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Replication Data for: "It Takes a Village: The Economics of Parenting with Neighborhood and Peer Effects," 2023

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Acknowledgement:

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Data Availability:

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This research uses restricted-use data from Add Health. For this reason, our data cannot be published in an openly accessible trusted data repository. Persons interested in obtaining Data Files from Add Health should contact Add Health, The University of North Carolina at Chapel Hill, Carolina Population Center (addhealth_contracts@unc.edu). Restricted-use data from Add Health can be accessed via restricted-use contract. To apply for restricted-use data, please access the Carolina Population Center (CPC) Data Portal: https://data.cpc.unc.edu/projects/2/view. From the CPS Portal (accessed on December 17, 2023), it is stated that:

"Restricted-Use Data will be distributed by contract only to certified researchers (this includes researchers located outside of the US) who commit themselves to maintaining limited access. To be eligible to enter into an Add Health contract, researchers must complete a Contract Application which includes the following requirements (as well as others):

--Security plan

--IRB approval letter

--NEW contracts: $1000 payment by check or credit card as arranged with Add Health Contracts

--Additional justification statement for each dataset ouside the “Core Files” category (see below for data listing).

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%Structure of the replication file:
    1.Empirical Data Analysis
    2.Structural Analysis
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The replication file is divided into two main parts. The first part of the file generates the empirical findings of the paper, as well as the empirical moments used to estimate the structural model. The second part of the file generates the model's estimation, as well as the counterfactual analysis discussed in the paper.

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PART 1. Empirical Data Analysis
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The files to run the empirical data analysis can be found in "Replication_Package_JPE\stata_dir". This part of the analysis was performed in Stata (version 15). There is a master file called "0.master.do" that runs in sequence the list of do-files that generate the various tables and figures. The sequential order of files is described by the first number in the name of the do-file (e.g.: 3.figures1_A1-2 represents the third file to run). This order is reflected in the structure of the master file (0.master.do). The first two do-files in order (1.key_variables and 2.skills_peers) open and merge the original Add Health data, as well as clear and construct the relevant variables for the empirical analysis.

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1.a This part of the empirical analysis produces the following list of figures and tables:

Figures:
--Figure 1: Authoritarian Parenting and Neighborhood Characteristics
--Appendix Figure A-1: Correlation between Parent and Child Reported Measure of Authoritarian Parenting
--Appendix Figure A-2: Parenting Style and Neighborhood

Tables:
--Table 1: Authoritarian Parenting and Peer Environment within Schools
--Table 2: Authoritarian Parenting and Academic Achievement of Friends (Child Fixed Effects)
--Table 3: Authoritarian Parenting and Dynamics of the Academic Achievement of Peers
--Appendix Table A-1: Summary Statistics
--Appendix Table A-2: Authoritarian Parenting and Peer Environment Across Schools
--Appendix Table A-3: Authoritarian Parenting and Peer Environment within Schools (Gini)

--Appendix Table A-4: Authoritarian Parenting and Peer Environment within Schools (by Gender)
--Appendix Table A-5: Authoritarian Parenting (Index) and Peer Environment within Schools
--Appendix Table A-6: Authoritarian Parenting and Dynamics of Peer Achievement (Index Measure)
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The list of the above figures and tables is generated by the do-files ordered from #3 to #6. Below we provide the exact details on how to replicate the empirical findings (the names of the do-files also suggest the figures and tables they generate):

The do-file "3.figures1_A1-2" generates the following figures:
--Figure 1: Authoritarian Parenting and Neighborhood Characteristics
--Appendix Figure A-1: Correlation between Parent and Child Reported Measure of Authoritarian Parenting
--Appendix Figure A-2: Parenting Style and Neighborhood

The do-file "3b.tableA2" generates the results in Figure A-2 in a multi-variate regression model:
--Appendix Table A-2: Authoritarian Parenting and Peer Environment Across Schools

The do-file "4.table1_A3-5" generates the following tables on within-school regression analysis:
--Table 1: Authoritarian Parenting and Peer Environment within Schools
--Appendix Table A-3: Authoritarian Parenting and Peer Environment within Schools (Gini)
--Appendix Table A-4: Authoritarian Parenting and Peer Environment within Schools (by Gender)
--Appendix Table A-5: Authoritarian Parenting (Index) and Peer Environment within Schools

The do-file "5.table2_3_A6" generates the following tables on longitudinal regressions analyses:
--Table 2: Authoritarian Parenting and Academic Achievement of Friends (Child Fixed Effects)
--Table 3: Authoritarian Parenting and Dynamics of the Academic Achievement of Peers
--Appendix Table A-6: Authoritarian Parenting and Dynamics of Peer Achievement (Index Measure)

The do-file "6.tableA1" generates the table of summary statistics:
--Appendix Table A-1: Summary Statistics

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1.b This part of the empirical analysis creates empirical moments used for the estimation of the model
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The set of empirical moments used for the estimation of the structural model is computed by the do-files ordered from #7 to #10.

The do-file "7.skills_measurement" estimates the measurement model in Appendix Equation B-1 and generates the table:
- Table B-1: Estimates for the Measurement Model

The do-files "8.initial_conditions" and "8b.initial_conditions_educ" estimate the initial conditions for the base model and the initial conditions for the model that includes mother's education (college), respectively. In the paper we report:
- Table 4: Characteristics of Synthetic Neighborhoods

The do-files "9.moments" and "9b.moments_educ" estimate the empirical moments we use as targeted moments in the structural estimation of the model. The do-file "9.moments" estimates the moments used for the estimation of the base model, while "9b.moments_educ" constructs the moments used for the estimation of the model that includes mother's education (college).

The do-file "10.bootstrap_moments" calculates the bootstrap distribution of the empirical moments used for the estimation.

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PART 2. Structural Analysis
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The files to run the structural analysis can be found in "Replication_Package_JPE\matlab_dir". This part of the analysis was performed in MATLAB (version 2022a). The main quantitative analysis can be found in the following folder "\Replication_Package_JPE\matlab_dir\main", while further robustness analyses are found in the director "\Replication_Package_JPE\matlab_dir\robustness".

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2.a The main analysis ("\Replication_Package_JPE\matlab_dir\main") produces the following list of figures and tables:
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Figures:
--Figure 3: Treatment Effects of Moving to a Better Neighborhood
--Figure 4: Scaling of Treatment Effects on Skills
--Figure 5: Scaling of Treatment Effects on Parental Behavior
--Figure 6: Endogenous Parental Behavior and Policy Effects
--Appendix Figure D-1: Comparative Statics of Friendship Formation
--Appendix Figure D-2: Perturbation of Model’s Parameters and Equilibrium Moments (Panels A-E)
--Appendix Figure E-2: The Impact of Homophily on the Policy Scale Up
--Appendix Figure E-3: Parental Responses and the Elasticity of Substitution Peers vs. Parents

Tables:
--Table 5: Estimated Parameters of the Skill Formation Technology
--Table 6: Estimated Parent's Preference Parameters
--Table 7: Estimated Child's Preference Parameters
--Table 8: Counterfactual Policy Experiments: Changing Initial Conditions (e.g., Early Childhood Interventions)
--Appendix Table D-1: Sample Fit of the Model: Parenting Style
--Appendix Table D-2: Sample Fit of the Model: Skill Accumulation
--Appendix Table D-3: Sample Fit of the Model: Peer Skills
--Appendix Table D-4: Sample Fit of the Model: Parental Investments
--Appendix Table D-5: Sample Fit: Longitudinal Analysis of Parenting
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The main analysis, located in "\Replication_Package_JPE\matlab_dir\main," consists of two primary files: "master_estimation" and "master_counterfactuals." These files respectively execute the estimation and counterfactual analyses. The compilation of figures and tables mentioned above is generated by sequentially running "master_estimation" followed by "master_counterfactuals."

The "master_estimation" file runs the estimation exercise. Additionally, it produces tables for estimates, the model's sample fit, as well as model's comparative statics exercises with respect to the estimated parameters. The complete list of tables and figures generated by this master file is:
--Table 5: Estimated Parameters of the Skill Formation Technology
--Table 6: Estimated Parent's Preference Parameters
--Table 7: Estimated Child's Preference Parameters
--Appendix Table D-1: Sample Fit of the Model: Parenting Style
--Appendix Table D-2: Sample Fit of the Model: Skill Accumulation
--Appendix Table D-3: Sample Fit of the Model: Peer Skills
--Appendix Table D-4: Sample Fit of the Model: Parental Investments
--Appendix Table D-5: Sample Fit: Longitudinal Analysis of Parenting
--Appendix Figure D-1: Comparative Statics of Friendship Formation
--Appendix Figure D-2: Perturbation of Model's Parameters and Equilibrium Moments (Panels A-E)

The "master_counterfactuals" file utilizes the model's estimates to conduct the counterfactual analysis, generating the main results for the primary counterfactual analyses outlined in the paper.

The initial series of counterfactual outcomes focuses on the "moving-to-opportunity policy" detailed in Section V.A. Within this class of policies, we examine three distinct specifications:
--Relocating a single child from a low-income neighborhood to a high-income one
--Expanding the score of the previous policy by relocating multiple children (up to 50)
--Replicating the second larger-scale policy while maintaining parenting choices at the baseline level

The complete list of tables and figures associated with the "moving-to-opportunity policy," generated by the "master_counterfactuals" file, is:
--Figure 3: Treatment Effects of Moving to a Better Neighborhood
--Figure 4: Scaling of Treatment Effects on Skills
--Figure 5: Scaling of Treatment Effects on Parental Behavior
--Figure 6: Endogenous Parental Behavior and Policy Effects

The "master_counterfactuals" also runs a second set of counterfactual analyses that considers various changes in the initial distribution of skills (outlined Section V.B of the paper). This analysis has the scope to highlight the role of interventions that occur before children reach high school. The results of this analysis are generated and tabulated by the "master_counterfactuals" file in the following table:
--Table 8: Counterfactual Policy Experiments: Changing Initial Conditions (e.g., Early Childhood Interventions)

In both the estimation and counterfactual analyses, the model is solved numerically. Each master file runs a program calling for the function "sim_data_function" which solves the model and collects simulated data. The model solution is run through the "solve" function (or "solve_counter" for the counterfactual analysis), which solves the fixed-point of the problem. The problem is solved backward in the "solve_backward" file ("solve_backward_counter" for the counterfactual analysis), given a distribution of parenting choices and skills produced in the "solve_forward" file ("solve_forward_counter" for the counterfactual analysis). Upon convergence, the function "solve" (or "solve_counter") runs simulations of the economy through the "solve_forward" file based on the optimal parental policy functions, generating simulated data. In the estimation exercise, the simulated data is used to replicate the model's simulated counterpart of the empirical moments ("mom_function" file), which is employed in our estimator (Simulated Method of Moments Estimator within the "obj_function" file). In the counterfactual analysis exercise, simulated data from both the baseline economy and the counterfactual economy are used to evaluate the impacts on children's skills and parental choices of the previously mentioned policies.

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Set of robustness analyses:
2.b Large-scale relocation policy allowing receiving parents to make endogenous moving decisions
2.c Large-scale relocation policy with calibrated CES technologies for authoritarian parents
2.d Estimation of model with mothers' education affecting preferences for parenting and technological TFP
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We conducted three sets of robustness exercises for our structural analysis. The files required to run each of these robustness analyses can be found in individual folders located within 'Replication_Package_JPE\matlab_dir\robustness'. The name of each folder provides information about the specific robustness exercise it pertains to. Within each folder, a master file runs the entire analysis. The program structure mirrors that of the one used in the main analysis.

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2.b Large-scale relocation policy allowing receiving parents to make endogenous moving decisions
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This robustness analysis, located in "\Replication_Package_JPE\matlab_dir\robustness\counterfactual_endogenous_moving," is generated by running the master file called "master_counterfactual_endogenous_moving". In this exercise, we replicate the "moving-to-opportunity policy" at scale allowing receiving parents in the high-income receiving neighborhood to relocate from their area. The master file produces the following figures:
--Appendix Figure E-4: Residential Elasticities w.r.t. Mean School Peer Achievement
--Appendix Figure E-5: Policy and Scaling Effects on Skills (with Endogenous Mobility)

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2.c Large-scale relocation policy with calibrated CES technologies for authoritarian parents
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This robustness analysis, located in "\Replication_Package_JPE\matlab_dir\robustness\counterfactual_two_CES_calibrated," is generated by executing the master file called "master_counterfactual_two_CES". In this exercise, we replicate the "moving-to-opportunity policy" at scale allowing the technology for authoritarian parents to take a CES form. In contrast to the Cobb-Douglas case, we allow for a higher degree of substitutability between parental investments and peers, and a higher degree of complementarity with the stock of skills. The master file produces the following figure:
--Appendix Figure E-1: Policy and Scaling Effects on Skills (Alternative Calibration)

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2.d Estimation of model with mothers' education affecting preferences for parenting and technological TFP
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This robustness analysis, located in "\Replication_Package_JPE\matlab_dir\robustness\mother_education," is generated by running the master file called "master_estimation_educ". The master file produces the following table:
--Appendix Table D-6: Estimates of Heterogeneous Productivity and Preferences by Education

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List of auxiliary functions called inside the master files (common across subfolders)
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--technology: defines the technology of skill formation
--mean_peers: calculates the mean skills of peers
--graphs_friendships_formation: runs comparative statics of friendship formation (Appendix Figure D-1)
--graphs_perturb_parameters: runs the perturbation of model's parameters (Appendix Figure D-2)
--compute_policy_function: compute the policy function
--compute_value_function: compute the value function
--policy_effects_counter1: computes the policy effects of the first "moving-to-opportunity policy" (moving one child)
--policy_effects_counter2: computes the policy effects of the second "moving-to-opportunity policy" (moving many children)
--Sample_fit_tables: creates LaTex tables for the model's sample fit
--Estimates_tables: creates LaTex tables for the model's estimates
--fminsearch_function: optimization function for SMM
--interp_function: interpolation value function backward induction
--Interp_function_simulation: interpolation for model's simulations
--New_Counter_Tables: creates LaTex tables for the "Changing Initial Conditions" counterfactual analysis (Section V.B, Table 8)
--gini: calculate gini coefficient for the "Changing Initial Conditions" counterfactual analysis (Section V.B, Table 8)