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Husband's income, wife's income, and number of biological children in the U.S

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ABSTRACT
Previous studies have found that the positive relationship between personal income and fertility for men in the United States is primarily due to childlessness among low-income men. Yet because of the opposite effects of income on fertility for men and women, it is important to examine the effects of income net of spouse's income. An analysis of income from all sources and biological fertility data for husbands and wives from the Survey of Income and Program Participation (2014) shows that for men their own income is positively associated with the number of their biological children, while their spouse's income is negatively associated with total children ever fathered. The reverse is true for women. These results are not because of childlessness among low-income men and high-income women, but also hold true among all those with children. For men and women aged 45–65, who likely have completed fertility, these results hold regardless of whether or not education is controlled. These findings suggest that if status is measured as personal income for men and husband's income for women, the positive relationship between status and fertility persists in a postdemographic transition society.

Previous studies have found that in modern, industrialized societies, higher-income men have more biological children compared to other men and higher-income women have fewer biological children compared to other women. This has been shown in the United States (Fieder and Huber 2022; Hopcroft 2006, 2015, 2019; Stulp et al. 2016; Weeden et al. 2006), the United Kingdom (Nettle and Pollet 2008), Norway (Lappegård and Rønsen 2013), Sweden (Fieder and Huber 2007; Goodman, Koupil, and Lawson 2012; Kolk and Barclay 2021), and Finland (Nisén et al. 2018). These findings for men are consistent with the hypothesis from behavioral ecology that individual status is positively associated with fertility (Borgerhoff Mulder 1987; Von Rueden, Gurven, and Kaplan 2011; Von Rueden and Jaeggi 2016). They are also consistent with the proposition from sexual strategies theory in evolutionary psychology that financial prospects and status in a mate are a higher priority for women than for men across all cultures (Buss 1989, 2016; Buss and Schmitt 2019; Fales et al. 2016; Hopcroft 2021; Walter et al. 2020; Wang et al. 2018; Williams and Sulikowski 2020). The negative relationship between personal income and number of children for women is also consistent with life history theory, which suggests that tradeoffs between income earning, child bearing, and child-raising are usually greater for women than for men (Kaplan and Lancaster 2003).

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Previous studies show the primary reason for the link between income and fertility for men is because low income men are more likely to be childless than high-income men (Barthold, Myrskylä, and Jones 2012; Fieder, Huber, and Bookstein 2011; Hopcroft 2015, 2021; Von Rueden, Gurven, and Kaplan 2011). The opposite is true for women, as high-income women are more likely to be childless than low-income women (Abma and Martinez 2006; Fieder and Huber 2020; Frejka 2017), although there are signs this is changing among recent cohorts in Scandinavia (e.g. Jalovaara et al. 2019; Kravdal and Rindfuss 2008).

High-income men are more likely to be married in the United States (Hopcroft 2021; Ruggles 2015; Schneider 2011), and in the United States, the majority of childbearing occurs within the context of married couple families (U.S. Census 2018), and over half of married couples in the United States are dual earner families (U.S. Bureau of Labor Statistics 2017). Because of the opposite effects of income on fertility for men and women, to fully evaluate the role of personal income in fertility it is important to examine the effect of personal income on fertility net of spouse's income. There is some evidence from the United States that income provided by wives has a negative relationship with fertility while income provided by husbands is positively associated fertility; however, the results are mixed. While Fleisher and Rhodes (1979), Freedman and Thornton (1982), Weeden et al. (2006), Huber, Bookstein, and Fieder (2010) found that the positive relationship for men in the United States between income and wife's number of children held when education was controlled, Butz and Ward (1979) and Hopcroft (2019) found evidence that wife's income was negatively associated with fertility while husband's' income was positively associated with fertility even without controlling for education. That is, it is unclear whether the positive relationship between income and number of children for husbands holds regardless of levels of education.

To resolve this issue, this paper further investigates the different effect of husband's and wife's income on the total number of biological children for men and women using a probability sample of husbands and wives drawn from the U.S. population, the 2014 Study of Income and Program Participation (SIPP). This survey is the first Census study to collect full fertility histories from both men and women, thus is one of the first to fully measure male (as well as female) biological fertility. The following hypotheses are tested:

(1) For all wives, personal income will be negatively associated with number of biological children.
(2) For all wives, their husband's income will be positively associated with number of biological children.
(3) For all husbands, personal income will be positively associated with number of biological children.
(4) For all husbands, their wife's income will be negatively associated with number of biological children.

Given the role of childlessness in the relationship between income and fertility for men and women, the following hypotheses are also tested

(1) For all wives with children, personal income will be negatively associated with number of biological children.

(2) For all wives with children, their husband's income will be positively associated with number of biological children.
(3) For all husbands with children, personal income will be positively associated with number of biological children.
(4) For all husbands with children, their wife's income will be negatively associated with number of biological children.

Because previous analyses only found a positive relationship between husband's income and wife's income when education was controlled, all these hypotheses will also be tested with and without controls for education. To evaluate the effects of income on completed fertility, the hypotheses will also be tested with a subsample of individuals aged 45–65.

2014 SIPP Data

These hypotheses are tested with data on husbands and wives from the Survey of Income and Program Participation (SIPP-2014) conducted by the U.S. Bureau of the Census. The 2014 SIPP sample is a multistage stratified sample of 53,070 housing units from 820 sample areas designed to represent the civilian, noninstitutionalized population of the U.S. Information was collected on all individuals over the age of 15 in the household by personal interview or proxy interview if the person was not present at the time of the interview, with a response rate of 70.19%, resulting in 67,994 completed interviews. This analysis only includes information on couples where both husbands and wives were currently living in the same household. Spouse characteristics were linked to all individuals.

The SIPP data and details can be found at https://www.census.gov/programs–surveys/sipp/data/2014–panel/wave–1.html. The analyses presented here only use data on respondents aged 18 and over.

Variables

Total Children Ever Born Number of biological children ever born to the respondent or ever fathered by the respondent. These children may or may not also be the children of the individual's current spouse. Thus, even though the analyses only include husbands and wives who currently live together, the dependent variable total children ever born may not be the same for each spouse.

Monthly Personal Income (in $1000s) is the sum of reported monthly earnings and income amounts received by an individual from all sources (jobs, businesses, rental property, investments, annuities, trust funds, government programs, alimony, etc.) during the previous year. This is a variable constructed and top-coded by the Census. This means that values at the top of the distribution for the variable are replaced by the mean or median of that variable. Because this variable includes business and investment income and loss, it can be negative and therefore cannot be logged.

Spouses Monthly Personal Income (in $1000s) measured the same way as monthly personal income.

Because fertility has declined in recent generations in the United States, *Age* (Respondent's age in years) and age-squared are included as control variables. To further examine completed childbearing, the analyses are repeated with only those respondents aged between 45 and 65 – that is, the period when childbearing is likely to be completed yet respondents are unlikely to be retired.

Black (1 = black, 0 = non-black) was controlled because previous research shows differences in income and multi-partner fertility between blacks and non-blacks in the United States (Guzzo and Furstenberg 2007).

Hispanic (1 = Hispanic, 0 = non-Hispanic) is also controlled because the relationship between income and fertility differs between Hispanic and non-Hispanic groups in the U.S. (Johnson and Lichter 2016).

Education (in years). This is the respondent's education measured in years.

Methods

Data were analyzed using general linear regression methods for stratified samples using SAS 9.4. Given the complex stratified sampling structure of the SIPP, specific SAS software was required. While Poisson regression is typically preferred for analysis of count data such as number of offspring, this was not possible in this case given the software. The SAS software necessary to analyze this data and allow for accurate estimation of variances does not allow for the option of Poisson regression.

The primary reason for the use of a Poisson distribution when analyzing count data is that such data often violate the assumptions of the normality of errors and homoscedasticity necessary for linear regression. An inspection of the residual plots and the Kolmogorov-Smirnov test of normality of residuals (suitable for when there are over 2000 cases as is the case here) showed violations of the normality of errors and homoscedasticity assumptions in this data set. However, given a large data set such as this one (it has over 26,000 cases) linear regression has been shown to perform well even when the assumptions of normality and homoscedasticity are violated, while the value of alternative techniques is less clear (Lumley et al. 2002; Sainani 2012).

The basic model estimated here is as follows:

$\hat{Y} = \beta_0 + \beta_1\ Age + \beta_2 Age\ Squared + \beta_3 Black + \beta_4\ Hispanic + \beta_5\ PersonalIncome + \beta_6\ Spouse's Income + \beta_7 Education + \mathcal{E}$

This model was estimated for males and females separately.

Following recommendations by the Census for the sample structure of the SIPP (see https://www.census.gov/content/dam/Census/programs-surveys/sipp/methodology/2014-SIPP-Panel-Users-Guide.pdf) (see also Rust and Rao 1996), Fay's) modified balanced repeated replication (BRR) method was used for estimating variances in the logistic regression models. Balanced repeated replication methods are used for estimating the variance of a statistic obtained by stratified sampling. The 2014 data uses 240 replicate weights. Replicate weights were computed by the Census and are available on the data website. In addition to the replicate weights, the Census provides individual person weights for use in analyses such as this one (with the person as the unit of analysis) to create unbiased estimates of variances, and these were also included in all analyses.

Table 1. Means and standard errors (in brackets).

	Women(Standard Error)	Men(Standard Error)
Age	49.989(0.083)	52.324(0.089)
Proportion Aged 45–65	0.534(0.003)	0.567(0.003)
Black	0.074(0.002)	0.078(0.002)
Hispanic	0.136(0.002)	0.137(0.002)
Monthly Personal Income	2,742(37.052)	5,582(117.950)
Spouse's Monthly Income	5,579(117.745)	2,742(36.237)
Education (years)	13.861(0.027)	13.838(0.033)
Proportion with biological children	0.855(0.004)	0.842(0.003)
Total number of biological children	2.069(0.012)	2.053(0.014)

Results

Table 1 gives descriptive statistics for all variables. The husbands in the sample are slightly older than the wives, on average, and are more likely to be in the age group 45–65. The sample is about 7% black and 14% Hispanic. For wives in the sample, their average monthly income is less than the husband's monthly income. The wives have slightly more education, on average, than the husbands in the sample, on average, and are slightly more likely to have biological children. This means some of the husbands in the sample are not the biological fathers of some or all of their wives' children.

Table 2 gives the results of the regression analysis of the effects of own and spouse's income for men and women for all cases and for all cases aged 45–65. Model 1 gives the results for all women. For women, total personal income is negatively and significantly

Table 2. General linear regression of total number of biological children, all cases. Effects of own and spouse's income together by sex. Unstandardized regression coefficients (Standard errors in brackets).

	All cases				Those aged 45–65			
	Women (1)	Men (2)	Women (3)	Men (4)	Women (5)	Men (6)	Women (7)	Men (8)
Intercept	0.214	0.049	1.568***	0.792***	5.230***	4.958**	6.676***	6.202***
	(0.116)	(0.135)	(0.136)	(0.163)	(1.470)	(1.652)	(1.470)	(1.651)
Age	0.053***	0.050***	0.052***	0.050***	−0.114*	−0.111	−0.128*	−0.133*
	(0.005)	(0.005)	(0.005)	(0.005)	(0.054)	(0.061)	(0.054)	(0.061)
Age Squared	−0.000***	−0.000***	−0.000***	−0.000***	0.001*	0.001	0.001*	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Black	0.322***	0.427***	0.296***	0.390***	0.236***	0.343	0.209**	0.310***
	(0.045)	(0.047)	(0.045)	(0.045)	(0.073)	(0.691)	(0.071)	(0.067)
Hispanic	0.509***	0.574***	0.303***	0.438***	0.563***	0.649***	0.375***	0.520***
	(0.047)	(0.046)	(0.041)	(0.045)	(0.075)	(0.078)	(0.072)	(0.076)
Total Personal Income (x 1,000)	−0.039*** (0.0061)	0.002* (0.001)	−0.019*** (0.005)	0.005*** (0.001)	−0.027*** (0.008)	0.002** (0.001)	−0.013* (0.006)	0.004** (0.001)
Total Spouses Income (x 1,000)	0.002 (0.001)	−0.030*** (0.005)	0.004*** (0.001)	−0.023*** (0.004)	0.002** (0.001)	−0.020*** (0.006)	0.004*** (0.001)	−0.015** (0.005)
Education in Years			−0.093*** (0.006)	−0.053*** (0.005)			−0.078*** (0.008)	−0.046*** (0.009)
Pseudo R-square	0.089	0.099	0.119	0.110	0.029	0.033	0.052	0.042
N	13,878	13,863	13,878	13,863	6,258	6,139	6,258	6,139

**p < 0.05 **p < 0.01 ***p < 0.001*

associated ($p < .0001$) with total number of biological children, while their spouse's income is positively but not significantly ($p = .0603$) associated with their number of biological children. This supports Hypothesis 1 but is limited support for Hypothesis 2. Model 2 shows that for men, total personal income is positively and significantly associated ($p = .0156$) with their number of biological children, while their spouse's income is negatively and significantly associated ($p < .0001$) with their number of biological children. These results support Hypotheses 3 and 4.

Models 3 and 4 repeat the same analyses for all cases with a control for education. With education controlled, women's personal income is negatively and significantly associated ($p < .0001$) with number of children, while their spouse's income is positively and significantly associated ($p < .0001$) with number of children, supporting Hypotheses 1 and 2. These results echo those of Weeden et al. (2006) and Huber, Bookstein, and Fieder (2010) who found that for women, husband's income was positively associated with number of children with education controlled. With education controlled, men's personal income is positively and significantly associated ($p = .0012$) with number of children, and their spouse's income is negatively and significantly associated ($p < .0001$) with number of children, supporting Hypotheses 3 and 4.

Models 5 and 6 repeat the same analysis only for those individuals aged 45–65, an age when most people have completed having children. These models show that for women their own income is negatively and significantly associated ($p = .0006$) with their number of children, while their spouse's income is positively and significantly associated ($p = .0035$) with their number of children. This supports Hypothesis 1 and 2. For men the reverse is true. For men, total personal income is positively and significantly associated ($p = .0138$) with fertility, while their spouse's income is negatively and significantly associated ($p = .0007$) with fertility. This supports Hypotheses 3 and 4. This analysis of individuals with likely completed fertility finds a positive and significant effect of spousal income on women's number of children even without controlling for education, supporting the findings in Hopcroft (2019). For men with completed fertility, own income is positively and significantly associated with number of biological children, while their spouse's income is negatively and significantly associated with their number of biological children, even without controlling for education.

Models 7 and 8 repeat the analyses for those individuals aged 45–65, but this time with education controlled, and find the same results. For women, total personal income is negatively and significantly associated ($p < .0001$) with number of children and their spouse's income is positively and significantly associated ($p < .0001$). For men, total personal income is positively and significantly associated ($p = .0031$) with number of children while their spouse's income is negatively and significantly associated ($p = .0055$) with number of children. These results support Hypotheses 1–4.

In sum, results of the analyses of all cases almost all support Hypotheses 1–4, and give evidence that for women their own income is negatively associated with number of biological children, while their spouse's income is positively associated with number of biological children. For men, their own income is positively associated with number of biological children, while their spouse's income is negatively associated with total children ever fathered. These relationships are significant for all those with completed fertility even when education is not controlled.

Table 3. General linear regression of total number of biological children, all cases with children. Effects of own and spouse's income together by sex. Unstandardized regression coefficients (Standard errors in brackets).

	All cases with children				Those aged 45–65 with children			
	Women (1)	Men (2)	Women (3)	Men (4)	Women (5)	Men (6)	Women (7)	Men (8)
Intercept	1.582***	1.454***	2.645***	2.044***	4.041**	2.696	5.408***	3.717**
	(0.118)	(0.141)	(0.135)	(0.155)	(1.460)	(1.489)	(1.488)	(1.505)
Age	0.015**	0.015**	0.016***	0.016**	−0.064	−0.015	−0.081	−0.033
	(0.000)	(0.005)	(0.005)	(0.005)	(0.054)	(0.055)	(0.054)	(0.055)
Age Squared	0.000	0.000	−0.000	0.000	0.001	0.000	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.005)	(0.001)	(0.000)	(0.001)	(0.000)
Black	0.228***	0.339***	0.216***	0.310***	0.183**	0.241***	0.165**	0.213***
	(0.045)	(0.045)	(0.045)	(0.044)	(0.070)	(0.065)	(0.068)	(0.064)
Hispanic	0.391***	0.460***	0.214***	0.343***	0.517***	0.555***	0.352***	0.441***
	(0.046)	(0.044)	(0.039)	(0.041)	(0.067)	(0.072)	(0.061)	(0.067)
TotalPersonal Income (x 1,000)	−0.029***	0.002**	−0.014***	0.003***	−0.022**	0.002***	−0.011	0.003***
	(0.005)	(0.001)	(0.004)	(0.001)	(0.007)	(0.001)	(0.006)	(0.001)
TotalSpouses Income (x 1,000)	0.001	−0.023***	0.003***	−0.018***	0.002**	−0.018***	0.003***	−0.015**
	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.005)	(0.001)	(0.005)
Education			−0.076***	−0.044***			−0.064***	−0.039***
			(0.005)	(0.004)			(0.008)	(0.008)
Pseudo R-square	0.065	0.076	0.093	0.087	0.031	0.033	0.052	0.043
N	12,046	11,851	12,046	11,851	5,508	5,322	5,508	5,322

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

To investigate whether the results are because of childlessness among high income women and low-income men, the same analyses were carried out for all those with biological children, excluding the childless. These results are shown in Table 3 in Models 1–8. Model 1 shows that for women with children, their own income is negatively and significantly associated ($p < .0001$) with their number of children, while their current spouse's income is positively but not significantly ($p = .2529$) related with their number of children. This supports Hypothesis 5 but not Hypothesis 6. These results also show that the negative relationship between own income and number of children for women is not due to greater childlessness among high-income women. Model 2 shows that for men personal income is positively and significantly associated ($p = .0089$) with total number of children, while their spouse's income is negatively and significantly associated ($p < .0001$) with total number of children, thus supporting Hypotheses 7 and 8, and showing that the positive relationship between men's personal income and their number of biological children is not because of greater childlessness among low-income men.

Models 3 and 4 repeat the analyses for men and women with children controlling for education. In these models, for women, total personal income is negatively and significantly associated ($p = .0012$) with their number of children while their spouse's income is positively and significantly associated ($p < .0001$) with their number of children, while for men the opposite is true. These findings support Hypotheses 5 and 6. For men with children, there is positive and significant relationship ($p < .001$) between own income and fertility, and a negative and significant relationship ($p < .001$) between spouse's income and fertility. These findings support Hypotheses 7 and 8.

Models 5 through 8 repeat the analysis for only those aged 45–65 who have children. Once again, Model 5 shows a negative and significant relationship ($p = .0025$) between personal income and number of children for women, while there is a positive and significant association ($p = .0033$) between husband's income and wife's number of biological children. These results support Hypotheses 5 and 6. Model 6 shows again that for men personal income is positively and significantly related ($p < .0001$) to number of children, while their spouse's income is negatively and significantly associated ($p = .0004$) with their number of children. These results support Hypotheses 7 and 8.

Models 7 and 8 repeat the analyses for those aged 45–65 who have children, this time controlling for education. These analyses show a negative but not significant effect ($p = .0832$) of personal income on number of children for women, and a positive and significant effect ($p = .0001$) of spouse's income on number of children for women. This supports Hypothesis 6 but not Hypothesis 5. For men there is a positive and significant effect ($p = .003$) of own income on number of children and a negative and significant effect ($p = .0017$) of spouse's income on number of children. This again supports Hypotheses 7 and 8.

In sum, these results of the analysis of those with children almost all support Hypotheses 5–8. They show that the negative relationship between own income and number of children for wives, and the positive relationship between own income and number of children for husbands, is not due to greater childlessness among high-income women and low-income men.

Conclusions

This analysis shows that husband's and wife's incomes are associated in opposite ways with their number of biological children and that this result is not because of childlessness among low-income men and high-income women. For women, their personal income is negatively associated with their number of biological children, while their spouse's income is positively associated with their number of biological children. While men's income is associated positively with number of biological children, their spouse's income is negatively associated with number of biological children. While the negative effect of women's personal income on number of children is well known (Brewster and Rindfuss 2000; Tsou, Liu, and Hammitt 2011), this is the first analysis to show that the positive effect of men's income on fertility is not because of childlessness among low-income men (Barthold et al. 2012; Fieder and Huber 2007; Hopcroft 2015).

Nor is this result only found when education is controlled. For the 45–65 age group, an age when fertility for most men and women is completed and yet people are unlikely to be retired, there was a positive relationship between a woman's husband's income and her number of biological children, and a positive relationship between a man's personal income and his number of biological children, even without controlling for education.

The fertility measures in this sample are complete measures of both male and female biological fertility, which improves on Huber, Bookstein, and Fieder (2010) and Fieder and Huber (2020) who did not know the total number of biological children of fathers in the sample. On the other hand, this study measures the biological fertility of couples who are currently married and living in the same household – the current spouse may or may not be the biological parent of each individual's biological children. This is particularly likely to be the case with women, given that women are more often the custodial parent of children after a divorce. So for women, the income of their current husband may not be the income of the father of their children. However, given educational and class homogamy in the United States (Schwartz and Mare 2005), for women with more than one husband, the income of the woman's current husband is likely similar to the income of previous husbands. Further, the analysis was repeated (not shown) with a sample of only husbands and wives who have been married once, thus improving the likelihood that the husband in the sample is the biological father of the wife's children. This did not change the results reported here.

When this data was collected, the United States was a society characterized by low fertility, high educational homogamy (Schwartz and Mare 2005) and where more than half of all married couple families had two breadwinners (U.S. Bureau of Labor Statistics 2017). Yet these results suggest that men with high incomes with a spouse with a low income have the most biological children in the United States, while women with low incomes with a spouse who earns a high income have the most biological children. For women there is no doubt reverse causation given tradeoffs between childbearing and raising and income earning. Nevertheless, the results support theorizing from behavioral ecology about the positive effect of an important dimension of social status- personal income- on reproductive success for men in the United States. For women, the results suggest an age-old form of female status – marriage to a high status man – is positively associated with reproductive success for women in the contemporary United States. Thus the central problem of modern sociobiology (Vining 1986) may be more a problem of appropriately measuring social status for men and women in modern societies, rather than a change to behavior that is no longer adaptive.

The negative effect of years of education on number of biological children for both men and women replicate previous findings using U.S. data (Fieder and Huber 2022; Hopcroft 2006, 2015) and support the finding that there is selection against genetic predispositions for education in the U.S. population (Beauchamp 2016). Yet the results here also give support to the idea that any such selection is likely to be less in men than in women, given that education is positively associated with personal income, and personal income is positively associated with number of children for men only. This is further supported by the analysis of Fieder and Huber (2022) using a sample from the U.S. Wisconsin Longitudinal Survey, a data set that includes individual genomic information. Consistent with the findings reported here they found a negative effect of years of education on number of children for both men and women, and a positive effect of wages on number of children for men only. However, their analysis also included a polygenic score for education/ cognitive ability. For men and women this polygenic score had no significant effect on number of biological children, but for men only there was a positive interaction effect between the polygenic score for education and wages for men only, such that there was a positive association of wages and number of children for men with a higher genetic predisposition to education, and a negative association of wages with number of children for men with a lower genetic predisposition to education. Such tendencies may counteract any tendency for selection pressures against genes for educational attainment for men in the population. Educational homogamy in marriage may also serve to mute such tendencies for women in the population.

These results on the opposite effects of income on fertility for men and women in married couples suggest that the decline in the proportion of men employed full time (Ullrich 2021) and the decline in male earnings relative to female earnings (Shrider et al. 2021) may have contributed to the current decline in aggregate fertility rates in the United States. Lower rates of men attending institutions of higher education are likely to exacerbate these tendencies in the near future.

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