Methods

ESS data

The data were acquired from the ESS. Then, the relevant variables were selected and cleaned, including removal of missing values and transformation of round to corresponding year. After the data cleaning, …..

a separate PCA was performed for each round and country. The loadings and explained variance metrics derived from the first principal component were then considered for further interpretation.

The data were obtained from the website of the European Social Survey Data Portal (ESS Data Portal, 2024) using the inbuilt datafile builder wizard tool which allows to specific selection of the variables, rounds, and countries of interest and extracts the resulting data set as a CSV file. The data for our analysis comprised the following 39 European countries Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kosovo, Latvia, Lithuania, Luxembourg, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and The United Kingdom. The data surveyed by the ESS are on a typical Likert scale. This type of scale measures attitudes, opinions, or perceptions and provides a range of options for respondents to choose from. It often ranges from strongly disagree (0) to neutral (5) to strongly agree (10), with shades in between (e.g., Jamieson, 2004; Joshie et al., 2015). The Likert scale is often used in social science in order to quantify subjective data such as attitudes and satisfaction levels (Journal of Social Sciences, 2022). The focus on was on three variables related to opinions about migration, which ranged from 0 to 10. Thus, 0 would indicate strong resentment, 5 a neutral sentiment, and 10 a strong approval of immigration. Other values encoding questionnaire answers such as 77 = ‘Refusal’, 88 = ‘Don’t know’ and 99 = ‘No answer’ were present in the data as well. Those values were re-labeled as missing data points and subsequently removed them from the data set. The three relevant variables were *imwbcnt*(‘Immigrants make country worse (0) or better (10) place to live’), *imueclt*(‘Country's cultural life is undermined (0) or enriched (10) by immigrants’), and *imgbeco*(‘Immigration is bad (0) or good (10) for country's economy’).

The data were analysed using the R programming language in version 4.3.2 (R Core Team, 2023). PCA was done using the inbuilt stats (R Core Team, 2023) package. Data manipulation was done using the dplyr (Wickham et al., 2023) and the glue (Hester & Bryan, 2024) packages. The 2-letter country codes were transformed to the full country names and vice versa using the countrycode (Arel-Bundock, Enevoldsen & Yetman, 2018) package. Missing data were handled using the naniar package (Tierney & Cook, 2023). Visualizations were created using the ggplot2 (Wickham, 2016) and the ggrepel (Slowikowsi, 2024) packages and composed using the Patchwork (Pedersen, 2024) package.

* How the data were obtained
* Variable description (imbgeco, imueclt, imwbcnt)

Non-neutrality

Average deviatio from neutrality

Dispersion

Moderate divergence

Moderate group consensus

Moderate size parity