UNITED NATIONS UNIVERSITY
UNU-WIDER

WIDER Working Paper 2022/158

Inequality configurations

Letícia Barbabela,[1] Miquel Pellicer,[2] and Eva Wegner[1]

December 2022

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: The notion of multidimensional inequality has attracted attention lately, but mostly as a micro approach to measuring inequality in well-being in a more complete way. We argue that considering inequality in a multidimensional way from a macro perspective is useful for a better understanding of the structure of inequality in different societies. Different societies display different degrees of inequality in different domains, such as the economic, social, political, and psychological. In this paper, we ask how these inequalities relate to each other and what inequality configurations societies display as a result. Are different inequalities simply a manifestation of one single basic dimension of inequality so that some countries are egalitarian in everything while other countries are fundamentally inegalitarian? Or are inequalities in different domains largely unrelated? We compile a dataset of 98 countries, merging income inequality data from the World Income Inequality Database, health (length-of-life) inequality data from life tables, and inequality measures of political participation, perceived political influence, self-efficacy, and social class compiled from a large set of cross-country attitudes surveys. Our results suggest two distinct dimensions of inequality. The first and by far more important captures socioeconomic and psychological inequality and we find that inequalities in income, health, social class, and self-efficacy are strongly related. A second, less important but still relevant, dimension of inequality concerns political inequality. These two underlying dimensions of inequality correlate differently with relevant outcomes. The socioeconomic/health/psychological inequality component correlates with life satisfaction, satisfaction with democracy, and violent protest. The political inequality component correlates with satisfaction with democracy and peaceful protest.

Key words: multidimensional inequality, WIID, inequality regimes

JEL classification: D63, I14, D72, P50

Acknowledgements: We would like to acknowledge the support from the World Income Inequality Database (WIID) project. We also would like to thank participants in the WIID project workshop, particularly Paul Segal, participants in the 2022 WIDER Development Conference in Bogota, and Iñaki Permanyer, Suman Seth, and Gaston Yalonetzky for very useful comments and suggestions. All errors are ours.

[1] Institute of Political Science, Marburg University, Marburg, Germany; [2] Center for Conflict Studies and Institute of Political Science, Marburg University, Marburg, Germany, corresponding author: miquel.pellicer@uni-marburg.de

This study has been prepared within the UNU-WIDER project World Income Inequality Database (WIID).

Information and requests: publications@wider.unu.edu

ISSN 1798-7237 ISBN 978-92-9267-291-1

https://doi.org/10.35188/UNU-WIDER/2022/291-1

Typescript prepared by Joseph Laredo.

United Nations University World Institute for Development Economics Research provides economic analysis and policy advice with the aim of promoting sustainable and equitable development. The Institute began operations in 1985 in Helsinki, Finland, as the first research and training centre of the United Nations University. Today it is a unique blend of think tank, research institute, and UN agency—providing a range of services from policy advice to governments as well as freely available original research.

The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland, Sweden, and the United Kingdom as well as earmarked contributions for specific projects from a variety of donors.

Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

There is increasing interest in understanding different dimensions of inequality. Often, building on Sen's capability approach, researchers have argued for the need to assess equality of human well-being using dimensions beyond income (Anand et al. 2020). Most existing research on multidimensional inequality comes from economics and takes a micro-approach, seeking to measure inequality in a specific society by taking into account different dimensions of well-being. Most of this literature deals with the challenges relating to measurement (Andreoli and Zoli 2020; Decancq and Lugo 2012; Muller and Trannoy 2012). Empirical analyses in this tradition tend to consist of country studies with a relatively narrow focus, extending the analysis of income inequality to other material factors such as access to education and health care (e.g. Statistics South Africa 2019).[1]

This standard approach to multidimensional inequality has measurement as its main focus, in the sense that it aims to obtain a more complete estimate of overall socioeconomic inequality and tends to pay less attention to how and why the different dimensions of inequality might relate to each other (although see Bleynat and Segal 2021).

At the same time, there has been an explosion of research in disciplines outside economics that seeks to estimate and explain the relation between inequality in economic status and inequalities in other dimensions. There has been considerable work at the micro level analysing the relation between status in the economic dimension and political participation and influence (e.g., Bartels 2008; Gallego 2015; Gilens 2012; Schakel 2021), psychological outcomes (Jetten and Peters 2019; Sheehy-Skeffington and Rea 2017), and length of life (Peltzman 2009; Smits and Monden 2009). There is also research at the macro level, studying the relation between income inequality and inequality in some other dimension—for instance, political inequality (Cole 2018) or life satisfaction inequality (Ovaska and Takashima 2010; Veenhoven 2005).

This paper approaches multidimensional inequality within this latter tradition. It focuses on the structure of inequality: on how different types of inequality relate, from a macro perspective. We extend this tradition to a genuine multidimensional focus, considering the many dimensions of inequality, not just the relation between income inequality and some other specific dimension.

This broadening of focus on multidimensional inequality raises a set of relevant new questions. Is equality/inequality a deep characteristic of societies that manifests itself in different dimensions? For instance, do economically equal societies tend to also be socio-psychologically and politically equal? Or are different dimensions of inequality largely unrelated, possibly driven by different forces? Do some societies 'trade off' different types of inequality so that, for instance, high economic inequality becomes socially acceptable only when social status and political inequalities are rather low?

In this paper, we address these questions by focusing on the economic, political, social, health, and psychological dimensions of inequality. We define a society's *inequality configuration* as the set of inequalities that a society displays in the different dimensions of inequality. We collect information on these dimensions of inequality by combining existing measures of income inequality (UNU-WIDER's from the World Income Inequality Database [WIID]) (UNU-WIDER 2022) and length-of-life inequality (calculated using WHO data) with measures of inequality in other dimensions

[1] A few papers also include other dimensions, for instance relating to social status (Bleynat and Segal 2021).

that we construct from a large set of cross-national surveys such as the joint World Values Survey and European Values Study, the European Social Survey, the International Social Survey Program, and the various Barometer surveys. These survey-based measures focus on political participation, (subjective) political influence, perceived social status, and self-efficacy. In our benchmark dataset we collect information on 105 countries. We measure inequality of all variables with the Gini coefficient. Most of our variables are bounded, so we adjust the Gini coefficients for these variables following the procedure in Permanyer et al. (2022). With these data, we seek to take a first step towards understanding the structure of inequality configurations. We conduct a principal component analysis (PCA) to answer the question of how the different dimensions of inequality combine to generate a few basic or fundamental dimensions of inequality. We then perform a cluster analysis to understand how countries group themselves into similar inequality configurations.

Our work builds on theoretical and historical scholarship that studies inequality holistically. To guide our empirical work we use frameworks from Therborn (2013) and Piketty (2020). Therborn (2013) proposes a systematization of multidimensional inequality that combines inequalities in three basic dimensions: vital, existential, and resource inequality. Vital inequality relates to health issues, existential inequality to social respect and autonomy, and resource inequality to income, power, and politics. Piketty (2020) analyses different types of societies that historically displayed specific inequality configurations, such as ternary societies, ownership societies, or social democratic societies. Broadly speaking, these societies differ in the type of inequality they exhibit, mainly along a social/political dimension and an economic dimension.

We find that two-thirds of the overall variation in all types of inequality is explained by two components. The first component, which explains almost half of the variation, consists of socioeconomic, psychological, and health inequalities (we denote this component socioeconomic inequalities for short). The second component captures mainly political inequalities. Western European countries display low inequality in both components. African countries tend to display high socioeconomic inequalities but low political inequality, whereas Latin American countries tend to display high levels of both types of inequality.

We study whether these different types of inequality affect outcomes such as life satisfaction, support for democracy, or occurrence of protest. We find that different types of inequality matter for different outcomes. Socioeconomic inequalities (partially) matter for life satisfaction, satisfaction with democracy, and violent protest. Political inequality matters for satisfaction with democracy and peaceful protest.

The rest of the paper is structured as follows: Section 2 outlines the conceptual framework of the study; Section 3 describes the data, variables, and descriptive statistics; Section 4 presents the results; and Section 5 concludes.

2 Conceptual framework

We aim to understand the different inequality configurations that countries display from a multidimensional perspective by attempting to answer the following questions. Do the different types of inequality relate? Are there a few basic underlying dimensions of inequality? Do countries cluster in specific inequality configurations so that a typology of these configurations can be established?

In order to guide our empirical analysis on these issues, we need to conceptualize the relationship between different dimensions of inequality and potential types of inequality configuration. We propose four possible 'frameworks' or hypotheses to guide our expectations.

2.1 Inequality configuration frameworks

a. A single fundamental inequality underlies all different types of inequality

Research linking economic status to status in non-economic domains tends to find strong correlations between the two. Higher socioeconomic status individuals tend to participate more in politics than lower status individuals (Gallego 2015; Verba et al. 1995); wealthier citizens have more political influence than poorer citizens (Bartels 2008; Elkjaer and Klitgaard 2021; Gillens 2012); poorer individuals tend to display worse psychological outcomes, including lower self-appraisal and self-efficacy (Sheehy-Skeffington and Rea 2017); wealthier citizens display better health (Mackenbach et al. 2008).

This suggests that all inequalities are strongly related and that there is therefore a single factor, socioeconomic status, driving all the different types of inequality. Large inequalities in socioeconomic status would then spill over to other dimensions of inequality. We would observe countries with an egalitarian ethos to be egalitarian in all respects, whereas countries at the other extreme would be inegalitarian in all respects. Countries may cluster more or less clearly along this dimension but in any case the structure of inequality would basically be unidimensional.

b. Separate, domain-specific inequalities

At the other extreme, we may consider that different domains of inequality are unrelated. Each domain of inequality could be mostly driven by forces that are specific to that domain. Inequality in political participation and influence could be a separate domain that is mostly driven by political factors such as the quality of democracy or specific cleavages. The quality of democracy could determine to what extent diversity of political participation and influence may flourish, with closed countries displaying across-the-board low (and therefore rather equal) levels of political engagement. Depending on the society, politically relevant cleavages could be ethnic divisions, rural/urban divides, or class divides.

Similar arguments can be made about other dimensions. Inequality in psychological empowerment could be a separate dimension that is driven by biological or cultural factors such as differences in gender norms or the social status of different age groups.

c. Therborn's multidimensional inequality

In between the two extremes that view all types of inequality as emerging from one single source vs. all inequalities as being largely independent lie frameworks that group different types of inequality according to some criteria.

Therborn (2013) proposes a multidimensional inequality framework building on Sen's capability approach. His starting point is to consider that human life has three basic dimensions and these fundamental dimensions give rise to different fundamental types of inequality:

- human beings as *organisms* that live, fall sick, and die; differences in these outcomes lead to 'vital inequality';
- human beings as *persons* that seek respect and autonomy; differences in these outcomes lead to 'existential inequality';

- human beings as *actors* that seek to have an impact and require resources to do so; differences in these lead to 'resource inequality'.

Therborn (2013) goes on to argue that these different types of inequality have specific 'roots and dynamics', although of course they also interact with each other. For instance, resource inequality would be driven by 'economic and political systems', whereas existential inequality would be driven by family, gender, ethnic, or social status systems; vital inequality, in turn, would be driven by factors such as the state of medical knowledge and the status system.

This framework seems to have been left largely undeveloped and is therefore fairly vague. However, it can be useful for thinking about the fundamental dimensions of inequality. In particular, the idea that drivers of different types of inequality might be distinct, and that therefore the resulting inequalities can be distinguished in a meaningful way and might be independent of each other, is useful.

d. Piketty's inequality regimes

Piketty (2020) analyses inequality regimes in a historical perspective. He defines inequality regimes as the 'set of discourses and institutional arrangements intended to justify and structure the economic, social, and political inequalities of a given society'. Different inequality regimes tend to display different combinations of political, social, and economic inequalities:

Ternary societies. These societies are divided into three basic social groups: clergy (the educated elite), noblemen (the warrior elite), and the third state (the working people). In this type of regime, political and social inequalities are particularly large, with warriors and clergymen explicitly having more rights, status, and powers than the third state; economic inequality is also generally large, yet more moderate than in other regimes. The purest form of these societies can be found in the Middle Ages and up to the 17th century, but Piketty argues that traces of this regime can still be found today.

Ownership societies. These societies are based on egalitarianism in terms of rights and (theoretical) political power but are permissive of inequality in the economic domain. The paradigmatic case of transformation from ternary to ownership society is France during the Revolution. The clergy's and noblemen's ruling rights were erased but their property (ownership) rights were expanded, leading eventually to an extremely high level of economic inequality.

Slave and colonial societies. These are the most unequal societies on record. They combine political and social inequality (as in ternary societies) with economic inequality (as in, or even larger than in, ownership societies). The central cleavage in these societies was ethnic and its legacy is still clear in some societies such as Brazil and South Africa, which remain among the most economically unequal in the world.

Social democratic societies. These are the most egalitarian societies on record. The paradigmatic cases of this type of society are the Nordic countries, particularly around the 1970s. To the (theoretical) political and social egalitarianism of ownership society, they added mechanisms of economic equality in the form of high levels of redistribution and universal public provision of services.

In summary, using a very simplified adaptation of Piketty's (2020) analysis, we could envisage two basic dimensions of inequality: an economic dimension and a social/political dimension. Social democratic societies would be low in both dimensions of inequality; ownership societies would be high in economic but low in political/social inequality; societies with a strong legacy or remnants of ternary societies would display the opposite pattern (low/moderate economic, but high

political/social); societies with strong ethnic-cleavage/colonial legacies would display high economic inequality, but it is unclear whether the political/social inequality from the pure form of this regime would persist.

2.2 Mapping variables to frameworks

Following the above discussion, we have two extreme hypotheses—namely that either a single inequality underlies all different types, or all types of inequality are independent of each other—as well as two hypotheses about specific clusters.

The two extreme hypotheses do not require a specific operationalization. If a single inequality underlies all different types, we would expect all forms of inequality that we are able to measure in the data—income, health, self-efficacy, perceived social class, political participation, and political influence—to be strongly related. At the other extreme, they should be independent (except inequality in political participation and influence, which measure related concepts).

The other frameworks require a mapping of the variables to their inequality clusters. Following Therborn (2013), we operationalize

- *vital inequality* as health inequality;
- *existential inequality* as inequality in perceived social class and (possibly) self-efficacy, because of the autonomy component in existential inequality;
- *resource inequality* as inequality in income, political participation, perceived political influence, and (possibly) self-efficacy, because of the personal power/control aspect in resource inequality.

Therefore, for Therborn, the mapping is fairly straightforward except for self-efficacy, which presents some ambiguity.

Following Piketty (2020), we operationalize

- *economic inequality* as income inequality;
- *social/political inequality* as inequality in perceived social class, self-efficacy, political participation, and perceived political influence.[2]

3 Data

3.1 Data sources

Our objective is to construct a cross-country dataset of measures of different types of inequality. To do so, we combined different data sources to assemble measures of seven types of inequality. First, we gathered ready-made indices of income inequality from the World Income Inequality Database (WIID) (UNU-WIDER 2022). Second, we computed inequality of length of life, drawing on life tables from the World Health Organization (WHO).[3] Third, we computed inequality

[2] There is no clear mapping of the health dimension in the Piketty (2020) framework.

[3] https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/gho-ghe-global-health-estimates-life-tables

measures of five outcomes—self-efficacy, social class, political influence, political participation, and life satisfaction—using 15 public opinion surveys.[4]

The basis for our measures of self-efficacy, social class, political influence, political participation, and life satisfaction is the joint World Values Survey/European Values Study fielded between 2017 and 2020 (WVS/EVS 2017–20). These surveys cover most of these five outcomes in 77 countries. Although these 77 countries cover various regime types, the coverage of certain regions (mostly Africa and the Americas) is rather limited (Table 1). Some variables are also not present in all countries (e.g. questions about social class and political influence are usually not asked in Western Europe).

Table 1: Geographic coverage of WVS/EVS 2017–20 dataset

Continent	WVS/EVS 2017–20 n/share
Africa	6 (0.08)
Americas	12 (0.16)
Asia	20 (0.26)
Europe	32 (0.42)
Oceania	2 (0.03)
n	*77*

Source: authors' calculations based on WVS/EVS 2017–20.

Thus we expanded our coverage using 13 other global and regional survey datasets that had questions capturing non-economic measures with similar wording. Using these individual-level survey data from various sources, we computed country-level inequality measures of self-efficacy, social class, political influence, political participation, and life satisfaction. To select one estimate of each variable per country, we privileged the data in the joint WVS/EVS 2017–20, and if the country/variable was not present there, took the observation from the most recent source (the oldest survey used as a source in our dataset is the WVS 1999–2004). Appendix D provides additional information about the surveys used to construct the final dataset.[5]

The resulting dataset has information on a large variety of countries, with very different economic and political environments. While this is a strength, we were concerned about data quality in overly autocratic contexts. For understandable reasons, respondents in these contexts might be particularly prone to self-censorship when answering some of the questions used in our analysis, particularly the political ones. For this reason, we dropped observations from closed autocracies using the V-DEM's classification of regime type. This implied dropping only eight countries in our dataset.[6]

[4] We refer to these different survey projects in the following way: Afrobarometer (AFRO); European Social Survey (ESS); European Values Survey (EVS); International Social Survey Programme (ISSP); Latin American Public Opinion Project (LAPOP); Latinobarometro (LBR); World Values Survey (WVS). We also indicate the year or year range of the field research conducted in a specific wave. See Table D1 in Appendix D for additional information on data versions.

[5] Even after this massive data-gathering effort, it was not possible to derive Gini coefficients to measure inequality in terms of self-efficacy, social class, political influence, political participation, or life satisfaction in all the countries covered by the 15 survey waves. In the case of countries for which we have information for at least three different types of inequality we impute the missing values using the k-nearest neighbour (KNN) algorithm. Only 7 per cent of all survey-based inequality measures in our final dataset are imputed (see Table A1 in Appendix A).

[6] The countries consistently classified as 'closed autocracies' between 2017 and 2020 that we dropped are China, Jordan, Morocco, Qatar, Saudi Arabia, and Thailand.

Our final dataset comprises 98 countries, and 61 per cent of all survey-based inequality measures are calculated using the joint WVS/EVS 2017–20. The geographic distribution of our data in comparison with the joint WVS/EVS 2017–20 is shown in Table 2.

Table 1: Geographic coverage of main dataset vs. WVS/EVS 2017–20 dataset

Continent	Main dataset n/share	WVS/EVS 2017–20 n/share
Africa	14 (0.14)	6 (0.08)
Americas	21 (0.21)	12 (0.16)
Asia	23 (0.24)	20 (0.26)
Europe	38 (0.39)	32 (0.42)
Oceania	2 (0.02)	2 (0.03)
n	*98*	*77*

Source: authors' calculations.

3.2 Inequality variables

Our dataset combines Gini coefficients of seven types of inequality:

1. Income inequality. We use the standardized Gini coefficients from the WIID Companion (UNU-WIDER 2022).[7] These Gini coefficients correspond to inequality in per capita net income. We take the average of these adjusted Gini coefficients from 2011 until the latest value.

2. Length of life inequality. Length of life inequality captures an aspect of health inequality. Individuals in a society vary in the age at which they die. Some die very young while others die at a very old age. Some countries display rather large differences across individuals in length of life, whereas in other countries most citizens die at around the same age, resulting in a rather equal distribution of length of life. Length of life inequality has been studied by demographers and economists (Peltzman 2009; Permanyer and Shi 2022; Smits and Monden 2009). We compute Gini coefficients of length of life using WHO life tables.[8]

The remaining five types of inequality are calculated on the basis of numeric answers to survey questions from public opinion projects (see Table D2 in Appendix D for the original questions and recoded answers):

3. Self-efficacy inequality. This measure is based on questions that ask whether people feel they have free choice and control over their lives, respondents answering according to a 0–9 scale, ranging from 'no control at all' to 'a great degree of control'.

4. Social class inequality. Calculated on a 0–4 scale depending on the social class respondents state they belong to, roughly: lower, working, lower-middle, upper-middle, or upper class.

[7] https://doi.org/10.35188/UNU-WIDER/WIIDcomp-300622

[8] The WHO life tables estimate various demographic quantities for different age groups, such as the number of people alive at the beginning of the age window and the probability of dying. To construct length of life Gini coefficients from abridged life tables, we follow the procedure in Rodríguez García (2007). The computation requires an estimate of the mean age of death among those dying within a given age interval. For this, we use simply the midpoint of the age range.

5. Political influence inequality. Measured using survey questions capturing respondents' beliefs on whether their opinions are considered by the government when making decisions, transformed into a 0–3 scale where the lowest values represent a lack of perceived influence.

6. Political participation inequality. Following Somma and Bargsted (2018), we calculate political participation inequality using the distribution of an index of participation in non-electoral political actions. Our index ranges from 0 to 4, where the highest values indicate that respondents have taken part in all the following activities in the past: signing a petition, joining in boycotts, attending peaceful demonstrations, and participating in strikes.[9]

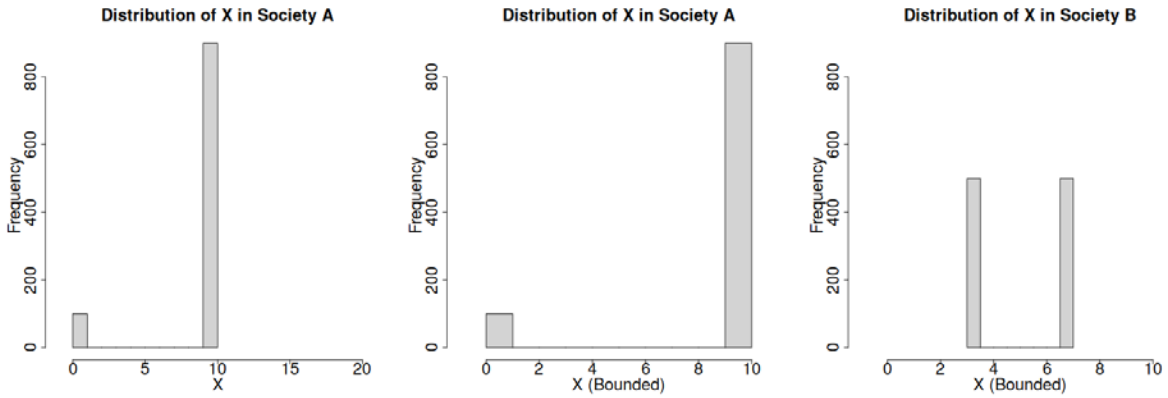
7. Life satisfaction inequality. Although life satisfaction inequality is not part of our main PCA, it is used as an outcome variable. The underlying variable ranges from 0 to 3, where the highest values represent the highest levels of satisfaction with life.

3.3 Computing inequality for bounded variables

Most of the variables in our analysis are bounded. The variables that come from survey responses are bounded by construction: for example, we consider the highest self-efficacy score a person can have to be 9, and the highest score for political participation to be 4. Length of life is also bounded in practice, with no human verified to have lived more than 125 years.

Standard relative inequality measures can yield counter-intuitive results when applied to bounded variables. This has been emphasized by demography literature on length of life inequality as well as by recent literature in economics (Permanyer et al. 2022; Petrie and Tang 2008). Partly, this is because bounded variables imply a mechanical relation between average and maximum inequality. As an illustration, consider the examples shown in Figure 1.

Figure 1: Maximum and minimum levels of inequality using bounded variables



Source: authors' illustration.

[9] Like Somma and Bargsted (2018) we refrain from including voting in our index, as voting is mandatory in some countries. Their *political Gini* coefficient covers 38 countries and was calculated using a question from ISSP 2004 asking whether the respondent had engaged (in the past year, in the more distant past, or never) in eight types of political action: signing a petition; boycotting, or deliberately buying, certain products for political, ethical, or environmental reasons; taking part in demonstrations; attending political meetings or rallies; contacting (or attempting to contact) politicians; donating money or raising funds for social or political activities; contacting the media, or appearing in the media, to express a view; and joining an internet political forum or discussion group. The Pearson's correlation coefficient between their political Gini and our measure of political participation inequality is strong (0.69). Therefore, although our indicator uses fewer forms of political participation—only signing a petition, joining in boycotts, attending peaceful demonstrations, and participating in strikes—we believe that it is not a significantly inferior measure.

The left panel shows a distribution where 10 per cent of the population have 0 of some variable and the remaining 90 per cent have 10. This panel is meant to illustrate a case where the variable is unbounded and so the horizontal axis goes up to 20. An observer of this distribution may conclude that it is fairly equal, since most of the people are similar and 'middle class', with only a few people being 'poor'. The middle panel shows the same distribution but now for a case where the variable is bounded at 10. From this, an observer may conclude that there are only 'rich' and 'poor' in this society with no one in the middle, and therefore that inequality is high. The distributions are, however, the same, but the fact that in one case the distribution is not bounded but in the other it is, changes our judgement. This judgement indeed comes from the boundedness of the variable: in the left panel, there is scope to make the society much more unequal through regressive transfers (by having all except one of those with 10 give their 'income' to the remaining one with 10). This is not possible in the middle panel. Since the variable is bounded at 10, no regressive transfers are possible: given the total amount of resources, the distribution is as unequal as it can possibly be. If we compare the distribution in the middle panel, knowing that the variable is bounded at 10, with the distribution in the right-hand panel, it seems sensible to consider that the rightward distribution is more equal. The distance between the 'upper' and 'lower' class is smaller in the right panel, and there is scope to increase inequality through regressive transfers.

The standard relative Gini coefficient indeed delivers an ordering counter to this discussion: the Gini coefficient for the distribution in the middle panel (the same, of course, as the left panel) is 0.1, very low, and lower than in the right panel, which is 0.2. To deal with this issue, we adjust the Gini coefficients for all our bounded variables (all our variables except income, including life satisfaction, the inequality of which we use as an outcome variable). The adjustment we use follows the procedure recently proposed in Permanyer et al. (2022). This involves normalizing the coefficient by the maximum possible value consistent with the variable mean. For the examples in Figure 1, this gives an adjusted Gini coefficient of 1 for the middle panel, and of 0.7 for the right panel. A less comprehensive version of this same adjustment has been independently suggested for length of life inequality in the demography literature (Petrie and Tang 2008).

3.4 Descriptive statistics

Table 2 shows the descriptive statistics for the seven types of inequality measure in our dataset. For the inequality measures calculated using public opinion surveys we also indicate the range of the specific survey variables that were used to calculate them. In the case of self-efficacy and life satisfaction, all 15 surveys used the same range of answers, whereas for the others it was necessary to standardize the answers range before calculating the Gini coefficients. Table D2 in Appendix D provides more information on the original range of answers across the different surveys and how they were uniformized before calculating the Gini coefficients.

Table 2: Descriptive statistics

		Main dataset		WVS/EVS 2017–20	
Gini coefficients	**Uniformized range**	**Mean**	**St. dev.**	**Mean**	**St. dev.**
Income	–	0.40	0.10	0.37	0.08
Health	–	0.48	0.04	0.47	0.04
Self-efficacy	0–9	0.64	0.10	0.63	0.10
Social class	0–4	0.52	0.10	-	-
Pol. influence	0–3	0.82	0.08	-	-
Pol. participation	0–4	0.86	0.09	0.85	0.10
Life satisfaction	0–3	0.63	0.11	0.62	0.11
n		*98*		72	

Source: authors' calculations.

The types of inequality that are highest overall are inequality in political participation and political influence, whereas health inequality and income inequality are the lowest. The mean and standard deviation of the variables in the main dataset are virtually the same as those in the reference dataset, the WVS/EVS 2017–20.

The results presented in the next section derive from the analysis using the main dataset; the joint WVS/EVS 2017–20 surveys are used for robustness checks (see Appendix C).

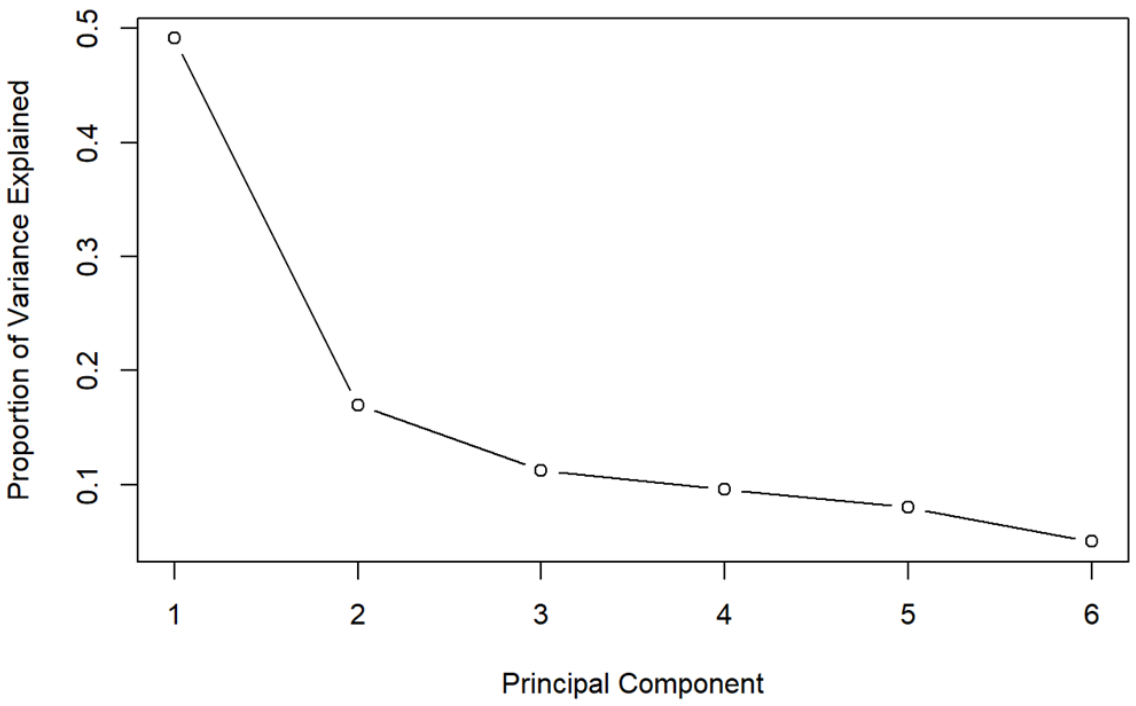
4 Results

4.1 Principal component analysis

We conduct a principal component analysis (PCA) to study whether certain types of inequality tend to go together, suggesting a smaller set of fundamental drivers of the different types of inequality. PCA is a data-driven procedure to reduce the dimensionality of a set of variables while keeping as much of the variation as possible. If all the original variables are mainly driven by one underlying driver, all variables will be highly correlated and a single component, given by a linear combination of all original variables, will capture most of the variation in the original data. At the other extreme, if the original variables are all driven by separate, unrelated factors, the variables will be largely uncorrelated and no dimensionality reduction will be possible without losing a substantial part of the original variability.

Figure 2 shows the proportion of the variance explained by the different components. The first component accounts for close to half (49 per cent) of the total variance, whereas the second component contributes less, but still a non-negligible 17 per cent.

Figure 2: Proportion of variance explained by each principal component



Source: authors' illustration.

Had all the variables been completely independent, each component would have explained the same amount of variance, 100/6 = 16 per cent of the variance. Because components 3 to 6 explain less than that, we focus on the first two components in the analysis below. These first two components together explain roughly two-thirds of the total variation of the original variables. It is a matter of judgement whether this represents a lot or a little. On the one hand, it implies that we can account for a large majority of the variation with only two variables. On the other hand, there is still one full third of variation that we are ignoring when we focus on the first two components.

Table 3 shows the loadings of these components, i.e. the weights of the original variables in each component. All variables load positively into the first component. This suggests that there are common forces driving all the different inequalities. At the same time, variables differ in how strongly they load, with a very clear pattern: the two political variables (political participation inequality and political influence inequality) load less than the others into the first component. Indeed, in the second component it is the two political variables that load by far the most strongly. We conclude that there are two main underlying drivers of our inequality data: the first and by far the more important consists of socioeconomic, health, and psychological inequality; the second component, less prominent, consists of political inequality.

Table 3: PCA. Loadings of two first components

	PC 1	**PC 2**
Income inequality	0.48	-0.26
Health inequality	0.47	-0.34
Social class inequality	0.43	-0.29
Self-efficacy inequality	0.42	0.10
Pol. participation inequality	0.32	0.54
Pol. influence inequality	0.29	0.66

Source: authors' calculations.

What do the PCA results imply for the 'hypotheses' in our conceptual framework? The first hypothesis is partially supported: all types of inequalities are correlated with each other and a linear combination of all of them explains almost half of the variation. This implies that the idea that countries are either equal in everything or rather unequal in everything has some support in the data. In that respect, analyses that focus on only one type of inequality—say, income inequality—might have some generalizability to other types of inequality. At the same time, it appears that a better characterization of the data is to consider that there are not one but two distinct and largely unrelated dimensions of inequality, the second one being to do with political inequality.

This result is not fully consistent with Therborn's (2013) framework as we have interpreted it. We have taken his categorization of different types of inequality (vital, existential, and resource inequality) in analytical terms, as implying that each type has different roots. We find instead that inequalities align according to criteria other than the vital, existential, and resource distinction. For instance, income and political inequality, which are both resources, are (mostly) part of different components, whereas income (a resource) and health (the vital component) inequality are part of the same component. The results are also not entirely consistent with our interpretation of the Piketty (2020) framework. Political inequality does not particularly load with social inequality, and the basic distinction between economic and social inequality is not supported by the PCA results.

To gauge the robustness of these patterns, we conduct a PCA using only the joint WVS/EVS 2017–20 survey data (without social class or political influence). The results (see Table C1 in Appendix C) are similar to the main analysis. Income inequality, health inequality, and self-efficacy

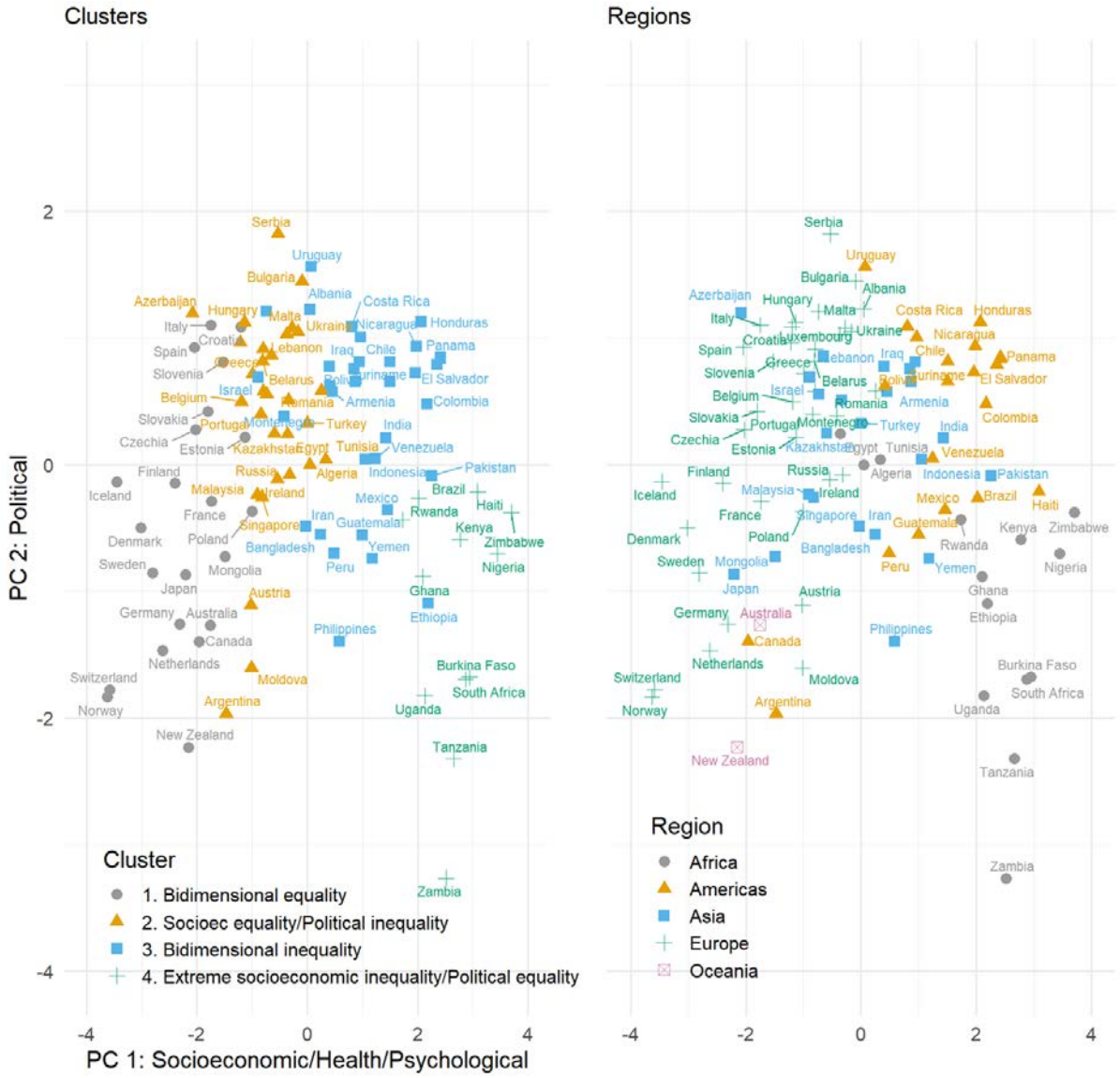
inequality load more in the first component than political participation inequality, although the figures are closer. Political participation clearly loads more strongly than the other variables in the second component.

4.2 Countries along the two dimensions of inequality

In the previous section we identified two dimensions of inequality: one more general and substantial, in terms of socioeconomic, health, and psychological inequalities (socioeconomic inequalities for short); the second, more specific, in terms of political inequality. In this subsection we explore how countries group into different inequality configurations along these two dimensions.

We perform a cluster analysis to see how countries form groups with different inequality configurations (see Figure B1, and Tables B2 and B3 in Appendix B for the detailed results). The left panel of Figure 3 depicts these clusters along the two main dimensions of inequality from the PCA.

Figure 3: Countries along the two dimensions of inequality



Source: authors' illustration.

The horizontal axis shows the first PCA component (socioeconomic/health/psychological inequalities) and the vertical axis shows the second PCA component (political inequality). Clusters are distributed mainly along the first dimension, the first cluster being the most equal and the fourth the most unequal in socioeconomic terms. At the same time, the clusters differ in terms of the second dimension. Notably, clusters 1 and 4 display extreme values in socioeconomic inequalities but relatively low political inequality, whereas clusters 3 and 4 show fairly high values of political inequality. As a result, the graph shows an inverted U-shaped pattern in the relation between countries' socioeconomic and political inequalities: political inequality is lowest in countries with either high or low socioeconomic inequalities.

The right panel of Figure 3 shows the same data but grouping the countries by region instead of by cluster. Clusters and world regions overlap to a certain extent. African countries, particularly sub-Saharan African ones, tend to fall into cluster 4, with extremely high levels of socioeconomic inequalities but relatively low levels of political inequality. Latin American countries tend to be in cluster 3, with high levels of both socioeconomic inequalities and political inequality. European countries tend to display relatively low levels of socioeconomic inequalities, but they vary in the extent to which they display political inequality: Western European countries like Switzerland and Norway display fairly low levels of political inequality, whereas Eastern European ones, like Serbia and Bulgaria, display rather high levels of political inequality. Asian countries tend to have intermediate values in both dimensions.

4.3 Different dimensions of inequality: relevance for well-being and political behaviour

There is a sizeable literature studying the consequences of inequality for diverse outcomes, such as economic growth (Banerjee and Duflo 2003; Perotti 1996), conflict (Cramer 2003; Nafziger and Auvinen 1997), protests (De Juan and Wegner 2019), and life satisfaction (Ovaska and Takashima 2010), as well as crime, life expectancy, and other social and health outcomes (Wilkinson and Pickett 2009). This literature focuses almost invariably on income inequality as an explanatory factor. Acknowledging that there are different types of inequalities opens the door to considering whether different types of inequality may have different effects on different outcomes. Here we focus on the potentially distinct role of our two principal components: socioeconomic inequalities and political inequality. As outcome variables, we focus on life satisfaction, satisfaction with the political system, and protests/riots. We conduct very simple regressions that control only for world region, GDP per capita, and, when appropriate, population. We view these results as merely suggestive: studying the effect of different types of inequality on all these different outcomes in a causal manner, if practicable at all, is enormously difficult and outside the scope of this paper.

The first question we consider is whether our principal components of inequality have a different effect on the inequality of life satisfaction. Life satisfaction potentially encompasses all the other dimensions we have been considering. The rationale to analyse inequality from a multidimensional perspective is that income is not enough to account for overall well-being and one needs to consider other dimensions, such as the social and psychological. However, which of these dimensions matter for life satisfaction is an open question, as is the related question of which dimensions of inequality account for inequality in life satisfaction.

Column 1 in Table 4 shows the results for life satisfaction inequality. The coefficient for socioeconomic inequalities, the first principal component, is positive and statistically significant. But the coefficient for political inequality, the second component, is not. This suggests that socioeconomic, psychological, and health dimensions matter for life satisfaction, but political participation less so. This makes sense. Political participation and political influence are crucial for citizens, but not because they confer well-being as such; rather, they allow citizens to shape the society in which they live. Similarly, political inequality is extremely problematic from a normative

point of view, not because of its implications for well-being inequality but because it has implications for the type of laws and policies that shape society (Scanlon 2018). Our results on life satisfaction inequality are in line with these insights.

Table 4: Regression results using the two dimensions of inequality

	Life Satisfaction (inequality)	Life Satisfaction (mean)	Satisfaction with the political system	Protest events (log)	Riot events (log)
	(1)	(2)	(3)	(4)	(5)
PC1: Socioeconomic Inq	0.040***	-0.021	-0.387***	0.165	0.371**
	(0.011)	(0.025)	(0.144)	(0.141)	(0.165)
PC2: Political Inq	-0.017	-0.011	-0.474***	0.286*	0.154
	(0.012)	(0.026)	(0.164)	(0.154)	(0.179)
Americas	0.121***	0.555***	0.376	1.080**	0.499
	(0.042)	(0.093)	(0.588)	(0.521)	(0.608)
Asia	0.077*	0.312***	1.212**	1.223**	0.006
	(0.042)	(0.095)	(0.602)	(0.532)	(0.621)
Europe	0.137***	0.372***	0.242	1.079*	-0.568
	(0.051)	(0.114)	(0.728)	(0.644)	(0.751)
Oceania	0.122	0.384**	-0.098		
	(0.084)	(0.187)	(0.933)		
log GDP per capita	-0.013	0.035	-0.225	0.309*	0.139
	(0.013)	(0.029)	(0.181)	(0.169)	(0.197)
log pop.				0.798***	0.747***
				(0.094)	(0.110)
Constant	0.646***	1.327***	6.560***	-2.972*	-2.417
	(0.114)	(0.256)	(1.608)	(1.632)	(1.903)
Observations	97	97	70	91	91

Note: *p<0.1; **p<0.05; ***p<0.01

Source: authors' calculations.

Next we consider average life satisfaction (column 2). Inequality may reduce average life satisfaction, for instance by generating status anxiety, which can affect both rich and poor, as suggested in Wilkinson and Pickett (2009). This argument, again, is likely to apply to socioeconomic inequalities rather than political inequality. The results in column 2 show that the coefficient for socioeconomic inequalities is indeed negative and higher in absolute value than the coefficient for political inequality. In (unreported) regressions, the coefficient is statistically significant in the absence of controls for GDP per capita, but in the specification with controls displayed in column 2 of Table 4 the coefficient is not statistically significant.

We now turn to how different dimensions of inequality relate to satisfaction with the political system. This matters particularly at this moment, given the current crisis of legitimacy faced by many democratic regimes (Haggard and Kaufman 2021). We investigate this phenomenon using three different variables. First we test whether the dimensions of inequality are negatively associated with satisfaction with the political system, using a survey question from WVS/EVS 2017–20 asking respondents how satisfied they are with how the political system is functioning in their countries these days, with possible answers ranging from '1' (not satisfied at all) to '10' (completely satisfied). The other two variables capture to what extent the two dimensions of inequality relate to public demonstrations, using the number of demonstration events taking place in each country between 2017 and 2020. In this case we use data from the Armed Conflict Location and Event Data Project (ACLED), which is compiled by taking information from journalistic

sources and from a wide range of local and regional sources, including reports from NGOs and international organizations and selected social media accounts. ACLED records the occurrence of two broad types of demonstration: protests and riots. Protests are defined as public demonstrations in which the participants do not engage in violence, though violence may be used against them—a category encompassing the occurrence of peaceful protests, protests with interventions, and events where there was excessive use of force against protesters. Riots are defined as violent events where demonstrators or mobs engage in disruptive acts, encompassing violent demonstrations and mob violence. We analyse protest and riot events in each country as different variables and in both cases we log the original values.

Columns 3 to 5 show the effect of our inequality components on these outcomes. The outcome variable in column 3 is average satisfaction with the political system across countries. Both components' coefficients are negative and statistically significant. This means that the more inequality there is in a country, either in terms of socioeconomic/health aspects or in political ones, the less satisfied with the political system are its citizens. In columns 4 and 5 we turn to outcome variables that represent public demonstrations of dissatisfaction, not only subjective assessments. The outcome variable in column 4 is protests, that is, peaceful demonstrations. The coefficients for both inequalities are positive, but only political inequality is statistically significant. The outcome in column 5 is riots, that is, violent demonstrations. Also in that case both coefficients go in the same direction, but only socioeconomic inequalities 1 is statistically significant. Taken together, columns 3 to 5 indicate that, although both dimensions of inequality seem to depress satisfaction with the political system, the way this dissatisfaction is externalized likely differs. The more political inequality in a country, the more peaceful demonstrations there are (column 4), whereas the more socioeconomic inequalities, the more violent demonstrations there are (column 5). In that sense, dissatisfaction with the political system fuelled by political inequality seems to be associated with more orderly and constructive opposition, whereas that fuelled by socioeconomic inequalities seems to be more closely related to hostile resistance and widespread discontentment.

In sum, these findings suggest that different types of inequality can lead to different types of political reaction. When citizens feel neglected by the state and see the socioeconomic gap between rich and poor widening, they lose faith in the ability of the political system to address these problems and express their discontent outside standard forms of participation. When they see the gap in influence and participation widen, on the other hand, they seek to remedy this by increasing their own political participation in more conventional ways.

5 Conclusion

In this paper, we have studied the structure of inequality from a multidimensional perspective. We have considered the economic, political, social, and psychological dimensions of inequality. Using data from various sources, including a large set of cross-national attitude surveys, we have assembled a dataset including almost 100 countries from all major world regions with information on inequality in income, in health (length of life), social class, political participation, political influence, and self-efficacy. We used different frameworks/hypotheses to guide our analysis, notably the multidimensional framework of Therbron (2013) and the historical study on inequality regimes by Piketty (2020).

We conducted a principal component analysis of these data to ascertain how these different types of inequality relate. Our results suggest that there are two principal and distinct dimensions of inequality. The first is clearly more prominent and includes socioeconomic, health, and psychological inequalities. The second includes political inequalities. Countries group into different

clusters, mostly along along the socioeconomic/health/psychological dimension, but they differ in terms of political inequality as well. There appears to be an inverted-U relation between the two dimensions, suggesting that political inequality is highest at intermediate levels of socioeconomic inequalities. We have also found that different types of inequality matter for different outcomes. Our tentative regressions suggest that socioeconomic inequalities matter more for life satisfaction than political inequality, but that both matter for satisfaction with the political system. Interestingly, socioeconomic inequalities correlate with riots, but it is political inequality that correlates with peaceful protests.

We hope that this paper will help to direct more scholarly attention to the many different types of inequality that divide societies. Different disciplines have studied different types of inequality without talking much to each other. We hope our study will help to bridge these efforts. The disciplines of Economics and Development Studies, which have traditionally focused on income and wealth inequality, have expanded their focus to other normatively relevant constructs such as inequality of opportunities (Bourguignon et al. 2007; Checchi and Peragine 2010; Ferreira and Gignoux 2011). However, little attention has been dedicated to other normative approaches to inequality that have emerged in recent decades, notably under the banner of 'democratic egalitarianism' or 'relational egalitarianism'. These approaches emphasize the normative importance of power and status differences in a society. We hope that this paper is a first step towards bringing attention to the need to better measure and study these other important types of inequality.

References

Anand, P., B. Ferrer, Q. Gao, R. Nogales, and E. Unterhalter (2020). 'COVID-19 as a Capability Crisis: Using the Capability Framework to Understand Policy Challenges'. *Journal of Human Development and Capabilities*, 21(3): 293–99. https://doi.org/10.1080/19452829.2020.1789079

Andreoli, F., and C. Zoli (2020). 'From Unidimensional to Multidimensional Inequality: a Review.' *Metron*, 78(1): 5–42. https://doi.org/10.1007/s40300-020-00168-4

Banerjee, A.V., and E. Duflo (2003). 'Inequality and Growth: What Can the Data Say?'. *Journal of Economic Growth*, 8(3): 267–99. https://doi.org/10.1023/A:1026205114860

Bartels, L.M. (2008). *Unequal Democracy*. Princeton, NJ: Princeton University Press.

Bleynat, I., and P. Segal (2021). 'Faces of Inequality: a Mixed Methods Approach to Multidimensional Inequalities'. LSE International Inequalities Institute Working Paper 68. Available at: http://eprints.lse.ac.uk/111041/1/Faces_of_inequality_working_paper_68.pdf (accessed 24 November 2022).

Bourguignon, F., F.H.G. Ferreira, and M. Menéndez (2007). 'Inequality of Opportunity in Brazil'. *Review of Income and Wealth*, 53(4): 585–618. https://doi.org/10.1111/j.1475-4991.2007.00247.x

Checchi, D., and V. Peragine (2010). 'Inequality of Opportunity in Italy'. *The Journal of Economic Inequality*, 8(4): 429–50. https://doi.org/10.1007/s10888-009-9118-3

Cole, W.M. (2018). 'Poor and Powerless: Economic and Political Inequality in Cross-National Perspective, 1981–2011'. *International Sociology*, 33(3): 357–85. https://doi.org/10.1177/0268580918760430

Cramer, C. (2003). 'Does Inequality Cause Conflict?'. *Journal of International Development*, 15(4): 397–412. https://doi.org/10.1002/jid.992

Decancq, K., and M.A. Lugo (2012). 'Inequality of Wellbeing: a Multidimensional Approach'. *Economica*, 79(316): 721–46. https://doi.org/10.1111/j.1468-0335.2012.00929.x

De Juan, A., and E. Wegner (2019). 'Social Inequality, State-centered Grievances, and Protest: Evidence from South Africa'. *Journal of Conflict Resolution*, 63(1): 31–58. https://doi.org/10.1177/0022002717723136

Elkjær, M.A., and M. Baggesen Klitgaard (2021). 'Economic Inequality and Political Responsiveness: a Systematic Review'. *Perspectives on Politics*, online. https://doi.org/10.1017/S1537592721002188

Ferreira, F.H.G., and J. Gignoux (2011). 'The Measurement of Inequality of Opportunity: Theory and an Application to Latin America'. *Review of Income and Wealth*, 57(4): 622–57. https://doi.org/10.1111/j.1475-4991.2011.00467.x

Gallego, A. (2015). *Unequal Political Participation Worldwide*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139151726

Gilens, M. (2012). *Affluence and Influence*. Princeton, NJ: Princeton University Press. https://doi.org/10.1515/9781400844821

Haggard, S., and R. Kaufman (2021). 'The Anatomy of Democratic Backsliding'. *Journal of Democracy*, 32(4): 27–41. https://doi.org/10.1353/jod.2021.0050

Jetten, J., and K. Peters (2019). *The Social Psychology of Inequality*. New York: Springer. https://doi.org/10.31234/osf.io/s5ed4

Mackenbach, J.P., I. Stirbu, A.-J.R. Roskam, M.M. Schaap, G. Menvielle, M. Leinsalu, and A.E. Kunst (2008). 'Socioeconomic Inequalities in Health in 22 European Countries'. *New England Journal of Medicine*, 358(23): 2468–81. https://doi.org/10.1056/NEJMsa0707519

Muller, C., and A. Trannoy (2012). 'Multidimensional Inequality Comparisons: a Compensation Perspective'. *Journal of Economic Theory*, 147(4): 1427–49. https://doi.org/10.1016/j.jet.2011.09.002

Nafziger, E.W., and J. Auvinen (2002). 'Economic Development, Inequality, War, and State Violence'. *World Development*, 30(2): 153–63. https://doi.org/10.1016/S0305-750X(01)00108-5

Ovaska, T., and R. Takashima (2010). 'Does a Rising Tide Lift All the Boats? Explaining the National Inequality of Happiness'. *Journal of Economic Issues*, 44(1): 205–24. https://doi.org/10.2753/JEI0021-3624440110

Peltzman, S. (2009). 'Mortality Inequality'. *Journal of Economic Perspectives*, 23(4): 175–90. https://doi.org/10.1257/jep.23.4.175

Permanyer, I., and J. Shi (2022). 'Normalized Lifespan Inequality: Disentangling the Longevity–Lifespan Variability Nexus'. *Genus*, 78(1): 1–29. https://doi.org/10.1186/s41118-021-00150-6

Perotti, R. (1996). 'Growth, Income Distribution, and Democracy: What the Data Say'. *Journal of Economic Growth*, 1(2): 149–87. https://doi.org/10.1007/BF00138861

Petrie, D., and K.K. Tang (2008). 'A Rethink on Measuring Health Inequalities Using the Gini Coefficient'. Discussion Paper 381. The University of Queensland School of Economics.

Piketty, T. (2020). *Capital and Ideology*. Cambridge, MA: Harvard University Press. https://doi.org/10.4159/9780674245075

Rodríguez García, J. (2007). 'Desigualdades socioeconómicas entre departmentos y su asociación con indicadores de mortalidad en Colombia en 2000'. *Revista Panamericana de Salud Pública*, 21(1): 111–24. https://doi.org/10.1590/S1020-49892007000200006

Scanlon, T. (2018). *Why Does Inequality Matter?* Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780198812692.001.0001

Schakel, W. (2021). 'Unequal Policy Responsiveness in the Netherlands'. *Socio-economic Review*, 19(1): 37–57. https://doi.org/10.1093/ser/mwz018

Sheehy-Skeffington, J., and J. Rea (2017). *How Poverty Affects People's Decision-Making Processes*. York, UK: Joseph Rowntree Foundation.

Smits, J., and C. Monden (2009). 'Length of Life Inequality around the Globe'. *Social Science & Medicine*, 68(6): 1114–23. https://doi.org/10.1016/j.socscimed.2008.12.034

Somma, N.M., and M.A. Bargsted (2018). 'Political Inequality in 38 Countries: A Distributional Approach'. *Comparative Sociology*, 17(5): 469–95. https://doi.org/10.1163/15691330-12341475

Statistics South Africa (2019). 'Inequality Trends in South Africa: a Multidimensional Diagnostics of Inequality'. Report 03-10-19. Available at: https://www.statssa.gov.za/publications/Report-03-10-19/Report-03-10-192017.pdf (accessed 24 November 2022).

Therborn, G. (2013). *The Killing Fields of Inequality*. New York: John Wiley & Sons.

UNU-WIDER (2022). 'World Income Inequality Database (WIID) Companion dataset (wiidcountry)'. Version 30 June 2022. https://doi.org/10.35188/UNU-WIDER/WIIDcomp-300622

Veenhoven, R. (2005). 'Inequality of Happiness in Nations'. *Journal of Happiness Studies*, 6(4): 351–55. https://doi.org/10.1007/s10902-005-0003-x

Verba, S., K. Lehman Schlozman, and H.E. Brady (1995). *Voice and Equality: Civic Voluntarism in American Politics*. Cambridge, MA: Harvard University Press. https://doi.org/10.2307/j.ctv1pnc1k7

Wilkinson, R.G., and K. Pickett (2009). *The Spirit Level: Why More Equal Societies Almost Always Do Better*. London: Allen Lane.

Appendix A: Dataset using different survey projects—additional information about construction and diagnostics

In this section we provide additional information about the construction of the dataset used in the main analysis and show that the outcomes comprising our final dataset are sufficiently consistent across different surveys.

In this paper we combine different survey sources to increase and re-balance geographic coverage but the base upon which we constructed our dataset is the joint WVS/EVS 2017–20, which is the source of roughly 60 per cent of our data. Although we use 13 other datasets, these sources mostly serve to fill the gaps in cases where a given question was not asked in a country, and in a minority of cases to add new countries to the dataset. Table A1 shows how many observations in the final dataset were taken from each survey or from imputation:

Table A1: Sources used to calculate Gini coefficients measuring inequality of non-economic outcomes for 98 countries (main dataset)

Survey	Self-efficacy	Social class	Political participation	Political influence	Life satisfaction	Total	Share
WVS 2017	45	45	45	36	45	216	0.44
EVS 2017	27		27		27	81	0.17
WVS 2010	8	15	8		6	37	0.08
Imputation	2	6	13	14	1	36	0.07
ESS 2018				27	3	30	0.06
LBR 2020		7			7	14	0.03
WVS 1999	2	5	3		3	13	0.03
ISSP 2019		12				12	0.02
EVS 2008	6				3	9	0.02
LPOP 2019				9		9	0.02
WVS 2005	2	3	2		2	9	0.02
AFRO 2019				6		6	0.01
LBR 2008	6					6	0.01
ISSP 2009		5				5	0.01
ISSP 2017				4		4	0.01
LPOP 2017				2	1	3	0.01

Source: authors' calculations.

To conduct a diagnostic of the quality of our data we look at the correlation coefficient of inequality measures calculated for a given country using different surveys. This is possible because we have a reference dataset upon which to compare the other 13 surveys listed in Table A1, and some of the countries covered by the WVS/EVS 2017–20 feature in other surveys as well. Differently from the approach employed to construct the main dataset, we do not drop observations, but instead have a long version of the dataset, with different rows for all possible country/survey combinations. That is, we use all the available information from the 15 surveys listed in Table A1. We explore the overlap information of single countries, already covered by the reference dataset, as an indicator of consistency. For each of these surveys we calculate all possible Gini coefficients, for all possible countries covered by the survey.

Table A2 shows Pearson's correlation coefficient, with the number of countries covered by the baseline and another survey source in parentheses. The margins show the average correlation weighted according to the number of observations.

Table A2: Correlation table: Gini coefficients from surveys with respect to WVS 2017-20 Gini coefficients

Survey source	Self-efficacy	Life satisfaction	Political influence	Political participation	Social class	Weighted average
AFRO 2019			-0.28 (5)			-0.28 (5)
ESS 2018		0.58 (26)				0.58 (26)
EVS 2008	0.63 (37)	0.41 (37)				0.52 (74)
ISSP 2009					0.24 (14)	0.24 (14)
ISSP 2017			0.88 (6)			0.88 (6)
ISSP 2019					0.62 (8)	0.62 (8)
LAPOP 2017		0.58 (13)	0.28 (9)			0.46 (22)
LAPOP 2019			0.32 (9)			0.32 (9)
LBR 2008	0.61 (12)					0.61 (12)
LBR 2020		0.26 (11)			0.55 (3)	0.32 (14)
WVS 99-04	0.18 (33)	0.28 (33)		0.84 (29)	0.55 (29)	0.45 (124)
WVS 05-09	0.61 (48)	0.52 (48)		0.21 (34)	0.51 (30)	0.48 (160)
WVS 10-12	0.57 (47)	0.58 (47)		0.85 (45)	0.78 (38)	0.69 (177)
Weighted average	0.52 (177)	0.48 (215)	0.32 (29)	0.70 (108)	0.58 (122)	

Source: authors' calculations.

Table A2 is an indication of the general consistency using data for the countries that are covered by more than one survey; it is also a way to identify patterns driving our main results. The correlation coefficients suggest how consistently we measure inequality using comparable but slightly different survey questions, from different projects, and collected at different times. Considering all this, the coefficients in Table A2 demonstrate that to a great extent our measures are consistent, as all but one coefficient are positive, and only a minority of variables/surveys display weak correlations (under 0.25). Although one might expect older data sources to display a weaker correlation, such a pattern is not observed. Neither is it the case that previous waves of the WVS display generally stronger correlation coefficients than other surveys. In terms of variables, the strongest correlations are in terms of political participation, self-efficacy, and social class (over 0.5), whereas the weakest are in terms of life satisfaction and political influence. The surveys with the strongest correlations are the ISSP 2017, ISSP 2019, LBR 2008, and the WVS 2010 (over 0.6), while those with the weakest correlations are the Afrobarometer 2019 and ISSP 2009 (under 0.3). Only one correlation is negative: political influence in Afrobarometer 2019, but it should be noted that the correlations in that case are obtained using only five countries (indicated in parentheses), which means that the results from a single country can have a strong impact on the correlation coefficient. Even in the cases where the correlation is not particularly strong, we still consider the aggregation of data from different sources suitable for our purpose. Instead of dropping observations from surveys/variables with weak correlations, we report a robustness test using only data from WVS/EVS 2017–20 (see Appendix C), which corroborates our main results.

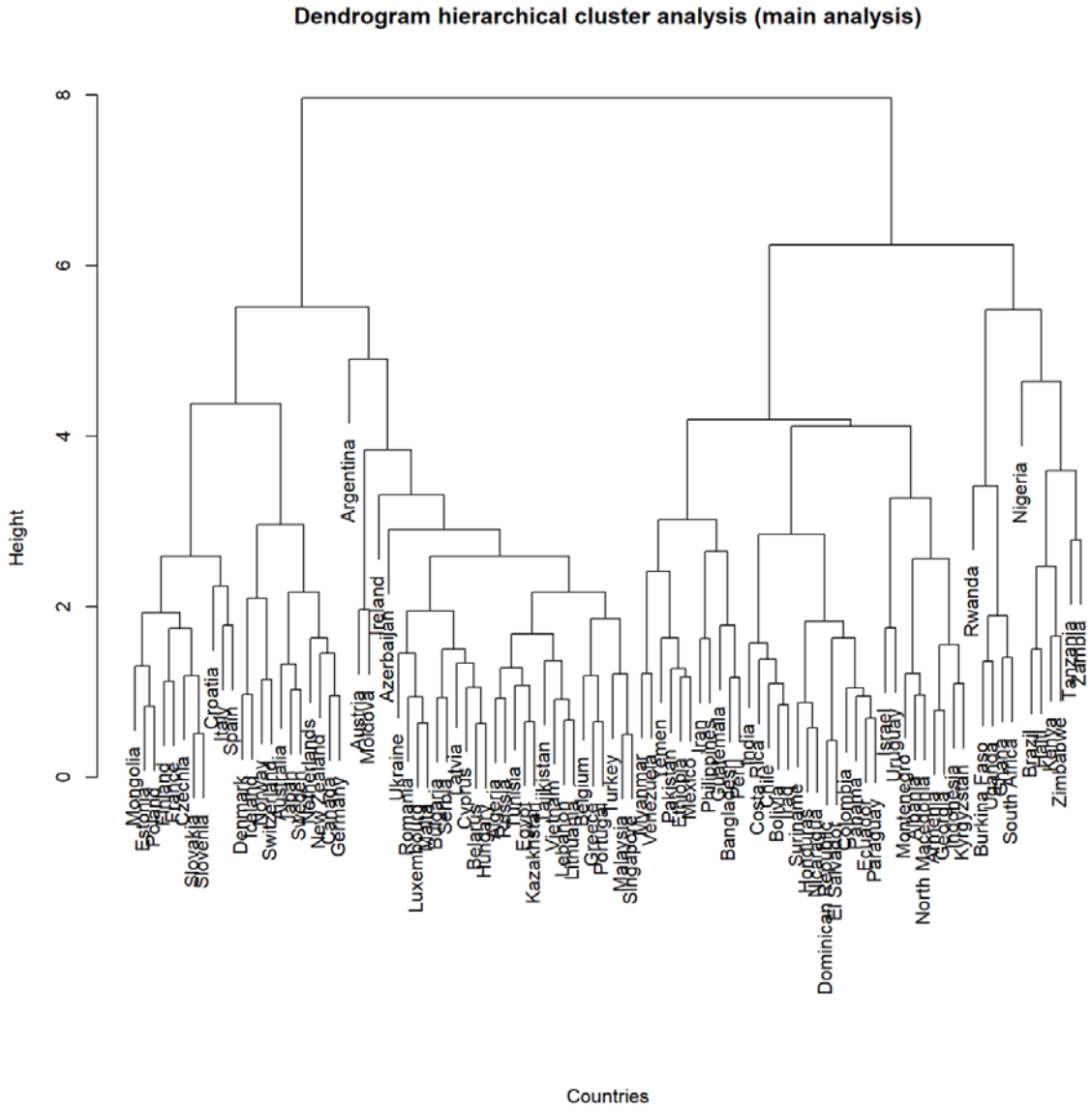
Appendix B: Detailed results of cluster analysis

Table B1: PCA. Loadings of all components (main analysis)

	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6
Income inequality	0.48	-0.26	0.12	-0.24	-0.32	-0.72
Health inequality	0.47	-0.34	0.11	-0.15	-0.41	0.68
Social class inequality	0.43	-0.29	-0.23	-0.16	0.81	0.05
Self-efficacy inequality	0.42	0.10	0.14	0.89	0.03	-0.05
Pol. participation inequality	0.32	0.54	-0.75	-0.09	-0.21	0.02
Pol. influence inequality	0.29	0.66	0.59	-0.31	0.18	0.07

Source: authors' calculations.

Figure B1: Dendrogram hierarchical cluster analysis



Source: authors' illustration.

Table B2: Standardized characteristics of clusters

Cluster		Income	Self-efficacy	Social class	Health	Political influence	Political particip.
1	Bidimensional equality	-0.90	-0.97	-0.91	-0.69	-0.48	-1.44
2	Socioeconomic/health equality and political inequality	-0.55	-0.41	-0.10	-0.53	-0.30	0.51
3	Bidimensional inequality	0.46	0.75	0.09	0.35	0.47	0.48
4	Extreme socioeconomic/health inequality and political equality	1.69	0.66	1.66	1.60	0.31	0.01

Source: authors' calculations.

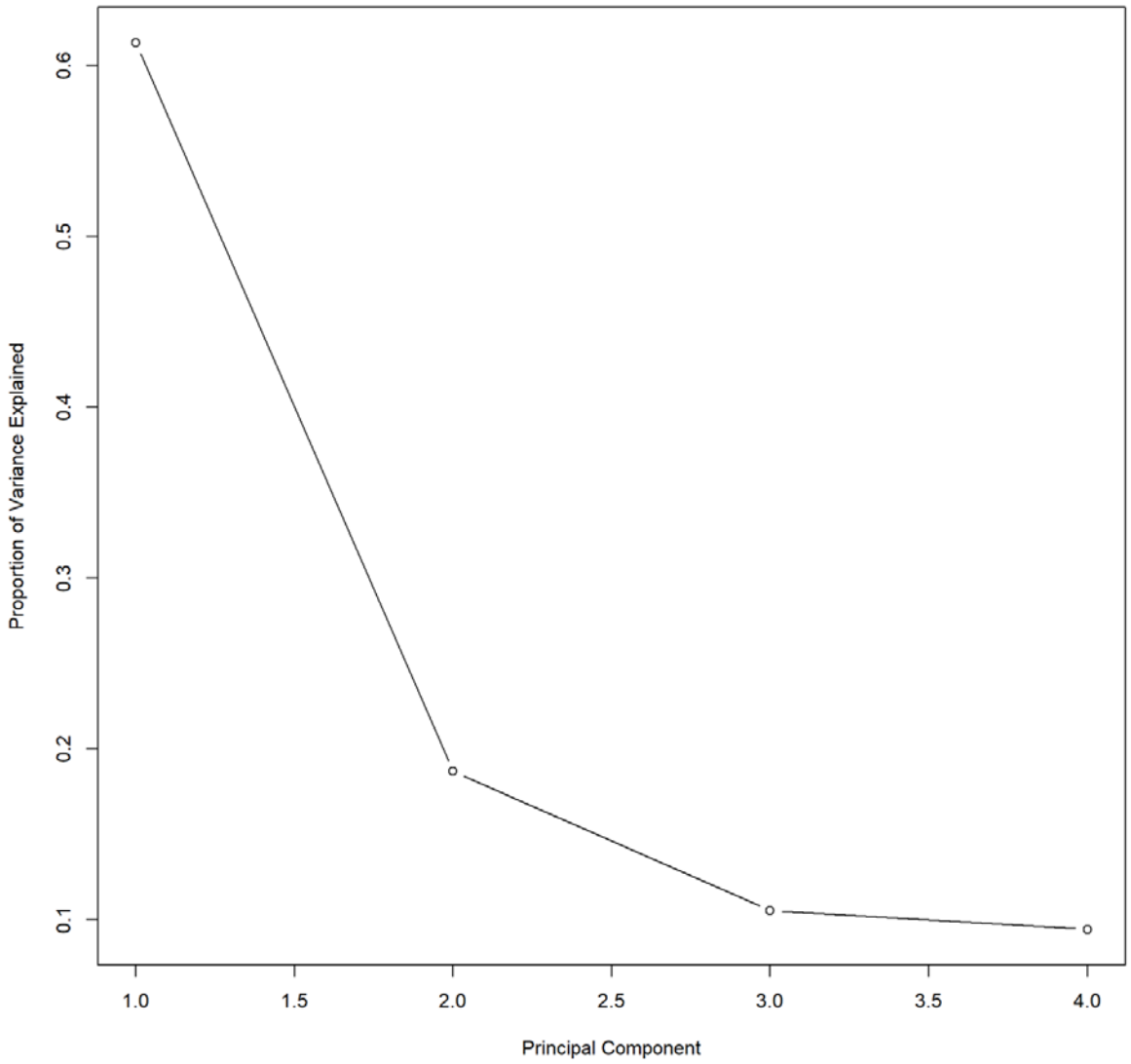
Table B3: List of countries in each cluster

Cluster		Countries
1	Bidimensional equality	Australia, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Iceland, Italy, Japan, Mongolia, Netherlands, New Zealand, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland
2	Socioeconomic/health equality and political inequality	Algeria, Argentina, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Cyprus, Egypt, Greece, Hungary, Ireland, Kazakhstan, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Malta, Moldova, Portugal, Romania, Russia, Serbia, Singapore, Tajikistan, Tunisia, Turkey, Ukraine, Viet Nam
3	Bidimensional inequality	Albania, Armenia, Bangladesh, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Ethiopia, Georgia, Guatemala, Honduras, India, Indonesia, Iran, Iraq, Israel, Kyrgyzstan, Mexico, Montenegro, Myanmar, Nicaragua, North Macedonia, Pakistan, Panama, Paraguay, Peru, Philippines, Suriname, Uruguay, Venezuela, Yemen
4	Extreme socioeconomic/ health inequality and political equality	Brazil, Burkina Faso, Ghana, Haiti, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe

Source: authors' calculations.

Appendix C: Robustness test. Analysis using only WVS/EVS 2017–20

Figure C1: Scree plot. PCA using only WVS/EVS 2017–20



Source: authors' calculations.

Table C1: PCA. Loadings of three first components (using only WVS/EVS 2017–20 dataset)

Gini coefficients	PC 1	PC 2	PC3
Income inequality	0.54	-0.24	0.27
Health inequality	0.49	-0.55	-0.61
Self-efficacy inequality	0.54	0.11	0.61
Political participation inequality	0.43	0.79	-0.43

Source: authors' calculations.

Appendix D: Additional information about data sources

Table D1: Additional information about data file versions/sources

Sources	Reference
Surveys	
AFRO 2019	Afrobarometer Round 7. Merged Round 7 data (34 countries) (2019). Available at: https://www.afrobarometer.org/data/
ESS 2018	European Social Survey European Research Infrastructure (ESS ERIC) (2021). ESS9—integrated file, edition 3.1 [Dataset]. Sikt—Norwegian Agency for Shared Services in Education and Research. Available at: https://doi.org/10.21338/ESS9E03_1
EVS 2008-2010	EVS (2016). European Values Study 2008: Integrated Dataset (EVS 2008). GESIS Data Archive, Cologne. ZA4800 Data file Version 4.0.0. Available at: https://doi.org/10.4232/1.12458
ISSP 2009	ISSP Research Group (2017). International Social Survey Programme: Social Inequality IV—ISSP 2009. GESIS Data Archive, Cologne. ZA5400 Data file Version 4.0.0. Available at: https://doi.org/10.4232/1.12777
ISSP 2017-2019	ISSP Research Group (2019). International Social Survey Programme: Social Networks and Social Resources—ISSP 2017. GESIS Data Archive, Cologne. ZA6980 Data file Version 2.0.0. Available at: https://doi.org/10.4232/1.13322
ISSP 2019	ISSP Research Group (2021). International Social Survey Programme: Social Inequality V—ISSP 2019. GESIS Data Archive, Cologne. ZA7600 Data file Version 2.0.0. Available at: https://doi.org/10.4232/1.13829
EVS 2017-2020	EVS/WVS (2022). European Values Study and World Values Survey: Joint EVS/WVS 2017–22 Dataset (Joint EVS/WVS). Dataset Version 3.0.0. Available at: https://doi.org/10.14281/18241.19
LAPOP 2017	LAPOP (2016/17). The AmericasBarometer by the LAPOP Lab, www.vanderbilt.edu/lapop
LAPOP 2019	LAPOP (2018/19). The AmericasBarometer by the LAPOP Lab, www.vanderbilt.edu/lapop
LBR 2007	Latinobarómetro 2007. Available at: https://www.latinobarometro.org/latContents.jsp
LBR 2008	Latinobarómetro 2008. Available at: https://www.latinobarometro.org/latContents.jsp
LBR 2020	Latinobarómetro 2020. Available at: https://www.latinobarometro.org/latContents.jsp
WVS 1999-2004	Inglehart, R., et al. (eds) (2014). World Values Survey: Round Four—Country-Pooled Datafile Version. Available at: www.worldvaluessurvey.org/WVSDocumentationWV4.jsp. Madrid: JD Systems Institute.
WVS 2005-2009	Inglehart, R., et al. (eds) (2014). World Values Survey: Round Five—Country-Pooled Datafile Version. Available at: www.worldvaluessurvey.org/WVSDocumentationWV5.jsp. Madrid: JD Systems Institute.
WVS 2010-2012	Inglehart, R., et al. (eds) (2014). World Values Survey: Round Six—Country-Pooled Datafile Version. Available at: https://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp. Madrid: JD Systems Institute.
WVS 2017-2020	Haerpfer, C., et al. (eds) (2022). World Values Survey: Round Seven—Country-Pooled Datafile Version 4.0. Madrid, Spain & Vienna, Austria: JD Systems Institute & WVSA Secretariat. Available at: https://doi.org/10.14281/18241.18
Other data sources	
Demonstration events are measured using protest and riot events sub-types in 2017–20	Raleigh, C., A. Linke, H. Hegre, and J. Karlsen (2010). 'Introducing ACLED-Armed Conflict Location and Event Data'. *Journal of Peace Research*, 47(5): 651–60.
Length of life is measured using WHO life tables	Available at: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-life-expectancy-and-healthy-life-expectancy
GDP per capita is measured using World Bank 2017 data	Available at: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD
Population is measured using V-DEM V11.1 'e_pop'	Coppedge, M., et al. (2021). 'V-Dem Codebook v11.1' Varieties of Democracy (V-Dem) Project

Source: authors' construction.

Table D2: Original survey questions and coding

Surveys used	Variable	Question	Original range	Original answers	Transformed range	Recoded answers
Self-efficacy						
EVS_2017_2020	A173	Some people feel they have completely free choice and control over their lives, and other people feel that what they do has no real effect on what happens to them. Please use the scale to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = None at all; 10 = A great deal	0–9	Subtracted 1 from scale
WVS_2017_2020	Q48	Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = No choice at all; 10 = A great deal of choice	0–9	Subtracted 1 from scale
WVS_2010_2012	V55	Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = No choice at all; 10 = A great deal of choice	0–9	Subtracted 1 from scale
EVS 2010–2008	A173	Some people feel they have completely free choice and control over their lives, and other people feel that what they do has no real effect on what happens to them. Please use the scale to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = None at all; 10 = A great deal	0–9	Subtracted 1 from scale
LBR_2008	p79wvsst	Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'none at all' and 10 means 'a great deal' to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = None at all; 10 = A lot of freedom	0–9	Subtracted 1 from scale
WVS_2005_2009	V46	Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = No choice at all; 10 = A great deal of choice	0–9	Subtracted 1 from scale

Surveys used	Variable	Question	Original range	Original answers	Transformed range	Recoded answers
WVS_1999_2004	V82	Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out.	1–10	1 = No choice at all; 10 = A great deal of choice	0–9	Subtracted 1 from scale
Life satisfaction						
EVS_2017_2020	A170	All things considered, how satisfied are you with your life as a whole these days? Please use this card to help with your answer.	1–10	1 = Dissatisfied; 10 = Satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
WVS_2017_2020	Q49	All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?	1–10	1 = Completely dissatisfied; 10 = Completely satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
ESS_2018	stflife	All things considered, how satisfied are you with your life as a whole nowadays? Please answer using this card, where 0 means extremely dissatisfied and 10 means extremely satisfied.	0–10	0 = Extremely dissatisfied; 10 = Extremely satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
WVS_2010_2012	V23	All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?	1–10	1 = Completely dissatisfied; 10 = Completely satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
EVS 2010–2008	A170	All things considered, how satisfied are you with your life as a whole these days? Please use this card to help with your answer.	1–10	1 = Dissatisfied; 10 = Satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
LAPOP_2017	ls3	In general how satisfied are you with your life? Would you say that you are:	1–4	1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Somewhat satisfied; 4 = Very satisfied	0–3	Subtracted 1 from scale
LBR_2020	p1st	Generally speaking, would you say you are satisfied with your life? Would you say you are ...?	1–4	1 = Not at all satisfied; 2 = Not very satisfied; 3 = Quite satisfied; 4 = Very satisfied	0–3	Subtracted 1 from scale

Surveys used	Variable	Question	Original range	Original answers	Transformed range	Recoded answers
WVS_2005_2009	V22	All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?	1–10	1 = Completely dissatisfied; 10 = Completely satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
WVS_1999_2004	V81	All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?	1–10	1 = Completely dissatisfied; 10 = Completely satisfied	0–3	0 (1–2); 1 (3–5); 2 (6–8); 3 (9–10)
Social class						
WVS_2017_2020		People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the … ?	1–5	1 = lower class; 2 = working class; 3 = lower middle class; 4 = upper middle class; 5 = upper class	0–4	0 = lower class; 1 = working class; 2 = lower middle class; 3 = upper middle class; 4 = upper class
LBR_2020	s1	People sometimes describe themselves as belonging to a social class. Would you describe yourself belonging to the … ?	1–5	1 = lower class; 2 = working class; 3 = lower middle class; 4 = upper middle class; 5 = upper class	0–4	0 = lower class; 2 = lower middle class; 2.5 = middle class; 3 = upper middle class; 4 = upper class
ISSP_2019	v61	Most people see themselves as belonging to a particular class. Please tell me which social class you would say you belong to?	1–6	1 = lower class; 2 = working class; 3 = lower middle class; 4 = middle class; 5 = upper middle class; 6 = upper class	0–4	0 = lower class; 1 = working class; 2 = lower middle class; 2.5 = middle class; 3 = upper middle class; 4 = upper class
WVS_2010_2012	V238	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the	1–5	1 = lower class; 2 = working class; 3 = lower middle class; 4 = upper middle class; 5 = upper class	0–4	0 = lower class; 1 = working class; 2 = lower middle class; 3 = upper middle class; 4 = upper class
ISSP_2009	V66	Most people see themselves as belonging to a particular class. Please tell me which social class you would say you belong to?	1–6	1 = lower class; 2 = working class; 3 = lower middle class; 4 = middle class; 5 = upper middle class; 6 = upper class	0–4	0 = lower class; 1 = working class; 2 = lower middle class; 2.5 = middle class; 3 = upper middle class; 4 = upper class

Surveys used	Variable	Question	Original range	Original answers	Transformed range	Recoded answers
WVS_2005_2009	V252	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the … ?	1–5	1 = lower class; 2 = working class; 3 = lower middle class; 4 = upper middle class; 5 = upper class	0–4	0 = lower class; 1 = working class; 2 = lower middle class; 3 = upper middle class; 4 = upper class
WVS_1999_2004	V235	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the … ?	1–5	1 = lower class; 2 = working class; 3 = lower middle class; 4 = upper middle class; 5 = upper class	0–4	0 = lower class; 1 = working class; 2 = lower middle class; 3 = upper middle class; 4 = upper class
Political influence						
AFRO_2019	Q54A	How much of the time do you think the following try their best to listen to what people like you have to say? Members of local government council.	1–4	1 = Never ; 2 = Only sometimes; 3 = Often; 4 = Always	0–3	Subtracted 1 from scale
LAPOP_2019	eff1	Those who govern this country are interested in what people like you think. How much do you agree or disagree with this statement?	1–7	1 = Strongly disagree; 7 = Strongly agree	0–3	0 (1–3); 1 (4); 2 (5); 3 (6)
ESS_2018	psppsgva	How much would you say the political system in [country] allows people like you to have a say in what the government does?	1–5	1 = Not at all; 2 = Very little; 3 = Some; 4 = A lot; 5 = A great deal	0–3	0 (1–2); 1 (3); 2 (4); 3 (5)
ISSP_2017_2019	v20	Please tick one box on each line to show how much you agree or disagree with each of the following statements. People like me don't have any say about what the government does.	1–5	1 = Strongly agree; 2 = Agree; 3 = Neither agree nor disagree; 4 = Disagree; 5 = Strongly disagree	0–3	0 (1–2); 1 (3); 2 (4); 3 (5)
LAPOP_2017	eff1	Those who govern this country are interested in what people like you think. How much do you agree or disagree with this statement?	1–7	1 = Strongly disagree; 7 = Strongly agree	0–3	0 (1–3); 1 (4); 2 (5); 3 (6)
LAPOP_2019	eff1	Those who govern this country are interested in what people like you think. How much do you agree or disagree with this statement?	1–7	1 = Strongly disagree; 7 = Strongly agree	0–3	0 (1–3); 1 (4); 2 (5); 3 (6)
Political participation						
WVS_2017_2020	Q209-212	'd like you to look at this card. I'm going to read out some forms of political action that people can take, and I'd like you to tell me, for each one, whether you have done [it], whether you might do it or would never under any circumstances do it: signing a petition, joining in boycotts, attending peaceful demonstrations, joining strikes.		Have done, might do, would never	0–4	For each form of participation add dummies recoded as: 1 = have done; 0 = otherwise

Surveys used	Variable	Question	Original range	Original answers	Transformed range	Recoded answers
WVS_2010_2012	V85-88	I'd like you to look at this card. I'm going to read out some forms of political action that people can take, and I'd like you to tell me, for each one, whether you have done [it], whether you might do it or would never under any circumstances do it: signing a petition, joining in boycotts, attending peaceful demonstrations, joining strikes.		Have done, might do, would never	0–4	For each form of participation add dummies recoded as: 1 = have done; 0 = otherwise
WVS_2005_2009	V96-99	I'd like you to look at this card. I'm going to read out some forms of political action that people can take, and I'd like you to tell me, for each one, whether you have done [it], whether you might do it or would never under any circumstances do it: signing a petition, joining in boycotts, attending peaceful demonstrations, other [form of political action].		Have done, might do, would never	0–4	For each form of participation add dummies recoded as: 1 = have done; 0 = otherwise
WVS_1999_2004	V134-137	I'd like you to look at this card. I'm going to read out some forms of political action that people can take, and I'd like you to tell me, for each one, whether you have done [it], whether you might do it or would never under any circumstances do it: signing a petition, joining in boycotts, attending peaceful demonstrations, joining strikes.		Have done, might do, would never	0–4	For each form of participation add dummies recoded as: 1 = have done; 0 = otherwise

Source: authors' construction.