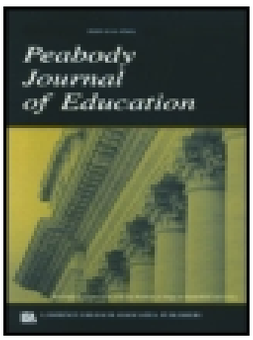

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What Have We Learned About Homeschooling?

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This article discusses quantitative research on homeschooling, including the available data, pitfalls of using the data, estimates of the number of homeschooled children, part-time homeschooling, and why families homeschool. I compare research on homeschooling to research on charter schools, voucher programs, and private schools.

The number of homeschooled children is over 1 million, more than 2% of the total number of school children and roughly equal to the total in charter schools and voucher schools combined. There is approximately one homeschooled child for every five children enrolled in private school.[1] Despite its size, scarce data on homeschooling have impaired our understanding of even the most basic questions, including a precise

[1]The most recent national estimate of the number of homeschooled children is 1,096,000, from the 2003 National Household Education Survey. Charter schools enrolled 1,077,000 students in 2005–06, according to the Center for Education Reform (http://www.edreform.com). The Milwaukee Parental Choice voucher program enrolled 14,825 students in 2005–06 (http://www.schoolchoicewi.org). The Cleveland Scholarship and Tutoring Program provided vouchers to 5,813 students in 2005–06. Florida's Opportunity Scholarship Program enrolled about 750 students before being declared unconstitutional by the Florida Supreme Court. Vouchers awarded to students displaced by Hurricane Katrina were temporary. According to the American Community Survey, 5,674,000 students were enrolled in private schools in 2005, 10.7% of the total enrolled in public or private schools.

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estimate of how many homeschooled children there are, why families homeschool, and how families combine homeschooling with using conventional schools. The political history of homeschooling has constrained the data that can be collected at the state level, so that the most useful data on homeschooling derive from national phone surveys, especially the National Household Education Survey (NHES). The combined insights gained from the NHES and other data sets allow us to glimpse answers to the questions of how many, why, and how parents homeschool their children.

History

Modern homeschooling began in the 1970s with a dual impetus, one group "fervently religious and … the rest might best be characterized as the philosophical heirs of Jean-Jacques Rousseau" (Guterson, 1992).[2] Based on fieldwork, sociologists Van Galen (1991) and Stevens (2001) distinguished between these groups. The essential motive for "fervently religious" evangelical Protestants (frequently Baptists or Pentecostals) is a belief that local schools teach a curriculum objectionable to their fundamentalist religion. For others, homeschooling is a route to a superior academic education.[3]

During the 1980s, religious and secular homeschoolers worked as allies to establish legal rights for homeschooling at the state level. Many school districts following mandatory school attendance laws initially treated homeschooling as a form of truancy; some early contacts between public school authorities and homeschoolers were antagonistic. Homeschoolers responded by forming support networks and pursuing legal and political channels to legalize homeschooling (Cibulka, 1991). In 1983, former Moral Majority leader Michael Farris founded a national organization, the Homeschool Legal Defense Association (HSLDA), to provide lobbying and legal assistance to evangelical Protestant homeschoolers. In Florida, homeschoolers organized themselves into a statewide organization with an elected chairperson and 12 elected regional officers. Through a combination of favorable state judicial decisions and statutes, homeschooling became legal in every state. The establishment of favorable laws for homeschooling demonstrated how a small, organized inter-

[2]Lines (1991) provided a more detailed history, including a brief account of homeschooling prior to the 1970s.

[3]Among popular homeschooling magazines, newsletters, Web sites, and support groups, the split between two culturally distinct groups is still evident.

est group with time to lobby (because many homeschooling mothers did not work) and much to gain was able to prevail politically. Fearing the possibility of state regulation, homeschooling interest groups succeeded not only in winning a legal status with minimal regulation but also in restricting the data that could be collected about homeschoolers.[4]

Even at the national level, homeschooling lobbyists could exert a powerful influence. An amendment to the reauthorization of the Elementary and Secondary Education Act in the House of Representatives in 1994 to require that each full-time teacher be certified in their subject area aroused passionate disapproval from homeschoolers, who saw this as a means by which states could interfere with homeschooling by imposing this rule on parents. Homeschooling families made hundreds of thousands of phone calls to their representatives, and the House defeated the amendment 424–1 (Stevens, 2001). When the Elementary and Secondary Education Act came up for reauthorization in 2001—under what came to be known as the No Child Left Behind Act—Congress banned any of its provisions from applying to homeschooling.

The establishment of a legal right to homeschooling combined with the expansion of the Internet to energize a growth spurt in homeschooling in the mid-1990s. The Internet eased the delivery of homeschooling materials and better connected homeschooling families. As homeschooling grew, the alliance between secular and religious homeschoolers fractured, but homeschooling support groups of both types proliferated (Stevens, 2001).

Homeschooling Data

The main barrier to research on homeschooling has been lack of data. Administrative data allows researchers to analyze charter schools (Hill, Angel, & Christensen 2006). Similarly, the relatively few voucher programs in the United States have received scrutiny (McEwan, 2004). There has been extensive research on the effect of private schooling on outcomes by using panel data such as the National Longitudinal Survey of Youth, High School and Beyond, or National Education Longitudinal Study (Neal, 1998, 2000).

The wealth of school administrative data available to study public schools or publicly funded voucher programs precludes a study of homeschooling because by definition the population of interest is absent from the data. Similarly, panel data sets cannot be employed to study

[4]The HSLDA Web site (http://www.hslda.org) catalogs homeschooling laws by state.

homeschooling as they have been used to study private schooling. Older data sets like High School and Beyond did not include questions about homeschooling. More recent data, like the Panel Study of Income Dynamics 1997 Child Development Supplement, Children of National Longitudinal Survey of Youth 1979, and National Longitudinal Survey of Youth 1997, include questions about homeschooling, but the sample sizes are too small to create a large enough subset for studying homeschooling.

There are two sources of data for studying homeschooling choice: state administrative data sets that enumerate the number of homeschooled children per public school district and national cross-sectional surveys, particularly the NHES. These data sets are large enough to include a sufficiently large sample of homeschooled children and a comparison group of children who attend a conventional school.[5]

To compare the achievement of homeschooled students to public and private school students, the only data currently available are Scholastic Achievement Test (SAT) data from the Educational Testing Service (Belfield, 2002a). Whether from homeschools or conventional schools, however, SAT test takers are a self-selected group. In addition, many children who were homeschooled in elementary school will attend a conventional school by the time they take the SAT.

State Administrative Data Sets

As of 2004, about half the states had begun to collect official data on the number of homeschooled children per public school district (Belfield, 2004).[6] Not all state data sets are trustworthy. There are three general problems with aggregate state-level data: haphazard data collection, alternate legal means by which children may be homeschooled, and underground homeschooling. Each is related to state school law and its en-

[5]Due to the success of homeschooling lobbying organizations, there are no representative data sets for studying the achievement of homeschooled students. Some states require homeschooling parents to demonstrate that their children have made academic progress, but often this can be accomplished in one of several ways, including presenting a portfolio of materials, being evaluated by a certified teacher, or having the child take an age-appropriate achievement test. Not only do many states allow parents to choose whether to use an achievement test, but the parents are often allowed to choose the test. In some states, the results must be reported to the school district. Even in these states, state law generally bans using them for research.

[6]Of the 24 states listed in Belfield (2004), three states report having a trivial number of homeschooled students, suggesting the data are grossly underreporting the true number. Belfield does not list Indiana, which also (under)reports the number of homeschooled children (Kunzman, 2005).

forcement. Haphazard data collection occurs because the burden of reporting homeschooling generally falls on the families rather than school districts. Districts gain no reimbursement from homeschooled children in their district and generally have little incentive to collect accurate information.[7] The second problem—alternate legal means of homeschooling—occurs in states in which registering with the public school system is not the only way to homeschool. States such as California, Florida, and Pennsylvania allow families to homeschool by technically enrolling their child in a private school. The third problem is underground homeschooling, or, as some homeschoolers like to call it, "homeschooling under your constitutional rights." Legally, this is a form of truancy, as children are neither enrolled in a school nor legally homeschooled. It is not known how many children are homeschooled in this way, although increasingly favorable homeschooling statutes would seem to diminish their numbers over time.

For an ideal state data set, the state would impose no restrictions except to require parents to inform the state that they are homeschooling. Wisconsin follows this procedure, requiring parents to register for homeschooling by mailing a one-page form to the Wisconsin Department of Public Instruction (DPI). There is neither a requirement that students are tested nor any regulation of the parents' qualifications. DPI staff believes that there is little underground homeschooling due to the ease with which parents can homeschool. Isenberg (2003) analyzed Wisconsin data.

Even accurate state administrative data have limitations for studying the effect of family characteristics on school choice, resulting from aggregation of students by districts. Because parents decide whether to send their children to public schools based on their own characteristics and those of their neighbors, it is not possible to interpret the coefficients of aggregate measures of family characteristics in a regression with (a function of) the percentage homeschooled as the dependent variable. This was recognized in the private school choice literature (Lankford & Wyckoff, 1992) and given an econometric treatment in Isenberg (2003). For instance, mothers who have a bachelor's degree may be more likely to homeschool because they can teach their children more effectively or less likely because they have higher opportunity costs for time spent homeschooling. Parents who live in districts in which many mothers have bachelor's degrees may be more or less likely to send their children

[7]There are a few exceptions. California and Washington have instituted programs by which school districts aid homeschooling families and are reimbursed by the state (Lines, 2000). Because these programs are optional, however, these states do not necessarily have a complete count of the homeschooling population.

to public school, depending on whether they believe that the children of well-educated mothers will provide good classmates for their own children. A regression coefficient on the number of women with a bachelor's degree in a particular school district cannot distinguish between the direct (effectiveness/opportunity cost trade-off) effect on homeschooling and the indirect (peer) effect. A variable has no direct interpretation unless one is willing to assume that there is either no direct or no indirect effect of this variable on school choice.[8]

Child-Level Data

Child-level data on homeschooling do not suffer from the problems that beset aggregate data. Three data sets include child-level data on homeschooling along with a control group of children in school: the October 1994 Current Population Survey Education Supplement (CPS: Oct94), the Educational Testing Service (ETS) SAT data, and the 1996–2005 NHES.

The CPS is collected each month by the Census Bureau. A rotating group of 60,000 households are asked a set of questions. In October of each year, a supplementary survey asks extra questions on school enrollment. In 1994, for the only time, the CPS included a set of questions on homeschooling. Because these data include a large number of covariates from the regular CPS, this would be an excellent data set with which to study homeschooling, except that the sequence by which the questions were asked systematically undercounted homeschooled children. The CPS: Oct94 first asked whether a child attended a "regular school," and only if parents answered *no* to this question did it ask about homeschooling. Some homeschooled children are technically enrolled in private umbrella schools, in public charter schools (Finn, Manno, & Vanourek, 2000), or attend a school part-time for a few hours a week. If parents answered *yes* to the question about regular schooling, they were not asked about homeschooling (Henke, Kaufman, Broughman, & Chandler, 2000). Only Bauman (2002) used the CPS:Oct94 data to study the choice of homeschooling.[9]

[8]Houston and Toma (2003) is the first article to use state administrative data to study homeschooling choice, but the authors do not acknowledge this limitation. Their interpretations implicitly make the strong assumption that the indirect (peer) effect of household characteristics is zero. In addition, Houston and Toma did not indicate that they have corrected for heteroscedasticity, which arises in models of this type when the aggregate units—in this case, school districts—are of different size. A model without a heteroscedasticity correction gives the same weight to districts with 100 students and districts with 100,000 students. Typically coefficient estimates and standard errors change markedly when corrected for heteroscedasticity.

[9]The American Community Survey (ACS) and SF–3 (long form) data from the Census are a similarly problematic potential source for homeschooling data. Begun in 2001, the ACS is an an-

Belfield (2002a) used 2001 ETS data to study the choice of homeschooling and outcomes for homeschooled children. SAT takers are asked to record whether they attend a public school, private independent school, private religious school, or are homeschooled. There are a number of other survey questions about the child's family, including religion. There are 6,033 homeschooled children in this data set, the largest number from a single microdata source. The main drawback to using the ETS data is that SAT takers are a self-selected group, so this data set is not a random sample of students.

The richest data for studying the choice of homeschooling is the NHES, a nationally representative survey of American households sponsored by the U.S. Department of Education. The NHES was been conducted in 1991, 1993, 1995, 1996, 1999, 2001, 2003, and 2005. It is scheduled to be conducted again in 2007. Each NHES samples a new cross-section of the U.S. population.

Each NHES comprises several surveys, and the content of the surveys varies each year. For instance, in 1996 NHES had four surveys, two of which contain homeschooling data. The Household and Library Survey or "Screener Data" enumerated all members of the surveyed households and collected data on the schooling of each child in a household. The Parent and Family Involvement in Education (PFI) survey focused on how parents are involved inside and outside of school in the education of a focal child selected at random from the Screener Data.

The PFI has been collected in 1996, 1999, and 2003. There are questions about homeschooling, although the exact questions vary by year. There were 251 homeschooled children in the 1996 PFI, 301 in the 1999 PFI, and 262 in the 2003 PFI. Bauman (2002) used data provided in the 1996 and 1999 PFI and Belfield (2002b) in the 1999 PFI to model the choice of homeschooling versus alternatives.

Isenberg (2006) increased the number of observations available for studying homeschooling by merging the Screener Data with the PFI for 1996 and 1999. The new data set includes the siblings of the children sampled in the PFIC.[10] Isenberg then pooled data from 1996, 1999, and 2003 to

nual survey of the American population that is intended to replace the Census long form. There are questions about public and private schooling of children. Homeschoolers in these data could be identified as the residual group of children in neither public nor private school. Like the CPS:Oct94, however, some families who either homeschool their children part-time or technically enroll them in a school may answer affirmatively to one of the earlier school enrollment questions. In addition, children under 7 may be out of school not because they are homeschooled but because they are not old enough to be eligible for the lowest public school grade offered; children older than 14 may have dropped out or been expelled.

[10]The Screener Data were not publicly released in 1999, but Isenberg (2006) obtained the Screener Data from the U.S. Department of Education for the 1999 NHES to create a data set comparable to the 1996 NHES.

create a relatively large random sample of homeschooled students: 1,112 homeschooled students of 58,836 total students in the data set.[11]

There are homeschooling data in the other NHES surveys, but they do not cover the full range of children. Before 1996, homeschooling questions were asked only about the youngest children, and in 2001 and 2005 about the homeschooling of focal children in eighth grade or below in the After-School Programs and Activities (ASPA) survey. For these age ranges, these data are untapped as sources of information about homeschooling choice. A PFI survey is scheduled for the 2007 NHES.

The main shortcoming of the NHES is that it does not collect data on wages earned by individual household members. There are only data on total household income and hours worked. To understand the effect of income on the likelihood of homeschooling requires distinguishing income earned by the mother from other sources of household income. If a mother spends time homeschooling, she will have less time to spend working, decreasing household income. By this mechanism, household income and homeschooling are jointly determined. Isenberg (2003a, 2006) presented a solution to this problem: an algorithm to simulate the individual incomes of a husband and wife given total household income and a set of individual and household characteristics, all of which are available in the NHES.[12]

[11]To explicitly test the implications of a model of mother's time use, Isenberg (2006) excluded households in which there is not a mother present or households shared by two mothers of school-age children. This results in excluding 130 homeschooling observations, only about 10% of the total.

[12]The key to this method is recognizing that the information provided—individual work hours and household income—constrains the wages of the two spouses to fall along a line. The algorithm involves using a log-wage regression to simulate the individual wages of spouses, checking to see if the sum of the simulated wages multiplied by hours of work equals household income, accepting the wages if so and simulating new wages if not. For instance, if both spouses work 50 hr a week and earn $2,000 a week collectively, then if the wife earns $30/hour, her husband must earn $10/hour. If she earns $20/hour, he must earn $20/hour. If she earns $10/hour, he must earn $30/hour. If the wife is equally likely to earn in a range from $10/hour to $20/hour, and her husband is equally likely to earn between $20/hour and $30/hour, then random draws from these distributions that would "award" the wife with a wage of $18/hour and the husband with a salary of $28/hour would not be accepted, because this would mean that together they would earn $2,150 a week, more than they actually earn. The algorithm would continue to pick wages for each spouse until the total salary equaled $2,000/week.

To correct for the sampling error introduced by this method, 10 simulated pairs of wages are chosen for every married couple in the data set. A multiple imputation method is used (Rubin, 1987). Ten regressions are run, one for each of the simulated data, and final regression coefficients obtained by averaging the 10 results.

Estimating the Number of Homeschooled Children

Accurate counts of the number of students in charter schools or voucher schools are available from administrative data, and estimates of private school attendance can be estimated from the Census or American Community Survey. Estimating homeschooling is more difficult. I discuss four sources of data on the number of homeschooled children: the CPS:Oct96, several years of estimates from the NHES, 2 years of ACS data, and administrative data from Wisconsin. The Wisconsin data provide a very accurate census of homeschooled children for one state. The CPS: Oct96, ACS 2004, and ACS 2005 estimates undercount homeschooled children but provide a lower bound, assuming that children in neither public nor private school in the ACS are homeschooled. The NHES data are unbiased estimates, assuming that homeschoolers were equally likely to participate in the telephone surveys. In 1996, 1999, and 2003, the years in which the PFI was conducted, the estimate covers all age groups. For 2001 and 2005, the ASPA provides estimates for grades K–8. Table 1 summarizes the point estimates from these various sources.

The NHES PFI data provide the official estimates of the U.S. Department of Education (Bielick, Chandler, & Broughman 2001; Henke et al., 2000; Princiotta & Bielick 2006). It shows an increasing number of homeschooled children from 1996 to 1999 to 2003. It is possible that some homeschoolers, particularly religious homeschoolers, are less likely to complete the survey, but if there is undercoverage of this group, it seems to be limited to 1996, when a relatively lower percentage of homeschoolers cited religion as a reason for homeschooling. On the other hand, it is possible that homeschooling families, having a disproportionate number of mothers who do not work outside the home, would be more likely to complete a lengthy phone survey. If there is a bias, it is not clear in which direction.

The official estimates from the PFI use only data on focal children. I estimate the number of homeschooled children based on the Screener Data for 1996 and 1999 to give a more precise estimate. The results show a slightly larger estimate for homeschooling each year.[13] The K–8 estimates from the 2001 and 2005 ASPA survey of the NHES estimate a larger proportion for homeschooled children in this grade range but slow growth from 2001 to

[13]Part of the discrepancy is explained by the definition of homeschooling used by the U.S. Department of Education when making estimates of the total number. Their practice is to drop students whose parents indicate that they are being homeschooled due to a temporary illness or who attend a school for 25 or more hr a week. This lowers the estimate slightly. Including these children in 2003, for instance, would increase the estimate from 1,096,000 (2.2% of the total) to 1,193,000 homeschooled children (2.3% of the total). Because these questions are not asked to children in the Screener, I cannot follow a similar procedure. Note also that if these exclusions are applied to the ASPA data from 2001 and 2005 shown in Table 1, it would slightly decrease the estimate.

Table 1

Estimates of the Number of Homeschooled Children

	CPS:Oct 94	*NHES PFI*	*NHES PFI*	*NHES ASPA*	*NHES PFI*	*ACS*	*NHES ASPA*	*ACS*
	1994	*1996*	*1999*	*2001*	*2003*	*2004*	*2005*	*2006*
Lower bound	345,000 0.8%							
Official point estimate		636,000 1.4%	850,000 1.7%		1,096,000 2.2%			
Full data point estimate		727,000 1.6%	980,000 2.0%					
Lower bound/Ages 7–14						680,000 2.1%	726,000 2.2%	
Point estimate/K–8				936,000 2.6%			974,000 2.4%	
Wisconsin	10,612 1.1%	14,539 1.4%	18,503 1.8%	20,382 1.9%	21,288 2.0%	21,034 2.0%	20,743 2.0%	20,323 2.0%

Note. CPS = Current Population Survey Education Supplement; NHES = National Household Education Survey; PFI = Parent and Family Involvement in Education; ASPA = After-School Programs and Activities; ACS = American Community Survey.

2005, and a decrease in the proportion homeschooled. In the 2003 PFI, only 2.2% of K–8 students were homeschooled.[14]

All estimates provided by the NHES data are imprecise because they are based on a few hundred homeschooled children each year. Standard 95% confidence intervals produce ranges on either side of the point estimate of about 200,000 children. It is unlikely that the number of homeschooled children is fluctuating from year to year as the point estimates would imply. More likely, the 2001 ASPA estimate was high and 2003 PFI estimate low.

The lower bound estimates from the CPS:Oct94 and ACS provide further evidence of an overall upward arc in the growth of homeschooling. For comparison, the Wisconsin data are also included. The longer time series for Wisconsin show annual increases in both the number and percentage of children homeschooled from 1984–85, when the data were first recorded, until a peak in 2002–03, after which homeschooling begins a slight decline. This may be due to specific circumstances in Wisconsin, but these data may be a bellwether of the stagnation of homeschooling nationally, particularly given the small growth in numbers between the 2001 and 2005 ASPA.

In sum, there appears to be growth from 1996 to 2003, quite possibly with a deceleration in the rate of growth. It is very likely that at least 1 million children are homeschooled in 2006. As the next section makes clear, much homeschooling occurs in intervals of 1 to 4 years. This implies that the total number of 18-year-olds in 2006 who have been homeschooled at least intermittently is around 375,000, or about 10%.[15]

Part-Time Homeschooling

Families who homeschool a child tend to send that child to school in other grades, use conventional schools concurrently with homeschooling, or send other children to school (Isenberg, 2006). Pooling the 1996 and 1999 data, 55% of homeschooling households with more than one school child

[14]The estimate is 2.1% excluding students homeschooled due to a temporary illness or who attend a school for 25 or more hr a week.

[15]The back-of-the-envelope calculation: Eighteen-year-olds in 2006 would have been eligible to enter kindergarten in the 1993–94 school year. Presume that there were 500,000 homeschooled children in 1993–94 and 1,000,000 (a very conservative estimate) in 2005–06 with a linear growth rate in between and an equal proportion of homeschooled children in each grade. The average number homeschooled per grade over this period is then 58,000. If the average number of years homeschooled is 2, then the number who will have been homeschooled by the time they are no longer "school-aged" is approximately 58,000*(13/2) = 375,000. If the number homeschooled in a given year were to stabilize at 1,000,000 and the average duration at 2 years, then the annual number of 18-year-olds with homeschooling as part of their education would reach an equilibrium value of (1,000,000/13)*(13/2) = 500,000.

sent at least one other child to school. For households with three or more children, the distribution of children homeschooled is bimodal, with peaks at one child and all children. Families who self-report homeschooling for religious reasons are much more likely to homeschool all their children.[16]

Some children are homeschooled part-time and attend school part-time. Combining data from the 1999 and 2003 NHES, 21% of homeschooled children also attended a school. Most attend for few hours per week; very few homeschooled children attend school for the majority of their schooling hours (Bielick et al., 2001; Isenberg, 2003a). Lines (2000) discussed some cooperative programs between school districts and homeschoolers.

In addition, there is a high degree of attrition. The 1996 NHES collects data on homeschooling in past years for focal children who are either currently homeschooled or currently enrolled in school. There is a large quit rate in homeschooling after the 1st year; only 63% of homeschooled students continue to the 2nd year. After that, annual survival rates are much higher, with point estimates ranging from 73% to 94% for Years 2 to 6. Religious homeschoolers quit at lower rates than secular homeschoolers. By the end of 6 years, 15% of secular homeschoolers are still homeschooling. Even among religious homeschoolers, attrition decreases their numbers significantly, so that only 48% are still homeschooling after 6 years (Isenberg, 2006).

Why Homeschool?

Parents make school choice decisions based on preferences, the quality of local schools, and constraints of income and available leisure time. Separating the causal effect of each variable on school choice requires holding the others constant. For instance, if two families with identical preferences, income, and leisure time choose different schools, the difference can be ascribed to the local education market. Families who live in the same area with the same time and income constraints but who choose different schools must have different preferences.

With microeconomic data from the NHES, it is possible to measure differences in the "price" (i.e., opportunity cost) and quantity of time of potential home teaching mothers in different households and, using a simulation/multiple imputation technique, to measure the variation in income not earned by the mother.[17] School quality is measured by test scores. It is

[16]These comparisons cannot be made for the 2003 data because the Screener Data are not available for this year.

[17]Interviews with homeschooling families find that mothers are primarily responsible for home teaching. See Stevens (2001) and Isenberg (2003a).

most difficult to capture individual preferences or child-specific factors like the demand for special education that affect how otherwise similar families view their school options.

Self-Reports

To learn about preference-based or child-specific motives for homeschooling, it is useful to analyze data on self-reports of why parents homeschool. The main problem with inferring causality from self-reports is that there is no control group, i.e. parents who send their children to school are not asked why they do not homeschool. A second problem is how to interpret the response categories in the NHES. With these caveats in mind, self-reports from three rounds of NHES data on 814 students provide a basis on which to begin to examine the preferences of homeschooling parents.

The 1996, 1999, and 2003 NHES include a question on reasons for homeschooling the focal child. In 1996 and 1999, the question was open-ended, with responses coded into one of 17 categories, including a category for miscellaneous responses. Some respondents gave more than one reason for homeschooling. In 2003, the survey asked seven questions, each of the form "Do you homeschool for this reason?" The 2003 survey also asked parents to choose the most important reason for homeschooling.

Sociologists Van Galen (1991) and Stevens (2001) emphasized the split between religious and educational homeschooling. There is support in these data that both reasons are important. The three top reasons for homeschooling in 1996 and 1999 are "to give a child better education at home," "religious reasons," and "poor learning environment at school," a catch-all category that includes worries about peer pressure, drugs, and safety. The methodology changes for 2003, but the top three reasons in 2003 are similar: "concern about environment of other schools," "dissatisfaction with academic instruction at other schools," and "to provide religious or moral instruction." There is also a significant number homeschooled due to physical or mental health/behavioral problems or other special needs.

Because the categories are broad, however, it is not clear how to divide homeschoolers between religious and educational subgroups, and it is not always easy to know what parents meant. In 1999, 16% indicate that they homeschool for "family reasons," and the most popular response in both years was to "give a child a better education at home."[18] Both responses allow for a multitude of interpretations.

[18]For all percentages presented, I have dropped children who were homeschooled because they were temporarily ill.

One way to better understand these reasons is to combine similar categories. For the 1996 and 1999 data, I combine the "religious" categories "religious reasons," "to develop character/morality," and "object to what school teaches" into one composite to try to provide an upper bound on the percentage of religious homeschoolers. I have done the same for educational homeschoolers, combining "can give child better education at home, "poor learning environment at school," and "school does not challenge child." I have also combined "student behavioral problems at school" with "child has special needs/disability" into one category. These percentages are not the sums of the categories from which they are derived because respondents could give more than one reason.

The results are given in Table 2. By this method, at most 25% of those surveyed in 1996 and 52% in 1999 homeschooled for religious reasons. Although 72% of respondents in 2003 answered affirmatively to "Do you homeschool in order to provide religious or moral instruction?" I believe that the inclusion of "moral instruction" in this question makes it too broad a category to accurately define religious homeschoolers. Although secular homeschoolers may not volunteer "moral instruction" as a reason for homeschooling, a majority of secular homeschoolers might answer that they homeschool to provide moral instruction as a response to a *yes/no* question. A more accurate estimate of religious homeschoolers in 2003 is 30%, the number for whom religious/moral instruction is the most important reason. For educational homeschoolers, the upper bounds are 61% in 1996 and 67% in 1999. In 2003, 48% cited either school environment or dissatisfaction with academic instruction as the most important reason for homeschooling. The percentages for the combined behavioral/special needs category are 14% to 15% in all years.

Summarizing these results, in these samples a plurality of homeschoolers are motivated by educational reasons, broadly construed. A significant minority homeschool for religious reasons, and about one in seven seem motivated by child-specific behavioral problems or special needs. To understand further how religion, school quality, and family characteristics affect the likelihood of choosing homeschooling over conventional schooling requires multiple regression analysis.

Religion

There are three sources of evidence on the effect of religion on homeschooling using data that compare children in homeschools and conventional schools. Belfield (2002a) analyzed ETS data on the religion of homeschoolers and others who took the SAT in 2001. There are also microdata

Table 2

Self-Reported Reasons for Homeschooling

	1996 NHES (Upper Bound)	*1999 NHES (Upper Bound)*	*2003 NHES (Point Estimate)*
Religion ("Religious Reasons," "Develop Character/Morality," or "Object to What the School Teaches" for 1996-99; "Religious or Moral Instruction" most important reason for 2003)	25%	52%	30%
Education ("Give Child a Better Education at Home," "Poor Learning Environment at School," or "School Does Not Challenge Child" for 1996–99; "Dissatisfied with Academic Instruction at Schools" or "Concerned about School Environment" most important reason for 2003)	61%	67%	48%
Behavioral or special need ("Child Has Special Needs/Disability" or "Student Behavioral Problems" in 1996–99; "Child Has Physical or Mental Health Problem" or "Special Needs that You Feel the School Can't or Won't Meet" most important reason for 2003)	14%	15%	14%
A different reason	23%	12%	9%

Note. Source: National Household Education Survey (NHES) 1996, 1999, 2003.

from the NHES that include a measure of religious participation and school district-level administrative data on homeschooling matched to demographic data on religion. None provides a complete picture, but there is evidence that religious families—particularly evangelical Protestants—are significantly more likely to homeschool.

According to Belfied (Table 1 in 2002a), for students taking the SAT in 2001, only 41.8% of homeschooling students report having any religious faith, fewer than students in public schools (52.5%). There is a higher proportion of Baptists among homeschoolers (17.7%) than among children attending school (10.3%). The disproportionate number of Baptists corresponds to sociological accounts of homeschooling, but it is surprising that the overall figure for religious participation is lower for homeschoolers.

The NHES has a measure of religiosity in 1996 and 2003 but not religious faith/denomination. Isenberg (2006) created a dummy variable for "very religious" that equals one if families have the highest level of religious participation (e.g., attending religious services at least once a week) and includes this variable as an independent variable in a logit model with homeschooling as the dependent variable and a full set of control variables. The results are displayed in Table 3. All results given in Table 3 are statistically significant at the 5% level and robust to changes in the specification, except as noted. All else equal, a child from a very religious family is 1.3 percentage points more likely to be homeschooled[19]. This is a strong effect considering that only 1.9% of the children in this sample are homeschooled. Similar results are obtained for private schooling. All else equal, children from very religious families are 3.5 percentage points more likely to enroll in private schools; 11.0% of the children in the sample are sent to private schools. Of course a measure of religiosity alone does not account for the differential effects of denomination on school choice. Very religious evangelical Protestants may be more likely to choose homeschooling and very religious Catholics more likely to use parochial schools. Despite the lack of denomination data in the NHES, the results show that religion plays an important role in the decision to homeschool just as it does in the decision to choose a private school.

A third approach is to use state administrative data on homeschooling. Using data on the percentage of children homeschooled in each school district as the dependent variable and the percentage of evangelical Protestants living in these districts as one of a group of independent variables, it is possible to use multiple regression analysis to test whether evangelical Protestants are more likely to homeschool.[20] Isenberg (2003) used state administrative data from Wisconsin matched to administrative data on test scores, School District Data Book data from the Census, and demographic religion data from the 2000 Religious Congregations and Membership Survey (RCMS), a decennial survey of religious membership. Using categories defined by the RCMS, religious groups are specified as the percentage evangelical Protestant; percentage mainline Protestant; and percentage Catholic. A log-odds regression model confirms the importance of evangelical Protestants to homeschooling but with an interesting twist: up to a point, the more evangelical Protestants in a district, the greater the number

[19]The marginal effects are computed from a logit model. Because the logit model is nonlinear, the marginal effect for any characteristic depends on the values of the other independent variables. The marginal effects reported assume that the values of other independent variables are set to their sample means.

[20]This assumes that the percentage evangelical Protestant does not affect the propensity to homeschool of families who are not evangelical Protestants.

Table 3
Summary of Key Results From Isenberg (2006)

Variable	*Increment*	*Percentage Point Change in Probability of Homeschooling, Ceteris Paribus*
Very religious	No to yes	1.3
State NAEP math test	One standard deviation below mean to one standard deviation above mean[a]	–0.3
Preschool child younger than 3 years old in household	Per child	1.2
Preschool child 3 to 6 years old in household	Per child	0.5
School-age sibling in household	One sibling to two siblings	1.2
	Two siblings to three or more siblings	1.7
Other adults in household aside from mother	Per adult	0.5
Mother's education (children 11 years and younger)	Less than a high school diploma to college degree	1.4
Age of child	5 years old to 10 years old	–0.4
Income (excluding mother's labor income)	$25,000 to $75,000	–0.3

[a]Parsimonious specification only.

of homeschooled children, as one would expect if this group prefers to avoid the public schools for religious reasons. For districts with large evangelical Protestant populations, however, further increases in the percentage evangelical Protestant have little effect on the percentage homeschooled.

There are two possible explanations: Either evangelical Protestants form private schools when they are concentrated together or they are more inclined to use public schools when many of their neighbors attend a similar church. I test these explanations using Wisconsin data on private schooling. For rural districts, evangelical Protestants appear inclined to use public schools as their numbers grow because private school enrollment does not depend on the percentage evangelical Protestant. In small towns, however, private school enrollment does depend on the percentage evangelical Protestant, showing that they substitute private schooling for

homeschooling when economies of scale for private schooling can be obtained. Cohen-Zada (2006) found similar results for the effect of the Catholic population on the percentage enrolled in Catholic schools: as the percentage of the local Catholic population increases, its effect on increasing Catholic school enrollment decreases. Catholic parents may feel more comfortable with sending children to public schools in these circumstances, just as evangelical Protestant families may be more comfortable with public schools when they are well represented in a local population.

School Effects

Using aggregate data or child-level data, there is some evidence that poorer academic quality of public schools and decreased choice of private schools both contribute to an increase in homeschooling. Isenberg (2003) used test score data to measure academic school quality in Wisconsin. The results indicate that in small towns, a decrease in math test scores in a school district increases the likelihood of homeschooling. The magnitude of this effect is significant. A decrease in math scores from the 1 standard deviation above the mean to 1 standard deviation below the mean increases homeschooling by 29%, from 1.9 percentage points to 2.4 percentage points, all else equal. A decrease from 2 standard deviations above to 2 standard deviations below increases homeschooling by 65%, from 1.6 percentage points to 2.7 percentage points.

The NHES data also show an effect of academic school quality, measured by state-level NAEP test scores. As Table 3 indicates, in a parsimonious specification, a decrease in math scores from 1 standard deviation above the mean to 1 standard deviation below raises the probability of homeschooling by approximately 20%, from 1.7 percentage points to 2.1 percentage points, all else equal. This is a slightly smaller effect than obtained with the aggregate data from Wisconsin. Adding more control variables to the specification, however, causes the measured effect of test scores to become insignificant.

The availability of private school options also affects the likelihood of homeschooling. Because the number of private schools in a local area is correlated with the propensity for a particular household to choose a private school, it is inappropriate to include the number of private schools as a control variable. The strategy followed in Isenberg (2006) is to include a set of instrumental variables, that is, variables correlated with the availability of private schools but not directly related to the likelihood of homeschooling. The variables used are the percentage of state funding raised locally, a dummy variable for whether there is a direct public vote on the level of local public school expenditure, and a dummy variable for

whether elected representatives vote on the level of local public school expenditure. In a reduced form regression, the percent local funding and direct vote variables are significantly positively related to the propensity for private schooling and significantly negatively related to the propensity for homeschooling. This suggests that the lack of private school alternatives may increase the propensity of families to homeschool.

Family Effects

If parents are dissatisfied with the public schools for academic, religious, or other reasons, they must choose between homeschooling and private schooling. Private school has tuition costs; homeschooling has opportunity costs of time. Isenberg (2006) showed the ways in which mothers are motivated by the amount of disposable time they have, the opportunity cost of time, and income constraints. The results are summarized in Table 3.

If a mother has preschool children as well as a school-age child, she is predisposed to stay home, decrease her work hours, or even stay out of the labor force entirely and therefore more likely to homeschool. Of course, small children require a great deal of time to care for, but this pull on a mother's time is dominated by the incentive to withdraw from the labor force, freeing daytime hours and eliminating commute time, thereby increasing the likelihood of homeschooling. All else equal, having a preschool child younger than 3 years old increases the probability of homeschooling a school-age sibling by 1.2 percentage points; a toddler age 3 to 6 increases the probability of homeschooling by 0.5 percentage points.

Having school-age siblings also increases the likelihood that a child is homeschooled. Each additional sibling beyond the first sibling increases the probability that a particular child is homeschooled. All else equal, a child with two other school-age siblings is 1.2 percentage points more likely to be homeschooled than a child with one school-age sibling, and a child with three or more siblings in school is an additional 1.7 percentage points more likely to be homeschooled than a child with two siblings. There appear to be economies of scale in homeschooling.

The presence of other adults in the household also has a significant effect on the likelihood of homeschooling. This may be because these extra adults take over household tasks, giving the mother more disposable time. Other adults in the household, including but not limited to a husband, increase the likelihood of homeschooling by 0.5 percentage points per extra adult.

The simulation/multiple imputation strategy allows Isenberg (2006) to uncover the marginal effect of income on the probability of homeschooling. This methodology shows that an increase in family income (ex-

empting labor income the mother earns) increases the likelihood of homeschooling at income levels below about $13,000 and decreases it beyond that. As families weigh the costs and benefits of educating their children in schools or at home, they appear to favor conventional schools if they can afford either to buy a house in a high-quality public school districts or pay private school tuition. Regression models using NHES data with private school as the dependent variable show that income has a strong positive effect on the probability that a child is sent to a private school, all else equal.

The effect of mother's education on the likelihood of homeschooling is especially interesting. Although better educated mothers may make more effective home teachers, the opportunity cost of their time—the implicit tuition cost of homeschooling—will also be higher. Empirically, the effect depends on the age of the child. For children 11 years and younger (approximately sixth grade), the better educated the mother, the more likely she is to homeschool her children. For older children, there is no strong relationship between mother's education and the likelihood of homeschooling. This shows that effectiveness trumps opportunity cost when children are young, but as children get older and the subject matter more complex, it becomes increasingly difficult for even well-educated mothers to provide an education equal to what schools provide.

Homeschooling of older children may be partly explained by carefully examining the data on stated reasons for homeschooling. Combining the 3 years of data, for children 13 and younger, only 10% are homeschooled for behavioral or other special needs, whereas for children 14 and older, 21% are homeschooled for these reasons. In calculating this figure, I have counted children in the 2003 data as homeschooled for behavioral or special needs if this is the primary reason for homeschooling. Alternately, just focusing on the 2003 data, if we include all children who are homeschooled for these reasons, whether or not they are the primary reason for homeschooling, 22% of young children and 48% of older children are homeschooled for behavioral or special needs.

The only NHES child-specific variables that can be included in a regression analysis are age and gender. Boys and girls are equally likely to be homeschooled but age matters: All else equal, from ages 5 to 10, the likelihood of homeschooling decreases, and beyond age 10 it increases. The initial decline as children age can be explained by either the increasing level of difficulty in the subject matter or children's increasing need for regular social contact with their peers as they age. The increase beyond age 10 may be due to the increasing importance of special needs in adolescents. The link between mother's education and the likelihood of homeschooling that is evident in younger children is broken in older children, further evidence

that the decision to homeschool older children is not just a calculation of the education the mother can provide versus a school but also factors in the student's behavioral needs.

Conclusion

Although we can answer fewer questions about homeschoolers than we can about children in charter, voucher, or private schools, we are not ignorant. Some tentative results stand out:

- There are at least 1 million children in homeschooling and many more who have been homeschooled for at least part of their education.
- Families who homeschool frequently also use public or private schools.
- Families choose to homeschool for both academic and religious reasons.
- For evangelical Protestant families, both public and private school options becoming more appealing in communities with large evangelical Protestant populations.
- Mothers with more time and less income are relatively more likely to choose homeschooling over private schooling as an alternative to public schools.
- Better educated mothers are more likely to homeschool young children.
- Older children are more likely to be homeschooled for behavioral reasons or special needs.

As future data become available, our knowledge of this fascinating experiment in school choice will continue to expand.

References

Bauman, K. (2002). Home schooling in the United States: Trends and characteristics. *Education Policy Analysis Archives, 10,* 26.

Belfield, C. (2002a). *The characteristics of home schoolers who take the SAT* (Occasional Paper No. 62). New York: National Center for the Study of Privatization in Education, Teachers College, Columbia University.

Belfield, C. (2002b). Modeling school choice: A comparison of public, private–independent, private–religious and home-schooled students. *Education on Policy Analysis Archives, 12,* 30.

Belfield, C. (2004). *Home-schooling in the US* (Occasional Paper No. 88). New York: National Center for the Study of Privatization in Education, Teachers College, Columbia University.

Bielick, S., Chandler, K., & Broughman, S. P. (2001). *Home schooling in the United States: 1999* (NCES 2001-033). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Cibulka, J. (1991). State regulation of home schooling: A policy analysis. In J. van Galen & M. A. Pitman (Eds.), *Home schooling: Political, historical, and pedagogical perspectives* (pp. 101–119). Norwood, NJ: Ablex.

Cohen-Zada, D. (2006). Preserving religious identity through education: Economic analysis and evidence from the US. *Journal of Urban Economy, 60,* 372–398.

Finn, C. E., Jr., Manno, B.V., & Vanourek, G. (2000). *Charter schools in action: Renewing public education.* Princeton, NJ: Princeton University Press.

Guterson, D. (1992). *Family matters: Why home schooling makes sense.* San Diego, CA: Harcourt, Brace.

Henke, R. R., Kaufman, P., Broughman, S., & Chandler, K. (2000). *Issues related to the home-schooled population in the United States with National Household Education Survey data* (NCES 2000-311). Washington, DC: U.S. Department of Education, National Center for Education Statistics..

Hill, P.T., Angel, L., & Christensen, J. (2006). Charter school achievement studies. *Education Finance and Policy, 1*, 139–150.

Houston, R., & Toma, E. (2003). Home schooling: An alternative school choice. *Southern Economic Journal, 69*, 920–935.

Isenberg, E. (2003a). *Home schooling: School choice and women's time use*. (Occasional Paper No. 6). New York: National Center for the Study of Privatization in Education, Teachers College, Columbia University.

Isenberg, E. (2003b). *Wisconsin case study. Home schooling: Household production and school choice.* Unpublished doctoral dissertation, Washington University, St. Louis, MO..

Isenberg, E. (2006). *The choice of public, private, or home schools* (Occasional Paper No. 132). New York: National Center for the Study of Privatization in Education, Teachers College, Columbia University

Kunzman, R. (2005). *Homeschooling in Indiana: A closer look*. Bloomington, Indiana: Center for Evaluation and Education Policy, Indiana University School of Education.

Lankford, H., & Wyckoff, J. (1992). Primary and secondary school choice among public and religious alternatives. *Economics of Education Review, 11,* 4.

Lines, P. (1991). Size and growth of the home schooling movement. In J. van Galen & M. A. Pitman (Eds.), *Home schooling: Political, historical, and pedagogical perspectives* (pp. 1–41). Norwood, NJ: Ablex.

Lines, P. (2000). When home schoolers go to school: A partnership between families and schools. *Peabody Journal of Education, 75*(1–2), 159–186.

McEwan, P. J. (2004). The potential impact of vouchers. *Peabody Journal of Education, 79*(3), 57–80.

Neal, D. (1998, March). What have we learned about the benefits of private schooling? *Federal Reserve Bank of New York Economic Policy Review, 4*(1), 79–86.

Neal, D. (2000). How vouchers could change the market for education. *Journal of Economic Perspectives, 16*, 25–44.

Princiotta, D., & Bielick, S. (2006). *Home schooling in the United States: 20-03* (NCES 2006-042). Washington, DC: U.S. Department of Education, National Center for Education Statistics

Rubin, D. (1987). *Multiple imputation for nonresponse in surveys.* New York: Wiley.

Stevens, M. (2001). *Kingdom of children: Culture and controversy in the home schooling movement.* Princeton, NJ: Princeton University Press.

Van Galen, J. (1991). Ideologues and pedagogues: Parents who teach their children at home. In J. van Galen & M. A. Pitman (Eds.), *Home schooling: Political, historical, and pedagogical perspectives* (pp. 63–76). Norwood, NJ: Ablex.