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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 severe recession during early adulthood shapes individuals' prosocial attitudes. The analysis uses survey responses to experimentally validated questions that measure prosocial attitudes for approximately 65,000 respondents in 75 countries. The identification approach exploits variation in recession experiences across 78 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 impressionable years (age 18–25), mainly affects prosocial attitudes among men, and is orthogonal to the effect of experiences with democracy.

JEL Codes: D91, E30, E71

Keywords: Prosocial attitudes; impressionable years; experience effects; cohort effects

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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](#), [La 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 across as well as within countries ([Falk et al., 2018](#)), but the mechanisms behind the emergence of this heterogeneity and their determinants are still not fully understood.

This paper tests the conjecture that the economic environment during early adulthood has a lasting impact on the formation of prosociality. Existing evidence in economics suggests that prosocial attitudes form early in life and are partly transmitted from parents to children and partly formed by the social environment in which individuals grow up (see, e.g., [Dohmen et al., 2012](#), [Kosse et al., 2020](#)). However, little is known about whether the aggregate economic environment during late adolescence and early adulthood has a lasting effect on prosocial attitudes later in life.

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,” findings of lab experiments report that trust and positive reciprocity vary until early adulthood and are relatively stable after that (see, e.g., [Sutter and Kocher, 2007](#)). Similarly, political preferences and trust in institutions appear susceptible to experiences during these ages ([Giuliano and Spilimbergo, 2014](#), [Eichengreen et al., 2021, 2022](#)). 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](#), [van den Bos et al., 2011](#), [Burke et al., 2020](#)).

During early adulthood, individuals are also particularly responsive to their social and eco-

conomic environment. Early adulthood constitutes a life phase when individuals strive to become socially and economically independent from their families of origin (e.g., [Arnett, 2000](#)). They explore and 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 (e.g., through job search, voting, or participation in social movements; see [Oreopoulos et al., 2012](#)). Severe 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 economic conditions experienced during early adulthood shape prosociality leaves open to what extent and in which direction exposure to severe recessions influences prosociality later in life. On the one hand, individuals who experienced a recession might feel more deserving or protective of their own needs and 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 behave more prosocially towards others. Moreover, it is unclear how various dimensions of prosocial behavior – like trust, reciprocity, and altruism – react to recessions. Trust plays a role in building social connections, reciprocity helps maintain these connections, and altruism reflects generosity towards friends and strangers. Lastly, we also explore whether prosociality is shaped by living in a democracy during early adulthood since the institutional environment might mediate the impact of recession experiences on prosocial attitudes.

The empirical analysis uses individual survey responses to questions measuring prosocial attitudes for approximately 65,000 respondents from 75 countries across the world, which were collected as part of the Global Preferences Survey ([Falk et al., 2018](#)). Specifically, we use measures of altruism, trust, and reciprocity that were elicited using experimentally validated survey items ([Falk et al., 2023](#)).¹ Using a Principal Component Analysis, we combine these three measures into an index of prosociality, which serves as our primary outcome variable.

¹The 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, 2022](#)).

Our empirical strategy exploits variation in the macroeconomic environment across birth cohorts in different countries. In particular, we use international data on macroeconomic performance to construct an indicator that measures whether an individual experienced at least one year of GDP growth lower than -3.4% during the age 18–25. This number corresponds to the lowest decile of GDP growth among the countries and years in our sample. 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 variation across birth cohorts and countries. We consider the variation in recession experience across different birth cohorts within a country, and within the same birth cohort across countries, as quasi-random at the level of the individuals. 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. In line with the impressionable years hypothesis, this result does not emerge for recession experiences at earlier or later ages. The effect is robust to different measures of recessions, controlling for demographic characteristics and country-specific cohort trends, stronger for positive reciprocity than for altruism and 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., 2021](#)), 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. Moreover, the

effect of democracy is less robust than that of experiencing a recession.

Overall, our results indicate that experiences of recessions and institutions during early adulthood have long-lasting effects on prosociality that can explain within-country differences in prosocial attitudes and behaviors.

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 risk preferences ([Malmendier and Nagel, 2011](#), [Shigeoka, 2019](#)), preferences for redistribution ([Giuliano and Spilimbergo, 2014](#), [Fisman et al., 2015](#), [Roth and Wohlfart, 2018](#), [Bietenbeck and Thiemann, 2023](#)), social preferences ([Li et al., 2023](#)), job preferences ([Cotofan et al., 2023](#)), attitudes towards immigration ([Cotofan et al., 2021](#)), political leanings and beliefs ([Krishnarajan et al., 2023](#), [Giuliano and Spilimbergo, 2023b](#)), as well as character traits ([Bianchi, 2014](#)). Moreover, experience with democratic systems has been shown to impact preferences for redistribution ([Alesina and Fuchs-Schündeln, 2007](#)) and attitudes towards political institutions ([Fuchs-Schündeln and Schündeln, 2015](#), [Acemoglu et al., 2021](#)).

In this study, we contribute to this body of research by investigating whether the experience of a severe recession or exposure to democratic political institutions influences prosocial attitudes on an individual level. Additionally, our work sheds light on the role of the broader socio-economic and institutional environment in shaping preferences during specific life stages. Our findings support the impressionable years hypothesis, suggesting that experiences during early adulthood significantly impact 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, 2023](#)).

The next section presents the data and empirical methodology, Section 3 presents the empirical results, and Section 4 concludes.

2 Data and Empirical Strategy

2.1 Data

The analysis uses data from the Global Preferences Survey, which was collected as part of the Gallup World Poll 2012/2013 (Falk et al., 2018). We use survey responses to questions about prosociality for approximately 65,000 respondents from 75 countries. These respondents belong to birth cohorts 1914–1991 and are between 21 and 99 years old at the time of the interview. The survey items to measure prosociality comprise questions about altruism, trust, and positive reciprocity. Altruism reflects an individual’s willingness to incur costs to benefit others without expecting a return; trust reflects prosocial beliefs about the behavior of others; and positive reciprocity reflects the willingness to reward kind behavior by others.² The precise wording of the survey questions is reported in Appendix A.1. The respective survey items have been selected based on their ability to predict incentivized behavior in standard laboratory experiments for these prosocial attitudes (for details, see Falk et al., 2023).

To make the three measures of prosociality comparable, we standardize them to have a mean of 0 and a standard deviation of 1 in the estimation sample. As a comprehensive measure of prosociality, we follow the literature (e.g., Kosse and Tincani, 2020) and combine the responses to questions about altruism, trust, and positive reciprocity using the first component obtained from a Principal Component Analysis (PCA). This combined measure is standardized to mean 0 and standard deviation 1. In additional analysis, we use an index of prosociality constructed as the unweighted average of the three dimensions of prosociality (standardized to have mean 0 and standard deviation 1) and conduct the estimation for each of the elements of prosociality separately.

To measure recession experiences, we use data on GDP per capita at the country-year level constructed by the Maddison Project (Bolt and van Zanden, 2020) and from the Penn World Tables 10.0 (Feenstra et al., 2015). We use several different definitions of recessions. For our main

²The data also contains a measure of negative reciprocity, which reflects the preparedness to punish unkind behavior by others. 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.

explanatory variable, we follow [Giuliano and Spilimbergo \(2014\)](#) and define a severe recession as GDP growth in the bottom decile of the GDP growth distribution among all countries in our data during the relevant observation period (i.e., between 1932, the year when the oldest birth cohort turned 18 and 2012, the survey year). This definition of a recession is equivalent to GDP growth of less than -3.4% .³ According to this measure, 31% of the respondents experienced at least one recession year during their early adulthood (age 18–25). We also construct recession measures using growth of less than -2.5% in a given year ([Doerr and Hofmann, 2022](#)), and growth of less than 0% in a given year (corresponding to the NBER’s definition that a recession “involves a significant decline in economic activity”).⁴ As further alternative measures, we use GDP growth in the bottom decile of the country-specific GDP growth distribution during the relevant observation period and deviations from the country-specific long-run growth trend by -5% or less ([Kotschy and Sunde, 2021](#)). Finally, to investigate whether the duration or frequency of recessions matters, we construct a measure of the number of years that GDP growth was less than -3.4% during a respondent’s impressionable years.

The estimation sample is constructed to have non-missing information about recession experiences in the 18–25 age range. Details about the construction of the estimation sample and descriptive statistics are reported in Appendix [A.1](#) and Table [A.1](#).

To construct a measure of the institutional environment, we use data from the Polity Project (Polity-V). We use information on whether the country of residence of a respondent exhibited democratic institutions (measured by a *polity2* score of 6 and higher) or a transition to democracy (coded analogously) when the respondent was between 18 and 25 years of age. The democracy data is available for 87% of the estimation sample. Approximately 60% of respondents experienced democracy at age 18–25, and approximately 13% experienced a transition to democracy.

³Coincidentally, this corresponds closely to the lowest decile of GDP growth in the data of [Giuliano and Spilimbergo \(2014\)](#).

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

2.2 Empirical Strategy

To investigate whether recession experiences shape individual prosociality, we exploit within-country between-cohort variation in the exposure to recessions during early adulthood. Specifically, we estimate regressions of the following form:

$$y_{ict} = \beta_0 + \beta_1 \text{recession}_{ct} + \delta_c + \delta_t + X_i' \gamma + X_{ct}' \rho + \varepsilon_{ict}. \quad (1)$$

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. We focus on recession experiences during the impressionable years (age range 18–25), during which individuals are particularly susceptible to changes in attitudes (see, e.g., [Krosnick and Alwin, 1989](#)). For comparison, we also consider other developmental stages: early childhood (age 0–5), late childhood (age 6–12), adolescence (age 13–17), and adulthood (ages 26–30 and 31–35).⁵ The variable δ_c denotes a vector of country fixed effects, δ_t is a vector of cohort (or age-at-interview) fixed effects, X_i is a vector of individual-level controls, X_{ct} is a vector of country-level controls,⁶ and ε_{ict} is the error term. To investigate whether experiencing a recession exhibits a distinct effect from the broader institutional environment, we also estimate an extended regression that additionally controls for the experience of democracy early in life.

The identification strategy exploits the fact that recessions happen in different countries at different points in time. [Figure A.1](#) in the Appendix illustrates this variation for the countries in our sample. As a consequence, recession experiences affect different birth cohorts at different ages (see [Figure A.2](#)). This means that variation in the macroeconomic environment in the same country can be used to construct a contrast between individuals that are affected by

⁵The concept of different stages of psychosocial development goes back to [Erikson \(1950, 1959\)](#). The age brackets proposed here are congruent with his framework. However, the age cutoffs always remain debatable and depend on institutional factors, such as ages of school entry and exit (see [Arnett, 2000](#)). We therefore conduct detailed robustness checks with alternative age brackets in [Section 3.2](#).

⁶At the individual level, our regressions control for gender and age-at-interview (linear and squared term) to account for potential non-linear age patterns (see, e.g. [Fitzenberger et al., 2022](#)). Further individual-level controls are not included in the publicly available Global Preferences Survey data. At the country level, some of our regressions control for political institutions and the broader institutional environment; for details, see text below.

this variation at different ages but within the same broader social and national environment. In this context, it should be noted that, as a consequence of the cross-sectional nature of the GPS data, birth-cohort fixed effects and age-at-interview fixed effects are equivalent. This collinearity prevents us from de-composing country-specific birth-cohort and age patterns in prosocial attitudes. Nevertheless, the non-linearity in the exposure to recessions across age groups and countries allows us to identify the coefficient of interest separately from common age or birth-cohort patterns.

3 Results

3.1 Main Findings

Table 1 shows estimates of the effect of experiencing a recession at different ages on the summary measure of prosociality. The main takeaway from the table is that experiencing a recession during the impressionable years (age 18–25) has a negative effect on prosociality later in life. This negative effect is unique to recession experiences during this age range: the experience of a recession during earlier ages, i.e., during early and late childhood, adolescence, or during adult ages, has no significant effect on prosociality.⁷ The result is virtually unchanged when controlling simultaneously for recession experiences at different ages, as in column 7 of Table 1, or when constructing the measure of prosociality as the unweighted average of its components (see Appendix Table A.2).

[Table 1 about here]

Replicating the analysis for each of the three different dimensions of prosocial attitudes separately shows that the effect has a consistently negative sign, as shown in Figure 1. The effect is most pronounced for positive reciprocity and somewhat smaller for altruism and trust. These findings suggest that the negative effect of recessions on prosociality mainly works through more selfish and less reciprocal behavior and less through lower trust or altruism.

⁷For some of these respondents, particularly relatively young ones, there is no information about recession experiences at later ages, which leads to a substantial drop in sample size for the respective specifications; see Table A.1 for details.

[Figure 1 about here]

These main findings corroborate and extend existing literature. Our study shows that experiencing economic downturns in early adulthood has a long-lasting negative impact on prosociality. This aligns with [Cotofan et al. \(2021, 2023\)](#), who show that facing recessions during this time makes people less inclined towards meaningful jobs and less welcoming to immigrants. Our findings reinforce this work by highlighting how recessions affect a general measure of prosocial attitudes.

Our research also reveals that recessions shape prosocial attitudes during a relatively confined age range. This supports the impressionable years hypothesis, suggesting that the economic and social landscape during early adulthood affects individual preferences. This idea complements but does not contradict existing knowledge about how early interventions during childhood influence prosocial behavior (see, e.g., [Kosse et al., 2020](#)).

Moreover, the persistent effect of recessions during early adulthood appears more consistent with an influence of the socioeconomic environment than with parental influence. While we acknowledge the potential for traits to be passed down through families, our findings resonate more with the notion that the broader environment shapes prosociality beyond parental transmission. This finding complements the insights of [Dohmen et al. \(2012\)](#).

3.2 Additional Findings and Robustness

Additional analyses reveal that the main result is not sensitive to the particular growth cutoff for the construction of the recession indicator. As illustrated in in [Figure 2](#), the estimates are very similar for definitions of recessions that entail less restrictive growth thresholds (growth lower than -2.5% or growth lower than 0). The results persist even when adopting a country-specific definition of recession based on growth performance within the bottom decile of a country's growth distribution. The coefficient estimates are smaller in magnitude and less precisely estimated when using definitions of recessions that involve deviations from a long-term trend, which are associated with considerable error and noise. Interestingly, the length of a recession (in terms of the number of years for which the baseline recession indicator is satisfied during

the age range 18–25) does not exhibit a significant effect on prosociality. Detailed estimation results are reported in Appendix Table [A.3](#).

[Figure [2](#) about here]

The robustness of results extends to alternative specifications of the empirical framework (1), as demonstrated in Table [2](#) (column 4 corresponds to our preferred specification displayed in Table [1](#), column 4). Specifically, the results are robust to excluding individuals who experienced the Great Recession during their early adulthood (i.e., restricting the sample to respondents of age 25 or older at the time of the survey), controlling for gender, controlling for country-specific cohort trends, and controlling for the average quality of political institutions during the respondent’s impressionable years. The coefficient estimates are slightly larger in size for more parsimonious specifications than in the baseline analysis.

[Table [2](#) about here.]

The finding that the effect occurs only in early adulthood is robust to alternative specifications of the age brackets (see Appendix Figure [A.3](#)). To explore gender differences, we also estimated specifications that allow for a heterogeneous effect of recession exposure during early adulthood by gender. The results indicate that the negative effect is mainly driven by males (see Appendix Table [A.4](#)).

Estimates based on an index of prosociality that also includes the measure of negative reciprocity deliver qualitatively and quantitatively very similar findings (see Appendix Table [A.5](#)). Recession experiences during the age range 18–25 have a positive but insignificant effect on negative reciprocity. Interestingly, for negative reciprocity, we find a significant and positive effect of experiencing a recession during early childhood, between birth and five years of age, see Appendix Table [A.6](#).

3.3 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, even when accounting for the quality of political

institutions. We conclude the analysis by investigating whether the effect of recession experiences during a respondent's impressionable years is separate from broader experiences, such as having lived in a particular institutional environment. To decompose the roles of experiences of recessions and the institutional environment on prosocial attitudes, we present estimates of an extended empirical framework that incorporates both recession experiences and experiences with democracy. This analysis uses a smaller sample that contains information for both democracy and recessions.⁸ For comparability, we first replicate the analysis of recession exposure during early adulthood in the smaller sample. The results replicate the previous findings, as illustrated by Panel A of Table 3.

[Table 3 about here]

To explore the role of democracy in way comparable to our analysis of recession experiences, we run a regression analogous to the empirical framework (1). The main explanatory variable is an indicator for having experienced at least one year of democracy during the age range 18–25. The results, shown in Panel B of Table 3, reveal that having experienced democracy during early adulthood is linked with significantly higher levels of prosociality. Quantitatively, the effect is about 1.5 times larger than the coefficient for recessions, and of opposite sign.

The main result is shown in Panel C of Table 3, which documents that the effect of experiencing a recession during early adulthood on prosociality is distinct from the effect of experiencing a democracy: when both explanatory variables are included in the regressions, the coefficients on the recession indicator are virtually identical to the ones reported in Panel A. Furthermore, we investigate whether recession experiences and experiences with democracy interact, but we find no evidence for such interactions (see Appendix Table A.8).

Additional analyses reveal that the effect of democracy is visible for democracy experienced at younger ages, but appears most consistently for experiences during young adulthood (see Tables A.9 and A.10 for details). Considering the different measures of prosocial attitudes in isolation depicts another interesting asymmetry to the effect of recessions. While the latter is

⁸The corresponding summary statistics are contained in Appendix Table A.7.

most pronounced for positive reciprocity, the effect of democracy is strongest for altruism and trust (see Table 3).

We further explore the robustness to alternative specifications of the empirical framework. We find that the effect of experiencing democracy during ages 18–25 is sensitive to including country-specific cohort trends, in contrast to the results for exposure to a recession (see Appendix Table A.11). Additional analyses show that the findings for democracy are robust to using a more restrictive threshold for defining democracy.⁹ When investigating the role of transitions to democracy or from democracy, however, the coefficient estimates indicate a positive but statistically insignificant association with prosociality, potentially due to the much more restricted variation along this margin (see Appendix Table A.12). We also investigated whether the effect of experience with democracy on prosociality differs between men and women. The findings reveal that, in contrast to the effects of recession exposure, democracy mainly affects prosociality among women (see Appendix Table A.13).

4 Concluding Remarks

This paper presents novel evidence that the exposure to recessions during early adulthood persistently affects prosocial attitudes. The effect is mainly confined to recession experiences during the age range 18–25, in line with mounting evidence in support of the impressionable years hypothesis (see, e.g., the survey by [Giuliano and Spilimbergo, 2023a](#)). 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 on 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

⁹In particular, while the conventional definition for democracy in the Polity-V data implies a value of 6 or greater for the *polity2* variable, we also replicated the analysis for a more restrictive definition of democracy that requires the *polity2* variable to be strictly greater than 6.

can help explain behavioral patterns, such as preferences for the provision of social insurance and welfare among different demographic groups.

References

- Acemoglu, Daron, Nicolás Ajzenman, Cevat Giray Aksoy, Martin Fiszbein, and Carlos A Molina**, “(Successful) Democracies Breed Their Own Support,” *NBER Working Paper*, 2021, 29167.
- , **Suresh Naidu, Pascual Restrepo, and James A. Robinson**, “Democracy does cause growth,” *Journal of Political Economy*, 2019, 127 (1), 47–100.
- Alesina, Alberto and Nicola Fuchs-Schündeln**, “Good Bye Lenin (or Not?): The Effect of Communism on People’s Preferences,” *American Economic Review*, 2007, 97 (4), 1507–1528.
- Alfaro, Laura, Ester Faia, Nora Lamersdorf, and Farzad Saidi**, “Health Externalities and Policy: The Role of Social Preferences,” *Management Science*, 2022, 68 (9), 6751–6767.
- Algan, Yann and Pierre Cahuc**, “Inherited trust and growth,” *American Economic Review*, 2010, 100 (5), 2060–2092.
- Arnett, Jeffrey Jensen**, “Emerging adulthood: A theory of development from the late teens through the twenties.,” *American Psychologist*, 2000, 55 (5), 469.
- Ashraf, Nava and Oriana Bandiera**, “Altruistic Capital,” *American Economic Review*, 2017, 107 (2), 70–75.
- Bauer, Michal, Julie Chytilová, and Edward Miguel**, “Using survey questions to measure preferences: Lessons from an experimental validation in Kenya,” *European Economic Review*, 2020, 127, 103493.
- Bianchi, Emily C**, “Entering adulthood in a recession tempers later narcissism,” *Psychological science*, 2014, 25 (7), 1429–1437.
- Bietenbeck, Jan and Petra Thiemann**, “Revisiting the Effect of Growing Up in a Recession on Attitudes towards Redistribution,” *Journal of Applied Econometrics*, 2023, 38 (5), 786–794.

Blakemore, Sarah-Jayne, “The social brain in adolescence,” *Nature Reviews Neuroscience*, 2008, 9, 267–277.

Bolt, Jutta and Jan Luiten van Zanden, “Maddison-style estimates of the evolution of the world economy,” *Maddison-Project Working Paper*, 2020, WP-15.

Burke, Sarah M., Suzanne van de Groep, Philip Brandner, and Eveline A. Crone, “Handbook of Developmental Cognitive Neuroscience,” in Kathrin Cohen Kadosh, ed., *Neurocognitive Developmental Changes in Trust and Reciprocity Across Adolescence*, Oxford, UK: Oxford Academic, 2020, chapter 18.

Campos-Mercade, Pol, Armando N Meier, Florian H Schneider, and Erik Wengström, “Prosociality predicts health behaviors during the COVID-19 pandemic,” *Journal of Public Economics*, 2021, 195, 104367.

Cotofan, Maria, Lea Cassar, Robert Dur, and Stephan Meier, “Macroeconomic Conditions When Young Shape Job Preferences for Life,” *The Review of Economics and Statistics*, 03 2023, 105 (2), 467–473.

—, **Robert Dur, and Stephan Meier**, “Growing up in a Recession Increases Compassion? The Case of Attitudes toward Immigration,” *mimeo, CEP-LSE*, 2021.

Doerr, Sebastian and Boris Hofmann, “Recessions and mortality: a global perspective,” *Economics Letters*, 2022, 220 (110860).

Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde, “Representative Trust and Reciprocity: Prevalence and Determinants,” *Economic Inquiry*, 2008, 46 (1), 84–90.

—, —, —, **and** —, “The Intergenerational Transmission of Risk and Trust Attitudes,” *Review of Economic Studies*, 2012, 79 (2), 645–677.

Eichengreen, Barry, Cevat Giray Aksoy, and Orkun Saka, “Revenge of the experts: Will COVID-19 renew or diminish public trust in science?,” *Journal of Public Economics*, 2021, 193, 104343.

— , **Orkun Saka, and Cevat Giray Aksoy**, “The Political Scar of Epidemics,” *NBER Working Paper*, 2022, 27401.

Erikson, Erik H., *Childhood and Society*, WW Norton & Company, 1950.

— , *Identity and the Life Cycle*, WW Norton & Company, 1959.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, “Global Evidence on Economic Preferences,” *Quarterly Journal of Economics*, 2018, 133 (4), 1645–1692.

— , — , — , **David Huffman, and Uwe Sunde**, “The Preference Survey Module: A Validated Instrument for Measuring Risk, Time, and Social Preferences,” *Management Science*, forthcoming, 2023.

Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer, “The Next Generation of the Penn World Table,” *American Economic Review*, 2015, 105 (10), 3150–3182.

Fisman, Raymond, Pamela Jakiela, and Shachar Kariv, “How Did the Great Recession Impact Social Preferences?,” *Journal of Public Economics*, 2015, 128, 84–95.

Fitzenberger, Bernd, Jan Nimczik, Gary Christian Mena, and Uwe Sunde, “Personality Traits Across the Life Cycle: Disentangling Age, Period, and Cohort Effects,” *Economic Journal*, 2022, 132 (646), 2141–2172.

Fuchs-Schündeln, Nicola and Matthias Schündeln, “On the endogeneity of political preferences: Evidence from individual experience with democracy,” *Science*, 2015, 347 (6226), 1145–1148.

Giuliano, Paola and Antonio Spilimbergo, “Growing up in a Recession,” *Review of Economic Studies*, 2014, 81 (2), 787–817.

— **and** — , “Aggregate Shocks and the Formation of Preferences and Beliefs,” *mimeo*, UCLA, 2023.

- **and** — , “Recessions, Lifetime Experiences and the Formation of Political Beliefs,” *mimeo*, *UCLA*, 2023.
- **and Nathan Nunn**, “Understanding Cultural Persistence and Change,” *Review of Economic Studies*, *forthcoming*, 2023.
- Guiso, Luigi, Paola Sapienza, and Luigi Zingales**, “Cultural Biases in Economic Exchange?,” *Quarterly Journal of Economics*, 2009, *124* (3), 1095–1131.
- Kiley, Kevin and Stephen Vaisey**, “Measuring Stability and Change in Personal Culture Using Panel Data,” *American Sociological Review*, 2020, *85* (3), 477–506.
- Knack, Stephen and Philip Keefer**, “Does social capital have an economic payoff? A cross-country investigation,” *Quarterly Journal of Economics*, 1997, *112* (4), 1251–1288.
- Kosfeld, Michael and Zahra Sharafi**, “The Preference Survey Module: Evidence on Social Preferences from Tehran,” *IZA Discussion Paper*, 2022, *15006*.
- Kosse, Fabian and Michela M. Tincani**, “Prosociality predicts labor market success around the world,” *Nature Communications*, 2020, *11* (5298).
- , **Thomas Deckers, Pia Pinger, Hannah Schildberg-Hörisch, and Armin Falk**, “The formation of Prosociality: Causal Evidence on the Role of the Social Environment,” *Journal of Political Economy*, 2020, *128* (2), 434–467.
- Kotschy, Rainer and Uwe Sunde**, “Income Shocks, Inequality, and Democracy,” *Scandinavian Journal of Economics*, 2021, *123*, 295–326.
- Krishnarajan, Suthan, Jonathan Doucette, and David Andersen**, “Early-Adulthood Economic Experiences and the Formation of Democratic Support,” *British Journal of Political Science*, *forthcoming*, 2023.
- Krosnick, Jon A. and Duane F. Alwin**, “Aging and susceptibility to attitude change,” *Journal of Personality and Social Psychology*, 1989, *57* (3), 416–425.

- Li, Haoyang, Xiaomeng Zhang, Shan Jin, Yuanchi Sun, Ding Ma, and Cong Wang**, “The Impact of the Macroeconomic Environment on Social Preferences: Evidence from the Global Preference Survey,” *Behavioral Sciences*, 2023, 13, 648.
- Malmendier, Ulrike and Stefan Nagel**, “Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?,” *Quarterly Journal of Economics*, 2011, 126 (1), 373–416.
- Marshall, Monty G. and Ted Robert Gurr**, “Political Regime Characteristics and Transitions, 1800-2018 – Dataset Users’ Manual,” *Center for Systemic Peace*, 2020.
- Oreopoulos, Philip, Till Von Wachter, and Andrew Heisz**, “The short-and long-term career effects of graduating in a recession,” *American Economic Journal: Applied Economics*, 2012, 4 (1), 1–29.
- Porta, Rafael La, Francisco Lopez de Silanes, Andrei Shleifer, and R.W. Vishny**, “Trust in Large Organizations,” *American Economic Review*, 1997, 87 (2), 333–38.
- Quinn, Dennis P. and John T. Woolley**, “Democracy and National Economic Performance: The Preference for Stability,” *American Journal of Political Science*, 2001, 45 (3), 634–657.
- Roth, Christopher and Johannes Wohlfart**, “Experienced Inequality and Preferences for Redistribution,” *Journal of Public Economics*, 2018, 167, 251–262.
- Shigeoka, Hitoshi**, “Long-term Consequences of Growing up in a Recession on Risk Preferences,” *mimeo, Tokyo University*, 2019.
- Sutter, Matthias and Martin G. Kocher**, “Trust and trustworthiness across different age groups,” *Games and Economic Behavior*, 2007, 59 (2), 364–382.
- van den Bos, Wouter, Eric van Dijk, Michiel Westenberg, Serge A.R.B. Rombouts, and Eveline A. Crone**, “Changing Brains, Changing Perspectives: The Neurocognitive Development of Reciprocity,” *Psychological Science*, 2011, 22 (1), 60–70.

Tables and Figures

Table 1: Exposure to Recessions at Different Ages and Prosociality

| | Dependent variable: prosociality (first component of PCA) | | | | | | |
|----------------------------|---|---------------------|---------------------|----------------------|---------------------|---------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Recession age 0-5 | -0.006 (0.012) | | | | | | -0.009 (0.012) |
| Recession age 6-12 | | 0.011 (0.012) | | | | | 0.006 (0.012) |
| Recession age 13-17 | | | 0.010 (0.013) | | | | 0.008 (0.013) |
| Recession age 18-25 | | | | -0.032*** (0.012) | | | -0.033*** (0.012) |
| Recession age 26-30 | | | | | -0.023* (0.014) | | -0.017 (0.014) |
| Recession age 31-35 | | | | | | -0.004 (0.015) | 0.004 (0.016) |
| Female | 0.046*** (0.009) | 0.047*** (0.009) | 0.050*** (0.009) | 0.050*** (0.009) | 0.051*** (0.009) | 0.047*** (0.010) | 0.050*** (0.009) |
| Mean of dependent variable | -0.00 | 0.00 | 0.00 | -0.00 | 0.00 | 0.01 | -0.00 |
| Mean of recession variable | 0.37 | 0.36 | 0.25 | 0.31 | 0.20 | 0.19 | |
| Observations | 60,670 | 61,931 | 63,688 | 64,805 | 60,265 | 51,708 | 64,805 |
| R-squared | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |

Note: OLS regressions of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity) on recession exposure at different ages. The age brackets at younger ages are chosen to reflect developmental stages typically used in psychological research (age 0–5: early childhood; age 6–12: late childhood; age 13–17: adolescence; age 18–25: early adulthood). At older ages we use 5-year age brackets. Recession exposure is measured as at least one year of GDP growth of less than -3.4% during the specified age bracket. All regressions include controls for cohort dummies, country dummies, and age trends (age and age squared). The regression in Column (7) in addition controls for dummy variables that indicate whether information on recessions during the specific age brackets are missing. See Appendix A.1 and Table A.1 for detailed variable definitions and descriptive statistics. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level. ***significant at the 1%-level. **significant at the 5%-level. *significant at the 10%-level. Data: GPS (Falk et al., 2018) and Maddison Project Database (Bolt and van Zanden, 2020), see text for details.

Table 2: Robustness: Different Specifications and Sample Restrictions

| | Dependent variable: prosociality (first component of PCA) | | | | | | |
|--------------------------------|---|---------------------|----------------------|----------------------|---------------------|----------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Recession age 18-25 | -0.044** (0.021) | -0.052** (0.022) | -0.033*** (0.012) | -0.032*** (0.012) | -0.024* (0.013) | -0.034*** (0.013) | -0.028** (0.014) |
| Female | | | | 0.050*** (0.009) | 0.049*** (0.009) | 0.051*** (0.009) | 0.049*** (0.009) |
| Cohort fixed effects | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Country fixed effects | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sample: age at survey 25+ | | | | | ✓ | | |
| Country-specific cohort trends | | | | | | ✓ | ✓ |
| Control: institutions | | | | | | | ✓ |
| Mean of dependent variable | -0.00 | -0.00 | -0.00 | -0.00 | 0.01 | -0.00 | 0.01 |
| Mean of recession variable | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.32 |
| Observations | 64,805 | 64,805 | 64,805 | 64,805 | 58,611 | 64,805 | 59,407 |
| R-squared | 0.00 | 0.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.17 |

Note: OLS regression coefficients. The dependent variable is a measure of prosociality based on a principal component analysis (PCA) of three dimensions of prosocial attitudes (altruism, trust, and positive reciprocity). The main explanatory variable is a binary indicators for being exposed to at least one recession year during age 18–25. Regressions in columns (2)–(7) control for age trends (age and age squared). Column (4) corresponds to the preferred specification used in the baseline analysis. Observations are weighted using sampling weights from the GPS. 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. Data: GPS (Falk et al., 2018) and Maddison Project Database (Bolt and van Zanden, 2020), see text for details.

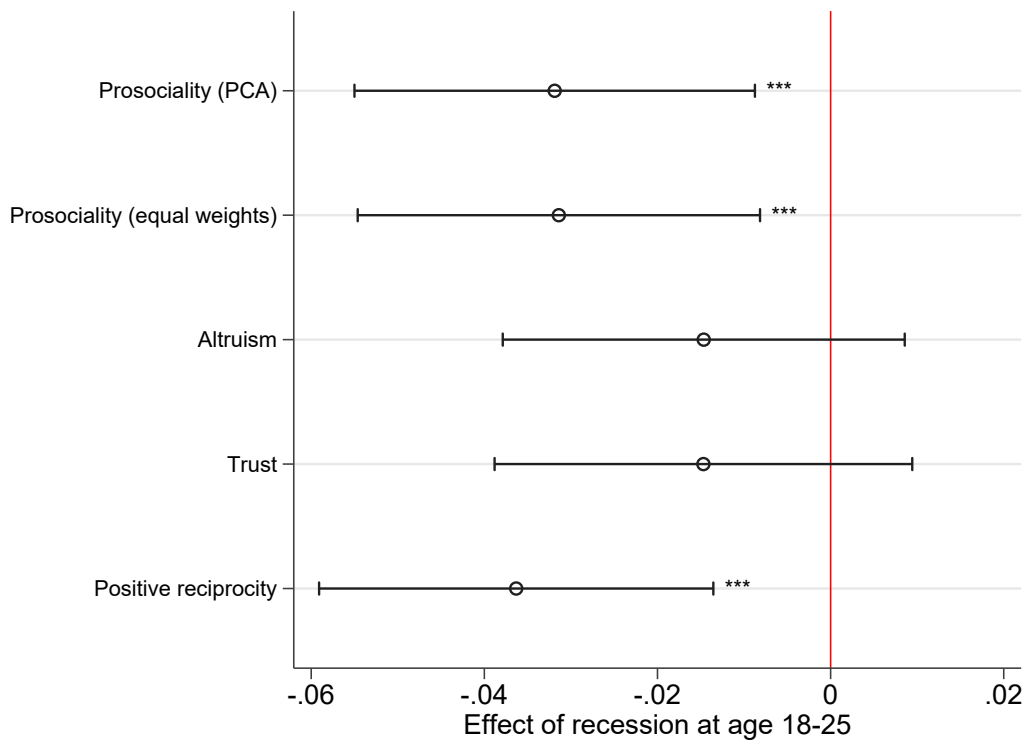
Table 3: Prosociality and Exposure to Democracy and Recessions

| | Prosociality | | | | |
|--|---------------------|---------------------|---------------------|--------------------|----------------------|
| | PCA | equal weights | Altruism | Trust | Positive Reciprocity |
| | (1) | (2) | (3) | (4) | (5) |
| Panel A: Recession Experience | | | | | |
| Recession age 18-25 | -0.032** (0.013) | -0.032** (0.013) | -0.016 (0.013) | -0.013 (0.014) | -0.036*** (0.013) |
| Panel B: Democracy Experience | | | | | |
| Democracy age 18-25 | 0.052*** (0.020) | 0.052*** (0.020) | 0.054*** (0.019) | 0.046** (0.019) | 0.013 (0.020) |
| Panel C: Recession and Democracy Experience | | | | | |
| Recession age 18-25 | -0.033** (0.013) | -0.033** (0.013) | -0.017 (0.013) | -0.014 (0.014) | -0.036*** (0.013) |
| Democracy age 18-25 | 0.053*** (0.020) | 0.053*** (0.020) | 0.055*** (0.019) | 0.046** (0.019) | 0.015 (0.020) |
| Mean of dep. var. | 0.01 | 0.01 | 0.02 | 0.01 | -0.01 |
| Observations | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 |

Note: OLS regressions of different measures of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity; the average of altruism, trust, and positive reciprocity; and the separate measures altruism, trust, and positive reciprocity) on indicators of democracy or recession during age 18–25. All regressions include controls for cohort dummies, country dummies, and age trends (age and age squared). All regressions also include controls for missings in the democracy and recession variables. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

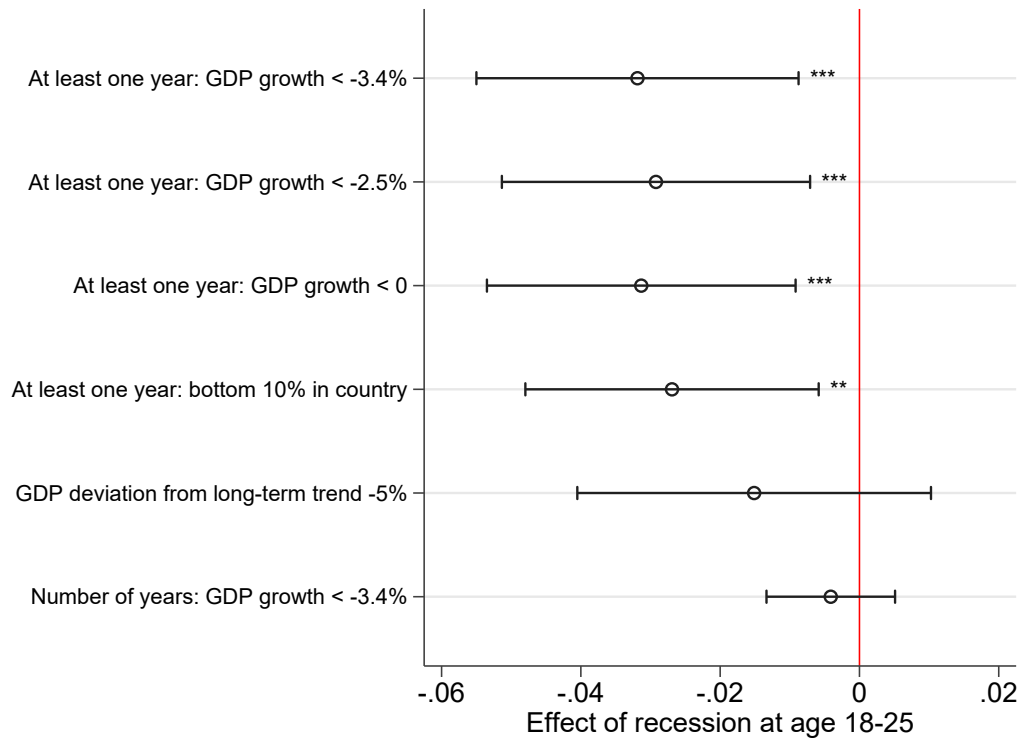
*p<0.01, **p<0.05, ***p<0.01.

Figure 1: Exposure to Recessions and Elements of Prosociality



Note: OLS regression coefficients. The respective dependent variables are different measures of prosociality as displayed on the vertical axis. These are prosociality based on a principal component analysis (PCA) of three dimensions of prosocial attitudes (altruism, trust, positive reciprocity), prosociality based on the average of the three dimensions (equal weights), and the three separate measures of prosocial attitudes (altruism, trust, positive reciprocity). Coefficients represent the effect of a binary indicator for being exposed to at least one recession year during ages 18–25. All coefficient estimates are based on separate regressions. All specifications include GPS survey weights and the following control variables: gender, age-at-interview (linear and squared), cohort and country fixed effects. The whiskers represent 95% confidence intervals. ***significant at the 1%-level. **significant at the 5%-level. *significant at the 10%-level. Data: GPS (Falk et al., 2018) and Maddison Project Database (Bolt and van Zanden, 2020), see text for details.

Figure 2: Robustness: Different Measures of Economic Recessions



Note: OLS regression coefficients. The dependent variable is a measure of prosociality based on a principal component analysis (PCA) of three dimensions of prosocial attitudes (altruism, trust, and positive reciprocity). Explanatory variables are indicated on the vertical axis and are binary indicators for being exposed to at least one recession year during age 18–25 (with the exception of the last variable, which counts the number of years of GDP growth lower than –3.4% during this age bracket). Each of the coefficients stems from a separate regression. All specifications include GPS survey weights and the following control variables: gender, age-at-interview (linear and squared), cohort and country fixed effects. The whiskers represent 95% confidence intervals. ***significant at the 1%-level. Data: GPS (Falk et al., 2018) and Maddison Project Database (Bolt and van Zanden, 2020), see text for details.

Supplementary Appendix (not for publication)

A.1 Data

A.1.1 Measures of Prosocial Attitudes

The exact wording of the respective survey items in the Global Preferences Survey is as follows:

Positive reciprocity. The wording of the survey items for positive reciprocity:

- Hypothetical scenario: Which bottle of wine do you give as a thank-you gift? (scale from 5 to 30 in increments of 5).
- When someone does me a favor I am willing to return it. (scale 0–10)

The survey item to measure positive reciprocity has been validated by the behavior of the second mover in a trust game.

Altruism.

- Hypothetical scenario: You won 1,000 Euro in a lottery. Considering your current situation, how much would you donate to charity? (scale 0–1000)
- How willing are you to give to good causes without expecting anything in return? (scale 0–10)

The survey item to measure altruism was validated with an actual donation.

Trust.

- As long as I am not convinced otherwise, I assume that people have only the best intentions (scale 0–10).

The survey item was validated with a trust game (first mover behavior).

Negative reciprocity. Scale 0–10 for all questions (validated using responder behavior in ultimatum game; prisoners' dilemma with punishment stage).

- If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so.
- How willing are you to punish someone who treats you unfairly, even if there may be costs for you?
- How willing are you to punish someone who treats others unfairly, even if there may be costs for you?

Prosociality. We construct different measures of prosocial attitudes for the analysis.

- **Prosociality (PCA):** To construct this variable we conducted a principal component analysis (PCA) of altruism, trust, and positive reciprocity, and extracted the first component. We then standardized the first component so that it has a mean of zero and a standard deviation of one. Factor loadings: altruism: 0.64, trust: 0.65, positive reciprocity: 0.42. The eigenvalue of the first component is 1.478, the eigenvalues of the other components are 0.897 and 0.624, suggesting that a one-dimensional construct is justified (the respective Kaiser-Meyer-Olkin measure is 0.55).
- **Prosociality (equal weights):** To construct this variable, we summed the (standardized) values for altruism, trust, and positive reciprocity and then standardized the resulting variable to have a mean of zero and a standard deviation of one.
- **Prosociality (PCA, with neg. reciprocity):** To construct this variable we conducted a PCA of altruism, trust, positive reciprocity, and negative reciprocity, and extracted the first component. We then standardized the first component so that it has a mean of zero and a standard deviation of one. Factor loadings: altruism: 0.62, trust: 0.64, positive reciprocity: 0.42, negative reciprocity: 0.13. The eigenvalue of the first component is 1.49.

A.1.2 Definitions of Other Variables

Recession experiences. To investigate the effect of the experience of a severe recession during adolescence and early adulthood, we construct several measures based on GDP per capita data from the Maddison Project ([Bolt and van Zanden, 2020](#)).

We compute recession experiences during each age bracket based on the macroeconomic environment in the respondent's country of residence at the time of the survey. Since individuals might have migrated prior to the survey, recession experiences might be measured with some error. The publicly available GPS data does not contain information on migration experiences, but according to previous work only a small share of the respondents ($\sim 3\%$) report to have moved within 5 years prior to the interview ([Falk et al., 2018](#)).

- **Recession age 18–25:** this variable is coded as 1 if a person experienced at least one year of a recession (national GDP growth of less than -3.4% ; this number corresponds to the lowest 10th percentile of GDP growth during the relevant observation period, 1932–2012, in our sample of countries) during ages 18–25, and as 0 otherwise. According to this definition, about 31% of the respondents experienced a recession during ages 18–25.
- **Recession age 0–5, recession age 6–12, recession age 13–17:** these variables are coded as 1 if a person experienced at least one year of a recession (national GDP growth of

less than -3.4%) during the respective age bracket, and as 0 otherwise. The variables are coded as 0 if information on GDP is missing during the respective age bracket.

- Recession age 26–30, recession age 31–35: these variables are coded as 1 if a person experienced at least one year of a recession (national GDP growth of less than -3.4%) during the respective age bracket, and as 0 otherwise. The variables are coded as 0 if information on GDP is missing during the respective age bracket, or because the individual was too young at the time of the survey to have experienced a recession during the respective age bracket.
- Missing: recession age 0–5, ..., missing: recession age 31–35: indicator variables for a missing value in the respective recession variable.
- Recession age 18–25: GDP growth $< -2.5\%$, GDP growth < 0 : these variables are coded in the same way as “Recession age 18–25,” but using alternative definitions of recessions (national GDP growth of less than -2.5% , or of less than 0%).
- Recession age 18–25: bottom 10% in country: during ages 18–25, at least one year of GDP growth in the bottom decile of the country-specific GDP growth distribution (observation period 1932–2012).
- GDP deviation from long-term trend -5% : this variable is coded in the same way as “Recession age 18–25,” but with an alternative definition of a recession (GDP deviation from the long-term country-specific GDP trend by -5% or less, see [Kotschy and Sunde, 2021](#)).

Democracy. To investigate the effect of the institutional environment during adolescence and early adulthood, we construct several measures based on data from Polity-V Project ([Marshall and Gurr, 2020](#)).

We compute democracy experiences during each age bracket based on the institutional environment in the respondent’s country of residence at the time of the survey.

- Democracy age 18–25: binary variable that takes value 1 if the value of the *polity2* variable was 6 or greater (“democracy”) for at least one year during ages 18–25, and 0 otherwise. Approximately 60% of respondents experienced a democracy during ages 18–25 according to this definition.
- Democracy age 0–5, ..., democracy age 31–35: binary variable that takes value 1 if the value of the *polity2* variable was 6 or greater (“democracy”) for at least one year during the respective age bracket, and 0 otherwise.

- Missing democracy age 0–5, ..., missing democracy age 31–35: as with recession experience, the experience of democracy exhibits a fraction of missing information. To account for this, missings for the variables “democracy age 0–5” etc. are coded as 0 and the regression specifications include a respective binary indicator for missing information.
- Democracy: *polity2* > 6: binary variable that takes value 1 if the value of the *polity2* variable was strictly greater than 6 (“democracy”) for at least one year during ages 18–25, and 0 otherwise.
- Transition to democracy: binary variable that takes value 1 if the *polity2* variable switches from 5 or smaller to greater than 5 during ages 18–25, and 0 otherwise. According to this definition, 13% of the sample experienced such a transition.
- Transition from democracy: binary variable that is constructed analogously (*polity2* falls below 6 during ages 18–25). Approximately 12% of respondents experienced a transition from democracy to autocracy.

A.1.3 Sample Restrictions

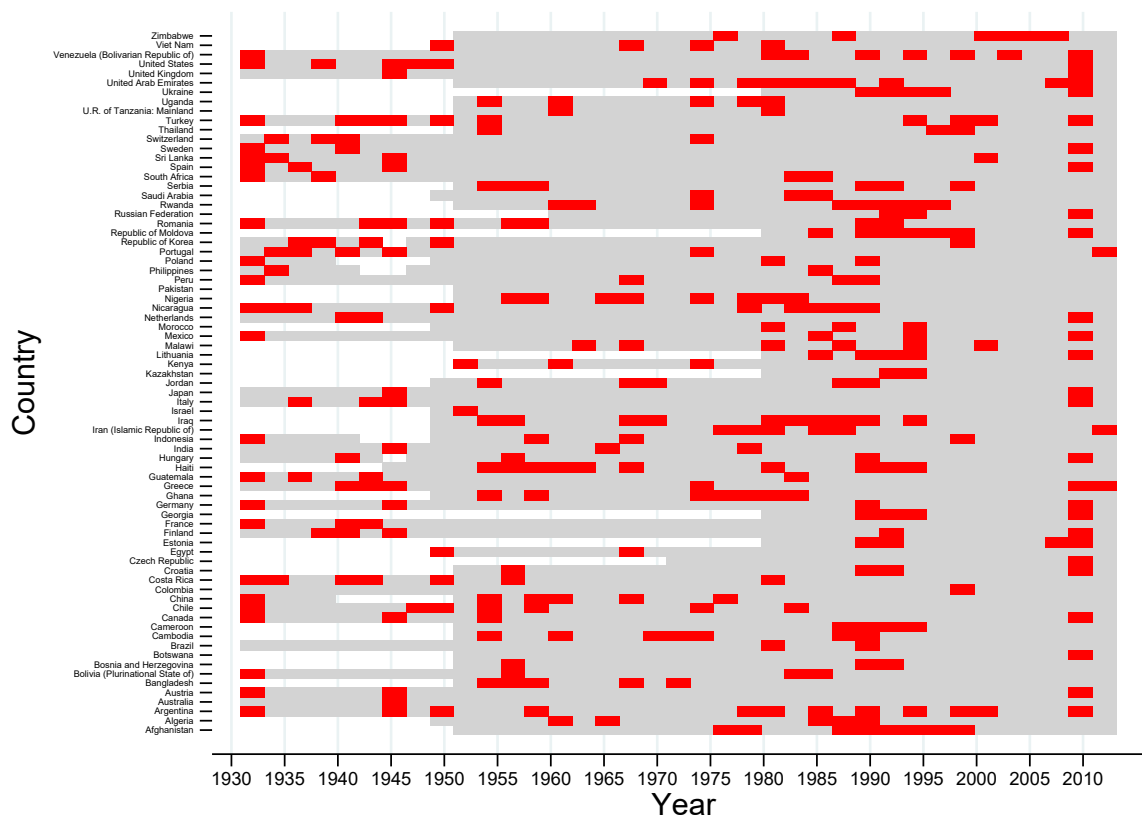
We use the sample of participants of the Global Preferences Survey (part of the Gallup World Poll in 2012) and additionally apply the following sample restrictions:

- Non-missing data on recessions in the country of residence during the age bracket 18–25. Recessions are constructed based on the Maddison Project Database (MPD).
- Age at most 99 at the time of the survey. For older individuals age is top-coded. We therefore cannot construct the recession variable for the older individuals.
- Non-missing values for all outcomes of interest (altruism, trust, positive reciprocity).

The baseline sample consists of 64,805 individuals in 75 countries.

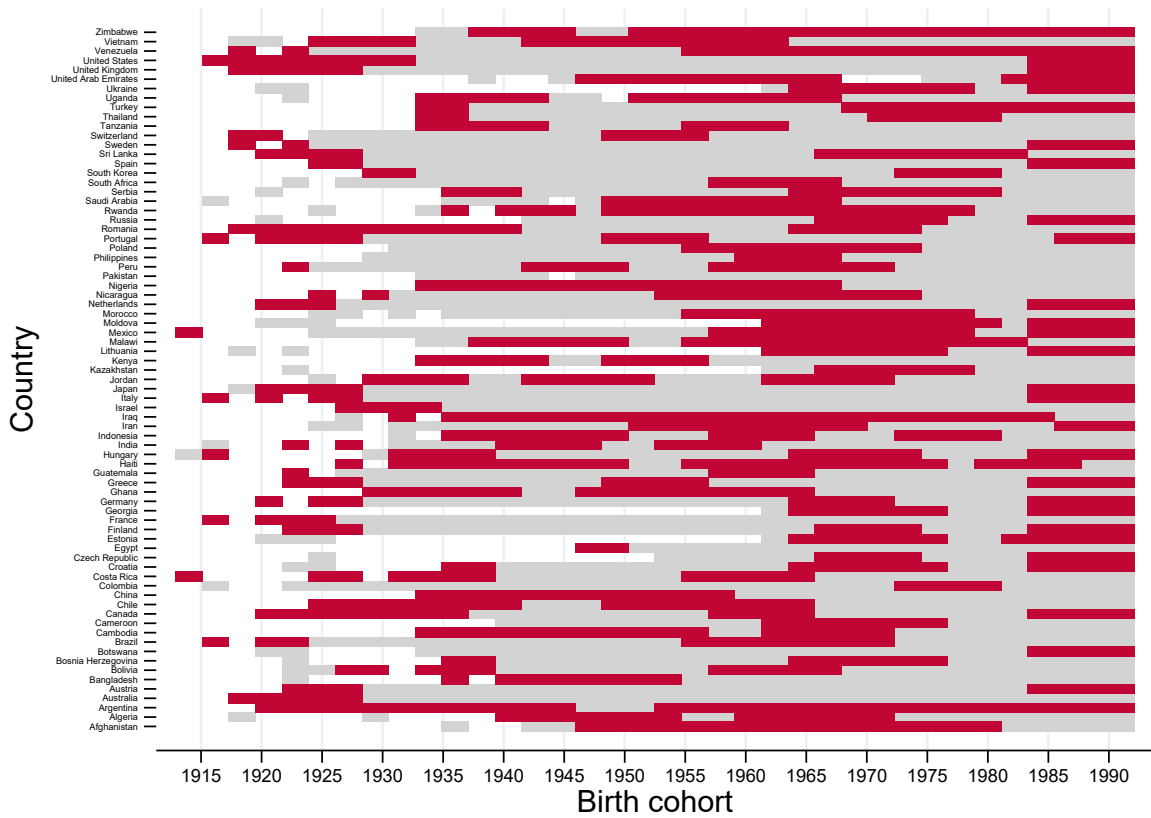
A.2 Additional Figures and Tables

Figure A.1: Recession Events in the Countries and Years Used for the Analysis



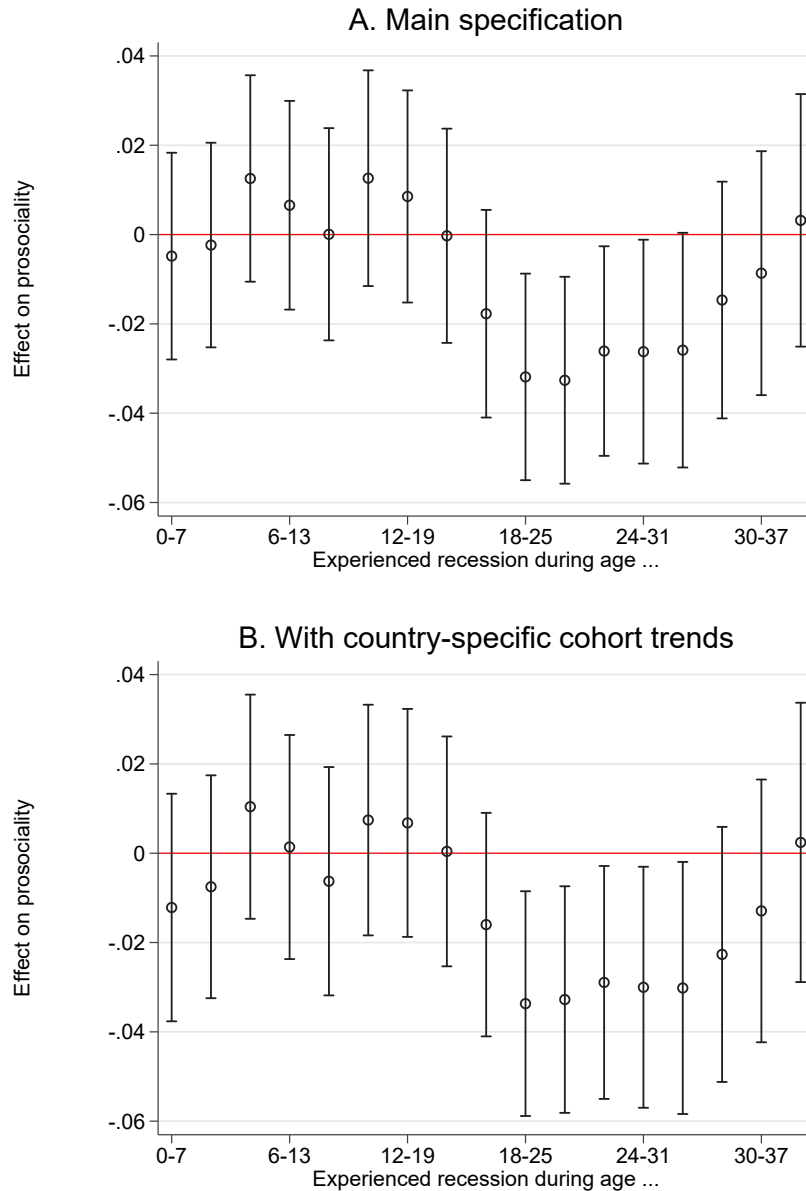
Note: Recession events for all countries in the estimation data during the years that are relevant for the analysis (1932–2012). Years are displayed on the horizontal axis and countries on the vertical axis (ordered alphabetically). A country-by-year observation is marked in red if a severe recession occurred (per capita GDP growth of less than -3.4%). It is marked in grey if no severe recession occurred and marked in white if data on GDP is not available. Data: Maddison Project Database ([Bolt and van Zanden, 2020](#)) and GPS ([Falk et al., 2018](#)).

Figure A.2: Exposure to Recessions for Different Birth Cohorts in Different Countries



Note: Identifying variation for all countries and cohorts in the estimation data. Birth cohorts are displayed on the horizontal axis and countries on the vertical axis (ordered alphabetically). The birth cohort in a country is marked in red if it was exposed to at least one year of a recession during ages 18–25. It is marked in grey if it was not exposed to any recession during ages 18–25 and marked in white either if data on recessions for the respective country and cohort is missing or if the cohort was not part of the GPS sample. Data: Maddison Project Database (Bolt and van Zanden, 2020) and GPS (Falk et al., 2018).

Figure A.3: Exposure to Recessions at Different Ages



Note: OLS regression coefficients of the effects of recession exposure during different age brackets. Each bracket spans eight years, and a new bracket starts every two years (i.e., the brackets are: age 0–7, age 2–9, age 4–11, ..., age 18–25, ..., age 32–39). Each coefficient comes from a separate OLS regression of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity) on a dummy variable for recession exposure during the respective age bracket. Sample sizes vary for the different regressions due to missing values in some recession variables (see Table A.14 for details). All specifications include survey weights and the following control variables: gender, age-at-interview (linear and squared), cohort and country fixed effects. In Panel B, we control additionally for country-specific age trends. The whiskers represent 95% confidence intervals.

Table A.1: Summary Statistics: Estimation Sample

| | N | Mean | SD | Min | Max |
|--|--------|-------|-------|------|-----|
| <i>Recessions age 18-25</i> | | | | | |
| Recession age 18-25 | 64,805 | 0.31 | 0.46 | 0 | 1 |
| Recession age 18-25: GDP growth < -2.5% | 64,805 | 0.35 | 0.48 | 0 | 1 |
| Recession age 18-25: GDP growth < 0 | 64,805 | 0.62 | 0.48 | 0 | 1 |
| Recession age 18-25: bottom 10% in country | 64,805 | 0.34 | 0.47 | 0 | 1 |
| GDP deviation from long-term trend -5% | 64,803 | 0.29 | 0.45 | 0 | 1 |
| Number of years in recession (age 18-25) | 64,805 | 0.61 | 1.18 | 0 | 8 |
| <i>Recessions during other ages</i> | | | | | |
| Recession age 0-5 | 64,805 | 0.35 | 0.48 | 0 | 1 |
| missing recession age 0-5 | 64,805 | 0.06 | 0.24 | 0 | 1 |
| Recession age 6-12 | 64,805 | 0.34 | 0.47 | 0 | 1 |
| missing recession age 6-12 | 64,805 | 0.04 | 0.21 | 0 | 1 |
| Recession age 13-17 | 64,805 | 0.25 | 0.43 | 0 | 1 |
| missing recession age 13-17 | 64,805 | 0.02 | 0.13 | 0 | 1 |
| Recession age 26-30 | 64,805 | 0.18 | 0.39 | 0 | 1 |
| missing recession age 26-30 | 64,805 | 0.07 | 0.26 | 0 | 1 |
| Recession age 31-35 | 64,805 | 0.15 | 0.36 | 0 | 1 |
| missing recession age 31-35 | 64,805 | 0.20 | 0.40 | 0 | 1 |
| <i>Outcomes</i> | | | | | |
| Altruism | 64,805 | 0.00 | 1.00 | -2.6 | 2.3 |
| Trust | 64,805 | 0.00 | 1.00 | -2 | 1.7 |
| Positive reciprocity | 64,805 | 0.00 | 1.00 | -3.9 | 1.3 |
| Prosociality (PCA, w/o neg. reciprocity) | 64,805 | -0.00 | 1.00 | -4.1 | 2.5 |
| Prosociality (equal weights) | 64,805 | -0.00 | 1.00 | -4.1 | 2.6 |
| <i>Individual and country characteristics</i> | | | | | |
| Female | 64,805 | 0.54 | 0.50 | 0 | 1 |
| Age | 64,805 | 43.55 | 15.72 | 20 | 98 |
| Institutional quality age 18-25 | 59,407 | 2.71 | 6.92 | -10 | 10 |

Note: Descriptive statistics for the estimation sample, based on the Global Preferences Survey (GPS) and the Maddison Project Database. Recession indicators capture exposure to at least one year of GDP growth of less than -3.4% during the given age bracket, unless noted otherwise. Recessions are coded as missing (a) if data on GDP is missing in the respondent's country of residence in the given age bracket and (b) if the respondent was younger than the given age bracket at the time of the survey (only applies to recessions at the ages of 26–35, 36–45, 46–55, 56–65). Missing values are replaced with a zero. Institutional quality is measured as the average of the *polity2* variable during age 18–25. Detailed variable descriptions can be found in Appendix A.1.

Table A.2: Exposure to Recessions at Different Ages and Different Measures of Prosociality

| | Prosociality | | | | | | | | | |
|----------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|---------------------|--------------------|--------------------|----------------------|----------------------|
| | PCA | | equal weights | | Altruism | | Trust | | Positive reciprocity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Recession age 18-25 | -0.032*** (0.012) | -0.035*** (0.012) | -0.031*** (0.012) | -0.035*** (0.012) | -0.015 (0.012) | -0.016 (0.012) | -0.015 (0.012) | -0.019 (0.013) | -0.036*** (0.012) | -0.038*** (0.012) |
| Recession age 0-5 | | -0.009 (0.012) | | -0.009 (0.012) | | 0.007 (0.012) | | -0.004 (0.012) | | -0.022* (0.012) |
| Recession age 6-12 | | 0.005 (0.012) | | 0.006 (0.012) | | 0.024** (0.012) | | 0.010 (0.012) | | -0.023* (0.012) |
| Recession age 13-17 | | 0.006 (0.013) | | 0.008 (0.013) | | 0.018 (0.013) | | 0.017 (0.014) | | -0.018 (0.013) |
| Recession age 26-30 | | -0.018 (0.014) | | -0.016 (0.015) | | -0.008 (0.014) | | -0.001 (0.016) | | -0.026* (0.014) |
| Recession age 31-35 | | 0.003 (0.016) | | -0.000 (0.016) | | 0.018 (0.016) | | -0.014 (0.016) | | -0.004 (0.015) |
| Female | 0.050*** (0.009) | 0.051*** (0.009) | 0.049*** (0.009) | 0.049*** (0.009) | 0.068*** (0.009) | 0.068*** (0.009) | 0.021** (0.009) | 0.021** (0.009) | 0.013 (0.009) | 0.013 (0.009) |
| Mean of dependent variable | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Observations | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 |
| R-squared | 0.16 | 0.16 | 0.16 | 0.16 | 0.12 | 0.12 | 0.09 | 0.09 | 0.13 | 0.13 |

Note: OLS regressions of different measures of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity; the average of altruism, trust, and positive reciprocity; and the separate measures altruism, trust, and positive reciprocity) on recession indicators. All regressions control for cohort dummies, country dummies, and age trends (age and age squared). Regressions presented in even columns additionally control for indicators for missing values in the added recession variables. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

*p<0.01, **p<0.05, ***p<0.01

Table A.3: Robustness: Different Measures of Recession Exposure During Impressionable Years

| | Dependent variable: prosociality (first component of PCA) | | | | | |
|--|---|----------------------|----------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Recession age 18-25 | -0.032*** (0.012) | | | | | |
| Recession age 18-25: GDP growth < -2.5% | | -0.029*** (0.011) | | | | |
| Recession age 18-25: GDP growth < 0 | | | -0.031*** (0.011) | | | |
| Recession age 18-25: bottom 10% in country | | | | -0.027** (0.011) | | |
| GDP deviation from long-term trend -5% | | | | | -0.015 (0.013) | |
| Number of years in recession (age 18-25) | | | | | | -0.004 (0.005) |
| Female | 0.050*** (0.009) | 0.050*** (0.009) | 0.050*** (0.009) | 0.050*** (0.009) | 0.051*** (0.009) | 0.051*** (0.009) |
| Mean of dependent variable | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 | -0.00 |
| Mean of recession variable | 0.31 | 0.35 | 0.62 | 0.34 | 0.29 | 0.61 |
| Observations | 64,805 | 64,805 | 64,805 | 64,805 | 64,803 | 64,805 |
| R-squared | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |

Note: OLS regressions of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity) on different recession indicators. All regressions include controls for cohort dummies, country dummies, and linear age trends. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level. *p<0.01, **p<0.05, ***p<0.01

Table A.4: Gender Heterogeneity of the Effects of Recessions

| | Prosociality | | | | |
|----------------------------|----------------------|----------------------|---------------------|-------------------|----------------------|
| | PCA | equal weights | Altruism | Trust | Pos. recip. |
| | (1) | (2) | (3) | (4) | (5) |
| Recession age 18-25 | -0.056*** (0.016) | -0.053*** (0.016) | -0.025 (0.016) | -0.014 (0.016) | -0.071*** (0.016) |
| Female | 0.035*** (0.011) | 0.035*** (0.011) | 0.061*** (0.011) | 0.021* (0.011) | -0.008 (0.011) |
| Female × recession | 0.047** (0.019) | 0.043** (0.019) | 0.021 (0.019) | -0.000 (0.020) | 0.068*** (0.020) |
| Mean of dependent variable | -0.00 | -0.00 | 0.00 | 0.00 | 0.00 |
| Observations | 64,805 | 64,805 | 64,805 | 64,805 | 64,805 |
| R-squared | 0.16 | 0.16 | 0.12 | 0.09 | 0.13 |

Note: OLS regressions of different measures of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity; the average of altruism, trust, and positive reciprocity; and the separate measures altruism, trust, and positive reciprocity) on an indicator for experiencing a recession during age 18–25 and its interaction with a female dummy. In all regressions we control for cohort dummies, country dummies, and age trends (age and age squared). Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

*p<0.01, **p<0.05, ***p<0.01

Table A.5: Robustness to Including Negative Reciprocity in the PCA

| | Prosociality (PCA) | | | |
|----------------------------|------------------------|-----------------------|------------------------|-----------------------|
| | w/o neg. recip. (1) | w/ neg. recip. (2) | w/o neg. recip. (3) | w/ neg. recip. (4) |
| Recession age 18-25 | -0.032*** (0.012) | -0.030** (0.012) | -0.035*** (0.012) | -0.033*** (0.012) |
| Recession age 0-5 | | | -0.009 (0.012) | -0.005 (0.012) |
| Recession age 6-12 | | | 0.005 (0.012) | 0.007 (0.012) |
| Recession age 13-17 | | | 0.006 (0.013) | 0.006 (0.013) |
| Recession age 26-30 | | | -0.018 (0.014) | -0.017 (0.014) |
| Recession age 31-35 | | | 0.003 (0.016) | 0.003 (0.016) |
| Female | 0.050*** (0.009) | 0.031*** (0.009) | 0.051*** (0.009) | 0.032*** (0.009) |
| Mean of dependent variable | -0.00 | 0.00 | -0.00 | 0.00 |
| Observations | 64,805 | 64,805 | 64,805 | 64,805 |
| R-squared | 0.16 | 0.16 | 0.16 | 0.16 |

Note: OLS regressions of measures of prosociality on recession indicators. Prosociality is measured as the first component of a PCA of altruism, trust, and positive reciprocity in odd columns. In even columns, prosociality is measured as the first component of a PCA of altruism, trust, positive and negative reciprocity. All regressions control for cohort dummies, country dummies, and age trends (age and age squared). The regressions in columns 3 and 4 additionally control for indicators for missing values in the added recession variables. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

*p<0.01, **p<0.05, ***p<0.01

Table A.6: Exposure to Recessions at Different Ages and Negative Reciprocity

| | Negative reciprocity | |
|----------------------------|----------------------|----------------------|
| | (1) | (2) |
| Recession age 18-25 | 0.012 (0.013) | 0.015 (0.013) |
| Recession age 0-5 | | 0.034** (0.013) |
| Recession age 6-12 | | 0.020 (0.013) |
| Recession age 13-17 | | 0.002 (0.014) |
| Recession age 26-30 | | 0.009 (0.016) |
| Recession age 31-35 | | 0.001 (0.016) |
| Female | -0.166*** (0.009) | -0.165*** (0.009) |
| Mean of dependent variable | -0.00 | -0.00 |
| Observations | 64,805 | 64,805 |
| R-squared | 0.10 | 0.10 |

Note: OLS regressions of measures of negative reciprocity on recession indicators. All regressions control for cohort dummies, country dummies, and age trends (age and age squared). The regression in column 2 additionally controls for indicators for missing values in the added recession variables. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: Summary Statistics: Democracy Sample

| | N | Mean | SD | Min | Max |
|---|--------|-------|-------|------|-----|
| Recessions age 18-25 | | | | | |
| Recession age 18-25 | 56,655 | 0.29 | 0.45 | 0 | 1 |
| Recession age 18-25: GDP growth < -2.5% | 56,655 | 0.33 | 0.47 | 0 | 1 |
| Recession age 18-25: GDP growth < 0 | 56,655 | 0.61 | 0.49 | 0 | 1 |
| Recession age 18-25: bottom 10% in country | 56,655 | 0.33 | 0.47 | 0 | 1 |
| GDP deviation from long-term trend -5% | 56,653 | 0.27 | 0.44 | 0 | 1 |
| Number of years in recession (age 18-25) | 56,655 | 0.55 | 1.10 | 0 | 8 |
| Recessions during other ages | | | | | |
| Recession age 0-5 | 56,655 | 0.35 | 0.48 | 0 | 1 |
| missing recession age 0-5 | 56,655 | 0.04 | 0.19 | 0 | 1 |
| Recession age 6-12 | 56,655 | 0.34 | 0.48 | 0 | 1 |
| missing recession age 6-12 | 56,655 | 0.02 | 0.13 | 0 | 1 |
| Recession age 13-17 | 56,655 | 0.24 | 0.43 | 0 | 1 |
| missing recession age 13-17 | 56,655 | 0.01 | 0.07 | 0 | 1 |
| Recession age 26-30 | 56,655 | 0.17 | 0.38 | 0 | 1 |
| missing recession age 26-30 | 56,655 | 0.07 | 0.26 | 0 | 1 |
| Recession age 31-35 | 56,655 | 0.14 | 0.35 | 0 | 1 |
| missing recession age 31-35 | 56,655 | 0.21 | 0.41 | 0 | 1 |
| Democracy age 18-25 | | | | | |
| Democracy age 18-25 | 56,655 | 0.60 | 0.49 | 0 | 1 |
| Democracy: <i>polity2</i> > 6 | 56,655 | 0.53 | 0.50 | 0 | 1 |
| Transition to democracy | 56,655 | 0.13 | 0.33 | 0 | 1 |
| Transition from democracy | 56,655 | 0.12 | 0.32 | 0 | 1 |
| Democracy during other ages | | | | | |
| Democracy age 0-5 | 56,655 | 0.39 | 0.49 | 0 | 1 |
| missing: democracy age 0-5 | 56,655 | 0.12 | 0.32 | 0 | 1 |
| Democracy age 6-12 | 56,655 | 0.47 | 0.50 | 0 | 1 |
| missing: democracy age 6-12 | 56,655 | 0.07 | 0.26 | 0 | 1 |
| Democracy age 13-17 | 56,655 | 0.52 | 0.50 | 0 | 1 |
| missing: democracy age 13-17 | 56,655 | 0.03 | 0.16 | 0 | 1 |
| Democracy age 26-30 | 56,655 | 0.54 | 0.50 | 0 | 1 |
| missing: democracy age 26-30 | 56,655 | 0.08 | 0.27 | 0 | 1 |
| Democracy age 30-35 | 56,655 | 0.47 | 0.50 | 0 | 1 |
| missing: democracy age 31-35 | 56,655 | 0.22 | 0.41 | 0 | 1 |
| Outcomes | | | | | |
| Altruism | 56,655 | 0.02 | 1.00 | -2.6 | 2.3 |
| Trust | 56,655 | 0.01 | 1.00 | -2 | 1.7 |
| Positive reciprocity | 56,655 | -0.01 | 1.00 | -3.9 | 1.3 |
| Prosociality (PCA, w/o neg. reciprocity) | 56,655 | 0.01 | 1.00 | -4.1 | 2.5 |
| Prosociality (equal weights) | 56,655 | 0.01 | 1.00 | -4.1 | 2.6 |
| Individual and country characteristics | | | | | |
| Female | 56,655 | 0.54 | 0.50 | 0 | 1 |
| Age | 56,655 | 42.99 | 15.64 | 20 | 98 |
| Institutional quality age 18-25 | 56,655 | 2.82 | 6.92 | -10 | 10 |

Note: Descriptive statistics for the sample that contains information on democracy exposure, based on the Global Preferences Survey (GPS) and the Polity-V Project. Recession indicators capture exposure to at least one year of GDP growth of less than -3.4% during the given age bracket, unless noted otherwise. Recessions/democracy are coded as missing (a) if data on GDP is missing in the respondent's country of residence in the given age bracket or (b) if the respondent was younger than the given age bracket at the time of the survey (only applies to recessions/democracy at the ages of 26-35, 36-45, 46-55, 56-65). Missing values are replaced with a zero. Institutional quality is measured as the average of the *polity2* variable during ages 18-25. Detailed variable descriptions can be found in Appendix A.1.

Table A.8: Prosociality and Exposure to Democracy and Recessions

| | Prosociality | | | | |
|------------------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| | PCA | equal weights | Altruism | Trust | Positive Reciprocity |
| | (1) | (2) | (3) | (4) | (5) |
| With Interaction Term | | | | | |
| Recession age 18-25 | -0.022 (0.020) | -0.019 (0.020) | -0.012 (0.020) | 0.008 (0.021) | -0.035* (0.020) |
| Democracy age 18-25 | 0.058*** (0.021) | 0.062*** (0.022) | 0.057*** (0.021) | 0.057*** (0.021) | 0.016 (0.021) |
| Interaction | -0.019 (0.025) | -0.023 (0.026) | -0.008 (0.026) | -0.038 (0.027) | -0.002 (0.025) |
| Mean of dep. var. | 0.01 | 0.01 | 0.02 | 0.01 | -0.01 |
| Observations | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 |

Note: OLS regressions of different measures of prosociality (measured using a PCA of altruism, trust, and positive reciprocity; the average of altruism, trust, and positive reciprocity; and the separate measures altruism, trust, and positive reciprocity) on indicators of democracy and recession during age 18–25. All regressions include controls for cohort dummies, country dummies, and age trends (age and age squared). All regressions also include controls for missings in the democracy and recession variables. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Robustness: Exposure to Democracy during Different Ages

| | Dependent variable: prosociality (first component of PCA) | | | | | | |
|----------------------------|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Democracy age 0-5 | 0.033* (0.019) | | | | | | 0.026 (0.019) |
| Democracy age 6-12 | | 0.054*** (0.019) | | | | | 0.024 (0.022) |
| Democracy age 13-17 | | | 0.046** (0.018) | | | | 0.008 (0.021) |
| Democracy age 18-25 | | | | 0.052*** (0.020) | | | 0.050** (0.023) |
| Democracy age 26-30 | | | | | 0.006 (0.019) | | -0.006 (0.022) |
| Democracy age 30-35 | | | | | | -0.024 (0.020) | -0.010 (0.020) |
| Female | 0.046*** (0.010) | 0.045*** (0.010) | 0.045*** (0.010) | 0.048*** (0.010) | 0.048*** (0.010) | 0.044*** (0.011) | 0.048*** (0.010) |
| Mean of dependent variable | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
| Mean of democracy variable | 0.43 | 0.49 | 0.52 | 0.60 | 0.58 | 0.60 | |
| Observations | 51,615 | 53,858 | 55,984 | 56,655 | 54,440 | 47,087 | 56,655 |
| R-squared | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |

Note: OLS regressions of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity) on indicators for having experienced at least one year of democracy during the indicated age bracket. All regressions include controls for cohort dummies, country dummies, and age trends (age and age squared). The regression in Column (7) in addition controls for dummy variables that indicate whether information on democracy during the specific age brackets is missing. See Appendix A.1 and A.7 for detailed variable definitions. Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: Experience with Democracy and Prosociality

| | Prosociality | | | | | | | | | |
|----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------|----------------------|----------------------|-------------------|
| | PCA | | equal weights | | Altruism | | Trust | | Positive reciprocity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Democracy age 18-25 | 0.063*** (0.020) | 0.058** (0.023) | 0.052*** (0.020) | 0.050** (0.023) | 0.054*** (0.019) | 0.041* (0.023) | 0.046** (0.019) | 0.043** (0.022) | 0.013 (0.020) | 0.026 (0.023) |
| Democracy age 0-5 | | 0.031 (0.020) | | 0.026 (0.019) | | 0.012 (0.020) | | 0.056*** (0.020) | | 0.000 (0.019) |
| Democracy age 6-12 | | 0.030 (0.022) | | 0.024 (0.022) | | 0.022 (0.021) | | 0.018 (0.023) | | 0.012 (0.021) |
| Democracy age 13-17 | | 0.009 (0.021) | | 0.008 (0.021) | | 0.033 (0.021) | | 0.001 (0.021) | | -0.020 (0.021) |
| Democracy age 26-30 | | -0.001 (0.022) | | -0.006 (0.022) | | -0.011 (0.022) | | 0.027 (0.023) | | -0.018 (0.022) |
| Democracy age 30-35 | | -0.011 (0.020) | | -0.010 (0.020) | | 0.014 (0.020) | | -0.059*** (0.021) | | 0.005 (0.021) |
| Female | 0.029*** (0.010) | 0.029*** (0.010) | 0.048*** (0.010) | 0.048*** (0.010) | 0.067*** (0.010) | 0.067*** (0.010) | 0.018* (0.010) | 0.018* (0.010) | 0.011 (0.010) | 0.011 (0.010) |
| Mean of dependent variable | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | -0.01 | -0.01 |
| Observations | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 |
| R-squared | 0.16 | 0.17 | 0.17 | 0.17 | 0.12 | 0.12 | 0.10 | 0.10 | 0.13 | 0.14 |

Note: OLS regression coefficients. Dependent variable is a measure of prosociality based on a principal component analysis (PCA) of altruism, trust, and positive reciprocity). Explanatory variables are binary indicators for being exposed to at least one year in a democracy during age 18–25. *significant at the 10%-level; **significant at the 5%-level; ***significant at the 1%-level. Data: GPS (Falk et al., 2018) and Polity Project Database (Marshall and Gurr, 2020), see text for details.

Table A.11: Robustness of Democracy Effects to Specifications and Sample Restrictions

| | Dependent variable: prosociality (first component of PCA) | | | | | | |
|--------------------------------|---|----------------------|--------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Democracy age 18-25 | -0.113*** (0.024) | -0.116*** (0.025) | 0.051** (0.020) | 0.052*** (0.020) | 0.049** (0.021) | 0.009 (0.026) | 0.012 (0.026) |
| Female | | | | 0.048*** (0.010) | 0.045*** (0.010) | 0.048*** (0.010) | 0.048*** (0.010) |
| Cohort fixed effects | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Country fixed effects | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sample: age at survey 25+ | | | | | ✓ | | |
| Country-specific cohort trends | | | | | | ✓ | ✓ |
| Control: recession age 18-25 | | | | | | | ✓ |
| Mean of dependent variable | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 |
| Mean of democracy variable | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Observations | 56,655 | 56,655 | 56,655 | 56,655 | 51,014 | 56,655 | 56,655 |
| R-squared | 0.00 | 0.01 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |

Note: OLS regression coefficients. The dependent variable is a measure of prosociality based on a principal component analysis of altruism, trust, and positive reciprocity). Explanatory variables are binary indicators for being exposed to at least one year in a democracy during age 18–25. In columns (2)–(7) we control for age trends (age and age squared). Column (4) corresponds to the preferred specification used in the baseline analysis. Observations are weighted using sampling weights from the GPS. 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. Data: GPS (Falk et al., 2018) and Maddison Project Database (Bolt and van Zanden, 2020), see text for details.

Table A.12: Robustness: Different Measures of Democracy

| | Dependent variable: prosociality (first component of PCA) | | | | | | | |
|-------------------------------|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Democracy age 18-25 | 0.052*** (0.020) | 0.053*** (0.020) | | | | | | |
| Democracy: <i>polity2</i> > 6 | | | 0.033* (0.018) | 0.034* (0.018) | | | | |
| Transition to democracy | | | | | 0.007 (0.017) | 0.012 (0.018) | | |
| Transition from democracy | | | | | | | 0.021 (0.018) | 0.026 (0.018) |
| Recession age 18-25 | | -0.033** (0.013) | | -0.032** (0.013) | | -0.033** (0.013) | | -0.034** (0.013) |
| Female | 0.048*** (0.010) | 0.048*** (0.010) | 0.048*** (0.010) | 0.048*** (0.010) | 0.048*** (0.010) | 0.047*** (0.010) | 0.048*** (0.010) | 0.047*** (0.010) |
| Mean of dependent variable | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Mean of democracy variable | 0.60 | 0.60 | 0.53 | 0.53 | 0.13 | 0.13 | 0.12 | 0.12 |
| Observations | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 |
| R-squared | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |

Note: OLS regressions of prosociality (measured as the first component of a PCA of altruism, trust, and positive reciprocity) on different democracy indicators. In all regressions we control for cohort dummies, country dummies, and age trends (age and age squared). Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

*p<0.01, **p<0.05, ***p<0.01

Table A.13: Gender Heterogeneity of the Effects of Democracy

| | Prosociality | | Altruism | Trust | Pos. recip. |
|----------------------------|---------------------|---------------------|---------------------|--------------------|------------------|
| | PCA | equal weights | | | |
| | (1) | (2) | (3) | (4) | (5) |
| Democracy age 18-25 | 0.013 (0.023) | 0.015 (0.023) | -0.000 (0.022) | 0.018 (0.022) | 0.013 (0.023) |
| Female | 0.003 (0.015) | -0.000 (0.015) | 0.004 (0.015) | -0.014 (0.017) | 0.010 (0.016) |
| Female × democracy | 0.075*** (0.020) | 0.076*** (0.020) | 0.104*** (0.019) | 0.053** (0.021) | 0.001 (0.021) |
| Mean of dependent variable | 0.01 | 0.01 | 0.02 | 0.01 | -0.01 |
| Observations | 56,655 | 56,655 | 56,655 | 56,655 | 56,655 |
| R-squared | 0.17 | 0.17 | 0.12 | 0.10 | 0.13 |

Note: OLS regressions of different behavioral measures of prosociality (measured using a PCA of altruism, trust, and positive reciprocity; the average of altruism, trust, and positive reciprocity; and the separate measures altruism, trust, and positive reciprocity) on an indicator for democracy (exposure to at least one year during ages 18-25) and gender interaction effects. In all regressions we control for cohort dummies, country dummies, and age trends (age and age squared). Observations are weighted using sampling weights from the GPS. Standard errors are in parentheses and clustered at the country-by-cohort level.

*p<0.01, **p<0.05, ***p<0.01

Table A.14: Samples for the Analysis of Exposure to Recessions at Different Ages (Figure A.3)

| | N | Mean |
|---|--------|-------|
| <i>Experienced recession during ...</i> | | |
| ... age 0-7 | 60,434 | 0.425 |
| ... age 2-9 | 60,832 | 0.416 |
| ... age 4-11 | 61,384 | 0.398 |
| ... age 6-13 | 61,833 | 0.383 |
| ... age 8-15 | 62,286 | 0.363 |
| ... age 10-17 | 62,856 | 0.342 |
| ... age 12-19 | 63,453 | 0.333 |
| ... age 14-21 | 63,951 | 0.322 |
| ... age 16-23 | 64,384 | 0.317 |
| ... age 18-25 | 64,805 | 0.312 |
| ... age 20-27 | 64,758 | 0.296 |
| ... age 22-29 | 61,804 | 0.291 |
| ... age 24-31 | 58,644 | 0.285 |
| ... age 26-33 | 55,117 | 0.283 |
| ... age 28-35 | 51,650 | 0.278 |
| ... age 30-37 | 47,756 | 0.280 |
| ... age 32-39 | 44,786 | 0.280 |

Note: Sample sizes and means of the recession variables for the estimation samples used in Figure A.3, based on the Global Preferences Survey (GPS) and the Maddison Project Database. Recession indicators capture exposure to at least one year of GDP growth of less than -3.4% during the given age bracket. The sample sizes vary over time (a) if no data on GDP exists in the respondent's country of residence in the given age bracket or (b) if the respondent was younger than the given age bracket at the time of the survey (applies only to recessions at age 20 and older).