

The Cost of Homeschooling:
The Effect of Income and Maternal Education on the Decision to Homeschool

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ABSTRACT

Despite the fact that over 2 million children in the US are home schooled each year, very little is known about the factors that influence the decision to home school children. We use data from the 2003, 2007, 2012, and 2016 National Center for Education Statistics (NCES) Parent and Family Involvement in Education Surveys to examine the characteristics of parents that decide to homeschool. We find that homeschooling is more likely to occur in larger families with lower levels of income and with mothers who have received higher levels of education. We discover that while household income is likely to decrease the probability of a child being homeschooled, an increase in mother's education increases that same probability.

Background and Context

The nationalization of modern homeschooling began with the 1970s movement under the direction of John Holt, an educational theorist and supporter of school reform, who argued that formal schools caused an oppressive classroom environment which taught students to become compliant employees. While at the time, there were several states which allowed parents to teach their children at home, it was not a popular choice at the time. The legalization of homeschool occurred at the state level, and by 1989, there were only three states (Michigan, North Dakota, and Iowa), which outlawed home education, and by 1993, home education was legal in all 50 states (Somerville 2001).

The decision to homeschool has become increasingly popular over the course of the past couple of decades. According to the earliest NHES survey in 1999, approximately 850,000 of students nationwide (1.7%) were being instructed at home. According to NHES and the Census Bureau, we find that 2.2% of children were homeschooled in 2003, 2.9% in 2007, and 3.4% 2012 (Smith 2013). While their 2016 survey is not yet publically available, various statistics have been shared. According to this survey, we find that the number of homeschooled students has remained nearly stagnant at 1.7 million. Given that the government spends approximately \$10,600 in education per student per year, the current savings of the government due to homeschooling is approximately 18 billion dollars per year (Vo 2017).

For the 2003, 2007, and 2012 NHES surveys, parents were prompted to report which of several possible reasons for homeschool matched their particular circumstance as well as the most important reason for them choosing to homeschool their children. We recognize there were likely other reasons for parents choosing to homeschool their children and perhaps certain situation in which parents did not accurately report their responses. However, it is still possible to determine which of the reasons were more popular, and how these values have changed over

the course of the decade. Common reasons for parents to homeschool their children include: provide religious or moral instruction, concern about negative peer pressure or child safety, provide religious or moral instruction, and dissatisfaction with academic instruction. Further results of these responses are shown in Table II.

The most popular reasons for homeschooling among the sample was due to dissatisfaction in academic instruction or so that the child may be provided with religious or moral instruction. We find that around 70% of the parents agreed with at least one of these reasons. This notion of religiosity being a primary factor in the decision to homeschool children has been shown in previous studies to be a significant factor (Cai, Reeve, and Robinson, 2002). These authors claimed that approximately 75% of homeschool educators are conservative Christians who believe that public schools are unable to properly instruct the morals they want their children to learn. As a whole, parental involvement in homeschooling has also been linked to the age of the child: as the child grew older, there is less parental involvement in child education (Green, Hoover-Dempsey, and Sandler, 2007). According to the 2016 NHES survey, the major concern among parents has turned from providing religious instruction to concern about the school environment, which includes safety, drugs, or negative peer pressure.

II. Data

Every four or five years since 1999, the National Household Education Surveys Program, developed by the National Center for Education Statistics, has collected data via telephone surveys or through the postal system on a variety of measures related to homeschooling including the motivations, practices, and public support behind families who homeschool their children. The data are ideal for our analysis as they demonstrate changes in homeschooling

patterns over time for a broad set of households, which cover all 50 states. The NHES Parent and Family Involvement in Education surveys cover learning from early childhood to school age and includes parental data as well. Since there has been very little research on the factors that contribute to the decision to home school, our empirical work will be largely descriptive.

III. Empirical Strategy

Our research will focus primarily on the effect of income on a family's disposition to homeschool. We will do this by through the use of a fixed effects model which accounts for variations within each year included in the analysis. This allows us to increase the number of observations included in our dataset while accounting for these year-to-year variations. It also allows us to determine, to an extent, how some of the predictors change over time. Our final dataset includes approximately 45,000 individuals, with approximately 822 (1.8%) coming from families in which the child was homeschooled. It is important to note that this NHES survey intentionally overrepresented the percentages of Black and Hispanic responses, especially in 2012, so the predictive power in estimating the true effect of various demographics on the probability of homeschooling was slightly affected.

We begin the analysis by summarizing our statistics, which explores the correlations between the choice to homeschool, income, maternal education, and select demographic characteristics from our data. This chart is provided as Table I. In our fixed effect model, we account for several additional demographic factors which may mediate the relation between income and homeschooling or maternal education and homeschooling. Such demographics include the age of the mother and child, the child's race, and whether or not the child was born in the United States. Because we include year fixed effects, in this situation we need not include

other macroeconomic factors which may influence the parents' decision to homeschool because they would already be considered within the year fixed effects. Hence, we are left with the following fixed effects framework to estimate the effect of income on the probability of homeschooling:

$$Pr(Homeschool_i) = \beta_0 + \beta_1 \cdot \ln(Income) + \beta_2 \cdot Education + \beta_3 \cdot Year + \beta_4 \cdot Demographics + \varepsilon_i \quad (1)$$

Where the value of *Homeschool_i* is 1 if the child attended a homeschool at the time of the survey, and a 0 otherwise. Note also that the education level is made up of different dummy variables indicating the type of education the mother received. Such levels of education include: high school graduate, some college, bachelor's degree, and advanced studies such as a master's or PhD. We report our results in terms of odds ratios so that coefficients below 1 are characteristics associated with being less likely to homeschool and coefficients above 1 are characteristics associated with being more likely to homeschool.

In order to determine how income and mother's education affects the likelihood of the child being homeschooled, we used several demographic and household controls provided by the corresponding NHES surveys. Such controls include whether or not the mother was married (or remarried), the age of the child and mother, the number of siblings the child had, the sex and ethnicity of the child, and the religiosity of the family. In this survey, religiosity was primarily measured by determining whether or not the family had attended a religious service in the past month. We also use year fixed effects to account for the potential differences within each year as well as a control for the area and community type in which the family lived at the time of the survey.

For purposes of anonymity, the participants of the study were not asked for their exact income. Rather, they were only to provide the bracket of income they belonged to. The specific brackets varied slightly between each year, but most brackets were small enough that we were able to use the median of the upper and lower brackets to estimate the relative effect of income on the child's probability of being homeschooled. For example, in the 2012 dataset, income brackets were in bins by \$10,000 from \$0 to \$60,000, then \$60,001 to \$75,000; \$75,000 to \$100,000; \$100,001 to \$150,000; and finally \$150,001 or more. Our corresponding estimates for that year are: \$2,500 (weighting for those in debt); \$15,000; \$25,000, \$35,000; \$45,000; \$55,000; \$72,500; \$87,500; \$125,000; and \$200,000 (weighting for those who earned much more than \$100,000).

IV. Results

The regression table presented in Figure III shows that a doubling (100% increase) in income decreases the probability that the child will be homeschooled by about 30-35% which value is, in fact, robust across the individual models for each year. In classical economics, opportunity cost refers to the value of the next best alternative. In this case, we find that households with higher levels of income are also those who are less likely to homeschool their children. Hence, it would be logical to believe that this occurs because the parents in these households do not have opportunities that would enable them to receive higher levels of income, or at least as high as the value of their utility gained by homeschooling their children. This level of utility is a function as well of various characteristics of the households: the number of siblings of the child, the religiosity of the family, and so forth. However, we also find that as maternal education increases, the likelihood of the child being homeschooled increases. This result partially adds an additional assumption to this idea of opportunity cost because as maternal

education increases, so does her earning capabilities. Hence, it appears that as maternal education increases, so does her utility from having her children be part of a homeschooling program.

We argue that the mothers with higher levels of education receive greater levels of utility by homeschooling their children than their expected increase in household income. This may be due to a number of driving factors, including family pressure, beliefs about the educational system, or other household characteristics described in the odds ratio table in Figure III. This may also be an indicator of the personality characteristics of the women who want to homeschool their children. Previous research also suggests that parents who homeschool are oftentimes motivated by a strong sense of efficacy for helping the child learn (Green and Hoover-Dempsey, 2007). For example, it is possible that the women who attain a higher education do so because they believe it will enable them to homeschool their children in a more efficient manner.

We also determine that the three strongest singular demographic predictors of the decision to home school are parental education, the race of the child, and the religious activity of the family. However, we find that the age and gender of the child as well as whether or not the child was born in the United States is not a significant predictor of the decision to homeschool. We also find that the marital status of the mother when included as a singular predictor is not statistically significant.

Previous research suggests that various demographic variables have no impact on the choice of parents to homeschool their children (Collom, 2005). Hence, the group of people who decide to homeschool their children are highly diverse. We find, however, that there are at least a couple of significant demographic predictors which affect the probability that the parents will homeschool their children, including political persuasion and religion. We find that the race of

the child is, in fact, a statistically significant predictor. Specifically, children who are White are slightly more likely to be homeschooled whereas children who are Black are roughly 38.4% less likely to be homeschooled compared to Hispanic, Asian, or other ethnicities. However, we find that whether the child was born in the United States or not is not significant, and neither is the sex or age of the child, given that the child is between the ages of 5 and 19.

V. Conclusion

Based on our results, we now have several implications to consider based off of the results of the more fully-informative model in Figure IV. We have also found several important factors which affect the probability of a child being homeschooled. It is clear that mother's education positively affects the child's likelihood of being homeschooled, and that income is negatively correlated with the probability of homeschooling. Perhaps more interestingly, we have also deduced that on average, mothers with higher levels of education receive greater utility through homeschooling their children than through the additional income it would otherwise provide.

We have subsequently determined that there exist certain demographic variables which are significant predictors of the child being homeschooled. However, generally, the group of children involved in homeschooling is heterogeneous. We have also shown, concurrent with previous studies, that religious activity is an important indicator, and perhaps one of the stronger reasons for why parents decide to homeschool.

Table I: Survey Summary Statistics: NHES PFI 2003, 2007, 2012, and 2016

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Table II: Unweighted Home-Schooling General Statistics for Homeschoolers, 2003, 2007, 2012, and 2016 PFI

	*2003	2007	2012	*2016
**Days Per Week Homeschooled	-	4.78 (0.79)	4.87 (0.87)	-
**Hours Per Week Homeschooled	-	21.27 (9.67)	23.26 (10.34)	-
<u>Primary Reason for Homeschooling</u>				
Concern about School Environment	27.8%	20.0%	27.2%	-
Dissatisfied with Academic Instruction	19.1%	15.1%	18.4%	12.7%
Provide Religious/Moral Instruction	32.4%	31.5%	24.9%	8.0%
Child has Physical/Mental Health Problems	6.2%	9.3%	7.4%	9.2%
Child has Other Special Needs	6.2%	6.8%	1.6%	3.5%
Provide Nontraditional Education	-	-	4.9%	2.3%
Safety/Peer Pressure	-	-	-	17.2%
Other/No Response	8.3%	17.3%	-	47.1%
<u>Parents' Reasons for Homeschooling</u>				
Concern about School Environment (Safety)	84.9%	87.3%	89.4%	-
Dissatisfied with Academic Instruction	70.2%	70.5%	75.3%	50.8%
Provide Religious/Moral Instruction	71.0%	76.9%	69.8%	46.2%
Child has Health Problems	2.7%	4.9%	5.8%	23.1%
Child has Other Special Needs	25.7%	22.8%	19.1%	27.7%
Provide Nontraditional Education	-	64.9%	44.1%	32.3%
N	245	268	233	76
<p><i>Does not include parents who did not respond to whether or not their child was homeschooled. Only homeschooling parents who responded to this part of the survey are included.</i></p> <p><i>*2003 and 2016 survey does not include days and hours per week homeschooled; however, 80.2% of homeschoolers were homeschooled full time in 2003.</i></p> <p><i>**Does not include parents who responded that "all time is homeschooling time".</i></p>				

Table III: Odds Ratio for Homeschooling

Based off National Home and Education Survey (NHES)						
	2003	2007	2012	2016	Overall	
Log(HH Income)	0.64** (0.05)	0.63** (0.05)	0.78** (0.05)	0.75** (0.09)	0.67** (0.03)	0.67** (0.03)
Mother's Ed. (Yrs.)	1.17** (0.08)	1.08** (0.02)	1.01 (0.03)	0.95 (0.04)	1.03** (0.01)	1.03** (0.01)
Mother is Married	2.12** (0.45)	2.59** (0.55)	0.88 (0.15)	1.08 (0.31)	1.49** (0.17)	1.46** (0.15)
Mother's Age	1.05** (0.01)	1.03** (0.01)	0.99 (0.01)	1.023 (0.02)	1.01** (0.01)	1.02** (0.01)
Child Number of Siblings	1.51** (0.09)	1.40** (0.09)	1.03 (0.08)	0.99 (0.11)	1.29** (0.05)	1.30** (0.05)
Family is Religious	1.48** (0.21)	1.82** (0.26)	1.23 (0.26)	1.52** (0.36)	1.56** (0.12)	1.52** (0.12)
N (Homeschooled)	245	268	233	76	822	822
N (Total)	11,052	9,326	14,096	10,761	45,235	45,235
Year Fixed Effect					✓	✓
Region Fixed Effect	✓	✓	✓	✓		✓
Other Demographics	✓	✓	✓	✓		✓

Dependent variable: Probability of child being homeschooled. Data provided by the National Center for Education Statistics Parent and Family Involvement in Education Survey (NHES-PFI) years 2003, 2007, 2012, and 2016. Data are in terms of odds ratios. Mother's Education is defined as approximate years of education. Year fixed effects included in overall (combined) model to control for variations across years. Region fixed effects control for differences between national areas and community types across students.

Citations:

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