The Impact of Children on Parental Happiness: Unraveling Gender, Education, and Economic Dynamics

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Abstract

This study examines how parenthood influences life satisfaction for parents in Germany using a longitudinal dataset (pairfam). Fixed effects models account for unobserved individual characteristics, revealing how factors like gender, education, and socioeconomic status interact with the impact of children on happiness over time. The analysis finds that having children is associated with higher life satisfaction, but this effect varies depending on parental demographics and resources. These findings highlight the complex relationship between parenthood and well-being, suggesting avenues for further research. Future studies could explore heterogeneity within the German population, delve deeper into the mechanisms influencing these effects, and analyze policy implications in the German context. This research contributes to a more nuanced understanding of how parenthood shapes life satisfaction across different demographic groups, with potential applications for policy and societal well-being in Germany.

Keywords: Life satisfaction Happiness Children Fixed Effects Parental status

1. Introduction

The main research question for this study is: "Do children make people happy? Are there differences in the effect on happiness by gender, education, and economic conditions?"

Previous Research on the relationship between children and parental happiness reveals complex dynamics. Angeles (2010) found that while children generally increase happiness, this effect is contingent on individual characteristics. Musick (Musick et al., 2016) further explored this, noting that parents report greater well-being in activities with children, but mothers experience more stress and fatigue. The happiness trajectory of parents may vary by age at parenthood, socioeconomic status, and gender. Those who have children at older ages or who have more education have a particularly positive happiness response to first birth (Myrskylä & Margolis, 2014). Meanwhile, women with more social and economic resources have less steep post-birth dips in life satisfaction than those with fewer resources (Myrskylä & Margolis, 2014).

These studies collectively suggest that while children can bring happiness, this is moderated by various factors, including gender, marital status, and education.

2. Theory & Hypothesis

Based on the previous research, our hypothesis for this study is that the influence of children on happiness will be different based on gender, education, and economic circumstances. We predict that having children will positively affect individuals' overall happiness, with this impact being moderated by gender and economic status. Therefore, the Hypotheses are:

Hypothesis 1: Women will experience a more significant rise in happiness from having children compared to men.

Hypothesis 2: Individuals with higher levels of education will experience a greater increase in happiness from having children compared to those with lower levels of education.

Hypothesis 3: The effect of children on happiness will be more pronounced for individuals with greater economic resources than those with fewer economic resources.

3. Data & Analytical Sample

Data and analytical sample

The pairfam dataset, which stands for "Panel Analysis of Intimate Relationships and Family Dynamics," is a comprehensive dataset that provides longitudinal information on various aspects of individuals' lives, including their relationships, family dynamics, and subjective well-being aspects of individuals and their families in Germany.

The sample size consists of 12313 respondents and 62046 observations (person-years) from the pairfam dataset, originally containing 103172 observations. Individuals who participated in the educational program or belong to the 2001-2003 cohort are not included, and the respondents' ages are restricted to between 20 and 49 for research purposes (33574 observations excluded). Besides, respondents who have missing data on key variables such as gender, education, labour force status, net equivalence income and happiness measures are excluded from the analysis (7552 observations excluded).

The sample includes data from 2008 to 2018, providing a decade's worth of information for analysis. Thus, the sample is representative of a diverse range of individuals in Germany and allows for a comprehensive examination of the hypothesized relationships between children and parental happiness.

Description of variables and sample statistics

The dependent variable in this study is parental happiness, which refers to the subjective well-being or life satisfaction of parents. We will utilize the variable, "Zufriedenheit mit Leben insgesamt", which means the general satisfaction with life.

This variable uses a standardized scale ranging from 0 to 10, where higher values indicate greater happiness. To measure the effect of children on parental happiness, we will compare the happiness level of respondents before and after the birth of a child.

The independent variables in this study include the count of children and various characteristics of the respondents, such as their gender, educational background, and socioeconomic status (measured by labour force status and net equivalence income). In linear regression, we will also control for other potential confounding variables, such as age and cohort.

- **Number of Children**: This will help us understand if the number of children a person has impacted their general happiness.
- **Age**: This variable captures the age of the parents, which can play a role in their happiness and the way they perceive the impact of children.
- **Cohort**: The annually collected survey data from a nationwide random sample of more than 12,000 persons of the three birth cohorts 1971-73, 1981-83, 1991-93 and their partners, parents, and children throughout multiple life phases.
- **Gender**: To understand if the impact of children on happiness differs between mothers and fathers.
- **Education Level:** The education level is divided into three categories: "1-Lower Secondary or lower", "2-Upper and Post Secondary", and "3-Tertiary Education".
- **Labour Force Status:** The variable captures whether the parents are currently “1-working” or “2-non-working”.
- **Net equivalence income (OECD):** This variable represents the household income adjusted for family size and composition, allowing for a comparison of economic status across different households.

Table 1 presents the sample statistics of the participants in the survey assessment on the impact of children on parental happiness in Germany. Here's a quick look at the numbers: Most people (40.8%) have no children, but a significant portion (22.0% + 25.9% = 47.9%) have 1 or 2 children. Over half (56.1%) have an upper secondary or post-secondary education, while 36.1% have a tertiary education. The majority (81.9%) are working, with a smaller portion not working (15.3%). The average net equivalence income is 1770.

Table 1. *Sample Statistics of Main Independent Variable and Explanatory Variables*

	0-No children (N=25338)	1-1 child (N=13621)	2-2 children (N=16053)	3-3 or more children (N=7034)	Overall (N=62046)
Satisfaction with life					
Mean (SD)	7.38 (1.69)	7.52 (1.69)	7.62 (1.62)	7.54 (1.78)	7.49 (1.69)
Median [Min, Max]	8.00 [0, 10.0]	8.00 [0, 10.0]	8.00 [0, 10.0]	8.00 [0, 10.0]	8.00 [0, 10.0]
KIDS					
0-No children	25338 (100%)	0 (0%)	0 (0%)	0 (0%)	25338 (40.8%)
1-1 child	0 (0%)	13621 (100%)	0 (0%)	0 (0%)	13621 (22.0%)
2-2 children	0 (0%)	0 (0%)	16053 (100%)	0 (0%)	16053 (25.9%)
3-3 or more children	0 (0%)	0 (0%)	0 (0%)	7034 (100%)	7034 (11.3%)
Age					
Mean (SD)	31.0 (6.69)	35.9 (6.35)	38.1 (5.51)	39.0 (5.10)	34.8 (6.99)
Median [Min, Max]	29.0 [20.0, 49.0]	37.0 [20.0, 49.0]	38.0 [20.0, 49.0]	39.0 [23.0, 49.0]	36.0 [20.0, 49.0]
Cohort					
1-1991-1993	8211 (32.4%)	1005 (7.4%)	338 (2.1%)	80 (1.1%)	9634 (15.5%)
2-1981-1983	11889 (46.9%)	6007 (44.1%)	5749 (35.8%)	2131 (30.3%)	25776 (41.5%)
3-1971-1973	5238 (20.7%)	6609 (48.5%)	9966 (62.1%)	4823 (68.6%)	26636 (42.9%)
Gender					
1-Female	11217 (44.3%)	8048 (59.1%)	10099 (62.9%)	4504 (64.0%)	33868 (54.6%)
2-Male	14121 (55.7%)	5573 (40.9%)	5954 (37.1%)	2530 (36.0%)	28178 (45.4%)
EDU					
1-Lower Secondary or below	1609 (6.4%)	1047 (7.7%)	1237 (7.7%)	970 (13.8%)	4863 (7.8%)
2-Upper and Post Secondary	13970 (55.1%)	8273 (60.7%)	8683 (54.1%)	3858 (54.8%)	34784 (56.1%)
3-Tertiary Education	9759 (38.5%)	4301 (31.6%)	6133 (38.2%)	2206 (31.4%)	22399 (36.1%)
Labor Force Status					
1-Working	21757 (85.9%)	10813 (79.4%)	13268 (82.7%)	4996 (71.0%)	50834 (81.9%)
2-Non-Working	2325 (9.2%)	2589 (19.0%)	2620 (16.3%)	1977 (28.1%)	9511 (15.3%)
Missing	1256 (5.0%)	219 (1.6%)	165 (1.0%)	61 (0.9%)	1701 (2.7%)
Net equivalence income (OECD)					
Mean (SD)	1960 (1440)	1710 (1140)	1670 (1130)	1420 (966)	1770 (1270)
Median [Min, Max]	1800 [0.500, 52000]	1560 [1.00, 36900]	1520 [59.5, 41000]	1260 [43.1, 27100]	1610 [0.500, 52000]

Description of method and research strategy

This study will utilize longitudinal data from the pairfam dataset to examine the relationship between children and parental happiness, with a specific focus on the educational background, socioeconomic status, and gender of the parents. The longitudinal nature of the pairfam dataset allows for examining changes in individuals' happiness before and after the birth of a child.

We will employ fixed effects models to account for unobserved individual characteristics and better understand how various factors, such as gender, education, and economic resources, interact with the impact of children on parental happiness over time. The heterogeneities should be studied, and subgroup FE analyses should be conducted based on gender, education, and economic conditions to assess the differential impact of children on parental happiness.

4. Results

Descriptive statistics

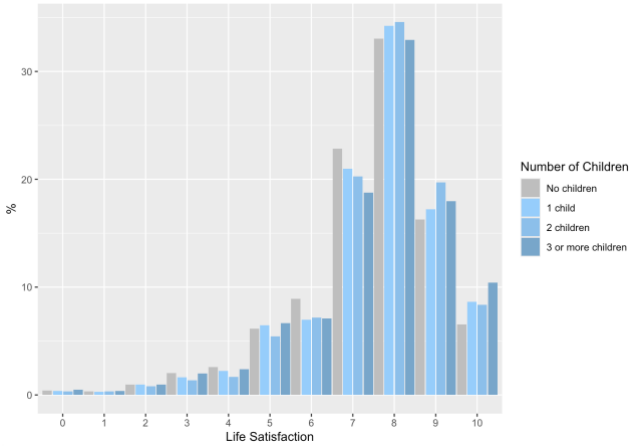
The survey findings indicate that a high proportion of participants rated their quality of life as 7, 8, or 9 (see **Figure 1** below). Based on the data available, the average happiness score for life is calculated to be 7.49.

Notably, the results reveal that parents have an average of 1.12 children based on the survey responses.

The distribution of life satisfaction score is shown in Figure 1 with the X-axis representing the happiness score and the Y-axis representing the frequency of respondents.

The reported level of life satisfaction can vary based on the number of children an individual has, but no clear patterns are apparent.

Figure 1. *Distribution of Life Satisfaction Scores*



Regression results

Impact of Having Children:

Table 2. *OLS Regression and Fixed Effects Regression Results Comparison*

	OLS			Fixed Effects		
Characteristic	**Beta**	**95% CI[†]**	**p-value**	**Beta**	**95% CI[†]**	**p-value**
KIDS						
0-No children	—	—		—	—	
1-1 child	0.39	0.36, 0.43	<0.001	0.12	0.06, 0.18	<0.001
2-2 children	0.53	0.49, 0.56	<0.001	-0.01	-0.09, 0.06	0.8
3-3 or more children	0.62	0.58, 0.67	<0.001	0.02	-0.09, 0.13	0.7
Gender						
1-Female	—	—				
2-Male	-0.12	-0.15, -0.10	<0.001			
Age	-0.06	-0.21, 0.09	0.4			
Cohort						
1-1991-1993	—	—				
2-1981-1983	-0.23	-0.38, -0.07	0.004			
3-1971-1973	-0.50	-0.80, -0.19	0.001			
EDU						
1-Lower Secondary or below	—	—				
2-Upper and Post Secondary	0.28	0.23, 0.33	<0.001			
3-Tertiary Education	0.49	0.44, 0.55	<0.001			
Labor Force Status						
1-Working	—	—				
2-Non-Working	-0.62	-0.66, -0.58	<0.001			
Net equivalence income (OECD)	0.16	0.15, 0.17	<0.001			
WAVE						
1	—	—		—	—	
2	-0.06	-0.13, 0.00	0.061	0.03	-0.03, 0.08	0.3
3	-0.18	-0.25, -0.11	<0.001	-0.05	-0.11, 0.00	0.052
4	-0.23	-0.31, -0.16	<0.001	-0.10	-0.15, -0.04	<0.001
5	-0.19	-0.28, -0.10	<0.001	-0.04	-0.10, 0.01	0.13
6	-0.16	-0.26, -0.06	0.001	-0.01	-0.07, 0.04	0.6
7	-0.24	-0.35, -0.13	<0.001	-0.06	-0.12, 0.00	0.049
8	-0.26	-0.38, -0.13	<0.001	-0.07	-0.13, -0.01	0.019
9	-0.22	-0.36, -0.08	0.002	0.00	-0.06, 0.06	>0.9
10	-0.26	-0.41, -0.11	<0.001	-0.02	-0.08, 0.04	0.5
11	-0.28	-0.45, -0.12	<0.001	-0.05	-0.11, 0.01	0.081
12	-0.29	-0.46, -0.11	0.002	-0.01	-0.07, 0.05	0.7
13	-0.46	-0.65, -0.27	<0.001	-0.19	-0.25, -0.13	<0.001

[†] CI = Confidence Interval

In the initial phase, we will assess the influence of parenthood on general happiness of life through OLS and Fixed Effects regression analyses. The results indicate that parenthood does have an impact (see Table 2).

- **OLS Model:** The coefficients for KIDS (number of children) are all positive and statistically significant compared to having no children. This suggests that having children is associated with higher life satisfaction in the OLS model. However, this association **may be upwardly biased due to unobserved characteristics** of individuals who choose to have children.
- **FE Model:** The coefficients for '1 child' are smaller in the FE model compared to the OLS model, '2 children' and '3 or more children' are not significant. This suggests that the initial positive association between children and life satisfaction in the OLS model might be inflated due to unobserved characteristics of individuals who choose to have children.

Other Factors in the OLS model:

- **Gender:** Males have slightly lower life satisfaction than females in the OLS model.
- **Age:** Age has a weak negative coefficient which is not significant. The coefficient is -0.06 which means that for every 10 years older, life satisfaction is estimated to decrease by 0.06.
- **Cohort:** People born in earlier cohorts (1971-1973) have a lower life satisfaction score compared to the most recent cohort (1991-1993).
- **Education:** Higher education levels are associated with higher life satisfaction.
- **Work Status:** People who are not working have a lower life satisfaction score compared to working people.
- **OECD Income:** Higher net equivalence income is associated with higher life satisfaction. The coefficient is 0.16 which means that for every 1000 income increase in net equivalence income, life satisfaction is expected to increase by 0.16.

Model Refinement

We will explore these findings further through subgroup analyses to account for potential unobserved heterogeneity. The following analysis will investigate the effects of gender, education, and socioeconomic factors on life satisfaction to gain a deeper understanding of their impact on individual well-being. In particular, we will examine if the relationship between children and life satisfaction differs by gender (mothers vs. fathers), education level (secondary school vs. tertiary education), or income level (low vs. high income).

Impact of Having Children by Gender:

Table 3. *Fixed Effects Regression Results by Gender*

	Female			Male		
Characteristic	**Beta**	**95% CI[†]**	**p-value**	**Beta**	**95% CI[†]**	**p-value**
KIDS						
0-No children	—	—		—	—	
1-1 child	0.22	0.13, 0.30	<0.001	0.03	-0.05, 0.11	0.4
2-2 children	0.06	-0.05, 0.16	0.3	-0.06	-0.16, 0.04	0.3
3-3 or more children	0.04	-0.12, 0.19	0.6	0.05	-0.12, 0.21	0.6
WAVE						
1	—	—		—	—	
2	0.04	-0.04, 0.11	0.3	0.01	-0.07, 0.09	0.9
3	-0.05	-0.12, 0.02	0.2	-0.07	-0.15, 0.01	0.10
4	-0.06	-0.13, 0.02	0.13	-0.16	-0.24, -0.08	<0.001
5	-0.02	-0.09, 0.06	0.6	-0.08	-0.16, 0.00	0.051
6	0.03	-0.04, 0.11	0.4	-0.08	-0.16, 0.00	0.063
7	-0.02	-0.10, 0.06	0.6	-0.11	-0.19, -0.02	0.013
8	-0.02	-0.10, 0.06	0.7	-0.14	-0.23, -0.06	0.001
9	0.06	-0.02, 0.14	0.14	-0.09	-0.17, 0.00	0.058
10	0.05	-0.03, 0.13	0.3	-0.11	-0.20, -0.02	0.019
11	-0.01	-0.09, 0.07	0.9	-0.12	-0.21, -0.03	0.010
12	0.07	-0.01, 0.16	0.077	-0.12	-0.21, -0.03	0.007
13	-0.17	-0.26, -0.09	<0.001	-0.21	-0.31, -0.12	<0.001

[†] CI = Confidence Interval

A weak positive association be shown in **Table 3** with having 1 child for females but not for males. The effect for other categories (2 or more children) is insignificant for either gender.

Impact of Having Children by Education Level:

Table 4. *Fixed Effects Regression Results by Education*

	Lower Secondary or below			Upper and Post Secondary			Tertiary Education		
Characteristic	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**
KIDS									
0-No children	—	—		—	—		—	—	
1-1 child	0.12	-0.24, 0.47	0.5	0.14	0.05, 0.22	0.001	0.11	0.03, 0.19	0.009
2-2 children	0.47	0.05, 0.89	0.028	0.06	-0.05, 0.17	0.3	-0.12	-0.22, -0.02	0.016
3-3 or more children	0.44	-0.12, 0.99	0.12	0.04	-0.12, 0.20	0.6	-0.01	-0.16, 0.15	>0.9
WAVE									
1	—	—		—	—		—	—	
2	-0.08	-0.29, 0.14	0.5	0.06	-0.01, 0.13	0.080	-0.03	-0.12, 0.06	0.5
3	-0.04	-0.27, 0.18	0.7	-0.05	-0.12, 0.03	0.2	-0.10	-0.19, -0.01	0.024
4	0.08	-0.15, 0.30	0.5	-0.08	-0.15, -0.01	0.031	-0.20	-0.29, -0.11	<0.001
5	0.03	-0.20, 0.26	0.8	-0.04	-0.11, 0.04	0.3	-0.10	-0.19, -0.01	0.028
6	0.18	-0.06, 0.42	0.2	-0.01	-0.09, 0.06	0.7	-0.10	-0.19, 0.00	0.039
7	0.07	-0.19, 0.32	0.6	-0.05	-0.13, 0.02	0.2	-0.12	-0.21, -0.03	0.013
8	0.12	-0.15, 0.38	0.4	-0.05	-0.13, 0.03	0.2	-0.17	-0.26, -0.08	<0.001
9	0.26	-0.01, 0.53	0.058	0.01	-0.07, 0.09	0.8	-0.11	-0.20, -0.02	0.022
10	-0.05	-0.33, 0.23	0.7	0.04	-0.04, 0.12	0.3	-0.14	-0.24, -0.05	0.004
11	-0.09	-0.37, 0.19	0.5	-0.02	-0.10, 0.06	0.7	-0.14	-0.23, -0.05	0.003
12	0.03	-0.25, 0.31	0.8	0.04	-0.05, 0.12	0.4	-0.12	-0.22, -0.03	0.010
13	0.09	-0.21, 0.38	0.6	-0.12	-0.21, -0.04	0.005	-0.34	-0.44, -0.24	<0.001

[1] CI = Confidence Interval

Table 4 shows a positive association with having 1 child for all education levels, but it's only significant for medium (Upper and Post Secondary) and high education (Tertiary Education). The effect for other categories (2 or more children) is positive for low education (FE_E1) but negative or not significant for medium and high education. This suggests that the impact of having children on life satisfaction varies based on individuals' education levels.

Impact of Having Children by Working Status:

Table 5 (see next page) presents a comparison of life satisfaction between those who are employed and those who are not. The data indicates a potential link between having two children and higher life satisfaction, but only among employed individuals. Other demographic categories did not show significant statistical associations with life satisfaction. However, the models explain a small portion of the variation in life satisfaction, so other factors likely play a role.

Impact of Having Children by OECE Income:

This analysis investigates the association between life satisfaction and parenthood among various income brackets. The findings from **Table 6** (see next page) indicate that the influence of having children on life contentment may differ based on income levels. It is evident that the presence of firstborn children significantly affects life satisfaction for those with moderate to high incomes. Individuals with lower incomes appear to experience less positive impact in terms of life satisfaction from having children, while participants in higher income brackets also report lower levels of overall happiness compared to those in the moderate-income group.

Table 5. *Fixed Effects Regression Results by Working Status*

	Working			Non-Working		
Characteristic	**Beta**	**95% CI**[1]	**p-value**	**Beta**	**95% CI**[1]	**p-value**
KIDS						
0-No children	—	—		—	—	
1-1 child	0.01	-0.05, 0.07	0.8	0.26	-0.02, 0.53	0.065
2-2 children	-0.11	-0.19, -0.03	0.009	0.09	-0.22, 0.40	0.6
3-3 or more children	-0.02	-0.15, 0.10	0.7	0.04	-0.34, 0.42	0.8
WAVE						
1	—	—		—	—	
2	0.04	-0.01, 0.10	0.14	-0.14	-0.31, 0.03	0.11
3	-0.05	-0.11, 0.01	0.11	-0.26	-0.44, -0.09	0.003
4	-0.11	-0.17, -0.05	<0.001	-0.19	-0.37, 0.00	0.051
5	-0.06	-0.12, 0.00	0.067	-0.16	-0.36, 0.04	0.11
6	-0.02	-0.08, 0.05	0.6	-0.16	-0.36, 0.04	0.11
7	-0.06	-0.12, 0.01	0.075	-0.28	-0.49, -0.07	0.008
8	-0.08	-0.14, -0.02	0.013	-0.22	-0.44, 0.00	0.046
9	-0.02	-0.09, 0.04	0.5	-0.13	-0.36, 0.10	0.3
10	-0.02	-0.09, 0.04	0.5	-0.13	-0.37, 0.11	0.3
11	-0.05	-0.11, 0.02	0.13	-0.27	-0.51, -0.04	0.024
12	-0.02	-0.09, 0.04	0.5	-0.19	-0.44, 0.05	0.12
13	-0.18	-0.25, -0.11	<0.001	-0.39	-0.64, -0.14	0.002

[1] CI = Confidence Interval

Table 6. *Fixed Effects Regression Results by OECD Income*

	OECD Income < 1000			OECD Income 1000-2000			OECD Income > 2000		
Characteristic	**Beta**	**95% CI**[1]	**p-value**	**Beta**	**95% CI**[1]	**p-value**	**Beta**	**95% CI**[1]	**p-value**
KIDS									
0-No children	—	—		—	—		—	—	
1-1 child	-0.04	-0.34, 0.25	0.8	0.23	0.14, 0.33	<0.001	0.10	0.01, 0.18	0.021
2-2 children	0.06	-0.30, 0.42	0.7	0.22	0.11, 0.33	<0.001	-0.22	-0.33, -0.11	<0.001
3-3 or more children	0.22	-0.22, 0.66	0.3	0.20	0.04, 0.37	0.014	-0.02	-0.22, 0.17	0.8
WAVE									
1	—	—		—	—		—	—	
2	0.00	-0.15, 0.14	>0.9	0.02	-0.06, 0.09	0.7	0.01	-0.10, 0.12	0.9
3	-0.11	-0.27, 0.04	0.2	-0.07	-0.15, 0.01	0.077	-0.08	-0.18, 0.03	0.2
4	-0.19	-0.35, -0.03	0.019	-0.11	-0.19, -0.03	0.005	-0.16	-0.27, -0.06	0.003
5	-0.05	-0.22, 0.12	0.6	-0.11	-0.19, -0.03	0.008	-0.09	-0.19, 0.02	0.11
6	-0.02	-0.20, 0.15	0.8	-0.11	-0.19, -0.03	0.007	-0.04	-0.15, 0.07	0.5
7	-0.01	-0.20, 0.18	>0.9	-0.18	-0.26, -0.09	<0.001	-0.09	-0.20, 0.02	0.11
8	-0.02	-0.21, 0.17	0.8	-0.20	-0.28, -0.11	<0.001	-0.14	-0.25, -0.03	0.012
9	0.05	-0.16, 0.25	0.7	-0.14	-0.22, -0.05	0.002	-0.12	-0.23, -0.01	0.037
10	-0.05	-0.27, 0.17	0.6	-0.15	-0.24, -0.06	0.001	-0.09	-0.20, 0.02	0.12
11	-0.20	-0.42, 0.03	0.090	-0.23	-0.32, -0.14	<0.001	-0.09	-0.20, 0.01	0.089
12	-0.21	-0.46, 0.03	0.080	-0.09	-0.18, 0.01	0.072	-0.12	-0.23, -0.02	0.024
13	-0.35	-0.60, -0.09	0.008	-0.26	-0.36, -0.16	<0.001	-0.33	-0.44, -0.22	<0.001

[1] CI = Confidence Interval

5. Conclusion

Summary of main results:

The analysis finds that having children has a positive association with life satisfaction, but unobserved characteristics might inflate this effect in a simple OLS model. Fixed effects models address this issue and show a weaker positive association, particularly for having one child. Other factors like gender, education, and income also influence life satisfaction.

- **Hypothesis 1:** The analysis found a weak positive association with having one child for females but not for males in the fixed effects model (**Table 3**). This suggests that women might experience a slightly larger increase in happiness from having one child compared to men. However, the effect of having two or more children was not significant for either gender.
- **Hypothesis 2:** The analysis investigated how education level interacts with the effect of having children (**Table 4**). There's a positive association with having one child for all education levels, but it's only statistically significant for medium (upper secondary and post-secondary) and high education (tertiary education). The effect of having two or more children is positive for low education but negative or not significant for medium and high education. This suggests that the impact of having children on life satisfaction may be greater for those with medium or high levels of education compared to those with lower education.
- **Hypothesis 3:** The analysis examines work status (**Table 5**) and OECD income (**Table 6**), interacting with the effect of having children. The results suggest that individuals with moderate to high incomes seem to benefit more from having children in terms of life satisfaction compared to those with lower incomes. This aligns with the idea that greater economic resources might help alleviate the challenges of raising children and enhance life satisfaction. The presence of a firstborn child has a significant positive effect on life satisfaction for those in moderate and high-income brackets, while this effect is less clear for those with lower incomes. Interestingly, having two children seems to be associated with higher life satisfaction only among employed individuals. This suggests that social status, as reflected by employment status in this case, might also play a role.

These findings provide valuable insights into the nuanced relationship between having children and life satisfaction across different demographic and socioeconomic groups.

Limitations & Avenues for future research:

Building on the strengths of this longitudinal study with German data, here are some areas for further exploration:

- **Heterogeneity by Subgroups:** The analysis provides valuable insights, but further breakdowns by subgroups within the German population could reveal even more nuanced relationships. For example, examining differences in the effect of parenthood on life satisfaction for East vs. West Germany, immigrants vs. native-born Germans, or single parents vs. two-parent families could offer valuable insights.
- **Mechanisms Underlying the Effects:** This study identifies associations, but future research could delve deeper into the mechanisms that explain how parenthood influences life satisfaction. For example, investigating changes in social connections, work-life balance, or self-identity after having children could provide a clearer picture of the causal pathways.
- **Policy Analysis in the German Context:** Considering the specific social and economic context of Germany, research could explore how existing family policies or potential interventions might influence the relationship between parenthood and life satisfaction. For example, examining the impact of childcare options, parental leave policies, or financial support programs on parents' well-being could be particularly relevant for German policymakers.

Overall, this research highlights the complex relationship between parenthood and life satisfaction. By delving deeper into these areas, researchers can leverage the richness of the longitudinal German data to gain a more comprehensive understanding of the dynamic relationship between parenthood and life satisfaction within the German context, with potential applications for policy and societal well-being.

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R code:

```
library(haven)
library(descr)
library(stargazer)
library(table1)
library(gtsummary)
library(ggplot2)
library(plm)


#### Step 1: data preparation ####
rm(list=ls())
#Read in data: pairfam | Germany | 2008-2018
DATA01 <- read_dta("assets/pairfam_Englishlabels.dta")
# 103172 obs.

# select variables of interest: id, wave, Number of all biological kids, Gender, Age, year of birth, Cohort, Migration status,
DATA02 <- subset(DATA01, select = c(id,wave, nkidsbio, SEX, age, doby_gen, cohort, migstatus,
                                    # General satisfaction with life, Self-assessment: Satisfaction with relationship, Satisfaction with family,
                                    sat6, sat3, sat1i4,
                                    # balance between work and private life, Satisfaction with household's financial situation,
                                    sat7, inc28,
                                    # Household net income, Net equivalence income (OECD), Monthly net household income,
                                    hhincnet, hhincoecd, inc13,
                                    # Highest level of education attained, ISCED, Parter's ISCED,
                                    sd27, isced, pisced,
                                    # Highest vocational degree, Highest school degree,  Socio-Economic Index of Occupational Status
                                    vocat, school, isei,
                                    # Labor force status, Partner's labor force status, Current occupational status
                                    lfs, plfs, job2))

# drop DATA01 to save memory
rm(DATA01)

# filter the observations of the interest

# Age between 20-50 who could have children
DATA03 <- subset(DATA02, DATA02$age >= 20 & DATA02$age < 50)
# select respondents who are not in education
DATA03 <- subset(DATA03, DATA03$isced > 0)     # ISCED (Education): 0 currently enrolled
DATA03 <- subset(DATA03, DATA03$lfs > 0)       # Labor force status: 0 Education
DATA03 <- subset(DATA03, DATA03$cohort < 4)    # Cohort: drop the cohort 4: 2001-2003
# Explanatory Variables:
DATA03 <- subset(DATA03, !is.na(DATA03$SEX))   # Gender
DATA03 <- subset(DATA03, DATA03$nkidsbio >= 0) # Number of all biological kids
DATA03 <- subset(DATA03, DATA03$hhincoecd > 0) # Net equivalence income (OECD)
# Outcome Variable:
DATA03 <- subset(DATA03, DATA03$sat6 >= 0)     # General satisfaction with life
# 62046 obs.

# calculate the number of the respondents by distinct "id"
length(unique(DATA03$id))
# 12313 respondents
```

```
#### Step 2: Generate New Variables ####

#Var: Number of Children
DATA03$KIDS <- NA
DATA03$KIDS[DATA03$nkidsbio==0] <- "0-No children"
DATA03$KIDS[DATA03$nkidsbio==1] <- "1-1 child"
DATA03$KIDS[DATA03$nkidsbio==2] <- "2-2 children"
DATA03$KIDS[DATA03$nkidsbio>=3] <- "3-3 or more children"
DATA03$KIDS <- as.factor(DATA03$KIDS)

#Var: Satisfaction with life
DATA03$SAT <- as.numeric(DATA03$sat6)

#Var: Gender
DATA03$GENDER<- NA
DATA03$GENDER[DATA03$SEX==2]<-"1-Female"
DATA03$GENDER[DATA03$SEX==1]<-"2-Male"
DATA03$GENDER <- as.factor(DATA03$GENDER)

#Var: Cohort
DATA03$COHORT <- NA
DATA03$COHORT[DATA03$cohort==1] <- "1-1991-1993"
DATA03$COHORT[DATA03$cohort==2] <- "2-1981-1983"
DATA03$COHORT[DATA03$cohort==3] <- "3-1971-1973"
DATA03$COHORT <- as.factor(DATA03$COHORT)

#Var: ID & WAVE
DATA03$ID   <- as.factor(DATA03$id)
DATA03$WAVE <- as.factor(DATA03$wave)

#Var: Continuous variables
DATA03$AGE   <- as.numeric(DATA03$age)
DATA03$OECDINC <- as.numeric(DATA03$hhincoecd)

#Var: International Standard Classification of Education (ISCED)
DATA03$EDU <- NA
DATA03$EDU[DATA03$isced==1] <- "1-Lower Secondary or below"
DATA03$EDU[DATA03$isced==2] <- "1-Lower Secondary or below"
DATA03$EDU[DATA03$isced==3] <- "1-Lower Secondary or below"
DATA03$EDU[DATA03$isced==4] <- "2-Upper and Post Secondary"
DATA03$EDU[DATA03$isced==5] <- "2-Upper and Post Secondary"
DATA03$EDU[DATA03$isced==6] <- "2-Upper and Post Secondary"
DATA03$EDU[DATA03$isced==7] <- "3-Tertiary Education"
DATA03$EDU[DATA03$isced==8] <- "3-Tertiary Education"
DATA03$EDU <- as.factor(DATA03$EDU)

#Var: Labor Force Status
DATA03$JOB <- NA
DATA03$JOB[DATA03$lfs==2] <- "2-Non-Working"
DATA03$JOB[DATA03$lfs==3] <- "2-Non-Working"
DATA03$JOB[DATA03$lfs==4] <- "2-Non-Working"
DATA03$JOB[DATA03$lfs==5] <- "2-Non-Working"
DATA03$JOB[DATA03$lfs==6] <- "2-Non-Working"
DATA03$JOB[DATA03$lfs==7] <- "2-Non-Working"
DATA03$JOB[DATA03$lfs==8]  <- "1-Working"
DATA03$JOB[DATA03$lfs==9]  <- "1-Working"
DATA03$JOB[DATA03$lfs==10] <- "1-Working"
DATA03$JOB[DATA03$lfs==11] <- "1-Working"
DATA03$JOB[DATA03$lfs==12] <- "1-Working"
```

```
DATA03$JOB[DATA03$lfs==13] <- "1-Working"
DATA03$JOB <- as.factor(DATA03$JOB)
# choose yes as reference
DATA03$JOB <- relevel(DATA03$JOB, ref = "1-Working")

# Sample Statistics
table1::label(DATA03$SAT)  <- "Satisfaction with life"
table1::label(DATA03$AGE)  <- "Age"
table1::label(DATA03$GENDER)  <- "Gender"
table1::label(DATA03$COHORT)  <- "Cohort"
table1::label(DATA03$JOB)     <- "Labor Force Status"
table1::label(DATA03$OECDINC) <- "Net equivalence income (OECD)"

table1::table1(~ SAT + KIDS + AGE + COHORT + GENDER + EDU + JOB + OECDINC | KIDS, data
= DATA03)
mean(DATA03$SAT)       # 7.49 as the average of life satisfaction
mean(DATA03$nkidsbio)  # 1.12 children per respondent as the average

#### Step 3: analysis of the effect of having children on life satisfaction ####

TABLE1 <- table(DATA03$KIDS,DATA03$SAT)
TABLE2 <- prop.table(TABLE1,1)
TABLE3 <- as.data.frame(TABLE2)
TABLE3$Percent <- TABLE3$Freq*100

# Plot the results
ggplot(TABLE3, aes(fill=Var1, x=Var2, y=Percent)) +
  geom_bar(stat="identity", position=position_dodge(width=1)) +
  ylab("%") +
  xlab("Life Satisfaction") +
  scale_fill_manual(name = "Number of Children",
                    labels = c("No children", "1 child", "2 children", "3 or more children"),
                    values = c("grey", "skyblue1", "skyblue2", "skyblue3"))

# Regression analysis
# AGE * 10 for better interpretation
DATA03$AGE10 <- DATA03$AGE/10
DATA03$OECDINC1000 <- DATA03$OECDINC/1000
OLS1 <- lm(SAT ~ KIDS + GENDER + AGE10 + COHORT + EDU + JOB + OECDINC1000 + WAVE,
data=DATA03)

# Generate the Fixed Effects model
FE1 <- plm(SAT ~ KIDS + WAVE, data = DATA03, index = c("ID", "WAVE"), model = "within")

# View the summary of the Fixed Effects model
OUTPUT_OLS <- tbl_regression(OLS1)
OUTPUT_FE <- tbl_regression(FE1)
tbl_merge( tbls = list(OUTPUT_OLS, OUTPUT_FE),
           tab_spanner = c("OLS", "Fixed Effects"))


# split the sample by GENDER
DATA_F <- subset(DATA03,DATA03$GENDER=="1-Female")
DATA_M <- subset(DATA03,DATA03$GENDER=="2-Male")

FE_F <- plm(SAT ~ KIDS+WAVE, data=DATA_F, index=c("ID","WAVE"), model = "within")
FE_M <- plm(SAT ~ KIDS+WAVE, data=DATA_M, index=c("ID","WAVE"), model = "within")

OUTPUT1 <- tbl_regression(FE_F)
OUTPUT2 <- tbl_regression(FE_M)
```

```
tbl_merge( tbls = list(OUTPUT1, OUTPUT2),
        tab_spanner = c("Female", "Male"))

# split the sample by EDU
DATA_E1 <- subset(DATA03,DATA03$EDU=="1-Lower Secondary or below")
DATA_E2 <- subset(DATA03,DATA03$EDU=="2-Upper and Post Secondary")
DATA_E3 <- subset(DATA03,DATA03$EDU=="3-Tertiary Education")

FE_E1 <- plm(SAT ~ KIDS+WAVE, data=DATA_E1, index=c("ID","WAVE"), model = "within")
FE_E2 <- plm(SAT ~ KIDS+WAVE, data=DATA_E2, index=c("ID","WAVE"), model = "within")
FE_E3 <- plm(SAT ~ KIDS+WAVE, data=DATA_E3, index=c("ID","WAVE"), model = "within")

OUTPUT1 <- tbl_regression(FE_E1)
OUTPUT2 <- tbl_regression(FE_E2)
OUTPUT3 <- tbl_regression(FE_E3)
tbl_merge( tbls = list(OUTPUT1, OUTPUT2, OUTPUT3),
        tab_spanner = c("Lower Secondary or below", "Upper and Post Secondary", "Tertiary
Education"))

# split the sample by working status
DATA_J1 <- subset(DATA03,DATA03$JOB=="1-Working")
DATA_J2 <- subset(DATA03,DATA03$JOB=="2-Non-Working")

FE_J1 <- plm(SAT ~ KIDS+WAVE, data=DATA_J1, index=c("ID","WAVE"), model = "within")
FE_J2 <- plm(SAT ~ KIDS+WAVE, data=DATA_J2, index=c("ID","WAVE"), model = "within")

OUTPUT1 <- tbl_regression(FE_J1)
OUTPUT2 <- tbl_regression(FE_J2)
tbl_merge( tbls = list(OUTPUT1, OUTPUT2),
        tab_spanner = c("Working", "Non-Working"))

# split the sample by OECDINC
DATA_I1 <- subset(DATA03,DATA03$OECDINC<1000)
DATA_I2 <- subset(DATA03,DATA03$OECDINC>=1000 & DATA03$OECDINC<2000)
DATA_I3 <- subset(DATA03,DATA03$OECDINC>=2000)

FE_I1 <- plm(SAT ~ KIDS+WAVE, data=DATA_I1, index=c("ID","WAVE"), model = "within")
FE_I2 <- plm(SAT ~ KIDS+WAVE, data=DATA_I2, index=c("ID","WAVE"), model = "within")
FE_I3 <- plm(SAT ~ KIDS+WAVE, data=DATA_I3, index=c("ID","WAVE"), model = "within")

OUTPUT1 <- tbl_regression(FE_I1)
OUTPUT2 <- tbl_regression(FE_I2)
OUTPUT3 <- tbl_regression(FE_I3)
tbl_merge( tbls = list(OUTPUT1, OUTPUT2, OUTPUT3),
        tab_spanner = c("OECD Income < 1000",
                "OECD Income 1000-2000",
                "OECD Income > 2000"))
```