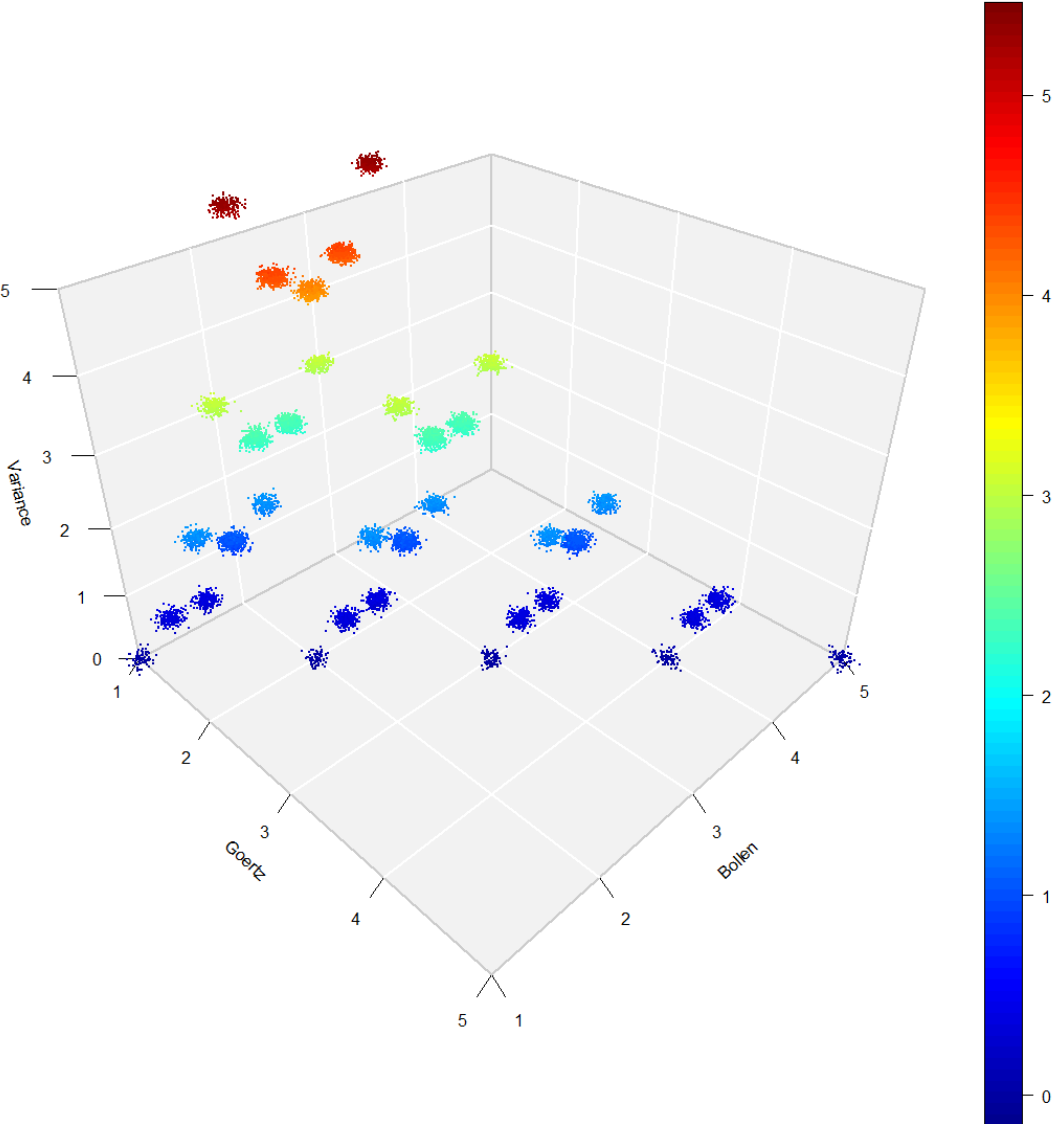
The stricter threshold requires individuals to “strongly agree” with the items. Yet, we still categorize individuals as populists if they “agree” (instead of “strongly agree”) with one of the three items for each subdimension. Altogether, this threshold is higher than the liberal threshold because it requires stronger support of at least two components of populism on the mass level. In this specification, 3.0 % of the respondents are classified as populists. Altogether, mirroring the results in the main text using relative thresholds, these numbers suggest that a segment of the German sample of respondents exhibits a populist world view. However, the share of populist individuals is rather small.

Supplement 11: Simulation of the relationship between the Bollen and the Goertz composite scores

Which conditions determine the size of disparities between the Bollen and the Goertz constructs of populist attitudes? To examine this question, we simulated a dataset with 10,000 randomly drawn observations, assuming that populist attitudes comprise three subdimensions.

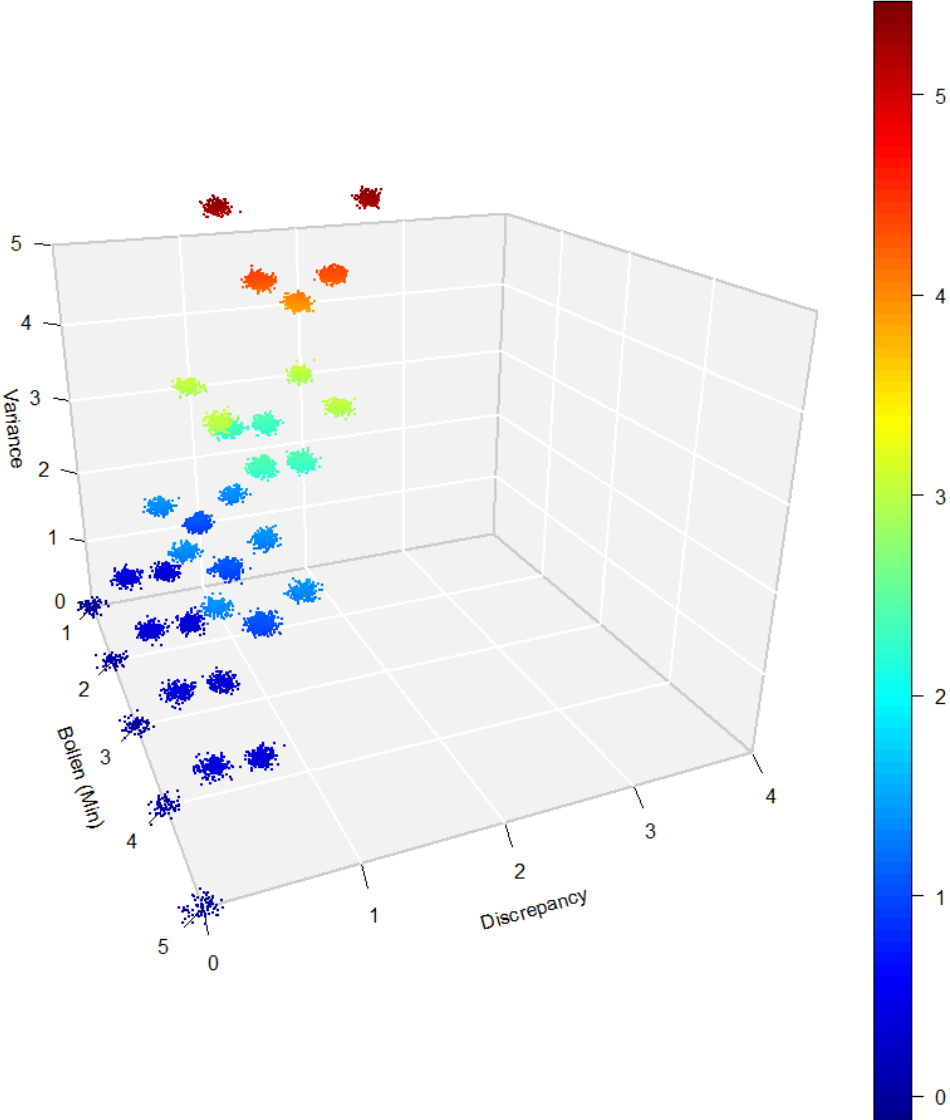
Figure S11-1 shows the empirical relationship between Bollen populism scores, Goertz populism scores, and the variance of the concept subdimensions. Figure S11-2 displays the empirical relationship between Goertz populism scores, the variance of the concept subdimensions, and the discrepancy between Bollen and Goertz scores in the simulated data set. The three-dimensional scatterplot demonstrates that the discrepancies between the Goertz and the Bollen populism scores increase when the Goertz scores increase. In addition, higher variances between the concept subdimensions also increase the discrepancy between the populism constructs.

Figure S11-1. Relationship between Bollen populism scores, Goertz populism scores and the variance of concept subdimensions



Notes: 10,000 randomly drawn observations, assuming three subdimensions of populist attitudes.

Figure S11-2. Relationship between Goertz populism scores, the variance of the concept subdimensions and the discrepancy between Bollen and Goertz scores in a simulated data set



Notes: 10,000 randomly drawn observations, assuming three subdimensions of populist attitudes.

Supplement 12: Correlations with conspiratorial thinking

Investigating how different concept structures of populist attitudes lead to different or similar correlations with substantive variables of interest, this appendix extends the analysis reported in Figure 5 in the main text. Specifically, it reports correlations of populist attitudes as derived with different operationalizations with conspiratorial thinking. Conspiratorial thinking is captured by a summary index of five indicators on the perception of hidden elite influences on the political process. The results vary between the four populism scales considerably.

The Castanho Silva et al. populism scale exhibits notable cross-national heterogeneity. People-centrism and Manichean outlook are positively correlated with conspiratorial thinking in some countries but negatively correlated in other countries. With respect to the disparities between the Goertz and the Bollen populism scores, the correlations with conspiratorial thinking differ significantly between both concept structures in all samples. In all but one case, the correlation is much weaker for the Goertz than for the Bollen concept structure. In several instances, only the correlation of the Bollen populism scores with conspiratorial thinking passes conventional levels of statistical significance, whereas the respective correlations of the Goertz populism scores do not.

Using the Oliver/Rahn populism scale, anti-elitist orientations are moderately correlated with conspiratorial thinking, but the other two subdimensions show hardly any association with the variable of interest. The disparities between the Goertz and Bollen concept structures are small to negligible. Using the Schulz et al. populism scale, all subdimensions are positively correlated with conspiratorial thinking in most of the samples. The evidence also exhibits small disparities between the Goertz and Bollen concept structures. Using the Akkerman et al. populism scale, the disparities between the Goertz and Bollen concept structures are negligible.

Altogether, whether and how the operationalization of populist attitudes makes a difference in investigating conspiratorial thinking depends a lot on the sample and the scale that is used.

Figure S12-1. **Bivariate correlations with conspiratorial thinking (Castanho Silva et al. populism scale)**

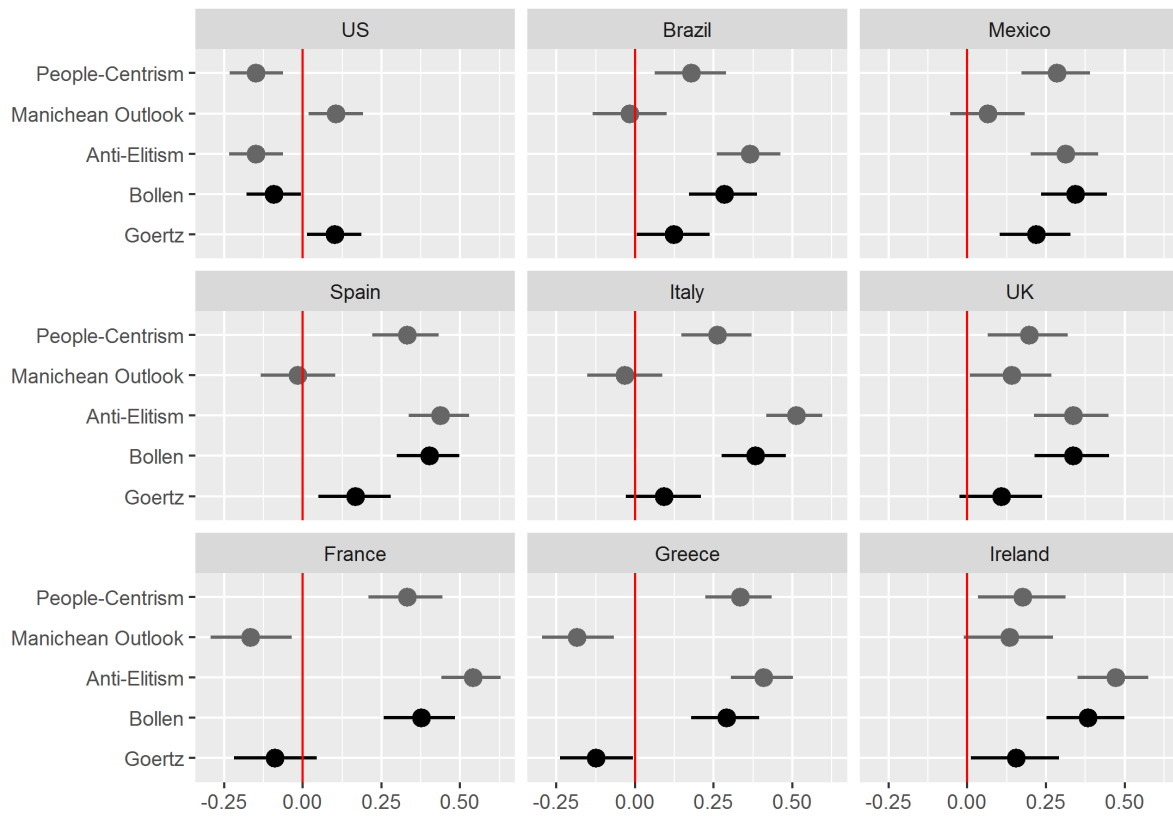


Figure S12-2. **Bivariate correlations with conspiratorial thinking (Oliver/Rahn populism scale)**

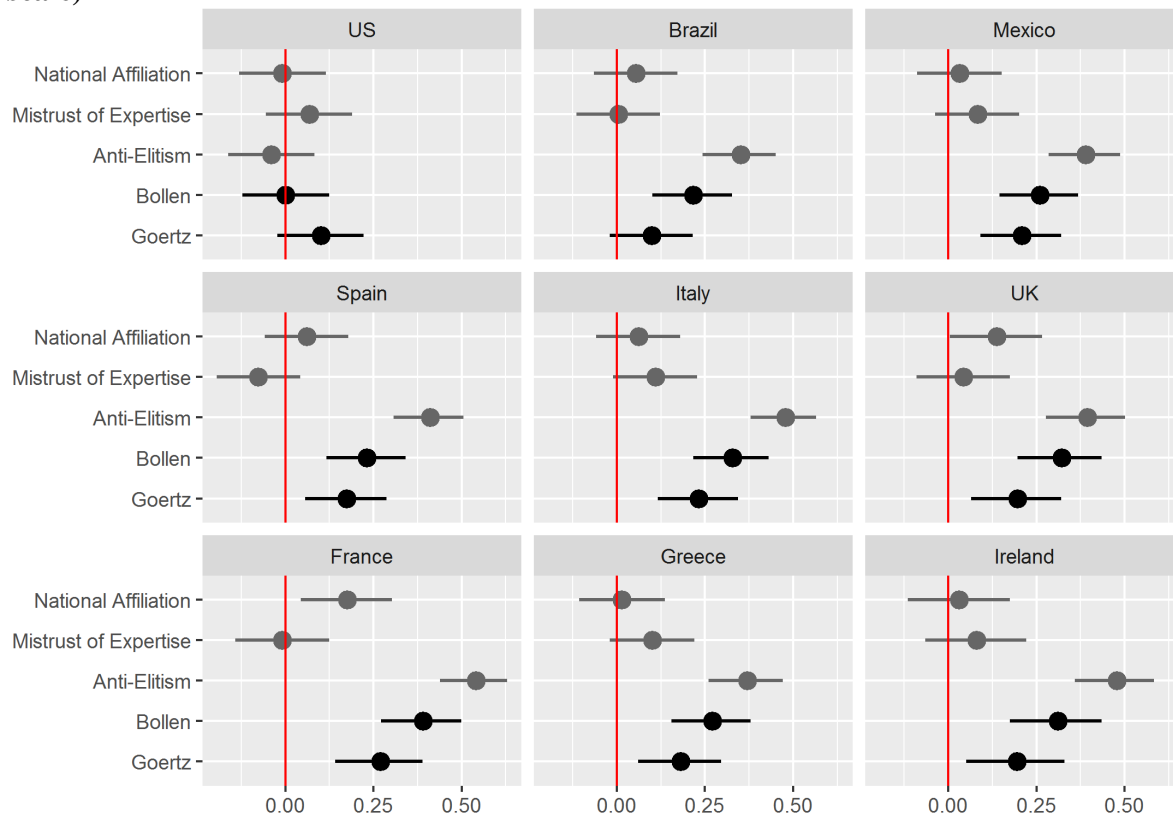


Figure S12-3. **Bivariate correlations with conspiratorial thinking (Schulz et al. populism scale)**

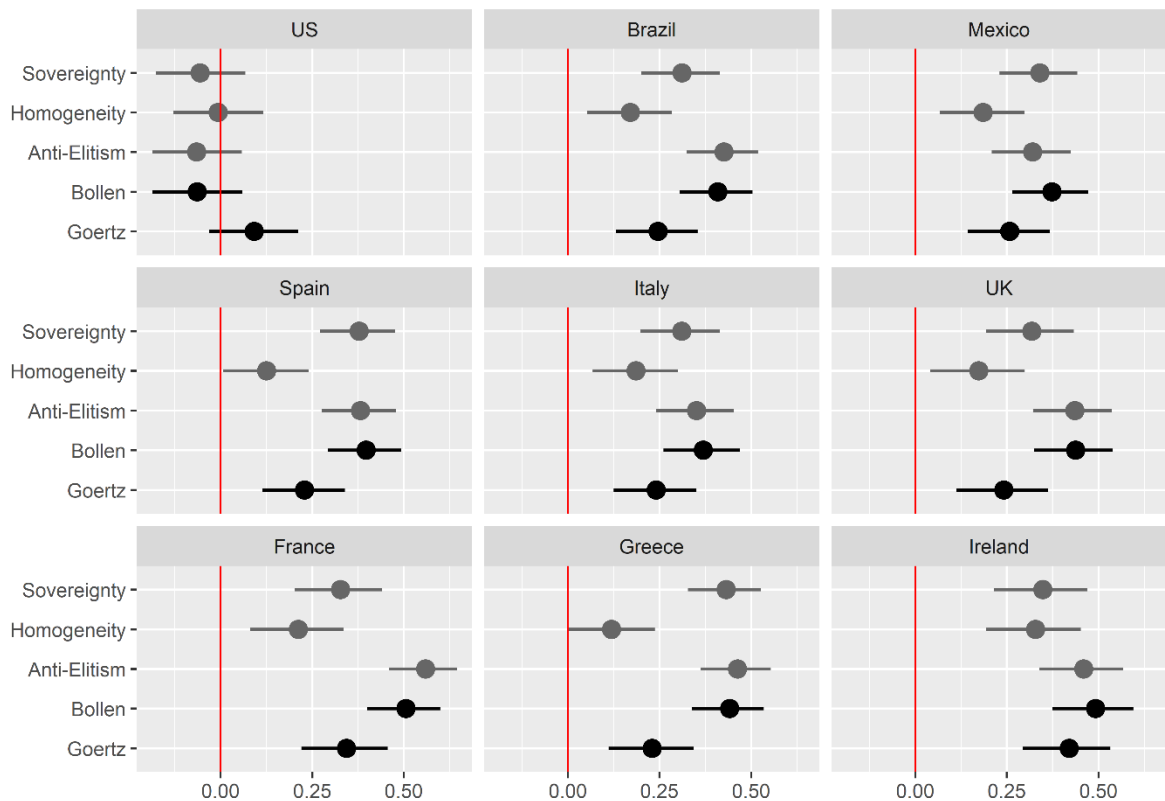
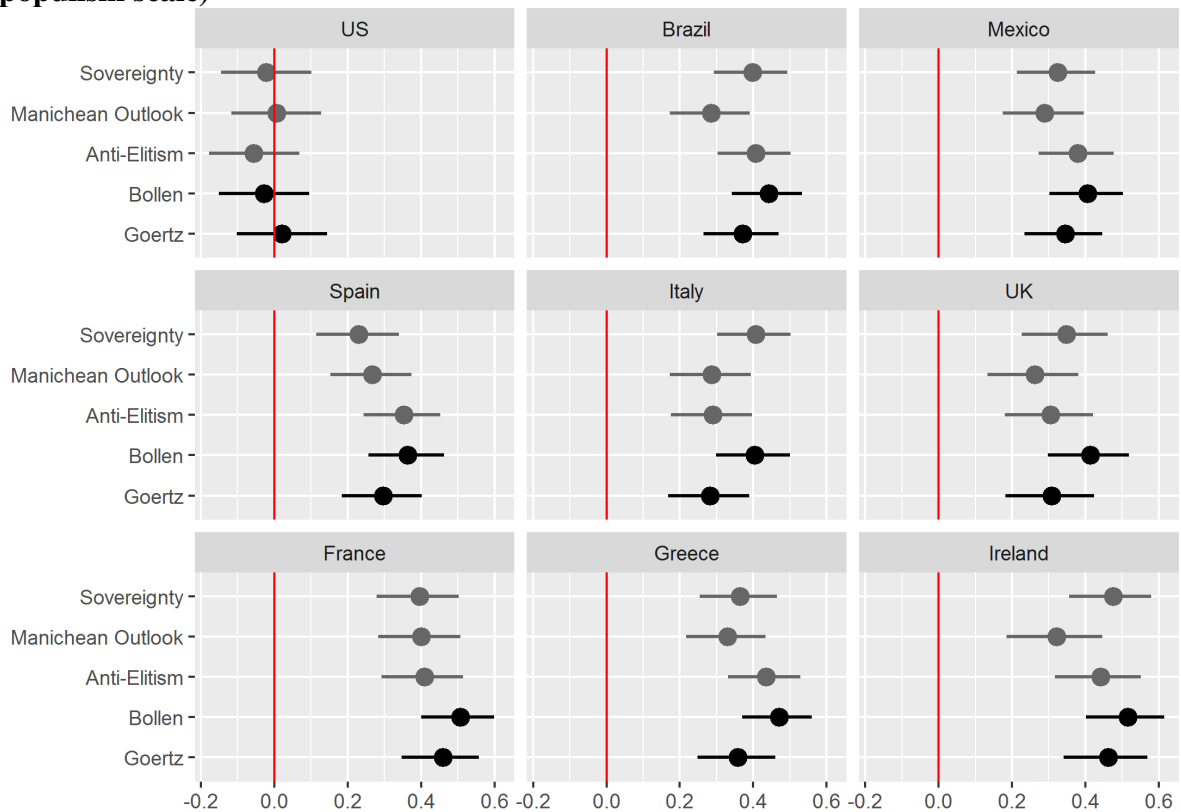


Figure S12-4. **Bivariate correlations with conspiratorial thinking (Akkerman et al. populism scale)**



Supplement 13: Correlations with institutional trust

Institutional trust was measured with three variables: Trust in the national government, trust in parliament and trust in political parties. In combining these indicators, we follow the practice by Castanho Silva et al. (2019). Substantively, the institutional trust variable reflects trust in political institutions. Table S13-1 shows that the internal consistency of the summary index is satisfactory in most samples, but it is considerably lower in the US and in the UK. This finding suggests that the empirical properties of the institutional trust variable vary between countries.

Table S13-1. Cronbach's alpha of institutional trust across samples

Sample	Cronbach's alpha
US	.62
Brazil	.86
Mexico	.81
Spain	.84
Italy	.90
UK	.69
France	.77
Greece	.83
Ireland	.78

In the main text, we reported correlations between institutional trust and different concept structures of populist attitudes using the Castanho Silva et al. populism scale. Figure S13-1 and Figure S13-2 replicate the analysis using the Oliver/Rahn populism scale and using the Schulz et al. populism scale. Compared to the results obtained with the Castanho Silva et al. scales, the discrepancies between populism scores are not as strong if the alternative scales are used. This is not surprising as the Castanho Silva et al. scale is particularly prone to concept-measurement inconsistencies of the Bollen approach due to the low covariances of the concept subdimensions. As written in the main text, thus, the extent of discrepancies between the Bollen and the Goertz concept structures depends on empirical properties of the scales and samples.

Figure S13-1. Bivariate correlations with institutional trust (Oliver/Rahn populism scale)

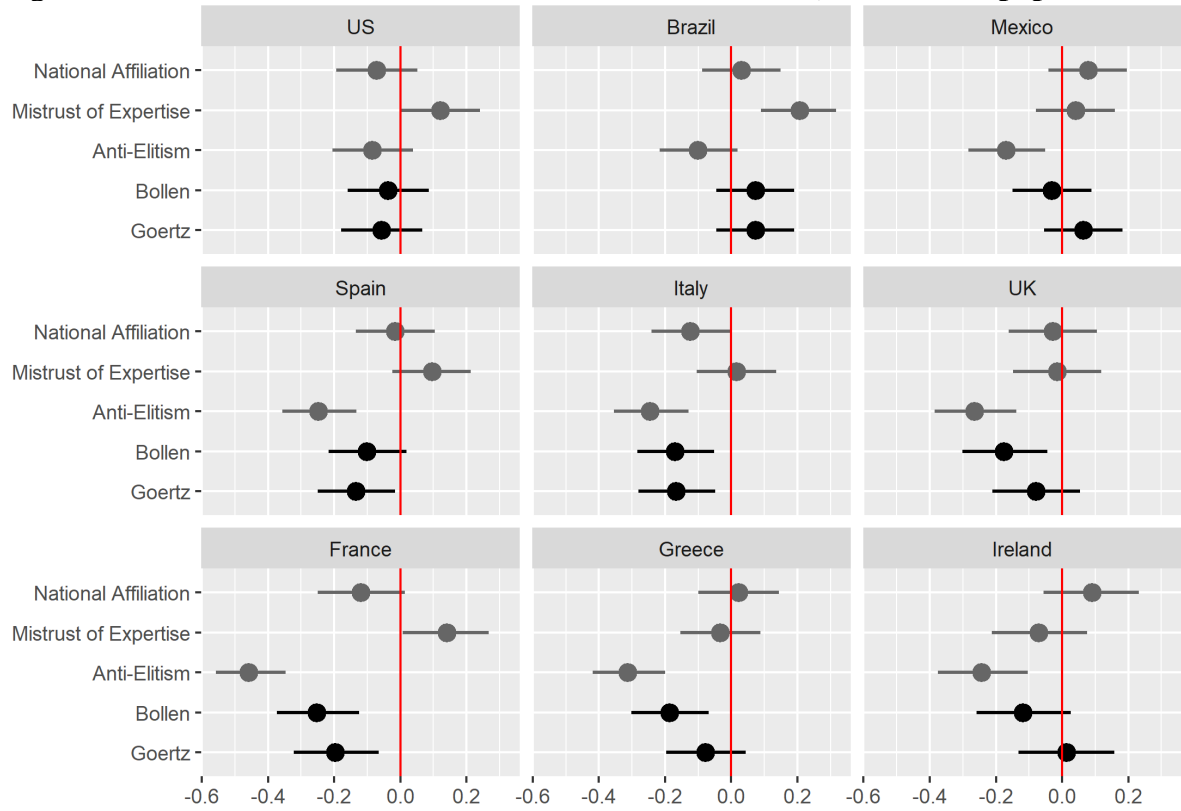
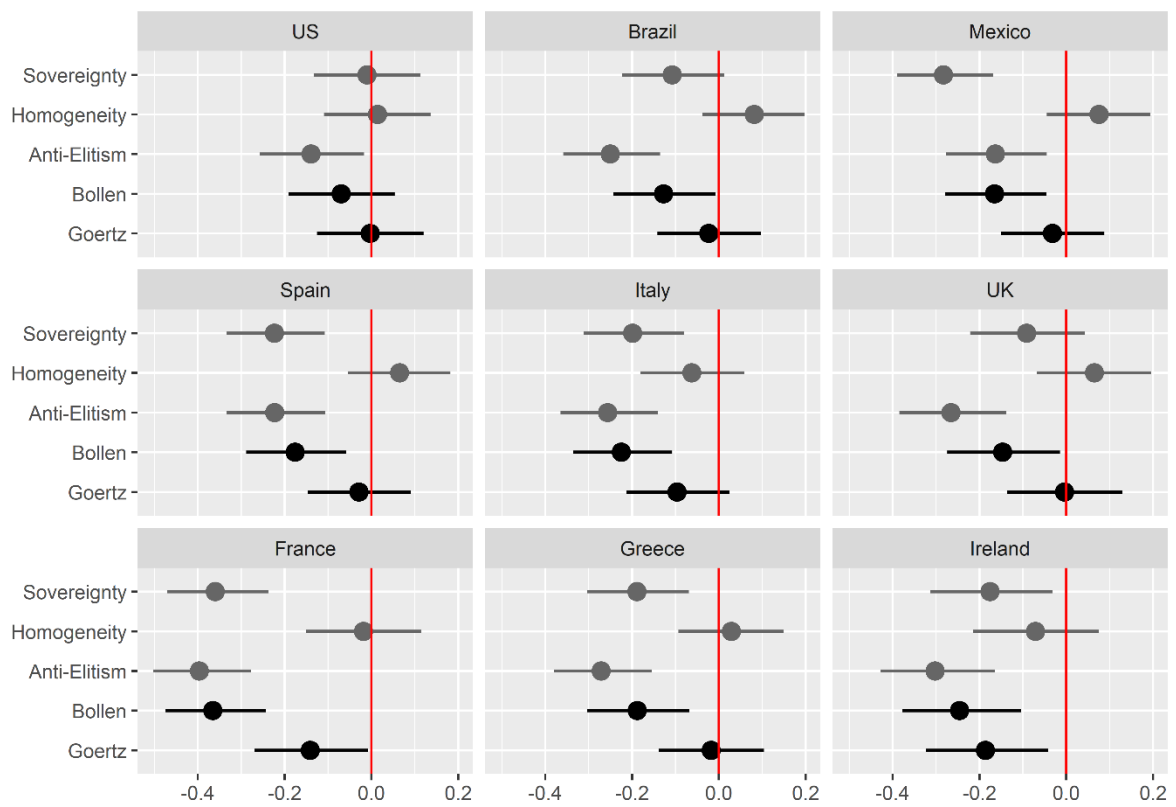


Figure S13-2. Bivariate correlations with institutional trust (Schulz et al. populism scale)



Supplement 14: Assessing non-compensatory multi-dimensional concepts already at the stage of measurement (Akkerman et al. scale)

The Akkerman et al. scale presents an interesting case which deserves further attention with regard to its logical organization and strategy of measurement. The scale differs crucially in one respect from other the scales reported in the main text as it employs a distinct strategy to assess the concept's multi-dimensionality.

In research on populist attitudes and in public opinion research, more generally, the most prevalent strategy to account for a concept's multi-dimensionality is to observe multiple, discrete subdimensions. Each of these subdimensions is then usually measured with one or multiple items where each item is reflective of one subdimension. As discussed in *Supplement 2: Decisions to be made for the aggregation of multi-dimensional constructs*, computational aggregation functions are then employed to combine these subdimensions into composite scores.

The Akkerman et al. scale, however, employs a different strategy (also see Elchardus and Spruyt 2016). Each indicator of the scale can be understood as intended to measure one concept subdimension but to incorporate multiple concept components into each single indicator (Akkerman, Mudde, and Zaslove 2014, 1332; Castanho Silva et al. 2019, 2). Specifically, some items of the Akkerman et al. scale are worded in a way so that respondents only agree with a statement if respondents concurrently agree with the tenets of multiple subdimensions (e.g., “*The people, and not politicians, should make our most important policy decisions*” which taps into sovereignty orientations and anti-elitist orientations, see Table S6-1 for an overview of the scale items). Using inherently multi-dimensional items to capture the multi-dimensionality of individual-level populism is thus crucially different from the approach to use uni-dimensional items to separate measure each subdimensions. Whereas the Akkerman et al. scale can be understood as following the first approach, the remaining populism scales can be understood as following the second approach. Note, however, that here we contrast the approach underlying the Akkerman et al. scale in a binary fashion with the approach underlying the other populism scales where, in fact, some of the items of the remaining scales are also not clearly one-dimensional.

Assessing multiple concept components simultaneously with one measurement instrument is an established research strategy in some disciplines. Consider educators or educational researchers who assess the competency of applying arithmetic skills to a problem that is described in plain text (Chalmers and Flora 2014, 341). Apparently, solving such math

word test requires skills in two competency domains (maths and text comprehension), which are non-compensatory. Instead of assessing the intersection of these competency domains by separately measuring mathematical ability and text comprehension and then aggregating these two dimensions according to the Goertz or Sartori operationalization strategies (the classical strategy that is also employed on the populism scales in the main text), another option is to account for the non-substitutability already on the stage of measurement.

For assessing the non-substitutability already on the stage of measurement, it is conceivable to administer a math word test that can only be solved when pupils simultaneously possess both verbal and mathematical competencies. High values on such a math word test indicate that pupils score high on both dimensions because solving the test will be impossible if individuals either lack text comprehension skills or arithmetic competencies. Accounting for non-substitutability already at the stage of measurement has at least two advantages: First, this strategy may achieve high congruence between measurement and the target concept (content validity). Second, this approach renders unnecessary any aggregation of distinct subdimensions. Hence, assessing the simultaneous presence of jointly necessary concept components appears to be generally feasible and in certain situations, potentially desirable for assessing multi-dimensional concepts with non-compensatory concept components.

However, this approach also comes with distinctive drawbacks. To begin with, this approach reduces the informational value of the assessment. Whereas the meaning of high values of such measurement is clear, the meaning and origins of assessments with low values are not clear. Researchers have no way of disentangling whether low values result from a lack of text comprehension or of arithmetic skills. Hence, the multi-concept measurement approach impedes in-depth analyses of the composition of individual competencies.

Things become worse once we turn to survey research. Researchers design survey questions to elicit object-specific responses from respondents. Differences in survey responses should reflect differences in respondents in terms of the target concept, i.e., the evaluation of an object. For comparability across individuals, survey researchers strive to administer stimuli that function similarly across individuals (Krosnick and Presser 2010). Equivalent item functioning is threatened if individuals do not interpret survey items in a similar way. This might be the case if a survey question alludes to a variety of different aspects of one phenomenon in order, e.g., to capture the response to a combination of two or more aspects. Some people may place greater relative weight on one aspect when constructing their answer, while other respondents place higher weight on another aspect. Therefore, the more complex a survey item is, the less certain a researcher can be how an item will be interpreted. In these

cases, differences in a survey response may reflect substantive differences in the target concept or solely differences in how respondents interpreted the question stimulus. Consequently, in developing survey items psychometric textbooks usually advise to keep survey items as simple as possible and to avoid double-barreled items (Krosnick and Presser 2010). Otherwise, the meaning of all responses – and not only of some outcomes as in case of the competence measurement mentioned above – becomes unclear.

To conclude, assessing the simultaneous presence of jointly necessary concept components already at the stage of measurement process comes with drawbacks particularly in survey research, but it is generally feasible and, in some research areas, an even promising approach. These considerations also apply to the Akkerman et al. scale and should be kept in mind when using the scale.

Supplement 15: Overview of data sources

Table S15-1 provides an overview of the survey datasets that underlie this study with further information on the scale that is contained in the dataset, in which country the dataset was surveyed and for which analysis the dataset was employed.

Table S15-1. **Data Sources**

<i>Dataset</i>	<i>Scale</i>	<i>Country</i>	<i>Analysis</i>
ANES 2016 Time Series	CSES	United States	<u>Shiny Web Applet:</u> How many populists, Correlations
AUTNES 2018 CSES Edition, doi:10.11587/W193UZ	CSES	Austria	<u>Shiny Web Applet:</u> How many populists, Correlations
BES 2017: Face-to-Face Post-Election Survey, doi:10.5255/UKDA-SN-8418-1	CSES	UK	<u>Shiny Web Applet:</u> How many populists, Correlations
GLES 2017 Post-election Cross Section, doi:10.4232/1.13235	CSES, Akkerman et al.	Germany	<u>Shiny Web Applet:</u> How many populists, Correlations
LISS 151.3 Measurement 3	Akkerman et al.	Netherlands	<u>Shiny Web Applet:</u> How many populists, Correlations
GLES Campaign Panel, doi:10.4232/1.13150	Schulz et al.	Germany	<u>Shiny Web Applet:</u> Correlations, Main text: Figure 2
Castanho Silva et al. replication material	Akkerman et al., Castanho Silva et al., Oliver/Rahn, Schulz et al.	Brazil, France, Greece, Ireland, Mexico, Spain, Italy, UK, United States	Main text: Figures 2-4

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