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Recession experiences during early adulthood shape prosocial attitudes later in life☆

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ABSTRACT

This paper explores whether the experience of a recession during early adulthood shapes individuals' prosocial attitudes. The analysis uses survey responses to experimentally validated questions that measure prosocial attitudes for approximately 64,000 respondents in 74 countries. The identification approach exploits variation in recession experiences across 75 different birth cohorts. We find that exposure to a recession during early adulthood is associated with lower levels of prosociality later in life. The effect only emerges for experiences during the impressionable years (age 18–25), mainly affects prosocial attitudes among men, and is orthogonal to the effect of experiences with democracy.

1. Introduction

Prosociality – positive other-regarding preferences and beliefs reflected in traits such as altruism, reciprocity, and trust – is crucial for human interactions. A growing body of empirical work documents that prosociality affects economic decisions and the working of markets and entire societies (see, e.g., Knack and Keefer, 1997; Porta et al., 1997; Guiso et al., 2009; Algan and Cahuc, 2010; Ashraf and Bandiera, 2017; Kosse and Tincani, 2020; Campos-Mercade et al., 2021; Alfaro et al., 2022). Recent worldwide survey data reveals substantial heterogeneity in prosocial attitudes between and within countries (Falk et al., 2018). While there is some evidence suggesting that prosocial attitudes form early in life and are partly transmitted from parents to children and partly affected by the social environment (see, e.g., Dohmen et al., 2012; Kosse et al., 2020), the exact reasons for this heterogeneity are still not fully understood. In particular, little is known about the role that the aggregate economic environment plays in determining prosocial attitudes.

This paper tests the conjecture that the experience of a recession during early adulthood has a lasting impact on individuals' prosociality. Evidence from social psychology has shown that individuals are particularly susceptible to changes in attitudes during this phase, which is usually approximated by age 18–25, and that attitudes are relatively stable afterward (see, e.g., Krosnick and Alwin, 1989). In line with this "impressionable years hypothesis," data from lab experiments and surveys show that trust, positive reciprocity, and prosociality vary until early adulthood and are relatively stable after that (see, e.g., Sutter and Kocher, 2007; Katsantonis and McLellan, 2024). Similarly, political preferences, trust in institutions, and attitudes towards immigration appear to be influenced by experiences during age 18–25 (see, e.g., Eichengreen et al., 2021, 2024; Kustov et al., 2021). The malleability of attitudes until early adulthood is related to neurocognitive developments, particularly to functional changes in brain regions that are involved in empathy and the understanding of social interactions (see, e.g., Blakemore, 2008; Bos et al., 2011; Burke et al., 2020).

During early adulthood, individuals are also particularly responsive to their social and economic environment. Early adulthood constitutes a life phase when individuals strive to become socially and economically independent from their families (e.g., Arnett, 2000). They explore and

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solidify their social identity through newly formed relationships outside the childhood home, such as with study mates or colleagues at work. At the same time, they start to engage more intensely with the social and economic environment at large, for example through job search, voting, or participation in social movements (see, e.g., Oreopoulos et al., 2012). This suggests that challenges experienced during early adulthood, like recessions marked by high unemployment and uncertain economic prospects, can potentially leave a lasting imprint on an individual's prosociality.

The conjecture that recession experiences during early adulthood shape later-life prosociality leaves open into which direction the effect goes. On the one hand, individuals who experienced a recession might feel more deserving or protective of their own needs and consequently behave less prosocially towards others. On the other hand, individuals who experienced a recession might empathize more with those less fortunate than themselves or have experienced the solidarity of others, and thus behave more prosocially towards others. Moreover, it is unclear to what extent the various dimensions of prosocial behavior – like altruism, reciprocity, and trust – are affected differently by recession experiences.

Our empirical analysis explores these effects using individual-level survey data on prosocial attitudes for approximately 64,000 respondents from 74 countries across the world, which were collected as part of the Global Preferences Survey (Falk et al., 2018). Specifically, we use measures of altruism, reciprocity, and trust that were elicited using experimentally validated survey items (Falk et al., 2023). Using a Principal Component Analysis, we combine these three measures into an index of prosociality, which serves as our primary outcome variable. To measure recession experiences, we use international data on GDP per capita at the country-by-year level. Our main independent variable is an indicator that measures whether an individual experienced at least one year of negative GDP growth during age 18–25. In additional analyses, we also consider alternative measures of recessions and other age ranges.

To identify the effect of recession experiences, we run regressions that control for country and cohort fixed effects, thus exploiting individual-level variation in recession experiences across different birth cohorts within a country, and within the same birth cohort across countries, to identify the effect of interest. Our empirical strategy allows us to identify the influence of these experiences in contrast to life-cycle effects or historical contingencies that are common to all individuals who grew up in a given country.

We find that experiencing a recession during early adulthood (age 18–25) is associated with lower levels of prosociality later in life. Exposure to at least one year of negative GDP growth during early adulthood decreases prosociality by 0.031 standard deviations. This effect size corresponds to about 55 percent of the gender gap in prosociality in the Global Preferences Survey data, where women score higher on prosociality than men. Moreover, it corresponds to about 30 percent of the prosociality gap between households above and below the median of the country-specific distributions of household income.

In line with the impressionable years hypothesis, this association between recession experience and prosociality is largely confined to the 18–25 age range. The effect is robust to different measures of recessions and to controlling for demographic characteristics, contemporaneous household income, and country-specific cohort trends. Moreover, the effect is stronger for positive reciprocity and altruism than for trust, and more pronounced for men than for women.

A potential concern with our results is that they might be driven by other experiences that correlate with recessions. In particular, previous research has found that experiences with democracy are an important determinant of individual preferences (e.g. Alesina and Fuchs-Schündeln, 2007; Acemoglu et al., 2024), and democratic institutions are closely linked to economic stability and growth (Quinn and Woolley, 2001; Acemoglu et al., 2019). We therefore examine whether experiences with democracy during early adulthood confound our estimates. We find that individuals who experienced at least one year of democracy during the age range 18–25 have higher levels of prosociality later in life. However, a joint analysis reveals that this effect is orthogonal to the effect of experiencing a recession; that is, the effect of experiencing a recession is unchanged when experiences with democracy are controlled for. Overall, our results suggest that recession experiences during early adulthood can explain part of the observed heterogeneity in prosociality between and within countries.

Our study builds upon previous research that has demonstrated how life experiences shape individual preferences across various domains. For instance, previous studies have explored how recession experiences influence labor market outcomes (e.g., Kahn, 2010), risk preferences (Malmendier and Nagel, 2011; Shigeoka, 2019), job satisfaction (Bianchi, 2013), preferences for redistribution (Giuliano and Spilimbergo, 2014, 2023b; Fisman et al., 2015; Roth and Wohlfart, 2018; Bietenbeck and Thiemann, 2023; Koczan and Plekhanov, 2023), social preferences (Li et al., 2023), job preferences (Cotofan et al., 2023), behavior on the job (Bianchi and Mohliver, 2016; Schoar and Zuo, 2017), attitudes towards immigration (Cotofan et al., 2024), political leanings and beliefs (Krishnarajan et al., 2023; Giuliano and Spilimbergo, 2023a), and character traits (Bianchi, 2014; Leckelt et al., 2016). Moreover, experience with democratic systems has been shown to affect preferences for redistribution (Alesina and Fuchs-Schündeln, 2007) and attitudes towards political institutions (Fuchs-Schündeln and Schündeln, 2015; Acemoglu et al., 2024). A recent survey of the literature can be found in Giuliano and Spilimbergo (2025).

In this study, we contribute to this body of research by investigating whether the experience of a recession influences prosocial attitudes on an individual level. Additionally, our work sheds light on the role of the broader socioeconomic and institutional environment in shaping preferences during specific life stages. Our findings support the impressionable years hypothesis, suggesting that experiences during early adulthood significantly influence attitudes. Furthermore, our results align with earlier evidence on the influence of the social environment at the local or family level (see, for instance, Dohmen et al., 2012; Kosse et al., 2020). Finally, our findings relate to recent literature that has pointed out interactions between the variability in environmental conditions and the persistence of cultural attitudes and traits (see, e.g., Kiley and Vaisey, 2020; Giuliano and Nunn, 2020).

2. Data

2.1. Individual-level data on prosociality

We use data from the Global Preferences Survey (GPS), a cross-sectional survey of economic preferences around the world (Falk et al., 2018). The data were collected as part of the 2012/13 wave of the Gallup World Poll. The representative survey includes individuals from 76 countries, which together account for approximately 90 percent of the world's population. Importantly for our purposes, the survey contains information on respondents' prosociality and age.

The dependent variable, prosociality, uses measures of altruism, trust, and positive reciprocity included in the GPS. Altruism reflects an individual's willingness to incur costs to benefit others without expecting a return; trust reflects prosocial beliefs about others' behaviors; and positive reciprocity reflects the willingness to reward kind behavior by others.[1] These measures were derived from questions selected based on

[1] The data also include a measure of negative reciprocity, which reflects the propensity to punish unkind behavior. Negative reciprocity exhibits a very low correlation with the three other dimensions of prosociality and has been argued to reflect a different trait (Dohmen et al., 2008; Falk et al., 2018). We therefore do not incorporate this measure into our main analysis but consider it in robustness checks.

their ability to predict incentivized behavior related to these prosocial attitudes in standard laboratory experiments (Falk et al., 2023).[2] The precise wording of the survey questions is reported in Appendix A.1.

Following the literature (e.g., Kosse and Tincani, 2020), our main outcome variable is an index of prosociality, constructed as follows: we standardize the measures of altruism, trust, and positive reciprocity to have a mean of 0 and a standard deviation of 1, and then take the first component from a Principal Component Analysis (PCA) of these measures. We standardize this first component to have a mean of 0 and a standard deviation of 1. As an alternative index of prosociality, we use the unweighted average of the three dimensions of prosociality, which we again standardize to have a mean of 0 and a standard deviation of 1. We also conduct the estimation for each of the elements of prosociality separately.

2.2. Measures of recessions

We consider various GDP-based measures of recessions. We use data on GDP per capita at the country-year level from the Maddison Project Database (Bolt and van Zanden, 2020) and the Penn World Tables 10.0 (Feenstra et al., 2015). These data are adjusted for purchasing power and inflation, allowing us to construct proxies for economic recessions that are comparable across countries and cohorts. GDP data are available for 75 out of the 76 countries in the GPS, with missing data for Surinam. The time coverage for GDP varies in the data: for half of the countries, we have GDP data beginning in 1932, when the oldest birth cohort in the GPS turns 18; most other countries have shorter GDP time series beginning in the 1950s (see Appendix Figure A.1). While existing literature often uses unemployment rates as indicators of recessions, this paper focuses exclusively on GDP, as comparable data on unemployment rates is unavailable for a sufficiently large set of countries and years in our sample.[3]

Our main independent variable captures recession experiences during early adulthood (age 18–25). We focus on this age range because evidence from social psychology has shown that individuals are particularly susceptible to changes in attitudes during these years. After that, attitudes are relatively stable (e.g., Krosnick and Alwin, 1989).

The macroeconomics literature has not converged on a unique GDP-based measure of economic recessions. In our preferred specification, we define recessions as years of negative GDP growth, consistent with the NBER's definition that a recession "involves a significant decline in economic activity that is spread across the economy and lasts more than a few months."[4] We define a dummy variable that takes value one if the respondent experienced at least one year of negative GDP growth during age 18–25, and zero otherwise. This measure captures both milder and severe recessions (Doerr and Hofmann, 2022).

To assess the robustness of our results, we construct several alternative recession measures based on GDP data. Specifically, we use an indicator of severe recessions, defined as GDP growth in the bottom decile of the GDP distribution among all countries and years (e.g., Carreri and Teso, 2023).[5] This definition of a recession is equivalent to GDP growth of less than –3.4 percent in our data. We also construct an alternative measure of severe recessions using growth of less than –2.5 percent in a given year (Doerr and Hofmann, 2022). As further measures, we use GDP growth in the bottom decile or the bottom quintile of the country-specific GDP growth distribution and deviations from the country-specific long-run growth trend by at least –5 percent (Kotschy and Sunde, 2021).

To investigate more generally whether the duration or frequency of recessions matters, we construct the number of years in which GDP growth was negative during the age range 18–25 and the number of years that growth was below the country-specific long-term growth trend during this age range. We also take into account that responses to recession experiences might be delayed, defining recession exposure as at least two years of negative GDP growth during the age range 18–25. This measure allows for a one-year delay in respondents' responses to the recession.

Finally, we test the robustness of our results to including average GDP growth alongside our recession measure to assess whether our effect is better captured by a binary recession measure or by a continuous measure of GDP growth.

2.3. Control variables

We consider various control variables in our analysis. From the GPS, we obtain information on respondents' age-at-interview and gender. These are the only two socio-demographic variables included in the publicly available version of the GPS data. We use respondents' age-at-interview primarily to determine their birth cohorts and thereby measure recession experiences, but we also include birth-cohort fixed effects as controls (see Section 3 for details). In robustness checks, we also control for respondents' contemporaneous household income from the restricted version of the Gallup World Poll 2012/13. Data on household income are available for 98 percent of the estimation sample.

We use publicly available data from the Polity Project (Marshall and Gurr, 2020) to construct two measures of the institutional environment during adulthood. First, we use the average of the *polity2* score, which rates countries on a scale from autocracy to democracy, during age 18–25. Second, we construct a dummy variable indicating whether a respondent experienced at least one year of democracy, defined as a *polity2* score of 6 or higher, during age 18–25. The Polity Project data are available for 87 percent of the estimation sample.

2.4. Sample construction and descriptive statistics

To construct our estimation sample, we merge the country-year-level measures of recessions and institutions with the GPS data. Recession experiences are attributed to respondents based on their current country of residence and their birth year, which we infer from their age at the time of the interview. The analysis focuses on individuals with complete information about prosociality and recession experiences during the 18–25 age range. We exclude respondents from Haiti (419 respondents) and the two oldest cohorts, 1914 and 1916 (4 respondents), because all respondents from this country and these cohorts experienced at least one year of negative GDP growth during age 18—25. Our final estimation sample comprises 64,382 respondents from 74 countries. These respondents belong to the birth cohorts 1917 to 1991 and were between 21 and 95 years old at the time of the interview.

Table A.1 in the Appendix presents descriptive statistics for our sample. On average, respondents are 44 years old, and 54 percent are female. Sixty-two percent of respondents experienced at least one year of negative GDP growth during age 18–25.

Fig. 1 depicts the variation in recession exposure across cohorts and countries, which we exploit in our identification strategy.[6] The fraction of respondents experiencing a recession during age 18–25 ranges from 7 percent in Pakistan to 99 percent in Argentina, with a

[2] The experimental validation was conducted using university students in Germany. Evidence from validation experiments in other countries generally support the validity of the measures of social preferences, especially altruism and reciprocity (see, e.g., Bauer et al., 2020; Kosfeld and Sharafi, 2024).

[3] Increases in the unemployment rate are used, for instance, in Tausig and Fenwick (1999), Ruhm (2000), Tella et al. (2001), Oyer (2006), Wolfers (2003), Kahn (2010), Oreopoulos et al. (2012), and Bianchi (2013) .

[4] See NBER, https://www.nber.org/research/business-cycle-dating.

[5] We calculate the bottom decile using the period of data relevant to our analysis: between 1932, the year when the oldest birth cohort in the GPS data turned 18, and 2012, the year of the GPS data collection.

[6] Figure A.1 in the Appendix shows the years identified as recessions for each country.

Fig. 1. Exposure to recessions for different birth cohorts in different countries.
Note: The figure displays the identifying variation in the estimation sample. Birth cohorts are displayed on the horizontal axis, and countries are listed alphabetically on the vertical axis. Red: the cohort experienced at least one year with negative GDP growth during age 18–25; gray: the cohort did not experience any year with negative GDP growth during age 18–25; white: missing data on GDP growth or no survey responses for the respective cohort and country. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

median of 63 percent in the Czech Republic. Similarly, the fraction of respondents experiencing a recession during age 18–25 ranges from 28 percent for the cohort of 1982 to 93 percent for the cohort of 1925, with a median of 64 percent for the cohort of 1950. Appendix Table A.1 also presents means and standard deviations for our alternative measures of recession experiences; the means of the binary measures, that is, of dummies for experiencing at least one year of a recession during age 18–25, range from 18 percent (at least one year in which GDP growth deviates by at least –5 percent from the country-specific growth trend) to 62 percent (at least one year of negative GDP growth).

3. Empirical strategy

To investigate whether recession experiences shape individual prosociality, we estimate regressions of the following form:

$$y_{ict} = \beta_0 + \beta_1 recession_{ct} + X_i'\gamma + X_{ct}'\rho + \delta_c + \omega_t + \varepsilon_{ict}. \quad (1)$$

Here, y_{ict} is a measure of prosociality for individual i in country c and birth cohort t. $recession_{ct}$ is a binary indicator that takes value 1 if cohort t in country c experienced a recession early in life, and 0 otherwise. While we primarily focus on recession experiences during age 18–25, for comparison, we also consider other developmental stages: early childhood (age 0–5), late childhood (age 6–12), adolescence (age 13–17), and adulthood (age 26–30 and 31–35).[7] X_i and X_{ct} are vectors of individual-level and country-level controls, respectively.[8] δ_c denotes a vector of country fixed effects, ω_t is a vector of cohort fixed

[7] The concept of different stages of psychosocial development goes back to Erikson (1950, 1959). The proposed age brackets align with his framework, but the age cutoffs are debatable; see Arnett (2000) for a discussion. Therefore, we report the results of robustness checks with alternative age brackets in Section 4.2.

[8] At the individual level, our regressions control for gender and both linear and squared age-at-interview to account for potential non-linear age

effects, and ε_{ict} is the error term. We cluster standard errors at the country-by-cohort level in all specifications.

The identification strategy exploits the fact that recessions happen in different countries at different points in time, as displayed in Fig. 1 and Appendix Figure A.1. In all specifications, we include country fixed effects, accounting for all country-level differences that are constant over time. Moreover, we include birth-cohort fixed effects, which absorb variation across birth cohorts in recession exposure and prosociality that is common across countries, including general age or birth-cohort trends in prosociality. The non-linearity in the exposure to recessions across birth cohorts and countries allows us to identify the coefficient of interest separately from birth-cohort or age-at-interview patterns in prosociality that are common across countries.

In this context, it should be noted that – because the GPS data capture a cross-section of individuals and do not allow us to observe respondents over time repeatedly – birth-cohort fixed effects and age-at-interview fixed effects are equivalent. As such, birth-cohort fixed effects absorb both global life-cycle patterns in prosociality and global changes in prosociality across birth cohorts.

A potential issue for the interpretation of our results arises if country-specific age trends in prosociality move parallel with country-specific recession exposure. In this case, our analysis would no longer disentangle the effect of recessions while young from life-cycle effects in prosociality. To address this concern, we conduct two different robustness checks. First, we include country-specific birth-cohort (i.e., age-at-interview) trends in our analysis, thus abstracting from linear, country-specific cohort or age trends in prosociality. Second, we exclude respondents from the sample who were born between 1983 and 1991 and thus young enough to have experienced the Great Recession during early adulthood. By doing this, we account for the fact that younger respondents tend to be less prosocial on average. This age trend might be amplified in countries affected by the Great Recession.

4. Results

4.1. Main findings

Fig. 2 shows estimates of the effect of experiencing a recession at different ages on our main index of prosociality. The main takeaway from the figure is that experiencing a recession during the impressionable years (age 18–25) has a negative effect on prosociality later in life. Experiencing at least one year of negative GDP growth during early adulthood decreases prosociality by 0.031 standard deviations. This effect is statistically significant ($p < 0.01$) and economically meaningful. It corresponds to 55 percent of the gender gap in prosociality in the GPS data, where women score 0.056 standard deviations higher on prosociality than men. Moreover, it corresponds to 30 percent of the average difference in prosociality between households above and below the median household income in a country (0.104).[9]

Fig. 2 further tests the impressionable years hypothesis by displaying the results for other age brackets (early and late childhood, adolescence, and adult ages beyond age 25) in separate regressions or in joint regressions. The effect is statistically significant only for the 18–25 age bracket and largest in magnitude for this age range. This result is robust to constructing the measure of prosociality as the unweighted average of its components (see Appendix Table A.2, columns 3 and 4) and does not change when controlling jointly for recession experiences at different ages (see Fig. 2 and Appendix Tables A.2 and A.3).[10] However, when conducting statistical tests for equality of coefficients, we cannot reject the hypothesis that the effect of recession exposure during age 18–25 is identical to the effect of recession exposure during late childhood (age 6–12) or during adulthood (age 26–30, see Appendix Table A.3 for detailed results). As such, we ultimately cannot exclude that recession experiences during other age brackets also play a role for prosociality.

Replicating the analysis for each of the three different dimensions of prosocial attitudes separately shows that the effect is mainly driven by decreases in positive reciprocity and altruism, as shown in Fig. 3. The effect on trust is close to zero and statistically insignificant. These findings suggest that the negative effect of recessions on prosociality mainly works through less reciprocal and less altruistic behaviors.

These main findings corroborate and extend existing literature by showing that experiencing economic downturns in early adulthood has a long-lasting negative impact on prosociality. This result aligns with Cotofan et al. (2023, 2024), who show that facing recessions during this time makes people care less about job meaning and makes them less welcoming to immigrants in later life. Our findings reinforce this work by highlighting how recessions affect a general measure of prosocial attitudes.

Our findings also contribute to ongoing debates about the factors that shape prosociality. Previous studies emphasize the role of parental influence and targeted childhood interventions in fostering prosocial behavior (see, e.g., Dohmen et al., 2012; Kosse et al., 2020). By contrast, our results highlight the potential impact of the broader socioeconomic environment. While our study does not allow us to determine the relative importance of parental upbringing versus broader environmental factors, our findings on the socioeconomic environment complement existing research on upbringing.

4.2. Additional findings and robustness

Alternative measures of recessions. We conduct extensive robustness checks using alternative GDP-based measures of recessions. We vary the growth cutoffs for the construction of the recession indicator, account for delayed responses to recessions, and analyze whether the duration of recession exposure matters.

The results, displayed in Fig. 4, are coherent across the different measures. We first consider a set of recession cutoffs meant to characterize severe recessions (growth lower than –2.5% or growth lower than the bottom 10% of growth in the sample). The results are similar to those of our preferred specification, suggesting that our findings do not depend on the severity of a recession. Next, we adopt country-specific definitions of recessions based on growth performance within the bottom decile or the bottom quintile of a country's growth distribution. The results are virtually identical to our main specification when using these cutoffs. The coefficient estimate is similar in magnitude but less precisely estimated when defining a recession as a substantial deviation from the long-term growth trend within a country; however, such a definition is associated with considerable noise because the country-level growth trends are estimates.

To account for delayed responses to recessions, we explore the effect of exposure to negative GDP growth for at least two years and find that the results are comparable in magnitude to our main results and statistically significant. The number of years of negative GDP growth during the age range 18–25 exhibits a weakly significantly negative effect on prosociality. By contrast, the number of years of GDP growth below the long-term growth trend is not associated with changes in prosociality. Detailed estimation results are reported in Appendix Table A.4.

patterns (see, e.g., Fitzenberger et al., 2022).

[9] The effect size is, however, modest compared to the effects of targeted interventions earlier in life. For instance, early childhood mentoring can increase prosociality by as much as 0.27–0.3 standard deviations (Kosse et al., 2020; Cappelen et al., 2020), and a one-standard-deviation increase in parent–child closeness is associated with increases in prosociality by 0.24 standard deviations (Katsantonis and McLellan, 2024). The recession effect we find is, in absolute terms, about 10–13 percent of these effect sizes.

[10] For some respondents, particularly relatively young ones, there is no information on recession experiences during later ages, which leads to a substantial drop in sample sizes for the respective specifications. See Appendix Table A.1 for details.

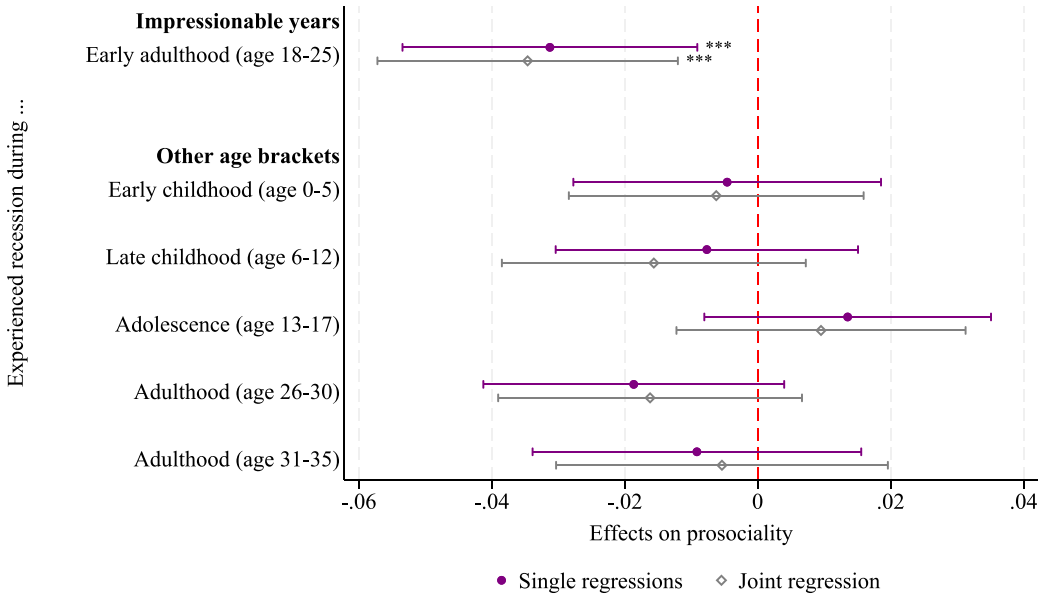

Fig. 2. Exposure to recessions at different ages and prosociality.
Note: The figure displays regression coefficients from OLS regressions of prosociality on recession exposure (at least one year of negative GDP growth) during different age brackets. For each age bracket, two coefficients are presented: the top one comes from a regression of prosociality on a recession indicator for that specific age bracket, and the bottom one comes from a regression of prosociality on six recession indicators (one for each age bracket). All specifications include GPS survey weights and control for gender, age-at-interview (linear and squared), cohort fixed effects, and country fixed effects. The joint regression also includes indicators for missing values in the recession variables. See Appendix Table A.3 for details. The whiskers represent 95% confidence intervals.
*significant at the 10%-level, **significant at the 5%-level, ***significant at the 1%-level.

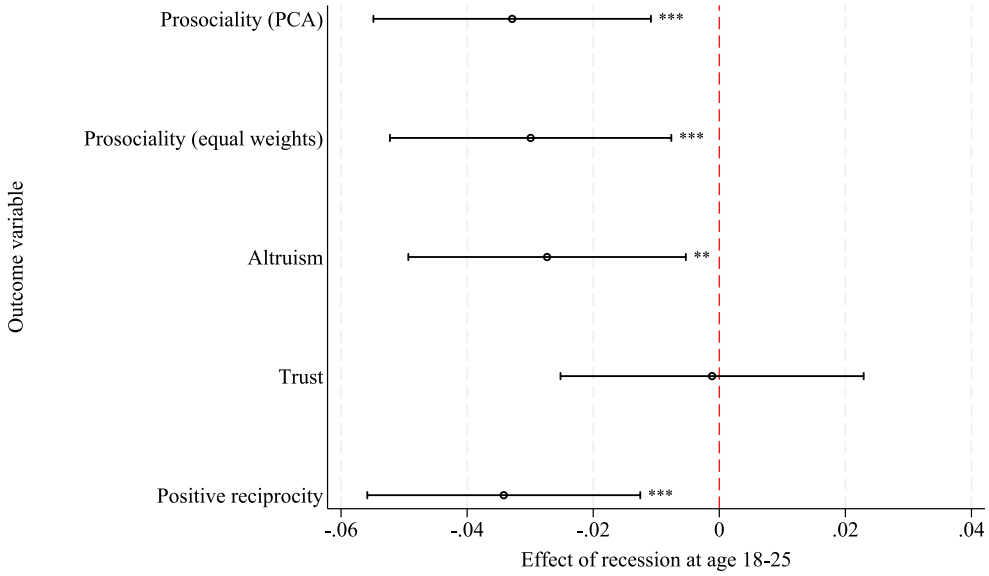

Fig. 3. Exposure to recessions and elements of prosociality.
Note: The figure displays regression coefficients from OLS regressions of prosociality on recession exposure (at least one year of negative GDP growth during age 18–25). The dependent variables are various measures of prosociality, shown on the vertical axis (see Section 2.1 for details). All specifications include GPS survey weights and control for gender, age-at-interview (linear and squared), cohort fixed effects, and country fixed effects. The whiskers represent 95% confidence intervals.
*significant at the 10%-level, **significant at the 5%-level, ***significant at the 1%-level.

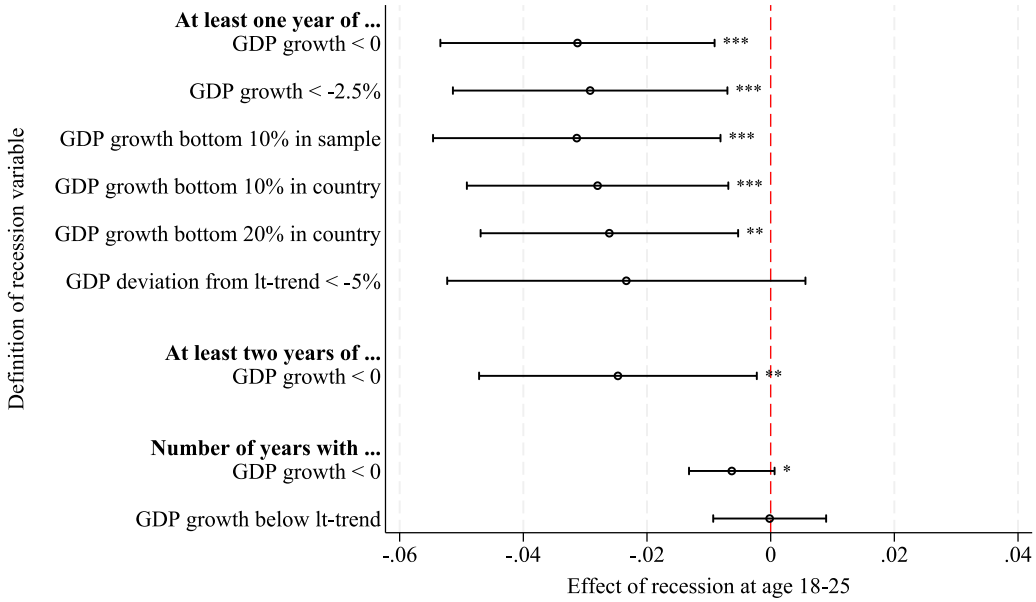

Fig. 4. Robustness: different measures of economic recessions.
Note: The figure displays regression coefficients from OLS regressions of prosociality on recession exposure during age 18–25. Each coefficient, shown on the vertical axis, is based on a different definition of recessions (see Section 2.2 for details). All specifications include GPS survey weights and control for gender, age-at-interview (linear and squared), cohort fixed effects, and country fixed effects. The whiskers represent 95% confidence intervals. "lt-trend:" long-term trend.
*significant at the 10%-level, **significant at the 5%-level, ***significant at the 1%-level.

We also disentangle the recession effect from exposure to average growth rates during age 18–25 (see Appendix Table A.5). We find no association between average growth rates during early adulthood and prosociality. Moreover, when we include both our main recession indicator and average growth in the same regression, the recession effect is unchanged compared to our headline results.

The recession effect is also robust to alternative specifications of the age brackets. When defining a rolling window of eight-year age brackets, we find that recession experiences matter from the age bracket 18–25 up to and including the age bracket 24–31 (see Appendix Figure A.2). These results suggest that recessions may continue to affect prosociality beyond the age of 25 when individuals transition into later stages of adulthood.

Alternative specifications and sample restrictions. The robustness of the results extends to alternative specifications and sample restrictions, as demonstrated in Table 1 (column 1 corresponds to our preferred specification displayed in Fig. 2). The results are unchanged when we include country-specific birth-cohort trends (column 2). When we exclude the birth cohorts of 1983 to 1991, who might have experienced the Great Recession during their early adulthood, the results are slightly attenuated (column 3).

In extended specifications, we incorporate potential confounders (columns 4–7). We control for contemporaneous household income since respondents with higher income may be more generous and find that the coefficient remains stable (column 4). The results are also robust when controlling for the average quality of political institutions during the respondent's impressionable years (column 5) and for exposure to at least one year of democracy during the impressionable years (column 6). The results also hold when including all covariates jointly (column 7).

The Appendix reports the results of additional robustness checks. When we include a measure of negative reciprocity into the prosociality index, the findings remain qualitatively and quantitatively very similar (see Appendix Table A.6), likely because recession experiences during the age range 18–25 do not impact negative reciprocity (see Appendix Table A.7).

Finally, one might be concerned that the main results are driven by specific age or birth-cohort groups. We replicate the analysis while dropping different birth cohorts (in 10-year groups) from the sample. We find little evidence that our findings are sensitive to dropping particular cohorts (see Appendix Figure A.3).

Gender heterogeneity. Previous work has pointed out the heterogeneity of the effects of recession experiences between men and women (e.g., Leckelt et al., 2016). To explore gender differences, we estimate specifications that allow for heterogeneous effects of recession exposure by gender. We find that the negative effect is mainly driven by males (see Appendix Table A.8).

4.3. Recession experiences, democracy, and prosociality

The previous findings indicate that the experience of a recession during early adulthood has a persistent negative effect on prosocial attitudes. We conclude the analysis by investigating in more detail to what extent the effect of recession experiences during a respondent's impressionable years is distinct from the effect of broader experiences, such as having lived in a particular institutional environment, as suggested in the literature (see, e.g., Cappelen et al., 2025).

The results in Table 1 (columns 6 and 7) present estimates of an extended empirical framework that incorporates both recession experiences and experiences with democracy.[11] The results reveal that having experienced at least one year of democracy during early adulthood is linked with significantly higher levels of prosociality (see column 6 of Table 1). The coefficient for democracy is about 1.3 times larger than the coefficient for recessions and of opposite sign.

These effects are quantitatively and qualitatively similar when we include the democracy and recession indicators in separate regressions, providing further evidence that recession and democracy experiences are independent of each other (see Panels A–C of Appendix Table A.9). Similarly, when testing whether recession experiences and experiences with democracy interact, we find no evidence for significant interactions (see Panel D of Appendix Table A.9).

[11] This analysis uses a smaller sample that contains information for both democracy and recessions. Our headline results replicate in this smaller sample; see Panel A of Appendix Table A.9.

Table 1
Robustness: Different specifications and sample restrictions.

	Dependent variable: prosociality (first component of PCA)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Recession age 18–25	−0.031***	−0.032***	−0.025*	−0.030***	−0.039***	−0.041***	−0.038***
	(0.011)	(0.012)	(0.013)	(0.011)	(0.012)	(0.012)	(0.012)
Log household income				0.060***			0.058***
				(0.005)			(0.005)
Institutional quality age 18–25					0.005***		0.004
					(0.002)		(0.002)
Democracy age 18–25						0.053***	0.026
						(0.020)	(0.027)
Female	0.050***	0.051***	0.047***	0.057***	0.047***	0.047***	0.054***
	(0.009)	(0.009)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)
Cohort fixed effects	✓	✓	✓	✓	✓	✓	✓
Country fixed effects	✓	✓	✓	✓	✓	✓	✓
Country-specific cohort trends		✓					
W/o Great Recession cohorts			✓				
Mean of dependent variable	0.00	0.00	0.02	0.01	0.01	0.01	0.02
Mean of recession variable	0.62	0.62	0.64	0.62	0.61	0.61	0.61
Observations	64,382	64,382	51,489	63,175	56,232	56,232	55,224
R-squared	0.16	0.16	0.16	0.16	0.17	0.17	0.17

Note: The table displays regression coefficients from OLS regressions of prosociality on recession exposure (at least one year of negative GDP growth during age 18–25). Log household income per capita is winsorized at the 99th percentile within each country. Institutional quality is measured using the average of the *polity2* score during age 18–25. The democracy variable captures at least one year of democracy during age 18–25 (see Section 2.3 for details). All specifications include GPS survey weights and control for gender, age-at-interview (linear and squared), cohort fixed effects, and country fixed effects. Standard errors are in parentheses and clustered at the country-by-cohort level.
*significant at the 10%-level, **significant at the 5%-level, ***significant at the 1%-level.

We also investigate gender heterogeneity of the recession and democracy experiences. The results reveal that the negative effect of recession exposure on prosociality mainly results from the sample of men and is substantially weaker for women. Conversely, the positive effect of exposure to democratic institutions only emerges in the sample of women (see Panel E of Appendix Table A.9).

5. Concluding remarks

This paper presents novel evidence that experiencing a recession during early adulthood persistently affects prosocial attitudes. The effect of recession experiences during the age range 18–25 is statistically significant and economically meaningful, in line with mounting evidence in support of the impressionable years hypothesis. This finding suggests that early life experiences of economic shocks can partly account for the observed heterogeneity in prosociality across generations and societies. We also find that the experience of democratic institutions during early adulthood affects prosociality, but in a distinct way.

Life experiences that occur during formative years cannot be undone or erased, which limits the normative implications of our findings. Nevertheless, this paper provides new insights into the determinants of the observed heterogeneity in prosociality at the level of individuals and populations. Since prosocial attitudes have consequences for real-world behavior, our findings can help explain behavioral patterns, such as preferences for the provision of social insurance and welfare among different demographic groups.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Grammarly and ChatGPT to check spelling, grammar, and wording. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Declaration of competing interest

The authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jpubeco.2025.105327.

Data availability

The data used for this article is publicly available. The replication files are available from the authors upon request.

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