2015

A Brief Report on Homeschooling across Indiana:

Academic Achievement and Demographic Characteristics

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INTRODUCTION AND PURPOSE

Research on home-based education has expanded dramatically since the first studies and academic articles of the late 1970s that dealt with the modern homeschool movement. Numerous researchers have examined the academic achievement of home-educated children and youth, their social, emotional, and psychological development, and their success into adulthood and various aspects of homeschool families. Researchers have also explored myriad other aspects and issues related to home education in disciplines such as philosophy, sociology, and law. Scant research, however, has focused on a sample of home educators and their children in the state of Indiana (Lindley, 1985; McGraw, 1989; Ray, 1997; Shepherd, 2010).

The purpose of this statewide cross-sectional, descriptive study (Johnson, 2001) is to examine the educational history, demographic features, and academic achievement of home-educated students and the basic demographics of their families in the state of Indiana, and to assess the relationships between the students' academic achievement and selected student and family variables.

METHODS

Data on the homeschool families and students were from a survey instrument and national standardized academic achievement tests *(Ray, 2010)*. The survey instrument was comprised of five parts that were (a) qualifiers, (b) student demographics, (c) parent and family demographics, (d) scholastic information, and (e) other information. Academic achievement is considered, in this study, to be the formal demonstration of learning (including knowledge, understanding, and thinking skills) attained by a student as measured by standardized academic achievement tests. For example, knowledge and ability in the areas of reading, language, and mathematics are included. The achievement tests most used in the nationwide study that was the basis of this state-specific study were the Iowa Tests of Basic Skills, California Achievement Tests, and Stanford Achievement Test.

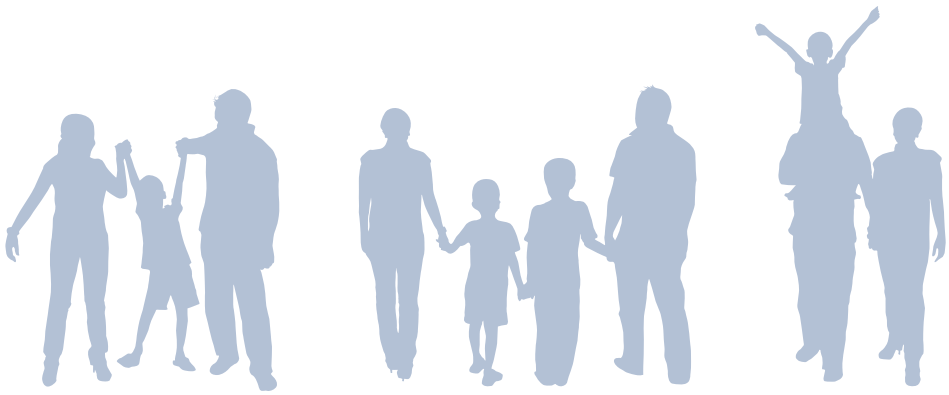
The target population was all families in the United States who were educating their school-age children at home and having national standardized achievement tests administered to their children. A total of 11,739 students provided useable questionnaires with corresponding achievement tests. Of these, 154 were from Indiana. The achievement test and questionnaire results were combined to form the dataset used in this analysis.

FINDINGS

The data revealed several key findings about these homeschool students and their families. Table 1 shows the mean z-scores for home-educated students on the Reading Total, Language Total, Mathematics Total (with computation), Science, Social Studies, Core (with computation), and Composite (with computation) subtest scores. Core is comprised of combination of a student's Reading, Language, and Mathematics scores. Composite is a combination of all subtests that the student took on the test. The corresponding percentiles shown in the table are the within-grade percentile scores for the nation that correspond to the given z-scores. By definition, the 50th percentile is the mean for all students nationwide (last column). Wide ranges of z-scores were included in the study (with scores as low as -2.33 z, about the 1st percentile, being reported).

The relationships between homeschool students' academic achievement and several variables were examined. Table 2 gives a summary of the relationships between core test z-scores and those variables.

Following is a narrative summary of the tables.



MAJOR FINDINGS: DEMOGRAPHICS

• The income of these families ranged from the category of $20,000 to 24,999 to $150,000 or more. The median income for these home-educating families in Indiana ($75,000- $79,999) is about the same as for all married-couple families nationwide with one or more related children under age 18 (median income $74,049 in 2006 dollars; or roughly $79,015 in 2008 dollars).

• Some of these homeschool parents had only graduated from high school and others had doctoral degrees. On average, they have more formal education than parents in the general U.S. population; 79.2% of the fathers and 75.3% of the mothers had a college degree (i.e., bachelor's degree) or a higher educational attainment. In 2007, 29.5% of all adult males nationwide ages 25 and over had finished college and 28.0% of females had done so.

• These homeschool families are notably larger – 63.6% have three or more children living in the home during the study – than families nationwide.

• The percent of homeschool students in this study who are White/ not-Hispanic (98.7%) is disproportionately high compared to public school students nationwide.

• Almost all homeschool students in this study (98.0%) are in married-couple families. Most of these homeschool mothers (76.6%) do not participate in the paid labor force; almost all homeschool fathers (97.4%) do work for pay.

• The median amount of money spent annually on educational materials is $600 to $799 per home-educated student.

Table 1

Mean z-scores and corresponding national percentiles by subtest for Indiana homeschool students

Subtest	N	Minimum z-score	Maximum z-score	Mean z-score[a]	Std. Deviation, z-score	Indiana National % Mean	Homeschool National % Mean[b]	Public School National % Mean
Reading Total	154	-.58	2.33	1.3645	.76762	91	89	50
Language Total	151	-.61	2.33	1.1052	.79435	86	84	50
Math Total	153	-.88	2.33	1.0503	.78271	85	84	50
Science	135	-.71	2.33	1.1544	.74323	88	86	50
Social Studies	135	-.81	2.33	1.0223	.75875	85	84	50
Core	150	-.67	2.33	1.2665	.76243	90	88	50
Composite	129	-.67	2.33	1.2360	.73731	89	86	50

a. Following are a few z-score/percentile equivalents: -0.67 = 25th percentile; 0.00 = 50th percentile; 0.67 =75th percentile; 1.00 = 84th percentile.

b. Ray, 2010.

MAJOR FINDINGS: ACADEMIC ACHIEVEMENT

• Homeschool student achievement test scores are high in this study in Indiana. The mean scores for every subtest (which are at least the 84th percentile) are well above those of public school students. The achievement scores being well above average is consistent with the findings in the nationwide study previously mentioned and in studies by many other researchers (e.g., reviews of research by Murphy, 2012 and Ray, 2013).

• There are no statistically significant differences in achievement by (a) whether the parents knew the child's test scores before participating in the study (but both groups were above the general national average), (b) the student has been home educated all his or her academic life, (c) whether the student is enrolled in a full-service curriculum, (d) student's gender, (e) amount of money spent on home education, (f) family income, (g) whether either parent had ever been a certified teacher, (h) the number of children living at home, (i) degree of structure in the homeschooling, (j) amount of time student spends in structured learning, and (k) the age at which formal instruction of the student began.

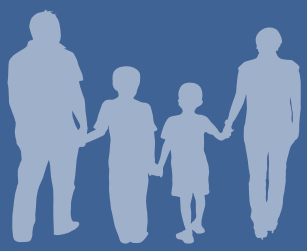
• There is a statistically significant difference in achievement among homeschool students according to the parents' education level. However, parent education level explained only 4.8% of the variance in student scores.

Table 2

Summary of relationships between core test z-scores and studied variables

Variable	Statistically Significant?[a]	p-value	Measure of Effect Size	Direction of Relationship	Practical Significance[b]
Parents knew scores before particpating	No	.448	n/a	n/a	None
Years of Homeschooling	No	.496	Partial eta squared = .004	n/a	None
Enrolled in Full-Service Curriculum	No	.940	Partial eta squared = .000	n/a	None
Gender of Student	No	.106	Partial eta squared = .021	n/a	None
$$$ Spent on Educational Materials	No	.930	Partial eta squared = .004	n/a	None
Family Income	No	.836	Partial eta squared = .008	n/a	None
Teacher-Certification Status of Parent(either parent ever certified?)[c]	No	.201	Partial eta squared = .013	n/a	None
Parent Education Levels	Yes	.050	Partial eta squared = .048	Positive	Small
Number of Children in the Family	No	.360	r = .075	Negative	None
Degree of Structure in the Home Education	No	.990	r = .001	Positive	None
Structured Learning Time, Amount	No	.439	r = .064	Negative	None
Age at Which Formal Instruction Began	No	.058	r = .156	Negative	None

a. Yes – $p < .01$; No – $p >= .01$; n.a. – not applicable; not tested or calculated.
b. Qualitative terms used are from Hopkins (2000, chapter "A Scale of Magnitudes for Effect Statistics") and Cohen & Cohen (1983); terms range from least to most signifi cant: trivial, small, moderate, large, very large, nearly perfect, and perfect.
c. Controlling for the formal education level of the parents.



CONCLUDING REMARKS

The results of the present study in Indiana are consistent with previous studies of the achievement of home school students *(Martin-Chang, Gould, & Meuse, 2011; Murphy, 2012; Oregon Department of Education, 2014; Ray, 1997, 2000, 2010, 2013; Rudner, 1999; van Pelt, 2003)*. That is, homeschool students in grades Kindergarten through 12 normally score, on average, well above the public school norm. Comparisons between home-educated students and institutional school students nationwide should be, however, interpreted with thoughtfulness and care. As stated at the beginning of this report, this is a cross-sectional, descriptive study *(Johnson, 2001)*. It is not a controlled experiment and readers should be careful about assigning causation to anything. On the one hand, as Rudner *(1999)* wrote: "This study simply shows that those parents choosing to make a commitment to home schooling are able to provide a very successful academic environment." On the other hand, it may be that something about the very nature and practice of home-based education in Indiana and across the nation causes higher academic achievement than institutional state-run schooling *(Ray, 1997, 2000, 2013)*.

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Brian D. Ray is internationally known for his research on homeschooling (home-based education) and publishing in journals such as Peabody Journal of Education, Educational Leadership, and Academic Leadership Journal. He is a former professor at the undergraduate and graduate levels, a former classroom teacher in public and private schools, and is an expert witness before many courts and legislatures. He holds a B.S. in biology from the University of Puget Sound, an M.S. in zoology from Ohio University, and a Ph.D. from Oregon State University. Dr. Ray is the president of the National Home Education Research Institute in Salem, Oregon (www.nheri.org).

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