Optimism and Fertility

Evidence from the Gallup World Poll

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Abstract

Expectations about the future play a role in household fertility decisions. We examine whether subjective optimism contains information about fertility-related outcomes after accounting for observed demographic and economic characteristics. Using over 1.4 million Gallup World Poll respondents ages 15–49 from 2005 through 2025, we first relate individual optimism to the number of children under age 15 living in the respondent's household. We then aggregate optimism to the country-year level and examine its association with World Bank total fertility rates in a panel of 950 country-year observations through 2024. A few findings emerge. First, a one-standard-deviation increase in individual optimism is associated with 0.0229 more household children after the full controls, or 1.4% of the sample mean. Second, interaction models further show that the positive association varies systematically by age, sex, and religiosity. Third, at the country level, higher average optimism is associated with higher fertility rates, although the estimated relationship is attenuated after controlling for macroeconomic conditions. Finally, optimism shocks originating in socially connected foreign countries do not retain an independent association with domestic fertility once macroeconomic controls are included. While the analysis does not establish causal effects, we provide the first evidence from a large cross-national sample that expectations about the future are systematically associated with fertility decisions.

Keywords: fertility; optimism; subjective expectations; co-resident children; Gallup World Poll.

JEL Codes: J11; J13; O15; D84; Z13.

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1 Introduction

Fertility decisions depend on expectations as well as current resources. Raising a child entails long-lived commitments whose costs and benefits extend well beyond the household's current economic circumstances. Economic models and empirical studies accordingly emphasize earnings, education, partnership formation, labor-market institutions, and family policy as determinants of fertility (Adsera, 2004; Black et al., 2013; Kearney and Wilson, 2018; Doepke and Kindermann, 2019; Doepke et al., 2023). These observed conditions may leave out an additional input to family formation: whether adults expect their own standard of living and the surrounding economy to improve.

The distinction matters as fertility declines across countries with different income levels, institutions, and family policies. Low fertility can alter the population age structure, dependency ratios, and the financing of public and private consumption (Lee et al., 2014; Jones, 2022). In many settings, desired family size also exceeds expected or realized fertility, suggesting that constraints and uncertainty intervene between preferences and outcomes (Stone, 2019; Piano and Stone, 2024). Existing work explains much of this variation through material conditions and changes in marriage, contraception, education, and women's employment (Goldin and Katz, 2002; Adsera, 2005; Doepke et al., 2023; Geruso and Spears, 2025). The present analysis asks whether subjective assessments of future prospects contain additional information about fertility-related behavior.

A large macroeconomic literature shows that expectations and sentiment predict household spending and aggregate activity, even after accounting for contemporaneous fundamentals (Carroll et al., 1994; Ludvigson, 2004; Barsky and Sims, 2012; Gillitzer and Prasad, 2018). Models of news,

information frictions, and sentiment provide several reasons why beliefs can move before measured economic conditions or summarize information that standard indicators omit (Beaudry and Portier, 2006; Blanchard et al., 2013; Angeletos and La'O, 2013; Coibion and Gorodnichenko, 2015). Social connections can also transmit economic beliefs across places (Bailey et al., 2018a,b; Makridis, 2022; Makridis and Wang, 2024). Fertility offers a demanding setting for this argument because the outcome reflects partnership, timing, and household-composition decisions with longer horizons than most consumption choices.[1]

Research on fertility intentions provides a direct basis for expecting subjective outlook to matter. The Theory of Planned Behavior links attitudes, perceived norms, and perceived control to intentions and subsequent behavior (Ajzen, 1991). Applications to fertility show that anticipated feasibility and uncertainty enter the process through which adults form and revise childbearing plans (Mencarini et al., 2015). Experimental and survey evidence further shows that optimistic and pessimistic narratives about the future can change stated fertility intentions, including within couples (Vignoli et al., 2022; Lappegård et al., 2022; Matera et al., 2023). These studies clarify how expectations may affect intentions. They provide less evidence from harmonized global data on realized household composition or national fertility rates.

The closest macro evidence comes from Comolli (2017), who shows that worsening consumer confidence accompanied fertility declines during the Great Recession in Europe and the United States after accounting for several labor-market conditions. That episode illustrates how perceived uncertainty can covary with fertility beyond measured unemployment and income. It also exposes the identification problem. Recessions, conflict, policy changes, and other shocks can simultaneously

[1]For an analysis of the bargaining process behind household fertility decisions, see Doepke and Kindermann (2019).

change economic sentiment and childbearing. Fertility outcomes may in turn influence reported wellbeing and optimism. Cross-sectional and country fixed-effects estimates therefore require an associational interpretation unless the source and timing of changes in outlook are independently identified.

We study this relationship using two linked samples. The individual analysis draws on 1,411,299 Gallup World Poll respondents ages 15–49 from 2005 through 2025. Gallup's Optimism Index combines assessments of whether the respondent's standard of living is improving, whether local economic conditions are improving, and where the respondent expects to stand on the Cantril life ladder in five years. The outcome is the number of children under age 15 living in the respondent's household. This measure provides a consistent global indicator of household child co-residence, but it does not measure completed fertility or establish that every child is biologically related to the respondent. The country analysis aggregates optimism using Gallup survey weights and links it to World Bank total fertility rates in a common panel of 950 country-year observations through 2024. Both sets of regressions include country and year fixed effects, and the country models add observed macroeconomic controls.

The individual results reveal substantial demographic composition. A one-standard-deviation increase in optimism is associated with 0.073 fewer co-resident children in the specification containing only country and year fixed effects. The coefficient becomes positive when the regression adds age, sex, marriage, employment, income, and education. In the full specification, which also controls for whether religion is important in the respondent's daily life, the coefficient is 0.023 (with a standard error of 0.0054) or about 1.4% of the sample mean of 1.63 children. The change in sign cautions against interpreting the unadjusted relationship as evidence about how optimism relates to family formation. It also shows that the optimism measure is strongly patterned by life-cycle

and socioeconomic characteristics.

The positive adjusted association varies across demographic groups. Interaction models indicate stronger associations among older respondents, particularly older women, while the association is weaker among women under age 30. The interaction between optimism and religiosity is negative and statistically significant, indicating that individual optimism is less predictive of household children among respondents who report religion is important in their daily lives. Decomposing the Optimism Index reveals that expecting greater levels of wellbeing in the future, rather than optimism about living standards or local economic conditions alone, is most predictive of household children.

The country estimates are smaller and less precise after macroeconomic adjustment. A one-standard-deviation increase in mean national optimism is associated with 0.0356 additional births per woman in the baseline country fixed-effects model, equivalent to 1.7% of the mean total fertility rate of 2.11. The coefficient is 0.0228 with a standard error of 0.0136 after controlling for GDP per capita, female labor-force participation, female education, religiosity, unemployment, and remittances. This fully adjusted estimate equals 1.1% of mean fertility and is statistically distinguishable from zero at the 10% level. We also examine whether optimistic attitudes can be influenced from abroad using an exposure measure that weights optimism innovations in foreign countries by the Meta Social Connectedness Index. Its coefficient is 0.0155 in the baseline model and 0.0016 after the full controls. The attenuation limits the evidence for an independent cross-country social-transmission channel.

The paper contributes to a growing literature on expectations and family formation by providing the first global evidence linking subjective optimism to both individual household composition and national fertility rates. It extends the downturn-focused evidence in Comolli (2017) to a

broader country panel. By combining more than 1.4 million Gallup World Poll respondents with a harmonized country panel, we show that optimism contains information beyond standard demographic and macroeconomic characteristics and that this relationship appears at both the individual and national levels. These findings are consistent with Easterlin (1961)'s insight that perceptions of future economic prospects shape family formation, while extending that idea from relative economic status to broader subjective expectations about the future. Although the analysis does not establish a causal relationship, it identifies a robust empirical regularity that motivates future work on how expectations influence fertility decisions.

The structure of the paper is as follows. Section 2 describes the Gallup World Poll, the fertility measures, and the foreign-optimism exposure index. Section 3 presents the individual and country empirical specifications. Section 4 reports the results. Section 5 discusses interpretation and limitations, and Section 6 concludes.

2 Data and Measurement

2.1 Gallup World Poll

The Gallup World Poll (GWP) conducts nationally representative surveys of adults in more than 100 countries using probability-based face-to-face or telephone samples. Gallup generally interviews approximately 1,000 adults per country and survey year and supplies post-stratification weights that align the sample with the adult population. The repeated cross-sections contain consistent measures of life evaluation, economic perceptions, and demographic characteristics (Deaton, 2008). Our individual estimation sample covers 2005–2025 and is restricted to respondents

ages 15–49. Requiring valid values for the outcome, optimism measure, and controls yields 1,411,299 observations.

2.1.1 Optimism Index

The principal explanatory variable is Gallup's Optimism Index. The index combines three assessments:

(i) whether the respondent's standard of living is getting better or getting worse;

(ii) whether economic conditions in the respondent's city or local area are getting better or getting worse; and

(iii) the respondent's expected position, five years ahead, on the Cantril ladder from 0 (the worst possible life) to 10 (the best possible life).

The first two items are coded as binary indicators, and the expected-life item is divided by 10. Gallup averages the valid components and multiplies the result by 100, producing an index from 0 to 100. The Online Appendix reports the question wording. In the individual sample, the index has a mean of 54.45 and a standard deviation of 32.08. We standardize it over the individual estimation sample, so the coefficient in the respondent-level regressions corresponds to a 32.08-point difference in the index.

For the country analysis, we calculate the survey-weighted mean Optimism Index among respondents ages 15–49 in each country-year. The country-year measure has a mean of 55.01 and a standard deviation of 12.52 in the descriptive sample. We standardize the country-year index separately for the national regressions. The individual and country coefficients therefore refer to different one-standard-deviation changes and should not be compared mechanically.

2.1.2 Household child co-residence and life evaluation

The individual outcome records how many children under age 15 live in the respondent's household. We top-code the measure at 20 to limit the influence of a small number of extreme responses. Its sample mean is 1.63. The measure captures household child co-residence at the survey date. It omits children age 15 or older, children living elsewhere, and completed fertility, and it does not establish biological parentage. We therefore refer to the outcome as the number of *co-resident children under age 15*, rather than as individual fertility.

We also use Gallup's Life Evaluation Index to examine whether the results extend to a related measure of current and expected wellbeing. Gallup classifies respondents as thriving when their current life evaluation is at least 7 and their expected evaluation in five years is at least 8. Respondents are classified as suffering when both evaluations are 4 or below. All remaining respondents are classified as struggling. The three categories are mutually exclusive. In the regressions, each indicator enters in a separate specification, so its coefficient compares the indicated category with the other two categories combined.

Figure 2 summarizes the Optimism Index by age and sex. Mean optimism declines across the age groups, while the male and female means remain close within each group. The error bars show weighted standard deviations and describe dispersion within the age-sex cells; they are not confidence intervals. This age pattern motivates careful adjustment for life-cycle composition in the individual regressions.

2.2 World Bank total fertility and country controls

We obtain total fertility rates (TFR) and country-year covariates from the World Bank for 2005–2024. TFR is the average number of children a woman would bear if current age-specific fertility rates applied throughout her reproductive years. Figure 1 plots TFR by World Bank income group. The figure shows persistent differences across income groups and a continued decline among high-income countries over the sample period.

The country regressions use log GDP per capita, female labor-force participation, female educational attainment, unemployment, personal remittances as a share of GDP, and the share of Gallup respondents who say religion is important in their daily lives. Female educational attainment measures the share of women ages 25 and older who have completed at least secondary school. Gallup survey weights are used to construct the country-year optimism and religiosity measures. Table 1 reports 966 country-year observations in the descriptive sample. The regression tables use a common sample of 950 country-years with the variables required for all six specifications.

Figure A.1 compares country-year mean household child co-residence in the GWP with World Bank TFR. The two measures are positively related in levels, but they capture different objects. The Gallup measure is a household stock for respondents ages 15–49, whereas TFR is a period rate constructed from births across the full reproductive-age schedule.

2.3 SCI-weighted foreign optimism exposure

We use the Meta Social Connectedness Index (SCI) to construct a secondary measure of exposure to optimism changes abroad. The SCI measures the relative frequency of Facebook friendship links between geographic areas, normalized by their Facebook user populations (Bailey et al., 2018a,b).

We use the 2016 country-to-country network as a fixed set of connection weights.

Let O_{kt} denote mean optimism in foreign country k in year t. We first remove country and year fixed effects and denote the residual innovation by $\widetilde{O}_{kt}$. For each focal country c, we normalize bilateral SCI values across all foreign countries:

$$w_{ck} = \frac{SCI_{ck}}{\sum_{j \neq c} SCI_{cj}}, \qquad \sum_{k \neq c} w_{ck} = 1. \tag{2.1}$$

The foreign-optimism exposure measure is

$$F_{ct} = \sum_{k \neq c} w_{ck} \widetilde{O}_{kt}. \tag{2.2}$$

We standardize F_{ct} for the country regressions. A higher value indicates that countries more strongly connected to country c experienced more positive optimism innovations in the same year.

The exposure measure is not treated as an instrument in the current analysis.[2] Socially connected countries may share trade, migration, regional, political, or other shocks that affect fertility directly. The regressions therefore use F_{ct} as a supplementary predictor and examine whether its association with TFR remains after the observed macroeconomic controls are added.

3 Empirical Framework

[2]When employing foreign optimism exposure as an IV, the first-stage coefficient was small and the associated weak-identification diagnostics indicate that the instrument does not meet conventional strength thresholds. Because weak instruments can produce biased IV estimates and misleading inference, we exclude this approach from the main analysis.

3.1 Individual associations

We estimate weighted linear regressions of co-resident children on individual optimism:

$$C_{ict} = \beta O_{ict} + \mathbf{X}'_{ict}\Gamma + \mu_c + \tau_t + \varepsilon_{ict}, \tag{3.1}$$

where C_{ict} is the number of children under age 15 living with respondent i in country c and survey year t, and O_{ict} is the standardized Optimism Index. Country fixed effects μ_c absorb persistent differences in household structure, fertility regimes, and measurement across countries. Year fixed effects τ_t absorb shocks common to the countries observed in a given year. We use Gallup survey weights and cluster standard errors by country.

Table 2 reports three specifications. Column (1) includes only the optimism measure and fixed effects. Column (2) adds age, sex, marital status, employment, education, and household-income-quintile indicators. Column (3) adds whether the respondent says religion is important in daily life. These regressions describe conditional associations in repeated cross-sections. Several controls, including marriage, employment, and income, may be jointly determined with household composition or may lie on pathways connecting expectations to family formation. The sequence of estimates is therefore informative about composition and conditional covariance; it does not define a single causal adjustment set.

We estimate interaction models that allow the association between optimism and household child co-residence to vary by age, sex, and religiosity. These specifications provide formal tests of whether the association between optimism and co-resident children differs across demographic groups.

3.2 National optimism and total fertility

The country analysis relates World Bank TFR to the survey-weighted mean Optimism Index:

$$TFR_{ct} = \theta \overline{O}_{ct} + \mathbf{W}'_{ct}\Pi + \alpha_c + \lambda_t + u_{ct}, \tag{3.2}$$

where $\overline{O}_{ct}$ is standardized mean optimism among Gallup respondents ages 15–49. Country fixed effects α_c remove time-invariant differences across countries, and year fixed effects λ_t remove common annual shocks. Standard errors are clustered by country. The baseline specification omits time-varying controls, the second adds log GDP per capita, and the third adds female labor-force participation, female educational attainment, religiosity, unemployment, and remittances.

The coefficient θ is identified from within-country co-movement between optimism and TFR after common year shocks and the included covariates are removed. This variation does not establish temporal ordering or causal direction. Unobserved country-specific shocks may change both variables, and births observed in year t reflect decisions made before the survey date. We therefore interpret θ as a conditional association between national outlook and contemporaneous TFR.

3.3 Foreign optimism exposure

We replace mean national optimism with the SCI-weighted foreign exposure measure defined in equation (2.2):

$$TFR_{ct} = \rho F_{ct} + \mathbf{W}'_{ct}\Pi + \alpha_c + \lambda_t + v_{ct}. \tag{3.3}$$

The same three control sets and the same 950-observation country-year sample are used. Equation (3.3) asks whether TFR covaries with optimism innovations in countries to which the focal country is more socially connected. The specification provides a demanding supplementary comparison because the focal country's own optimism is excluded from F_{ct}. It remains vulnerable to common shocks and non-sentiment spillovers among connected countries. We consequently do not use F_{ct} as an excluded instrument and do not assign a causal interpretation to ρ.

The individual and country coefficients operate on different outcomes and standardizations. Equation (3.1) concerns a household stock of co-resident children and a one-standard-deviation difference of 32.08 index points. Equation (3.2) concerns a period fertility rate and a one-standard-deviation within-panel difference based on a country-year standard deviation of 12.52 points. Similar signs across the two analyses provide complementary evidence, but the magnitudes are not directly comparable.

4 Optimism and Fertility-Related Outcomes

4.1 Individual optimism and co-resident children

Table 2 reports the respondent-level estimates. Column (1) shows a negative association before demographic adjustment. A one-standard-deviation increase in optimism is associated with 0.0730 fewer co-resident children under age 15 (standard error 0.0070, $p < 0.01$). Because one individual-level standard deviation equals 32.08 points on the 0–100 index, the coefficient is 4.5% of the sample mean of 1.63 children.

The coefficient changes sign when the regression adds respondent characteristics. Column

(2) reports an estimate of 0.0240 (standard error 0.0052, $p < 0.01$) after controlling for age, sex, marriage, employment, education, and income quintile. Adding the religion indicator in column (3) yields 0.0229 (standard error 0.0054, $p < 0.01$). The fully adjusted estimate is equivalent to 1.4% of the outcome mean. The table adds the controls as a block, so it does not show which variable accounts for the reversal. The pattern establishes that the raw optimism gradient is dominated by life-cycle and socioeconomic composition.

The control coefficients illustrate the strength of this composition. Marriage is associated with 0.5997 more co-resident children in column (3). Relative to the bottom household-income quintile, the coefficients decline monotonically from −0.3199 in quintile 2 to −1.428 in quintile 5. The linear age coefficient is small and statistically indistinguishable from zero after the remaining controls are included. These estimates should not be interpreted as causal effects because marriage, employment, income, and household child co-residence may be jointly determined.

4.2 Age, sex, and religiosity

Tables 3 and 4 estimate interaction models that allow the optimism coefficient to vary across age groups separately for men and women. Among men, optimism is positively associated with household child co-residence across all age groups, with significantly larger coefficients among respondents ages 30–49 relative to men under age 30. Among women, the association is strongest among respondents ages 40–49, weaker among women under age 30, and not statistically distinguishable from zero for women between 30-39. These interaction models indicate that the optimism–fertility relationship varies systematically over the life cycle rather than remaining constant across demographic groups.

Table 5 estimates an interaction between optimism and religiosity. The interaction term is

negative and statistically significant, indicating that the positive association between optimism and co-resident children is significantly smaller among respondents who report religion is important in their daily lives.

4.3 Decomposing Gallup's Optimism Index

Table 6 decomposes Gallup's Optimism Index, estimating individual responses to its three constituent questions separately. Positive responses to each question are associated with a greater number of household children. In particular, reporting that one's living standards and local economic conditions are improving is associated with roughly 0.03 more household children. Indicating that one's current life is at least a seven out of ten and future life is at least an eight or higher (also coded as "thriving" in the Life Evaluation Index) is the strongest predictor of household children, associated with about 0.08 more children.

4.4 National optimism and total fertility

Table 7 reports the country fixed-effects estimates. In column (1), a one-standard-deviation increase in mean national optimism is associated with 0.0356 additional births per woman (standard error 0.0152, $p < 0.05$). Relative to the mean TFR of 2.11, the estimate corresponds to 1.7%. Adding log GDP per capita in column (2) leaves the coefficient nearly unchanged at 0.0369.

The coefficient declines when the remaining macroeconomic controls enter. Column (3) reports an estimate of 0.0228 with a standard error of 0.0136, statistically distinguishable from zero at the 10% level. The fully adjusted estimate equals 1.1% of mean TFR and is 36% smaller than the baseline coefficient. The attenuation indicates that mean optimism overlaps with observed country

conditions. It also makes the country-level conclusion sensitive to the chosen control set.

Columns (4)–(6) use SCI-weighted foreign optimism exposure. The baseline coefficient is 0.0155 (standard error 0.0083, $p < 0.10$), and the GDP-controlled estimate is 0.0154. After the full set of controls enters, the coefficient falls to 0.0016 with a standard error of 0.0072. The point estimate is approximately one-tenth of the baseline value and is statistically indistinguishable from zero. The country results therefore provide limited evidence that optimism innovations in socially connected foreign countries predict TFR independently of observed macroeconomic conditions.

The two empirical levels yield the same positive sign after adjustment, but they answer different questions. The individual estimates compare respondents within countries and survey years using a household stock of young children. The country estimates compare changes within countries using a period fertility rate. The common direction is consistent with subjective outlook containing information about family formation, while the control sensitivity and foreign-exposure null limit stronger interpretations.

5 Interpretation and Scope

The estimates show that optimism contains information about fertility-related outcomes after several observed characteristics are held constant. The evidence is strongest in the individual sample, where the adjusted coefficient is positive across the full sample and five of six age-by-sex subsamples. The country coefficient is also positive, but it falls by 36% and becomes less precise when the full set of macroeconomic controls is added. The SCI-weighted foreign exposure coefficient disappears under the same adjustment. This pattern supports a limited conclusion: subjective outlook covaries with household child co-residence and national fertility, while the current designs

do not separate beliefs from the economic and social conditions that produce them.

A perceived-feasibility interpretation is consistent with the measures and prior literature. Gallup's Optimism Index asks whether the respondent's standard of living and local economic conditions are improving and where the respondent expects to stand in five years. Adults who perceive an improving trajectory may regard the costs of family formation as easier to absorb or the risks of having a child as lower. Research on fertility intentions shows that perceived control, uncertainty, and narratives about the future enter stated childbearing plans (Mencarini et al., 2015; Vignoli et al., 2022; Lappegård et al., 2022; Matera et al., 2023). Our results are consistent with the same channel appearing in realized household composition and TFR.

Two of the three Optimism Index components directly ask about living standards and local economic conditions, as highlighted in Table 6. Optimism can therefore summarize objective changes that are incompletely measured by current income, GDP, unemployment, or the remaining controls. Family formation can also change outlook through partnership, household roles, and the experience of raising children. The positive adjusted coefficient may reflect expected feasibility, unobserved resources, selection into marriage, or feedback from household composition. The estimates identify none of these pathways separately.

The sign reversal in Table 2 is substantively important. More optimistic respondents report fewer co-resident children in the specification with only country and year fixed effects. The coefficient becomes positive after demographic and socioeconomic controls enter. The reversal reflects the joint age, income, partnership, employment, education, and sex composition of the sample, although the table does not identify the contribution of each factor. It also shows why the household outcome requires careful interpretation. Respondents move into and out of the under-15 co-residence window over the life cycle, and men and women can differ in whether children

live in their household. A positive conditional coefficient can arise through the timing of births, partnership and custody arrangements, or family size.

The country analysis adds a distinct outcome and source of variation. Country fixed effects remove stable differences in culture, institutions, and fertility regimes, and year fixed effects remove common annual shocks. Remaining within-country changes may still reflect policy reforms, housing conditions, conflict, migration, public health, or other country-specific developments. The contemporaneous specification also cannot establish that optimism precedes the births summarized in annual TFR. The coefficient of 0.0228 in the full model should be read as conditional co-movement, especially because it is statistically distinguishable from zero only at the 10% level.

The foreign-exposure exercise places an additional limit on interpretation. SCI weights exclude the focal country's own optimism and use predetermined cross-country social connections. The baseline association is positive, but observed macroeconomic conditions absorb it almost entirely. Socially connected countries share trade, migration, regional, linguistic, and political ties, so the exposure measure can capture common shocks that operate through channels other than beliefs. The fully adjusted estimate of 0.0016 provides no evidence of an independent relationship between foreign optimism exposure and fertility in the current specification. A causal social-transmission claim would require a stronger design, a documented first stage linking foreign exposure to domestic optimism, and tests of the direct economic channels connecting country pairs.

The policy relevance lies in measurement and in the role of expectations within material policy changes. Governments that expand childcare, reduce housing uncertainty, or improve employment security may change both household resources and beliefs about future feasibility. The present analysis cannot decompose those two responses or show that communication alone changes fertility. Measures of public outlook can nevertheless help describe whether objective reforms alter the

expectations of adults making long-horizon family decisions. Policy evaluation would need to track changes in resources, expectations, intentions, and births in sequence to identify the contribution of each margin.

Several limitations define the scope of the findings. The individual data are repeated cross-sections, and the outcome is child co-residence rather than births or completed fertility. The country panel is unbalanced and uses contemporaneous annual measures. The Optimism Index and country-year means contain survey measurement error. The SCI network is fixed at its 2016 configuration even though the fertility panel spans earlier and later years. Finally, the individual specifications use a linear age control and condition on variables that may be endogenous to family formation. Designs using richer age controls, longitudinal respondents, or plausibly exogenous changes in uncertainty would provide stronger evidence about timing and mechanism.

6 Conclusion

This paper examines whether subjective outlook is associated with fertility-related outcomes in a harmonized global sample. The individual analysis covers 1,411,299 Gallup World Poll respondents ages 15–49 from 2005 through 2025. Before demographic adjustment, a one-standard-deviation increase in optimism is associated with 0.0730 fewer children under age 15 living in the respondent's household. After the full set of controls, the coefficient is positive at 0.0229 with a standard error of 0.0054, equivalent to 1.4% of the outcome mean. Interaction models reveal significant heterogeneity in the association between optimism and household child co-residence across age, sex, and religiosity.

The country analysis links survey-weighted mean optimism to World Bank total fertility

in 950 country-year observations through 2024. A one-standard-deviation increase in national optimism is associated with 0.0356 additional births per woman in the baseline country fixed-effects model. The estimate falls to 0.0228 with a standard error of 0.0136 after the full set of controls, or 1.1% of mean TFR. SCI-weighted foreign optimism exposure is positively associated with TFR in parsimonious specifications, but the coefficient declines from 0.0155 to 0.0016 under full macroeconomic adjustment.

The results place subjective expectations alongside income, employment, partnership, education, and other conditions considered in research on fertility. They are consistent with the view that perceived future trajectories enter decisions about family formation, an idea related to Easterlin's emphasis on relative economic prospects. The evidence also shows substantial overlap between optimism and observed demographic and economic conditions. The sign reversal in the individual models and the attenuation in the country models make that overlap visible.

The analysis establishes conditional associations rather than causal effects. Household child co-residence is not completed fertility, annual TFR does not reveal when the relevant expectations formed, and country fixed effects do not remove time-varying domestic shocks. The foreign-exposure specification provides no independent relationship after full adjustment. Future work that links lagged expectations to subsequent births, follows the same adults over time, or exploits identified changes in uncertainty can determine whether optimism predicts fertility because it changes perceived feasibility or because it summarizes conditions that standard covariates do not fully measure.

Tables and Figures

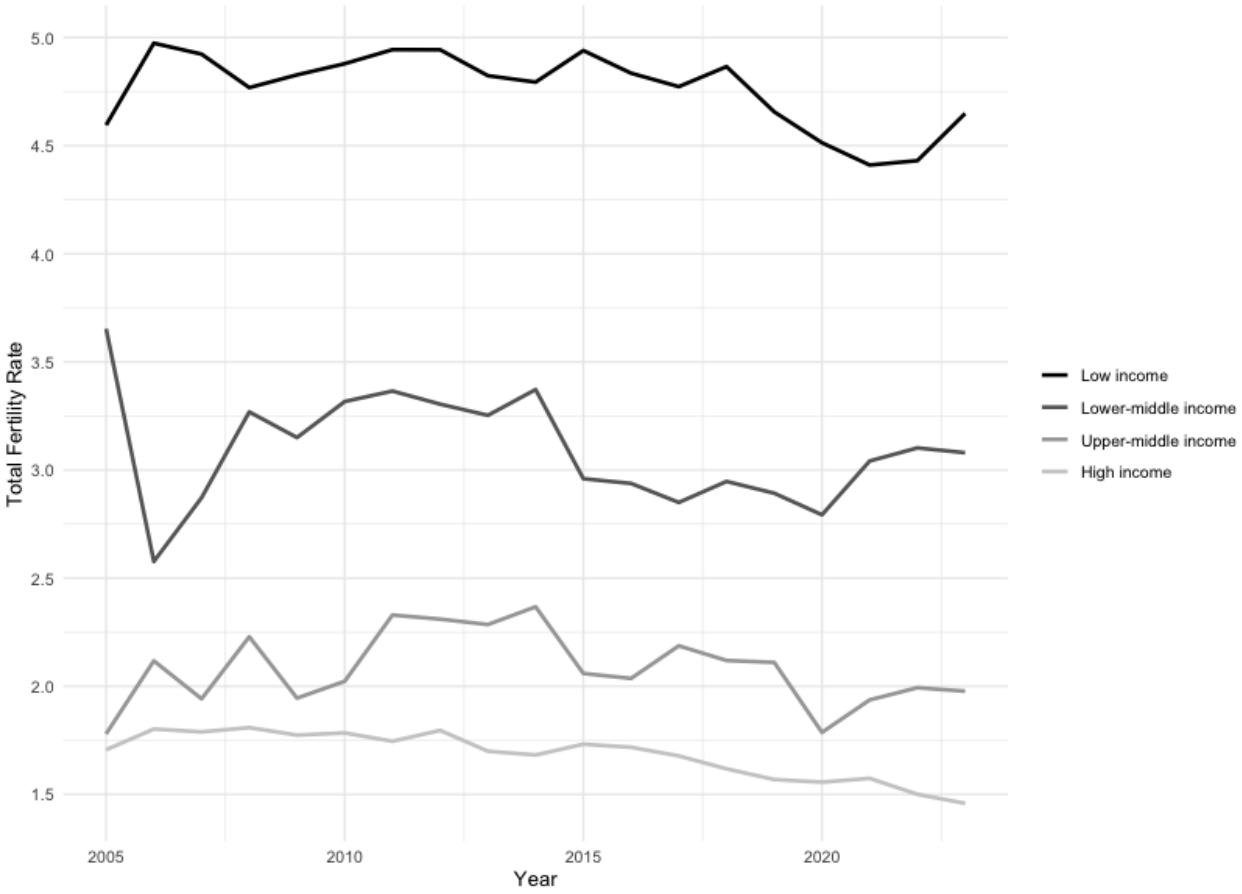


Figure 1: Total Fertility Rates by World Bank Income Group

Notes: The figure reports annual World Bank total fertility rates from 2005 through 2024. Countries are assigned to income groups using the 2024 World Bank income thresholds, with GDP per capita used in place of GNI per capita.

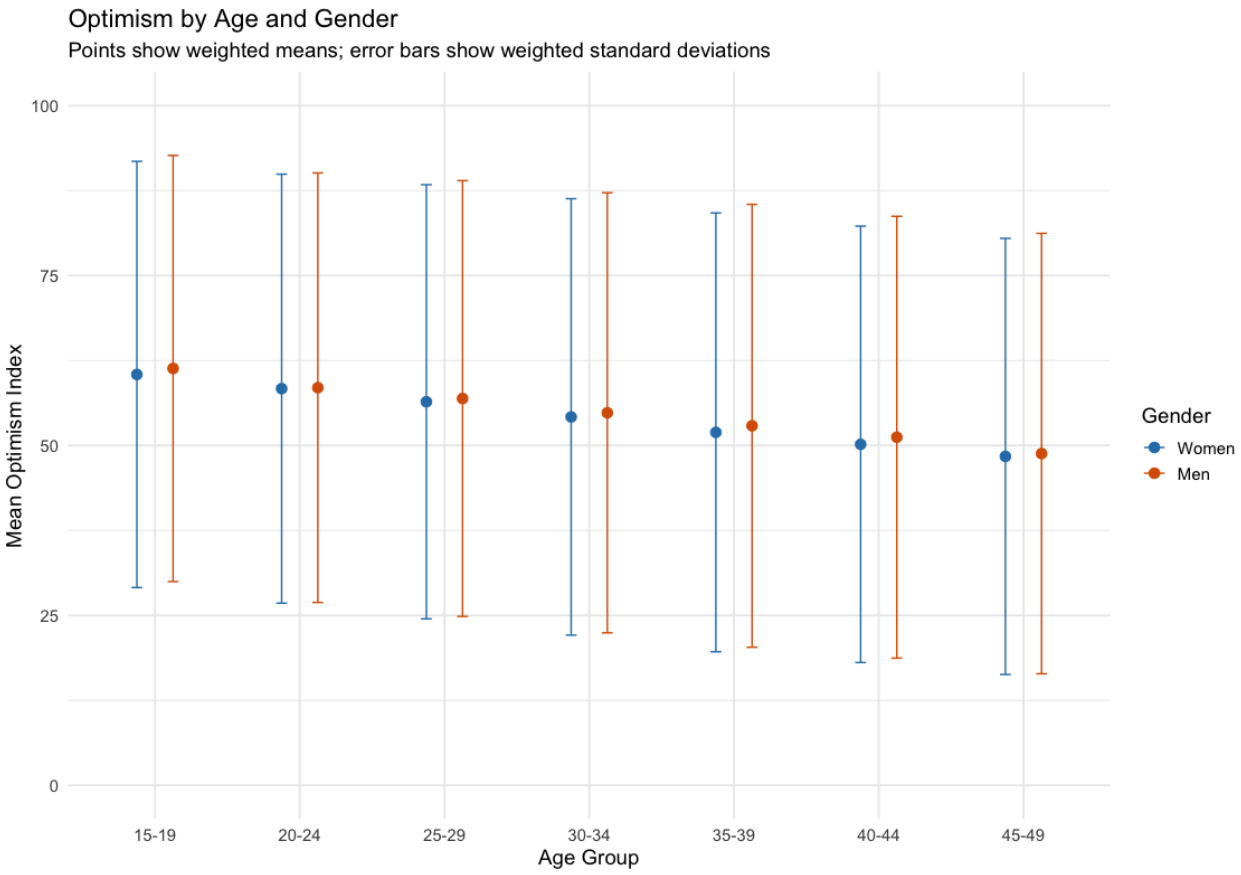


Figure 2: Optimism by Age and Sex

Notes: Points report Gallup survey-weighted mean Optimism Index values among respondents ages 15–49 from 2005 through 2025. Error bars report weighted standard deviations within each age-sex group and should not be interpreted as confidence intervals.

Table 1: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	N
Panel A. Gallup World Poll individual sample					
Co-resident children under age 15	1.63	1.96	0.00	20.00	1,411,299
Individual Optimism Index	54.45	32.08	0.00	100.00	1,411,299
Age	30.40	9.86	15.00	49.00	1,411,299
Male	0.49	0.50	0.00	1.00	1,411,299
Married	0.44	0.50	0.00	1.00	1,411,299
Employed	0.60	0.49	0.00	1.00	1,411,299
College degree	0.13	0.34	0.00	1.00	1,411,299
Religion important	0.71	0.45	0.00	1.00	1,411,299
Panel B. Country-year descriptive sample					
Total fertility rate	2.11	1.01	1.06	7.59	966
Mean Optimism Index	55.01	12.52	14.18	91.77	966
SCI-weighted foreign optimism exposure	0.05	3.17	-11.64	11.91	966
GDP per capita	21,826	24,014	190	131,408	966
Female labor-force participation	52.96	10.17	8.68	91.75	966
Female educational attainment	69.69	26.22	3.44	99.89	966
Unemployment rate	7.72	5.44	0.12	35.23	966
Remittances as a share of GDP	3.68	5.32	0.00	34.50	966
Share reporting religion important	0.59	0.27	0.10	1.00	966

Notes: Panel A uses Gallup World Poll respondents ages 15–49 from 2005 through 2025. Panel B combines Gallup World Poll, World Bank data through 2024, and the 2016 Social Connectedness Index. GDP per capita is reported in current U.S. dollars. Female educational attainment is the share of women ages 25 and older who completed at least secondary school. The foreign-optimism exposure measure is reported in its original units here and standardized in the regressions. The country regressions use a common 950-observation sample.

Table 2: Individual Optimism and Co-resident Children Under Age 15

Dependent Variable:	Number of Household Children		
	Baseline	Demographic Controls	Full Controls
Model:	(1)	(2)	(3)
Variables			
Optimism (1 SD)	-0.0730***	0.0240***	0.0229***
	(0.0070)	(0.0052)	(0.0054)
Married		0.6021***	0.5997***
		(0.0258)	(0.0254)
Employed		0.0741***	0.0745***
		(0.0090)	(0.0089)
Income Quintile 2		-0.3209***	-0.3199***
		(0.0171)	(0.0171)
Income Quintile 3		-0.6647***	-0.6627***
		(0.0232)	(0.0232)
Income Quintile 4		-1.001***	-0.9979***
		(0.0332)	(0.0332)
Income Quintile 5		-1.432***	-1.428***
		(0.0526)	(0.0527)
Age		-0.0011	-0.0012
		(0.0010)	(0.0010)
College		0.0695***	0.0714***
		(0.0182)	(0.0176)
Male		-0.0768***	-0.0744***
		(0.0112)	(0.0113)
Religion Important			0.0666***
			(0.0230)
Fixed-effects			
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Fit statistics			
Observations	1,411,299	1,411,299	1,411,299
R^2	0.26354	0.35164	0.35180
Within R^2	0.00167	0.12110	0.12131

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Source: Gallup World Poll (2005-2025). Sample is restricted to reproductive-aged men and women (15-49). Number of children refers to the number of children living in the respondent's household (0-20). Optimism is standardized to have mean zero and standard deviation one. Regressions use Gallup World Poll survey weights.

Table 3: Individual Optimism and Co-resident Children: Men by Age

Dependent Variable:	Number of Household Children		
Model:	(1)	(2)	(3)
Variables			
Optimism (1 SD)	0.0538***	0.0299***	0.0240***
	(0.0068)	(0.0071)	(0.0074)
Under Thirty	-0.1819***		
	(0.0178)		
Optimism (1 SD) × Under Thirty	-0.0261**		
	(0.0100)		
Thirty to Thirty-Nine		0.1891***	
		(0.0184)	
Optimism (1 SD) × Thirty to Thirty-Nine		0.0157*	
		(0.0093)	
Forty to Forty-Nine			-0.0177
			(0.0274)
Optimism (1 SD) × Forty to Forty-Nine			0.0252**
			(0.0121)
Married	0.5731***	0.6274***	0.6702***
	(0.0195)	(0.0184)	(0.0203)
Employed	0.0936***	0.1022***	0.1221***
	(0.0110)	(0.0108)	(0.0110)
Income Quintile 2	-0.2934***	-0.2929***	-0.2928***
	(0.0202)	(0.0202)	(0.0202)
Income Quintile 3	-0.6325***	-0.6313***	-0.6318***
	(0.0259)	(0.0260)	(0.0259)
Income Quintile 4	-0.9657***	-0.9649***	-0.9649***
	(0.0359)	(0.0358)	(0.0357)
Income Quintile 5	-1.415***	-1.414***	-1.410***
	(0.0568)	(0.0566)	(0.0566)
College	0.0509***	0.0488***	0.0641***
	(0.0156)	(0.0160)	(0.0161)
Religion Important	0.0718***	0.0748***	0.0744***
	(0.0248)	(0.0245)	(0.0246)
Fixed-effects			
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Fit statistics			
Observations	659,467	659,467	659,467
R^2	0.35507	0.35524	0.35360
Within R^2	0.13222	0.13246	0.13025

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*
Source: Gallup World Poll (2005-2025). Sample is restricted to reproductive-aged men and women

Table 4: Individual Optimism and Co-resident Children: Women by Age

Dependent Variable:	Number of Household Children		
Model:	(1)	(2)	(3)
Variables			
Optimism (1 SD)	0.0529***	0.0252***	-0.0049
	(0.0067)	(0.0063)	(0.0056)
Under Thirty	-0.1601***		
	(0.0179)		
Optimism (1 SD) × Under Thirty	-0.0481***		
	(0.0073)		
Thirty to Thirty-Nine		0.4464***	
		(0.0137)	
Optimism (1 SD) × Thirty to Thirty-Nine		0.0071	
		(0.0077)	
Forty to Forty-Nine			-0.3223***
			(0.0252)
Optimism (1 SD) × Forty to Forty-Nine			0.0412***
			(0.0110)
Married	0.4516***	0.4310***	0.5796***
	(0.0233)	(0.0201)	(0.0243)
Employed	-0.0114	-0.0173	0.0378***
	(0.0123)	(0.0129)	(0.0116)
Income Quintile 2	-0.3404***	-0.3377***	-0.3391***
	(0.0170)	(0.0169)	(0.0170)
Income Quintile 3	-0.6864***	-0.6800***	-0.6845***
	(0.0233)	(0.0234)	(0.0231)
Income Quintile 4	-1.021***	-1.011***	-1.021***
	(0.0331)	(0.0334)	(0.0328)
Income Quintile 5	-1.430***	-1.419***	-1.428***
	(0.0501)	(0.0506)	(0.0503)
College	0.0678***	0.0384*	0.0627***
	(0.0215)	(0.0218)	(0.0231)
Religion Important	0.0496**	0.0559***	0.0682***
	(0.0219)	(0.0214)	(0.0214)
Fixed-effects			
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Fit statistics			
Observations	751,832	751,832	751,832
R^2	0.35114	0.35956	0.35437
Within R^2	0.11076	0.12229	0.11518

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*
Source: Gallup World Poll (2005-2025). Sample is restricted to reproductive-aged men and women

Table 5: Individual Optimism and Co-resident Children by Religion Importance

Dependent Variable:	Number of Household Children
Model:	(1)
Variables	
Optimism (1 SD)	0.0569***
	(0.0067)
Religion Important	0.0652***
	(0.0226)
Optimism (1 SD) × Religion Important	-0.0468***
	(0.0109)
Male	-0.0743***
	(0.0113)
Married	0.5992***
	(0.0253)
Employed	0.0745***
	(0.0089)
Income Quintile 2	-0.3198***
	(0.0171)
Income Quintile 3	-0.6627***
	(0.0232)
Income Quintile 4	-0.9976***
	(0.0333)
Income Quintile 5	-1.428***
	(0.0527)
College	0.0707***
	(0.0177)
Age	-0.0011
	(0.0010)
Fixed-effects	
Year FE	Yes
Country FE	Yes
Fit statistics	
Observations	1,411,299
R^2	0.35191
Within R^2	0.12145

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Source: Gallup World Poll (2005-2025). Sample is restricted to reproductive-aged men and women (15-49). Number of children refers to the number of children living in the respondent's household (0-20). Optimism is standardized to have mean zero and standard deviation one. Regressions use Gallup World Poll survey weights.

Table 6: Optimism Index Categories and Co-resident Children

Dependent Variable:	Number of Household Children		
Model:	(1)	(2)	(3)
Variables			
Improving Living Standards	0.0324***		
	(0.0082)		
Improving Economic Conditions		0.0331***	
		(0.0077)	
Improving Life			0.0758***
			(0.0102)
Male	-0.0774***	-0.0780***	-0.0755***
	(0.0113)	(0.0113)	(0.0111)
Married	0.6011***	0.6009***	0.5986***
	(0.0256)	(0.0254)	(0.0253)
Employed	0.0746***	0.0760***	0.0774***
	(0.0090)	(0.0091)	(0.0096)
Income Quintile 2	-0.3201***	-0.3187***	-0.3193***
	(0.0172)	(0.0172)	(0.0174)
Income Quintile 3	-0.6637***	-0.6616***	-0.6629***
	(0.0233)	(0.0233)	(0.0234)
Income Quintile 4	-0.9996***	-0.9976***	-1.000***
	(0.0333)	(0.0333)	(0.0335)
Income Quintile 5	-1.431***	-1.426***	-1.432***
	(0.0527)	(0.0528)	(0.0528)
College	0.0709***	0.0726***	0.0622***
	(0.0175)	(0.0182)	(0.0174)
Age	-0.0012	-0.0013	-0.0007
	(0.0010)	(0.0010)	(0.0010)
Fixed-effects			
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Fit statistics			
Observations	1,402,431	1,398,371	1,318,339
R^2	0.35151	0.35191	0.35359
Within R^2	0.12082	0.12099	0.12221

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Source: Gallup World Poll (2005-2025). Sample is restricted to reproductive-aged men and women (15-49). Number of children refers to the number of children living in the respondent's household (0-20). Optimism is standardized to have mean zero and standard deviation one. Regressions use Gallup World Poll survey weights.

Table 7: National Optimism, SCI-Weighted Foreign Optimism Exposure, and Total Fertility

Dependent Variable:	TFR					
Model:	Baseline (1)	GDP Control (2)	Full Controls (3)	Baseline (4)	GDP Control (5)	Full Controls (6)
Variables						
Optimism (1 SD)	0.0356**	0.0369**	0.0228*			
	(0.0152)	(0.0163)	(0.0136)			
Foreign Optimism Shock (1 SD)				0.0155*	0.0154*	0.0016
				(0.0083)	(0.0086)	(0.0072)
Log GDP Per Capita		-0.0183	-0.1539**		0.0032	-0.1365*
		(0.0814)	(0.0694)		(0.0796)	(0.0722)
FLFP			0.0012			0.0012
			(0.0022)			(0.0022)
Female Education			-0.0051			-0.0049
			(0.0033)			(0.0034)
Share Religious			-0.1025			-0.1100
			(0.1415)			(0.1444)
Unemployment Rate			-0.0197***			-0.0212***
			(0.0039)			(0.0042)
Remittance Share			-0.0193**			-0.0184**
			(0.0079)			(0.0081)
Fixed-effects						
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics						
Observations	950	950	950	950	950	950
R^2	0.98234	0.98235	0.98470	0.98215	0.98215	0.98458
Within R^2	0.01960	0.01992	0.15069	0.00897	0.00898	0.14394

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Standard errors clustered at the country level. Optimism is standardized to have mean zero and standard deviation one. Regressions use Gallup World Poll survey weights.

A Online Appendix

A.1 Gallup World Poll question wording

A.1.1 Optimism Index

The Optimism Index combines the following items:

- "Right now, do you feel your standard of living is getting better or getting worse?"
- "Right now, do you think that economic conditions in the city or area where you live, as a whole, are getting better or getting worse?"
- "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom represents the worst possible life for you. On which step do you think you will stand in the future, say about five years from now?"

The first two items are coded as binary indicators. The expected-life item is rescaled from 0–10 to 0–1. The index equals the mean of the valid components multiplied by 100.

A.1.2 Life Evaluation Index

Gallup measures current and expected life evaluation using the Cantril Self-Anchoring Striving Scale:

- "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"

- "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom represents the worst possible life for you. Just your best guess, on which step do you think you will stand in the future, say about five years from now?"

Respondents are classified as thriving when current life evaluation is at least 7 and expected life evaluation is at least 8. They are classified as suffering when both current and expected life evaluation are 4 or below. All other respondents are classified as struggling.

A.2 Correspondence between household child co-residence and TFR

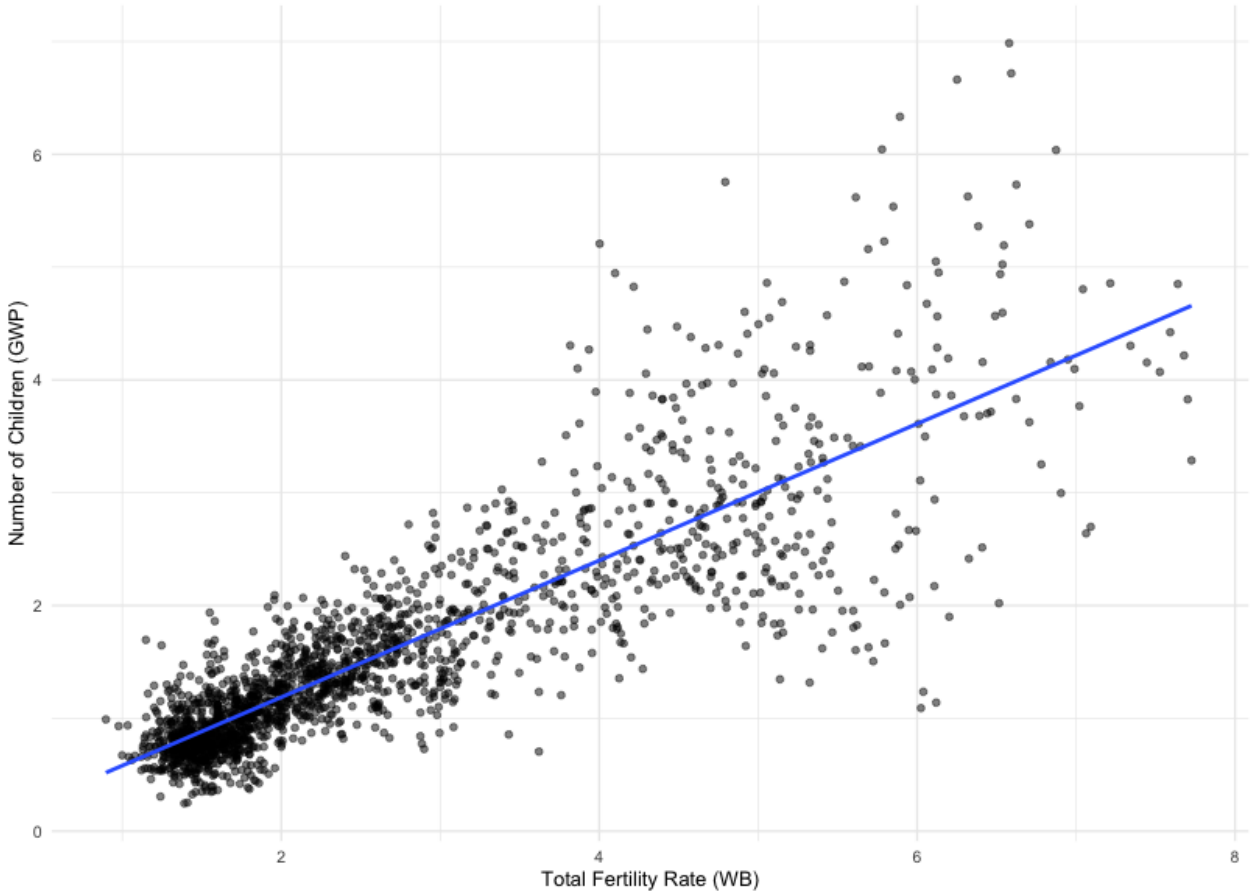


Figure A.1: Country-Year Mean Co-resident Children Under Age 15 and Total Fertility

Notes: The figure contains 966 country-year observations. The horizontal axis reports World Bank total fertility rates. The vertical axis reports the country-year mean number of children under age 15 living in the household among Gallup World Poll respondents ages 15–49. The fitted line is descriptive. The two outcomes are measured on different scales and capture a period fertility rate and a household stock, respectively.

References

Adsera, A. (2004). Changing fertility rates in developed countries. the impact of labor market institutions. *Journal of population economics*, 17(1):17–43.

Adsera, A. (2005). Vanishing children: From high unemployment to low fertility in developed countries. *American Economic Review*, 95(2):189–193.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2):179–211.

Angeletos, G.-M. and La'O, J. (2013). Sentiments. *Econometrica*, 81(2):739–779.

Bailey, M., Cao, R., Kuchler, T., Stroebel, J., and Wong, A. (2018a). The economic effects of social networks: Evidence from the housing market. *Journal of Political Economy*, 126(6):2224–2276.

Bailey, M., Farrell, P., Kuchler, T., and Stroebel, J. (2018b). Social connectedness: Measurement, determinants, and effects. *Journal of Economic Perspectives*, 32(3):259–280.

Barsky, R. B. and Sims, E. R. (2012). Information, animal spirits, and the meaning of innovations in consumer confidence. *American Economic Review*, 102(4):1343–1377.

Beaudry, P. and Portier, F. (2006). Stock prices, news, and economic fluctuations. *American Economic Review*, 96(4):1293–1307.

Black, D. A., Kolesnikova, N., Sanders, S. G., and Taylor, L. J. (2013). Are children "normal"? *The review of economics and statistics*, 95(1):21–33.

Blanchard, O. J., L'Huillier, J.-P., and Lorenzoni, G. (2013). News, noise, and fluctuations: An empirical exploration. *American Economic Review*, 103(7):3045–3070.

Carroll, C. D., Fuhrer, J. C., and Wilcox, D. W. (1994). Does consumer sentiment forecast household spending? if so, why? *American Economic Review*, 84(5):1397–1408.

Coibion, O. and Gorodnichenko, Y. (2015). Information rigidity and the expectations formation process: A simple framework and new facts. *American Economic Review*, 105(8):2644–2678.

Comolli, C. L. (2017). The fertility response to the great recession in europe and the united states: Structural economic conditions and perceived economic uncertainty. *Demographic Research*, 36(51):1549–1600.

Deaton, A. (2008). Income, health, and well-being around the world: Evidence from the gallup world poll. *Journal of Economic Perspectives*, 22(2):53–72.

Doepke, M., Hannusch, A., Kindermann, F., and Tertilt, M. (2023). The economics of fertility: A new era. In *Handbook of the Economics of the Family*, volume 1, pages 151–254. Elsevier.

Doepke, M. and Kindermann, F. (2019). Bargaining over babies: Theory, evidence, and policy implications. *American Economic Review*, 109(9):3264–3306.

Easterlin, R. A. (1961). The american baby boom in historical perspective. *The American Economic Review*, 51(5):869–911.

Geruso, M. and Spears, D. (2025). Childless or child-fewer? childlessness and parity progression where fertility is below replacement. Technical report, National Bureau of Economic Research.

Gillitzer, C. and Prasad, N. (2018). The effect of consumer sentiment on consumption: Cross-sectional evidence from elections. *American Economic Journal: Macroeconomics*, 10(4):234–269.

Goldin, C. and Katz, L. F. (2002). The power of the pill: Oral contraceptives and women's career and marriage decisions. *Journal of political Economy*, 110(4):730–770.

Jones, C. I. (2022). The end of economic growth? unintended consequences of a declining population. *American Economic Review*, 112(11):3489–3527.

Kearney, M. S. and Wilson, R. (2018). Male earnings, marriageable men, and nonmarital fertility: Evidence from the fracking boom. *Review of Economics and Statistics*, 100(4):678–690.

Lappegård, T., Kristensen, A. P., Dommermuth, L., Minello, A., and Vignoli, D. (2022). The impact of narratives of the future on fertility intentions in norway. *Journal of Marriage and Family*, 84(2):476–493.

Lee, R., Mason, A., and Network, N. T. A. (2014). Is low fertility really a problem? population aging, dependency, and consumption. *Science*, 346(6206):229–234.

Ludvigson, S. C. (2004). Consumer confidence and consumer spending. *Journal of Economic Perspectives*, 18(2):29–50.

Makridis, C. A. (2022). The social transmission of economic sentiment on consumption. *European Economic Review*, 148:104232.

Makridis, C. A. and Wang, T. (2024). Learning from friends in a pandemic: Social networks and the macroeconomic response of consumption. *European Economic Review*, 169.

Matera, C., Dommermuth, L., Bacci, S., Bertaccini, B., Minello, A., and Vignoli, D. (2023). Perceived economic uncertainty and fertility intentions in couples: A dyadic extension of the theory of planned behaviour. *Journal of Family and Economic Issues*, 44(4):790–806.

Mencarini, L., Vignoli, D., and Gottard, A. (2015). Fertility intentions and outcomes: Implementing the theory of planned behavior with graphical models. *Advances in Life Course Research*, 23:14–28.

Piano, C. E. and Stone, L. R. (2024). The fertility gap and economic freedom. *Contemporary Economic Policy*.

Stone, L. (2019). The global fertility gap. *The Institute for Family Studies Blog*.

Vignoli, D., Minello, A., Bazzani, G., Matera, C., and Rapallini, C. (2022). The influence of narratives of the future on fertility: A laborator experiment. *European Journal of Population*, 38(6):913–936.