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The Importance and Relevance of Home Education: Global Trends and Insights from the United States

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ABSTRACT

Homeschooling, also known as home education, is often used to describe an alternative way of education as different from traditional public or private schools. This educational phenomenon was salient before the pandemic and became irresistible in the wake of new technology.

Present-day home education contains a variety of arrangements, such as the one supplemented by a private tutor or a learning group, the one supplemented by the assistance of online learning, the one supplemented by part-time enrollment in a traditional school, as well as home education that is fully parent-delivered (Cheng and Hamlin, 2021).

This study aims to examine this global issue in light of school closures before the COVID-19 pandemic by introducing the scope, the debates, and the policy issues related to home education in the U.S. The study will answer three research questions: Who are home-educated children, how many children are studying at home, and how big is the phenomenon of home education globally? How well have these home-educated children been doing academically in the United States? What kind of family background do home-educated children in the United States come from, and how many cultural capitals have these children's families acquired, compared with traditionally schooled ones?

The research mainly draws on the Global Education Monitoring Report Profiles Enhancing Education Reviews (PEER), the American National Household Education Study (NHES) data, and insights from the academic world and nonprofit organizations in the United States and selected countries. The author first explores the legal status of homeschooling, the number of families with home-educated children, and the motivations for families to opt for home education. Second, the author summarizes the approaches and results researchers used to measure home-educated and traditionally schooled learning outcomes from empirical studies. Third, the author analyzed the NHES data and compared the profiles of home-educated children with their traditionally educated peers to give a complete picture of the recent home education phenomenon in the United States. In addition, the author discussed how related non-state actors acted in U.S. homeschooling movements in the past few decades. Finally, the author shares education policy recommendations relevant to other education systems with families who choose education at home.

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1. Introduction of Home Education

1.1. Definition of Home Education

Getting children educated at home has gained considerable and growing attention worldwide, particularly during the Coronavirus (COVID-19) pandemic. The COVID-19 has persuaded some parents who educate their children in those “kitchen-table classrooms” that homeschooling is more attractive, according to an article from the Economist published in February 2021. British parents featured in the news chose to withdraw their children from traditional schools for health reasons, and they believed children learn better and quicker when studying at home.

Another Forbes article published in April 2021 found that Indian families favored homeschooling instead of traditional schooling based on their concerns over its “monotonous, formal education system” coupled with “innovative approaches of education technology” (Kaushik, 2021). These are two examples behind the realm of home education.

Many cultures have seen families use the home as their “educational locus” for children since ancient times (Gaither, 2016). Home education describes an alternative way of education, as different from obtaining education at traditional public or private schools.

The terms, “homeschooling”, “homeschools”, and “home education”, have all been widely used now in publications to denote a particular practice. The practice could last for several years, covering early childhood education, primary education, and secondary education, typically among children aged five or six to seventeen or eighteen years old. Home education also denotes the practice of educating children at home because of the global Coronavirus disease (COVID-19) pandemic. Several arrangements and varied motivations behind home education could more precisely and comprehensively spell out the definition of this phenomenon.

This study uses home education and homeschooling interchangeably with subtle differences. When home education is mentioned in this study, it covers a broader range of educational practices and various groups of children that study at home because of all kinds of family motivations with different arrangements, long-term or short-term. On the other hand, homeschooling is used in this study as a particular choice of the schooling type compared with public or private schooling, which has happened before the COVID-19 pandemic. Having a child home educated, no matter why the family chooses this way of education or how they arrange it, often indicates that parents take direct responsibility for the child’s education.

To represent the comparative schooling types, where learning mainly happens in physical classrooms and school buildings, the author uses brick-and-mortar and traditional schools interchangeably in this report.

As for the study, the author aims to comprehensively examine this global issue before and during the COVID-19 pandemic: the scale and evolution, the motivation behind homeschooling, the advantages and disadvantages of homeschooled families, and the policy discussions related to home education.

1.2. Models, Arrangements, and Motivations of Home Education

Although homeschooling is not the result of technology, technology is used to “advance its courses” (Zhao and Lei, 2009). At least three models can explain the typical arrangements for homeschooled families.

The first model is that homeschoolers enroll in a virtual school that offers a general K-12 curriculum for specific subjects such as reading, mathematics, or foreign languages. Virtual school, also known as cyber school, is an educational process that allows individuals to take required courses for a degree, diploma, or certificate online. The number and services of such schools have been increasing since the 1990s (Zhao and Lei, 2009). For some states, virtual schools have gained similar status as traditional schools in receiving public funding (Mehta, 2007). These schools offer appealing options to homeschoolers, as they break the geographic boundaries and allow more flexible schedules. Many homeschoolers signed up for classes from such schools to supplement their education (Peterson, 2010).

For the second model, homeschooled families seek help from private tutors who can teach certain subjects out of their expertise or lack of time to teach. Private tutoring has been a common phenomenon in East Asia and appears more and more often in Africa, Europe, and North America. Children receiving such supplementary help in learning performed better than those who are not, in academics and in the long run (Bray, 2007).

Homeschooling does not always happen online or at home, and it can also occur outside of the house. In the third homeschooling model, homeschooled parents form groups and organize classes for their children by purchasing online courses or joining learning cooperatives. Learning happens within cooperatives (also known as co-ops). For some families, co-ops can help homeschoolers socialize with other children and allow them for other extracurricular activities, like those offered by traditional schools. For example, families can choose to have homeschooled children play sports together in a local learning cooperative organized by parents or by a non-profit organization.

The general reasons behind home education are multiple, traceable to concerns over the traditional school environment and the lack of accommodation for all learners' needs, and the willingness to provide value-oriented education and a particular family education philosophy.

Identifying family motivation is key to understanding the homeschool community in the first place. The reasons why a family home educates influence the learning experience. On the one hand, if a family chooses to educate at home because they are committed to a particular educational approach, they often see it as a positive step in life. On the other hand, if a family home educates because they feel they are left with no other options, they may see the step as a mark of failure for the family or that their children do not fit into the overall educational system.

When American families were asked the most important reason for homeschooling, 34 percent of a national sample chose dissatisfaction with the environment of schools, 17 percent chose dissatisfaction with academics at schools, and 16 percent chose the desire to provide religious instruction (McQuiggan et al., 2017). When allowed to select multiple reasons, 80% indicated they were dissatisfied with the school environment, 67% wanted to provide moral instruction, 61% were dissatisfied with school academics, and 51% wanted to provide religious education.

With respect to family dissatisfaction with the school environment, researchers found that parents chose to homeschool as they once had negative experiences in traditional schools, so did their children. Specifically, families decide to homeschool children because they are dissatisfied with conventional schools towards moral instruction, academics, child safety, racial diversity, and other aspects of education. These unpleasant past experiences made families choose home education instead of traditional education (Gray & Riley, 2013; Mazama & Lundy, 2015; Neuman, 2019).

Some scholars studied minority groups and found that racial concerns were also pervasive for the decision of homeschooling their children. Mazama and Lundy conducted 74 interviews with minority homeschooling parents (92.7% Black and African American families) across the Mid- and South Atlantic and the Midwest during the spring and summer of 2010. The answers to why they did homeschooling consisted of "concerns towards the quality of education" provided in brick and mortar schools and "racism," which served as the top two reasons that the most considerable proportions (25% and 24%) of respondents chose. This research also revealed that safety concerns (7.6%) served as another popular reason for minority families to choose homeschooling (Mazama & Lundy, 2015).

Different education systems share the reasons behind home education. With data from 34 in-depth interviews of home educating parents who had been home educating for more than three years in the US and England, and Wales, United Kingdom, researchers found that the main reason

was that their children were unhappy at school or that home education was a natural extension of their parenting beliefs (Safran, 2010). In this study, 30 families with 87 children had lived in the United States, in which 22 families with 54 children began to educate at home after they found a problem with their children at school; eight families with 33 children began home education without sending their children to school.

In contrast to these external motivations for homeschooling indicated above, homeschooling families hold a few reasons against traditional schooling. Some families have suspicion toward government and professional expertise, and other families are religious and are keen to pass on religious beliefs to their children.

Many families who want closer bonds with their children advocate for unschooling views. Gray and Riley's survey of 232 unschooling parents found that the parents who choose the homeschooling approach are more motivated by "fostering their children's autonomy and intrinsic motivation" than "social conventions" such as high test scores (Gray & Riley, 2013). Unschooling derives from Ivan Illich's term "deschooling" and gained popularity through homeschooling proponent John Holt's newsletter *Growing Without Schooling* in 1977 (Gray & Riley, 2013). It is considered a branch of homeschooling, in which they learn primarily through everyday life experiences instead of formal courses.

More research served as evidence for the external and internal categories summarized above regarding family motives for home education. For additional reasons, some families chose this because of a child's unique needs, such as a child's learning disability, a learner's medical or psychological condition, a child's giftedness, a family member's military obligation, and so forth (Jolly & Matthews, 2018; Prothero, 2018).

While researchers tried to tackle the question in their writings, the exact reasons for the motivation behind homeschooling remain complicated, as families may have a changing push towards a particular schooling type; families may homeschool some of their children, not all of them; and that some family may have an inaccurate description when talking about their motivations, and intend to self-justify their own homeschooling experiences.

1.3. Research Design

In today's world, every student gets "home education" and home instruction to some extent. Especially during the Covid-19 pandemic, the concept of and the motivation behind homeschooling became even more indefinite and complicated as parents mixed home, school, and online instruction. To comprehensively examine the issues around home education, this study specifically aims to answer the following questions.

Question 1: What are the global trends in home education? Question 2: What are the impacts of home education on measured learning outcomes by education researchers? Question 3: How much is the cultural capital generated in home-educated families?

The author regards mixed methods research as “an intellectual and practical synthesis based on qualitative and quantitative research” that recognizes “the importance of traditional quantitative and qualitative research but also offers a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful” study results (Johnson et al., 2007). Therefore, the author chose a mixed-methods design to account for the problem’s complexity.

This study mainly draws on a comprehensive combination of data sources, including the Global Education Monitoring Report Profiles Enhancing Education Reviews (PEER), the American National Household Education Study (NHES) data, and insights that have emerged from the academic world and nonprofit organizations in the United States and selected countries.

To answer the first question, this study explored the legal status of home education, reported the statistics for countries that have prevailing numbers of homeschoolers, and tracked the possible changes in these numbers during the COVID-19 pandemic. The selection of countries and regions is also based on the availability and accessibility of information.

For the second question, the author summarized the approaches and results researchers used to measure home-educated and traditionally schooled learning outcomes from existing empirical studies published in academic journals and reports of research institutions.

Question three is built on current homeschool research literature, and U.S. national dataset of American households, and the Parent and Family Involvement Survey as part of the National Household Education Survey (PFI-NHES), focusing on the most recent datasets since 2010.

The author wants to examine the impact of homeschooling as a school choice on cultural capital acquisition measured by cultural activities. The author compared the profiles of home-educated children with their traditionally educated peers to shape the recent home education phenomenon in the United States based on a few different indicators, such as race and ethnicity, region, community type, parent’s education level, immigration status, and so forth. PFI-NHES data was collected by National Center for Education Statistics (NCES), a primary federal entity for collecting, analyzing, and reporting data related to education in the United States.

The survey has been conducted every three or four years since 1996. The most recent datasets contain homeschooled children sampled and over-sampled, particularly for homeschooling research. Scholars agreed that PFI-NCES has generated the most reliable estimates, thus remaining the best

available source for large-scale American homeschool research. Second, the dataset is relatively large scale—for example, 347 households in 2012, 552 households in 2016, and 532 households in 2019. Furthermore, respondents were asked questions such as school choice decisions, parental involvement, family extracurricular activities.

The author searches for answers and discusses how related non-state actors acted in US homeschooling movements in the past few decades. Then the author seeks research topics related to home education that help understand the phenomenon and future research. The following sections are significant findings and discussions.

2. Global Trends of Home Education

The legal status and specific practices of homeschooling vary significantly by country and education systems globally. According to PEER, the latest online platform prepared by the GEM Report team and launched to describe countries' laws and policies on inclusion and education, out of the 211 education systems with available data, homeschooling is allowed in 123 of them and exists in 153 of them (PEER, 2021). Even in several countries that do not recognize homeschooling in law, the practices still exist and have grown in popularity, especially since the COVID-19 pandemic.

In the following subsections, countries and regions' selection is based on a few criteria. Cases are selected based on the availability and accessibility of information countries. The estimates are less likely to be biased for education systems where homeschooling practices are legal, and for which empirical homeschooling research are led by authoritative entities.

2.1. Countries Where Homeschooling is Not Allowed

Homeschooling is not allowed nationally in countries such as Brazil, China, France, and Germany. Some of these countries only allow homeschooling under tight restrictions or special conditions. However, home education occurs unofficially.

Home education was not encouraged fully in Brazil due to a lack of recognition by the Brazilian State and resistance from defenders of centralized education (Ray, 2019). The Brazilian Federal Constitution demanded that education is primarily the State's and the family's responsibility, which led to the law that Education in Brazil is compulsory from four to 17 years old that covers kindergarten, elementary and high school education (Barbosa, 2016). However, as homeschooling

practices have been “flourishing” in Brazil, it was regarded as an acceptable practice but lacking regulations (Madov, 2019). According to the Brazilian National Association of Homeschoolers (ANED), 7,500 families homeschooled their children in 2016 (Madov, 2019). Many supported the proposal of passing a bill explicitly legalizing home education.

In Asia, the Compulsory Education Law of the People’s Republic of China in 1986 established that nine-year compulsory education, implemented by Chinese governments at different levels, serving primary school students and middle school students (primarily six-to-15-year-olds, or Grades one-to-nine). The law requires that all children who have reached school age enroll in school and receive compulsory education, regardless of gender, nationality, or race. In 2017, Chinese officials openly opposed the homeschooling practice, calling it “unfavorable” to a child’s “lifelong development,” and reminded parents that homeschooling without authorization was banned. For most Chinese parents, permission is required for homeschooling during the compulsory education stage. Only parents who are not Chinese citizens can choose any schooling for their children. As for the numbers of homeschooled children, the 21st Century Education Research, a Beijing-based think-tank, estimated that about 56,000 children were being homeschooled or were about to be withdrawn from traditional schools in 2017, with a number that had almost tripled the number of 18,000 in 2013 (Economist, 2019). However, the number of homeschooled children during the COVID-19 pandemic remains uncertain, as untold families keep the practice underground.

A few other countries echoed these preferences. Educating children at home is illegal or under tight restrictions in many European countries (UNESCO, 2020). Homeschooling is heavily restricted in France. Homeschool has been “little practiced” and remained a “vastly unknown option” in France for the past two centuries, despite French Parliament’s school choice debates over time (Bongrand, 2016). French President Emmanuel Macron had proposed strict regulations on home education. According to a bill unveiled in November 2020, parents who homeschool their children in France may face up to six months in prison or be fined about 7,500 euros (Howard, 2020). The bill was introduced to prevent “hard-line beliefs” and “radical Islam” imposed on French children. French Prime Minister Jean Castex once shared with media in public that homeschooling would be allowed but only with “authorization from the local education authority” for a limited number of reasons such as disability or particular state of health, professional sport, or artistic training, and long-distance living from a school. According to the official figure available to date in 2016, there were less than 20,000 homeschoolers (ages from 6 to 16) in France, with three groups of children: 1) 3,297 children not enrolled in any distance learning institution; 2) 1,766 students registered in an independent private distance learning institution, and 3) 13,755 homeschooled students attending the National Center for Distance Education (Bongrand, 2016). It is estimated that more than 50,000

children are currently homeschooled in France (Hanks, 2020), almost threefold the number estimated before the COVID-19 pandemic (HSLDA, 2019).

Homeschooling has been illegal in Germany since 1919, and it is only allowed for severe illnesses, the children of diplomats, and working children, all of which are rare exceptions (Grunau and Schumacher, 2019). Germany does not permit homeschooling based on the religious or pedagogical convictions of parents. Many Germans, typically those associated with Christian communities, have tried to homeschool their children but failed to get approval for it. In 2019, the European Court of Human Rights ruled against a German family from the State of Hesse that has been “fighting for years for the right to homeschool” their children but was rejected for reasons such as children not properly socialized and so forth. It is estimated that there are between 500 and 1,000 cases of parents homeschooling their children across Germany (Grunau and Schumacher, 2019; HSLDA, 2021).

For many countries, the legal status of homeschooling is complicated and subject to different interpretations. To illustrate, some argue that homeschooling is not legally recognized in India, as there is no policy defending or opposing it (Kaushik, 2021). The 2009 Right of Children to Free and Compulsory Education Act required eight years of formal education for all children in India; however, it doesn't mention any alternative approach. Others argue that homeschooling has been gaining importance in recent years in metropolitan areas, including Bangalore, Pune, and Mumbai, India (HSLDA, 2021). Children who are homeschooled can participate in board examinations conducted by the National Institute of Open Schooling after 14 or for the International General Certificate of Secondary Education examination, an internationally recognized qualification for secondary students.

2.2. Countries Where Homeschooling is Allowed

Homeschooling is deemed legal and has gained popularity in education systems across the globe in countries like Austria, Australia, Canada, Chile, New Zealand, South Africa, the United Kingdom, and the United States (UNESCO, 2020).

For example, homeschooling is legal in Austria and regulated by its local government with the Compulsory Education Act of 1985. Private schools have equivalent status to public schools and are evaluated through student examination unless endowed with the right to examine in their own right. Austrian parents do not need any special qualifications to instruct children at home. The Constitution provides the freedom of instruction at home (Austria Bill of rights, 1867, Article 17), which safeguards parents' right to homeschool their children of school age (HSLDA, 2021). Austria's

anti-virus measures fueled a rise in education at home. Based on the HSLDA estimate, the number goes up to 30,000, including those who attend distance education schools (HSLDA, 2019). According to ministry statistics, the number of homeschoolers during the COVID-19 pandemic has been three times more than in previous years, reaching 7,500 (France 24, 2021).

In the Commonwealth of Australia, homeschooling is legal in all of its six states and two territories. There were approximately 30,000 homeschooling families in 2019 (HSLDA, 2019). The homeschooling statistics have started to “skyrocket” since the COVID-19 pandemic in early 2020 (Champ, 2021). Karen Chegwidan, the president of Home Education Association, a voluntary role in a national not for profit organization dedicated to supporting home educators across Australia, argued that the increase of homeschooling in the country was driven by the COVID-19 and the uncertainty around schools closing and family experiences at home during lockdown periods. The recent number of homeschooler registrations in almost all states in Australia rose above 20 percent from the end of 2019 to the end of 2020 (Champ, 2021).

While most families enroll in formal education and institutional schooling in Kenya, many families have opted for homeschooling. There is no law against homeschooling children in Kenya, and Homeschooling is considered part of its alternative education and curriculum implementation by the parents or delegates. Most parents use officially recognized curricula, some of which require training to use them. Home-schooling candidates can be privately registered to apply for college using the Kenya Certificate of Secondary Education (KCSE) test results (Oduor, 2019). Wolsey Hall Oxford, a registered online school of Cambridge Assessment International Education, based in England, estimated that more than 400 families homeschool in Kenya.

Home education in all Canadian jurisdictions satisfies compulsory education requirements, with the regulatory framework of how home education has been delivered in Canada varied over time and across educational jurisdictions (HSLDA, 2019). The percentage of homeschoolers among total student enrolment in Canada has increased in every province and Canada since 2006, estimated by the Fraser Institute, independent non-partisan research and educational organization based in Canada. They found that the share of Canadian parents choosing to homeschool their children went from 18,360 (0.3 percent of total student enrollment) in the 2006-07 school year to 37,458 (0.7 percent) in the 2018-19 school year (MacPherson, 2021). Before the pandemic, the various estimates of home education in Canada calculate it as ranging from 27,000 to 50,000 children from 2014 to 2019, some 0.5 to 1% of school-aged children (Brabant, 2021). According to the latest estimate from the Ontario Federation of Teaching Parents, there will be between 47,500 to 95,000 children homeschooled in Canada in the 2020 and 2021 school years, representing a significant increase during the global COVID-19 pandemic (Engle, 2021a).

Homeschooling is legal in Chile, evidenced by Article 41 of its General Education Law, stating that “A Supreme Decree issued by the Ministry of Education will regulate the way of validating knowledge developed outside the formal system, either from personal experience or the workplace, leading to levels or degrees, and how studies equivalent to primary or secondary education completed abroad will be validated” (Leturia and Vallejo, 2012). The estimated number of homeschoolers is about 2,000 in Chile (HSLDA, 2021).

In New Zealand, the Ministry of Education pays education supervision allowance to families that teach their children at home. It is reported that the number of parents home-schooling their children has “skyrocketed” since the pandemic hit, including in the South with an 40 per cent increase (Ryder, 2022). On December 2021, there were 8552 pupils in New Zealand with an exemption to be educated at home, up from 7749 at the beginning of July, 7192 in 2020, and 6573 in 2019 (Ryder, 2022).

Home education in South Africa was legalized by the South African Schools Act No. 84 of 1996 (S51), which states that each province has “the authority to set its standards,” and those home learners are required to apply to register with provincial education departments (HSLDA, 2019). In 2019, it was estimated that 140,000 students were home educated in South Africa, and the number has doubled to approximately 300,000 since COVID-19 (Engle, 2021b).

The British government listed special sections online to guide parents, articulating that parents can teach the child at home, either full-time or part-time, and get help with home education from the local council. The number of home-educated children in the United Kingdom had increased by 40% to about 75,000 from October 2019 to October 2020, based on research published by the Association of Directors of Children’s Services, which represents local officials (Economist, 2021).

2.3. Homeschooling in the United States

Homeschooling is one of the oldest forms of school choice, predating charter schools, school vouchers, and school districts in the United States (Patrick et al., 2021). Many argue that homeschooling is a constitutional right protected by the First Amendment’s free exercise clause, which prevents the government from making laws that prohibit the free exercise of religion. They also rely on the Fourteenth Amendment on the due process clause, which prevents the government from depriving any person of life, liberty, or property without due process of law, and the right to privacy that has emerged from it. Homeschooling is often claimed for specific minority groups. Lawyers cite *Wisconsin v. Yoder* (1972) to claim First Amendment rights, arguing that they qualify for

an exemption to compulsory school laws in a way similar to the one practiced by Amish people, despite many beliefs that this cannot be applied to homeschoolers (Lickstein, 2010).

The vague jurisprudence of the U.S. Supreme Court towards homeschooling contributed to the diverse interpretations of homeschooling's legal status. To date, the U.S. Supreme Court has not filed any case explicitly about homeschooling, nor did the lower Court find any individual constitutional right to homeschooling from the Fourteenth Amendment (Ross, 2010). Much of the academic literature regarding the legal status of American homeschooling seek to influence public policy by suggesting neutral legal arguments that either endorse or challenge the current situation. Some American scholars advocate for reduced regulation or no regulation; others argue for regulation, particularly with concerns about homeschoolers' welfare, safety, gender equity, qualification for parent educators, curriculum, learning assessment, and other matters (Kunzman and Gaither, 2020). By contrast, others argue that states without regulation of homeschooling violate the Constitutions' equal protection clause (Yuracko, 2008).

Modern-day American homeschooling began in the 1970s with a few main groups of people: the "intensely religious" and those of an "exceptionally high" academic philosophy (Isenberg, 2007). In the 1970s and 1980s, most states regarded homeschooling as a type of "truancy," claiming that children must be in school (Isenberg, 2007). Relations between homeschooling advocates and school authorities were intense and hostile.

During the 1980s, advocates came together to legalize home-based education at the state level. Between 1982 and 1988, twenty-eight states passed new homeschooling legislation in response to the Court finding that the previous compulsory education statute was vague or deficient (Carlson, 2020). In the 1990s, due to the legalization of home-based education and widespread Internet use, homeschooling began to grow and became a viable option for American families in all states.

Concerning the changing number of homeschoolers, in February 2020, around five percent of U.S. households with school-aged children reported homeschooling at least one child; by the fall of 2020, the rate reached as high as 11.1 percent, according to the Household Pulse Survey data conducted by the U.S. Census Bureau in 2020 and 2021 (Musaddiq et al., 2021; Wamsley, 2021). This change represents an increase of 5.6 percentage points and a doubling of American households that indicated they homeschooled their children at the start of the 2020-2021 school year compared to the prior year (Eggleston and Fields, 2021). Some researchers adjusted these estimates downward and found the number of homeschooling trends at four percent in spring 2020 and six percent in fall 2020 (Hamlin and Peterson, 2021). Notably, homeschooling is on the rise. Even conservative estimates indicated the growth of the homeschooling practice during the pandemic.

3. Learning Outcome of Home Educated Children

As the COVID-19 pandemic leading to school closures across the globe affected learning performances, researchers and teams have tried to monitor the learning losses among all school aged children. The Center for Research on Education Outcomes (CREDO) at Stanford University was established to improve empirical evidence about education reform and student performance at the primary and secondary levels, assessing learning outcomes in nineteen U.S. states. The team used scores from federally mandated achievement assessments for 3rd through 8th grade and high school assessments and applied innovative methods to build estimates of and simulate the loss from March 2020 until the end of the school year. As a result, they found sharp differences in the within-state variation in learning losses for reading among different states.

Based on the study result, the most extensive estimated loss has been located in Tennessee, wherein at least one school student faced a loss of $-.734$ standard deviation; North Carolina has a closely similar estimate of $-.715$ standard deviation (Raymond et al., 2021). The study argues that one standard deviation of achievement represents about 3.22 years of school or about 580 days; for a typical 180-day school year, a $.1$ std reflects 58 days of learning. In other words, in Tennessee, this equates to about loss of 426 days of school, and the learning loss in North Carolina equates to when children are missing about 415 days of school.

Researchers have examined and compared home-educated children with their brick-and-mortar peers using qualitative and quantitative methods, various data sets, and different measures to assess learning outcomes. This section on learning outcome aims to introduce how learning outcome is typically compared and cases for noticeable and representative results.

Researchers use diverse learning assessments to study homeschooler performance to track how homeschoolers perform academically. Learning assessment refers to “a wide range of methods and tools used to evaluate, measure and document learning outcomes and learning progress”; learning can be measured by “summative assessment,” used to certify or select learners for a given grade or age, for further education, for training, and work (UNESCO, 2021).

The American College Testing (also known as ACT, a standardized test used for college admissions in the United States), Scholastic Aptitude Test (also known as SAT, another standardized test used for college admissions in the United States), and state assessment (Barwegen et al., 2004; Quaqish, 2007; Coleman, 2014) are a few examples. Others applied large-scale national or state assessments, such as the National Survey on Drug Use and Health (Green-Hennessy, 2014), Alaska’s Correspondence School Program (Wilkins & Kalenda, 2019), and Kentucky’s Office of Education

Accountability's 2018 Report (Coleman, 2019) to study homeschoolers. To control for the outcome, researchers incorporated the years of homeschooling, family background, different type of schooling programs, and other demographic information to get more convincing results.

The learning outcome is assessed with different purposes. For example, summative assessment measures learning to certify or select learners for a given grade or age for further education, training, or work; formative assessment helps inform teaching and learning practices; the reviews can also provide evidence for policy development (UNESCO, 2021).

Have homeschoolers experienced any learning losses? Do homeschoolers perform better than their peers? How has homeschooler research assessed the learning outcome? Can homeschooling serve as a valid alternative for those not enrolled in public schools and reach satisfactory learning outcomes? These questions have received the most outstanding scholarly attention and have been investigated mainly in current home education research. The following section will introduce some representative cases.

3.1 Homeschooler Advantages in Learning Outcome

Some research shows that homeschooling promoted positive academic achievements and that homeschoolers performed better than their brick-and-mortar peers (Murphy, 2014; Rudner, 1999; Ray 1990, 1994, 1997a, 1997b, 2004a, 2004b, 2010, 2015, 2019; Woodruff, 2021).

Rudner's study in 1999 was one of the earliest and most widely cited studies in the history of homeschooling research. It is most commonly cited to support the claims that homeschoolers outperform traditionally schooled students academically.

Commissioned by Home School Legal Defense Association (HSLDA, a United States-based organization that seeks to aid homeschooling families through legal representation), the study assessed 20,760 Grade K-12 students in 11,930 families using two tests, the Bob Jones University Press Testing and Evaluation Service, a fundamentalist Protestant homeschooling service provider.

One test, Iowa Tests of Basic Skills (ITBS), developed by University of Iowa professors for K-8 students, measured skills and standards across curricula similar to those used in traditional schools. The test subjects included Reading, Language Arts, Mathematics, Social Studies, Science, and Information Sources. The other one, Tests for Achievement and Proficiency (TAP), assessed high school level or Grades 9-12 homeschoolers. This test served as an upward extension of the ITBS test for homeschoolers.

As for significant findings, this study showed that homeschoolers sampled had higher achievement in test scores. When comparing the median scaled scores, homeschoolers achieved higher scores than corresponding Catholic and Private School students, with higher scores than their public school counterparts. This finding was consistent across grade levels and subjects. For example, for 7th graders nationwide, homeschoolers had a 276 median score, while private schoolers scored 257 and the national average scored 239 (p.20). To reach a score of 250 typically needs a homeschooler in Grade 6, a private schooled student in Grade 7, and a student nationwide in the later stages of grade 8.

From 1990 to 2010, a few more large-scale studies on academic achievements were sponsored by HSLDA, where homeschooled children scored in the 80th percentile or above on nearly every measure. The Ray (2015) study found Black homeschool students score 23 to 42 percentile points above Black public school students. The study shows that these Black homeschool students' average reading, language, and math test scores were significantly higher than those of Black public school students and equal to or higher than all public school students as a group in the exploratory, cross-sectional, and non-experimental study.

State-level studies have reached similar conclusions. A study in Washington State involving the Stanford Achievement Test scores of 873 homeschooled children found their median test scores in the 65th to 66th percentile range (Ray, 1988). Another study in Arkansas on six-grader performance in 2007 shows that homeschoolers outperformed their public school peers in Reading, Language, Social Studies, and Science (Woodruff, 2021). The analysis of testing data by the State of Arkansas showed that the overall homeschooling average score was higher than the public school average on every subject but math, where it was lower.

Additional research on post-homeschool graduates has measured the college preparation, access, and success of homeschoolers (Murphy, 2014). Scholars attempted to track the long-term impacts of homeschooling on post-graduation success and found that homeschoolers were as well prepared as public school graduates on measures of verbal, writing, and critical thinking skills and were enrolled in distinguished higher education institutions and that once enrolled, homeschooled students in colleges and universities are performing as well as public school graduates (Basham et al., 2007; Galloway and Sutton, 1995; Oliviera et al., 1994; Ray, 2009).

Homeschooling advocates have widely cited these studies in media and journals, arguing that homeschoolers outperform public schoolers academically. They also received criticism from many scholars accusing that the study did not apply random sampling or control for confounding variables.

3.2 Homeschooler Disadvantages in Learning Outcome

Other research found the achievement of home-educated children not as well as their traditional public schools (Cogan, 2010; Green-Hennessy, 2014; Gutermam & Neuman, 2019; Jones & Gloeckner, 2004; Martin-Chang et al., 2011; Qaqish, 2007; Wilkens & Kalenda, 2019; Yu et al., 2016).

Martin-Chang and colleagues compared the academic achievements of 25 homeschooled children with 37 children attending traditional public schools in Canada. The homeschooled group was divided into two groups: those taught from organized lesson plans (structured homeschoolers) and those not (unstructured homeschoolers). Their data showed that while structured homeschooled children achieved higher standardized scores than children attending public school, unstructured homeschoolers achieved the lowest standardized scores across all these three groups (Martin-Chang et al., 2011).

Using Elul tests to detect learning disabilities and a Wechsler intelligence test, Gutermam and Neuman interviewed and conducted a Chi-square test for a sample of 101 children, with 65 homeschooled and 36 attending traditional school (Gutermam & Neuman, 2019). The finding showed significant differences between the homeschooled children and those who participated in the phonological and reading comprehension tests: the children who attended traditional school demonstrated higher phonological awareness than their homeschooled counterparts. Children who attended schools had better reading comprehension than the homeschooled children did.

Green-Hennessy analyzed the National Survey on Drug Use and Health for 2002-2011 (N = 182,351) and found that homeschoolers aged 12 and up were two to three times more likely than their public-school peers equivalents to report being behind grade level (Green-Hennessy, 2014).

An analysis of data from a popular correspondence school program in Alaska from 2010 to 2017 found that home-educated correspondence students had significantly lower graduation rates than students in public schools (Wilkens & Kalenda, 2019).

Additional findings from the literature showed that homeschoolers performed not as well on mathematics assessments compared with the performances of their brick-and-mortar peers.

For example, a study using the mathematics scores from The American College Testing (ACT) as an outcome factor found a slight mathematical disadvantage for homeschoolers (Qaqish, 2007). The study used two datasets from 1,807 homeschooled children and 5,400 non-homeschooled children on the same form of the 2003 ACT mathematics test. Two specific subsets were extracted, controlling for four demographic variables: grade level, gender, ethnicity, and socioeconomic status. After the matching technique, the final output was analyzed on two subsets of examinees with 1477 pairs. The finding showed on average, non-homeschoolers performed better than homeschoolers,

by about two items, out of sixty things, on the ACT mathematics test that was analyzed. The author also concluded that this result might be due to the different teaching and learning media used in these two groups, teacher-student interactions, or the number of years homeschooled before taking the ACT mathematics test.

Critiques pointed out that the sample of homeschoolers in many research studies is not representative of the homeschooling movement. For example, some argue that the Rudner survey in 1999 could only indicate that homeschooled white elementary- and middle-school-age Christian children from wealthy, single-income families with married, highly educated parents who administer standardized tests to their children score considerably above the national average on standardized tests (McCracken, 2014). These studies used small samples, and the overall topic of homeschooler learning outcome, in general, is still in short supply. Little data are available to inform further discussion.

3.3 Learning Outcome Discussion

Research studies on learning outcomes of home-educated children report mixed results. To this point, our knowledge of homeschooler performance on learning outcomes is still somewhat limited because many of the studies conducted on homeschoolers suffer from methodological problems that make their findings inconclusive.

Some studies on learning outcome variables such as college performance found little to no difference between homeschooled college students and those who attended traditional schools. For instance, studies of student retention and graduation rates have found no difference.

For example, Yu and colleagues used predictors of postsecondary academic performance (scholastic aptitude test and high school grade point average, with the abbreviation of SAT and HSGPA here) for homeschooled students. This research team examined the postsecondary performance of students at 140 colleges and universities matched to a sample of 732 homeschooled students on four demographic variables, HSGPA and SAT scores. The matched sample included 824,940 traditional students attending the same institutions as the homeschooled students (Yu et al., 2016). The findings from the comparison did not show a difference in first-year college grade point average (FGPA) or retention between homeschooled and traditional students; SAT scores predicted FGPA and retention equally well for both groups, but HSGPA was a weaker predictor for the homeschooled group. The authors concluded that these results suggest that homeschooled students perform similarly to traditionally educated students matched on demographics and academic preparedness.

At the moment, there have been no clear answers on either the absolute performance of homeschoolers or the treatment effect of homeschooling in many domains: religious or moral outcome goals; personal safety outcome goals; outcomes among students homeschooling due to particular student needs; outcome goals driven by artistic, pedagogic, or individualized interest goals, as well as career choices (Wilkins & Jennifer, 2021). The complexity of homeschooling practices renders the comparison of learning outcomes remain challenging.

Although it is critical to recognize the contribution of existing research on learning outcomes, an equally important question should color our understanding of homeschooling outcomes: many homeschoolers' families disagree with the notion that test scores and the assessments used for public schools should be the only measures of student success.

There are accepted goals and expectations in the form of a particular GPA system, standardized testing, textbooks and rubrics, and other tools for traditional schools. On the other hand, Homeschool families may have different definitions, expectations, and means of educational success for their children. Regarding children's education, homeschooling parents have used a range of other categories to define success: the love of learning, the ability to think critically, communication skills, healthy relationships, strengths of characters, and spiritual security (Johnson, 2014), most of which are not assessed or measured in previous comparative studies.

Researchers should be aware that the purpose of education can be diverse. The education efforts can also be distorted if we only focus on preparing children for tests and assessments. While many education systems in today's world prescribe a broad curriculum that includes much more than the limited number of subjects required for homeschoolers, those previously assessed subjects with the most attention and resources may push other meaningful ones to the periphery (Elmer et al., 2019). As for consequences, distorted educational purposes, cheating in the tests, psychological damages, stifled innovation, and many more would be side effects. The author introduces a few other aspects of homeschoolers and their families in the next section.

4. Homeschoolers in USA

With the highest prevalence of home education practices, the United States experienced a steady increase in homeschooled children during the past few decades. It was estimated by National Center for Education Statistics (NCES) that in 1999, about 850,000 American children were homeschooled, while approximately 1,690,000 (about 3.3%) school-age children were homeschooled in 2016 (Wang et al., 2019).

This section first depicts a detailed profile of homeschoolers obtained from the most recent U.S. national datasets made available in January 2021. A special note is that the data used here was collected before 2020 and could only give a snapshot of homeschoolers before the COVID-19 pandemic.

4.1 Who are homeschoolers in USA?

To explore the background and family engagement of American homeschoolers, this section mainly examines the Parent and Family Involvement Survey as part of the National Household Education Survey (PFI-NHES) program, a flagship household survey program conducted by NCES. The survey collected nationally representative samples of households with children in kindergarten through grade 12 among those who attend traditional schools and those who choose to homeschool.

The PFI-NHES is nationally representative, descriptive data on the educational activities of children and families in the United States, conducted every three to four years on various topics. Scholars agreed that NCES had generated the most reliable estimates and PFI-NHES data remained the best available source for large-scale American homeschooler research (Isenberg, 2017).

The survey has been completed a few times since 1996. The most recent datasets, mainly from 2012, 2016, and 2019, contained homeschooled children sampled. Among survey respondents who considered homeschooling their children included were 347 households in 2012, 552 households in 2016, and 532 families in 2019.

Children and students are considered homeschooled if parents reported them being educated at home instead of attending a public or private school and if the enrollment in public or private schools does not exceed 25 hours a week. Homeschooled children include those between 5 and 17 years old, with a grade equivalent of kindergarten through grade 12.

Table 1 below presents a more detailed summary of statistics on homeschoolers in the NHES for each of the three survey years. Data from the above three most recent cross-sectional datasets of the NHES were introduced, respectively. There are two columns in the table for each year: one reflects the percentage composition of specific characteristics among homeschoolers, the other demonstrates the composition of non-homeschoolers. This offers a chance for readers to see the relative comparison of categories for their non-homeschooled counterparts and to seek questions related to any trends.

Table 1: Characteristics of Homeschooler and Non-Homeschooler

Summary of the National Household Education Survey						
Year	2012		2016		2019	
	Homeschooler & Non-Homeschooler (Percentage)					
Child's Gender						
Male	49.12	51.92	48.37	51.40	51.88	51.82
Female	50.88	48.08	51.63	48.60	48.12	48.18
Child's Race/Ethnicity						
White (Non-Hispanic)	76.83	54.70	59.42	56.59	70.68	55.76
Black (Non-Hispanic)	5.29	11.92	6.34	9.99	5.26	9.66
Hispanic	10.08	22.13	25.18	20.83	15.41	20.76
Asian or Pacific Islander	1.76	5.74	3.26	6.64	1.69	7.10
All Other/Mixed Race	6.05	5.51	5.80	5.95	6.95	6.72
Region						
Northeast	9.32	17.63	10.33	17.53	11.28	16.92
South	46.60	37.14	45.47	36.26	45.68	36.55
Midwest	19.14	21.47	17.03	22.50	19.55	22.67
West	24.94	23.75	27.17	23.72	23.50	23.86
Community Type						
City	25.80	29.74	29.34	29.8	26.69	29.61
Suburban	29.48	38.05	36.95	45.26	36.27	44.43
Town	8.56	8.87	9.97	7.68	9.96	8.39
Rural	34.25	23.33	23.73	17.27	27.06	17.6

Sources: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program (PFI-NHES: 2012, 2016, and 2019)¹.

The 2012 PFI-NHES data revealed that 2.26 percent of children aged 5 to 17 with a grade equivalent of kindergarten through grade 12, representing the 1,222,671 of all homeschooled children once weighted. The majority of homeschoolers in 2012 were non-Hispanic White, Hispanic, and Black regarding their ethnic group, making up 76.83 percent, 10.08 percent, and 5.29 percent, respectively, of all responses. In comparison, those who go to traditional schools include 54.70 percent of White students, 22.13 percent of Hispanic students, and 11.92 percent of Black students. As for the Census region, the homeschooler came from in 2012, and the most significant percentage, 46.60 percent of them, came from the South area of the United States. As for the community type where homeschoolers' households are located, it is estimated that the most popular places where homeschoolers live are rural (34.25 percent), suburban (29.48 percent), city (25.80 percent), and town (8.56 percent), respectively.

The 2016 PFI-NHES data shows that about 3.92 percent of children aged 5 to 17 with a grade equivalent to kindergarten through grade 12 were homeschooled, representing 1,861,700 American

¹ Locale of student's household classifies the residential ZIP code into a set of four major community types: city, suburban, town, rural. Non homeschooler here include those who did not select homeschool.

homeschooled children. Concerning ethnicity, the largest percentage of children among all homeschoolers was 59.42 percent White, 25.18 percent Hispanic, and 6.34 percent, Black children. For non-homeschooler counterparts, 56.59 White, 20.83 Hispanic, and 9.99 for Black students. Concerning the region where these homeschoolers are located this year, the composition rhymed with the 2012 household one: they mainly came from the South region (45.47) and West region (27.17), both with relatively higher percentages than that of their traditionally schooled counterparts. As for the community type where homeschoolers' households are located, it is estimated that the areas where homeschoolers live are suburban (36.95 percent), city (29.34 percent), rural (23.73 percent), and town (9.97 percent), respectively.

The 2019 PFI-NHES data is the most recent available NCSE data for homeschoolers that went public in the year 2021. The data includes 532 responses among all 16,446 American children aged 5 to 17 who came from homeschooling families, which takes about 3.34 percent of all families with children of school age, representing 1,775,233 homeschooled children.

About 514 surveyed homeschooled families (96.62%) completed the survey in English, while 18 (3.38%) completed it in Spanish. Among these homeschoolers, about 93.05 percent have both parents speak English at home, while 88.88 percent of non-homeschoolers have both parents speak English at home. About 5.45 percent of homeschoolers do not have parents or guardians who speak English at home, while the percentage is 8.32 for non-homeschoolers' families.

For all responded homeschooling families, when detailed ethnicity was considered, 376 responses indicated that they came from non-Hispanic White families, which makes up about 70.68 percent of all homeschoolers; 38 homeschoolers came from Mexican descent, which makes up about 7.14 percent of all homeschoolers; 34 homeschoolers came from Hispanic, Latino, or Spanish families, which makes up about 6.39 percent of all homeschoolers; 28 homeschoolers came from non-Hispanic Black families, which makes up about 5.26 percent of all homeschoolers; and about 1.69 percent of homeschoolers were from Asian descent.

As for where homeschoolers came from, like the 2012 and 2016 data, the significant percentages of homeschoolers were living in the South region of the United States: 243 homeschoolers (45.68 percent) indicated they were from the South in 2019; the second-largest proportion of these families came from the West, with about 23.50 percent came from this region; 19.55 percent of homeschooled families came from the Midwest region. Besides, approximately 11.28 percent of homeschoolers went from the Northeast region, which composes the smallest percentage concerning the geographic location where homeschoolers' families lived in 2019.

Regarding reasons for homeschooling in 2019, about 77.26 percent (411 out of 532) responded "yes" to "school environment"; 50.94 percent (271 out of 532) answered "yes" to get "religious

instruction”; 67.67 percent (360 out of 532) responded “yes” to homeschool and have better “moral instruction.” These were consistent with major reasons indicated from previous data sets and our discussions earlier in this paper.

Table 2 (continued): Selected Characteristics of Homeschooler & Non-Homeschooler

Summary of the National Household Education Survey						
Year	2012		2016		2019	
	Homeschooler & Non-Homeschooler (Percentage)					
Total Household Income (\$)						
10,000 or less	4.03	7.49	7.97	4.85	3.76	4.03
10,001 to 20,000	8.31	9.14	9.78	6.63	4.89	5.17
20,001 to 30,000	10.58	10.30	10.51	8.15	8.65	6.95
30,001 to 40,000	9.82	8.63	9.06	8.16	7.71	7.26
40,001 to 50,000	10.83	8.04	9.60	6.99	8.08	6.57
50,001 to 60,000	8.56	7.19	8.70	6.88	8.27	6.3
60,001 to 75,000	13.10	9.51	11.05	8.84	9.77	8.72
75,001 to 100,000	15.87	14.13	15.76	14.75	15.98	14.06
100,001 to 150,000	11.08	13.86	11.59	16.76	20.11	18.21
More than 150,000	7.81	11.70	5.98	17.98	12.78	22.74
Highest Education Level of Parents/Guardians						
Less than High School	3.27	7.83	9.78	5.89	6.20	4.93
High School Graduate or Equivalent)	13.85	13.54	13.77	11.21	10.15	11.71
Vocational/Technical or Some College	35.52	32.74	31.70	29.59	28.20	28.04
Bachelor’s Degree	20.15	21.22	25.72	28.32	28.57	27.99
Graduate or Professional School	27.20	24.67	19.02	24.99	26.88	27.33

Sources: U.S. Department of Education, National Center for Education Statistics, Parent and Family Involvement in Education Survey of the National Household Education Surveys Program (PFI-NHES: 2012, 2016, and 2019)

As for family income and education levels, across datasets in 2012, 2016, and 2019, homeschoolers are raised in relatively higher-income households with highly educated parents.

For example, all three data sets show that nearly half of homeschoolers came from families with at least one parent or guardian with an education level of at least some college. The smallest percentage of homeschoolers came from families with parents’ highest education level less than high school. Detailed data in 2019 shows 55.45 percent of homeschoolers’ parents having at least a bachelor’s degree, 83.65 percent having some college, 93.80 percent of parents having high school or equivalent education. The 2016 data shows 44.74 percent of homeschoolers have at least one parent having a bachelor’s degree or higher, 76.44 percent with parents having at least some college, and 90.21 percent of parents having at least a high school or equivalent education. For 2012 data, it shows 47.35 percent of homeschoolers have parents with a bachelor’s degree or higher, 82.87 percent have parents with some college or higher, 96.72 percent of homeschoolers have parents with a high school education or higher.

Regarding the 2012 data, the top three most considerable proportions of households fall into the \$75,001 to the \$75,001 to 100,000 income group, the \$60,001 to \$75,000 groups, and the \$100,001 to 150,000 group, each with 15.87 percent, 13.10 percent, and 11.08 percent respectively. About 47.86 percent of homeschoolers' families earned at least \$60,000 annually. For 2016 homeschoolers, the household's top three most considerable proportions came from the \$75,001 to 100,000 income group, \$100,001 to 150,000 group, and \$60,001 to 75,000 group, each with 15.76 percent, 11.59 percent, and 11.05 percent falling into respectively. About 44.38 percent of homeschoolers' families earned at least \$60,000 annually. The 2019 homeschooled cohorts are distributed across all income categories for total household income, from making \$10,000 or less to earning more than 250,000. The top three largest proportions of the household came from the \$100,001 to 150,000 income group, where 20.11 percent came from, the \$75,001 to 100,000 income group with almost 16 percent of homeschoolers falling into, and the highest income category with more than \$150,000 (12.78 percent). Most homeschoolers (up to 58.64 percent) came from relatively high-income levels, with more than one family earning at least \$60,000 annually.

A few things drew the special attention of the author. The first is the racial and ethnic composition trend for homeschoolers across all three years of data. The percentage of minority homeschoolers became particularly substantial, mainly Hispanic, African American, and Asian homeschoolers with the growing numbers. To illustrate Hispanic homeschoolers, both the NHES 2012 and NHES 2016 found relatively significant increases in the rate of homeschooling among this group. According to NHES estimates, the number of Hispanic children being homeschooled rose from approximately 250,000 to just under 450,000 (CRHE, 2017).

Regarding the explanation for this growing number among ethnic-minority populations, Latino and Asian American families' decisions to homeschool represented similar or dissimilar ethnological motivations to Black families (Fields-Smith, 2017, as edited in Milton Gaither's Handbook of Home Education). Shared motivation for homeschooling was Latino parents' desire to "participate more directly in their children's learning," to "seek a bilingual education," and to "provide their children an educational experience fully integrated with their ethnic or cultural heritage" (pp.215-218). In addition, ethnic-minority homeschooling educators wanted to "infuse instruction with a cultural perspective," something that multicultural education scholars have urged public schools to do for decades (p, 218). Latino families have formed advocacy groups at the local and national levels in search of "justice" in the form of "equality, equity, and excellence" in education.

Another is the geographic characteristics of homeschoolers. From all three years of data, it is not difficult to identify that the most significant percentage of homeschoolers are located in the South region of the United States. The largest share of conservative Christian homeschoolers also

happens to reside. Pew survey on the religious landscape in the South of the United States showed that American residents in the South are highly religious, with 76 percent of respondents considered Christian, including 34 percent evangelical protestant, 14 percent mainline Protestant, 11 percent historically Black protestant, and 15 percent Catholic (Pew Research Center, 2020). According to Gaither, the vast majority of homeschoolers were conservative Christians. This group of learners intentionally left the “ungodly” public schools and have formed support groups that were “closed communion,” demanding adherence to their beliefs in values (Gaither, 2016). The political ideology among adults in the South is primarily conservative, with 40 percent of respondents indicating they are conservative, 32 percent indicating moderate, 21 percent liberal, and 7 percent unsure. The influence of conservative Christians on public policy and homeschooling could attribute to the activities of the Home School Legal Defense Association (HSLDA), which identified itself as a Christian organization and the largest homeschool advocacy group in the world, with more than 100, 000 members today (Kunzeman 2010; HSLDA, 2022). Besides Christian groups, other religious homeschoolers include Muslims, Mormons, Jews, and Catholics, to name just a few.

The survey programs also asked parents about many of their activities that may benefit their children; therefore, the data are helpful for analyses examining several dimensions of parental involvement. Next, the author draws on the information on the socialization of homeschoolers to discuss cultural capital. Using the latest available 2019 PFI data, the author analyzes the cultural capital homeschooling family-owned and how homeschooling affected the cultural capital index compared with their peers enrolled in traditional schools.

4.2 Who lack opportunities to acquire cultural capital?

Cultural capital is a sociological concept that has gained widespread popularity since Pierre Bourdieu first introduced it in the 1970s. Cultural capital refers to non-financial assets that promote social mobility beyond economic means. The concept of cultural capital denotes cultural dispositions, knowledge, and resources that could confer societal rewards, such as power and status, to individuals and groups in society (Bourdieu & Passeron, 1977). The concept is critical as it can promote educational success and it pertains to families and individuals in advantaged social and economic environments as a “principal asset” (Jæger, 2011; Azevedo et al., 2022).

Scholars across academic disciplines have applied the concept of cultural capital to empirical analyses over the past decades and used different proxies to measure the creation of cultural capital. For example, visiting an art gallery or museum; experiencing a live artistic performance; visiting a zoo or an aquarium; going to an athletic event; visiting a historical site; visiting a bookstore

or a library...these activities were used to represent cultural capital in classic and well-received scholarly work (Anderson & Jaeger, 2015; DiMaggio & Mohr, 1985; Hamlin, 2019; Gaddis, 2013; Kisida et al., 2014; Moskal, 2016; Rossel, 2011; Sullivan, 2001; Upright, 2004; Xu and Hampden-Thompson, 2011).

In a traditional school setting, organizational and institutional resources can promote the acquisition of cultural capital (Hamlin, 2019). However, homeschoolers seem to lack such a process thus may have less cultural capital than their peers. The common proxy measures of cultural capital are restrictive in home education settings. Few empirical analyses attempted to examine how these households sought opportunities to acquire cultural capital. As a result, how home-educated children and their families pursue cultural capital may partly remain an exciting question.

The 2019 PFI-NHES data contains survey questions to make such comparisons in cultural capital measured by cultural activities, as respondents were asked about their children's participation over a one-month duration in the following cultural activities, such as having "visited a library," "visited a bookstore," "gone to a play, concert, or other live show," "visited an art gallery, a museum, or a historical site," "visited a zoo or aquarium," "attended an event sponsored by a community, religious, or ethnic group," and "attended an athletic or sporting event outside of school." These are all categorical binary and closed questions that sought answers of "yes" or "no." The dataset is disaggregated by demographic and socioeconomic variables, such as age, gender, ethnicity, and socioeconomic measures.

The following section presents detailed results to compare the likelihood of pursuing cultural capital among different groups: in step one, the author explored the effect of homeschooling on seven cultural activities separately; in step two, the author further examined a few interactions between homeschooling and a few variables of interest, including gender, race, and parent education level.

Homeschooling and Cultural Activities

Here the null hypothesis across all models assumes that there is no significant relationship between homeschooled groups and the cultural activities their families engaged in the past month as of the time they completed the survey. In other words, being homeschooled does not make any difference in the cultural activity families have engaged in.

The dependent variables include whether the family goes to the library, a bookstore, a play, an art event, a zoo, a group event, and a sporting event. In the first step, homeschool variable is the major independent variable, defined as educating children at home rather than sending them to public or private school, plus children getting at least some classes or subjects at home. After

controlling a few variables such as child’s age, child’s sex, child’s racial and ethnic group, parental education status, location, community type, and parental immigration status, the result shows that homeschoolers are positively linked to most of these seven categories of cultural activities.

The models from this step showed homeschooling status significantly predicted most cultural activities among families compared with non-homeschooled counterparts. In other words, the status of being homeschooled is linked to a positive likelihood of engaging in most cultural activities, net of their family background with all other things being equal. Here are more detailed results.

The logistic command produces results in terms of odds ratios which measures the association between an exposure and an outcome. The ratios represent the odds that an outcome will occur given a particular direction, compared to the odds of the outcome occurring without that exposure. In our cases, the odds ratio of the homeschooling variable within seven models is positive for homeschoolers.

Table 1. Logistic regression predicting cultural activities participation by homeschooling status

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Homeschool	3.239*** (0.678)	1.902*** (0.318)	1.182 (0.173)	1.917*** (0.291)	1.514** (0.315)	2.288*** (0.504)	0.648*** (0.0926)
Observations	16,446	16,446	16,446	16,446	16,446	16,446	16,446

Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Models include the following controls: children’s gender, children’s age, children’s race and ethnicity, region, community type, parental education, and parent immigration status. Non-homeschooler students are the reference category in this table. See full model (table 7) in the Appendix. Survey weights are applied.

Table 1 shows that being homeschooled is linked to higher likelihood of participating in at least five of these cultural events. For example, there is an odds ratio of about 3.24 for the first cultural activity, with a p-value smaller than 0.05. This implies that the likelihood of homeschoolers’ participation in this first cultural activity, having visited the library in the past month, is about 3.24 times that of non-homeschoolers. The odds for model 2 is about 1.90, which indicates that the likelihood of participating the second cultural activity (having visited the bookstore) for homeschoolers is about two times that of non-homeschoolers. The odds of having the fourth cultural activity (going to the art gallery, museum, or historic site) is 1.9, which indicates that the likelihood of going to a play, concert, or other live show for homeschoolers is about two times that of non-homeschoolers. The odds ratio of having the fifth cultural activity (going to the zoo) is 1.5, which indicates that the likelihood of going to the zoo for homeschoolers is about 1.5 times that of non-homeschoolers. The odds ratio for model 6 is 2.29, meaning that the odds of having the sixth

cultural activity (going to a religious event, that is, an event sponsored by a community, religious, or ethnic group) for homeschoolers is more than two times that of non-homeschoolers.

At the same time, the result from the above analysis shown in the table also indicates that for homeschoolers and non-homeschoolers, participation in one cultural activity does not differ significantly. The odds of having the third cultural activity (play, concert, or other live show) is 1.18, which indicates that the likelihood of participation of such activities for homeschoolers is about the same as that of non-homeschoolers. In addition, the odds ratio for model seven is about 0.65, meaning that the likelihood of going to a sporting event is significantly less likely than that of non-homeschoolers.

In short, homeschooled children from the PFI-NHES survey are more engaged than their schooled, educated peers in five out of the seven investigated cultural activities. Being homeschooled proves to impact most of the cultural activities families engaged in, except for one showing a similar participation rate among homeschoolers and non-homeschoolers (play, concert, or live show), and one shows homeschoolers' lack of participation compared to their peers (sporting events).

5. Discussion and Conclusion

The findings from the main logistic regression intended to examine the impact of homeschooling. It showed that homeschooling status significantly predicted most cultural activities outside of school, other things being equal, including gender, race, parent's highest education level, geographic location, community type, immigration status, and so forth. Being homeschooled is significantly linked to higher likelihood of engaging in most of cultural activities.

Table 2. Logistic regression predicting cultural activities participation by gender and homeschooling status

Cultural Activities	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Library	Bookstore	Concert	Museum	Zoo	Group	Sports
Traditional&Female	1.218*** (0.0643)	1.376*** (0.0703)	1.373*** (0.0663)	0.979 (0.0546)	1.017 (0.0651)	1.136*** (0.0547)	0.883** (0.0435)
Homeschooler&Male	3.561*** (0.608)	2.362*** (0.396)	1.302 (0.235)	1.812*** (0.296)	2.301*** (0.464)	2.581*** (0.439)	0.707* (0.130)
Homeschool&Female	3.622*** (1.295)	2.179*** (0.578)	1.499* (0.326)	1.966*** (0.480)	1.046 (0.345)	2.342** (0.871)	0.527*** (0.113)

Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Traditional schooled male student is the reference category.

Models include the same controls. Survey weights are applied.

According to the estimates in table 2, compared with male traditional schoolers, female traditional schoolers are significantly more likely to go to library, bookstore, concert, and religious events with their family, but not the museum or sporting events, with all other things being equal.

As for male homeschoolers, they are much more likely to go to library, bookstore, museum, zoo, group events, but not sporting events, in comparison with traditional schooled male counterparts with all other things being equal. The difference of likelihood is greater than the comparison among traditional schoolers.

Compared with male traditional schoolers, female homeschoolers are significantly more likely to go to all of the cultural activities, especially going to the library, evidenced by the significant odds based on results in table 2. The number of 3.62 means that female homeschoolers are 3.62 times likely to visit library than that of male non-homeschoolers. This female home learners are also much less likely to do sports, as the likelihood of them going to sporting event is only half of that number with traditional male students.

Table 3. Logistic regression predicting Black family participation in cultural activities

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Non-Homeschool & Black	1.409*** (0.113)	0.972 (0.0760)	0.939 (0.0713)	0.950 (0.0816)	1.085 (0.104)	1.600*** (0.121)	1.260*** (0.0959)
Homeschooled & Non- Black	3.995*** (0.540)	2.164*** (0.307)	1.286* (0.180)	2.234*** (0.295)	1.630*** (0.270)	2.757*** (0.398)	0.704** (0.0989)
Homeschooled & Black	1.594 (1.175)	0.956 (0.580)	0.728 (0.386)	0.755 (0.429)	1.037 (0.804)	1.440 (1.058)	0.526 (0.241)

Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Traditional schooled non-Black student is the reference category.
Models include the same controls. Survey weights are applied.

Table 4. Logistic regression predicting Asian family participation in cultural activities

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Non-Homeschool&ASIAN	1.355*** (0.131)	1.094 (0.0970)	0.866 (0.0763)	1.158 (0.109)	1.147 (0.129)	0.761*** (0.0707)	0.738*** (0.0726)
Homeschool&Non-ASIAN	3.239*** (0.648)	1.913*** (0.333)	1.188 (0.179)	1.893*** (0.294)	1.532** (0.316)	2.200*** (0.454)	0.623*** (0.0879)
Homeschool&ASIAN	4.749*** (2.454)	2.291 (1.234)	1.156 (0.607)	4.094** (2.613)	0.664 (0.441)	2.853* (1.721)	1.209 (0.855)

Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Traditional schooled non-Asian student is the reference category.
Models include the same controls. Survey weights are applied.

The full regression results from table 1, the Black and Asian categories have the most significant results. Therefore, the author performed a few additional models that examined the interaction between these racial groups and homeschooling status. Table 3 and 4 showed the detailed results.

Based on these numbers, one can tell that families of Black traditional students are significantly more likely to visit a library (1.41 times), attend a group event (1.6 times), and watch sports (1.26 times), compared with the numbers of non-Black student that go to traditional schools.

With respect to non-black students, homeschooled ones are significantly more likely to go to almost all cultural activities. For example, the likelihood of them visiting a library is four times of traditional schooled non-black students. And the likelihood of them visiting a bookstore (2.16), going to a play, concert or live show (1.29), visiting an art gallery, museum, or historical site (2.23), visiting a zoo or aquarium, going to a group or religious event (2.76) are all significantly higher than their traditional peers.

As for homeschooled Black students, the likelihood of them participating in cultural events with family are quite similar to the likelihood of traditional students. This group of learners are less likely to go to a bookstore, concert, museum, sporting events. They are more likely to go to library, zoo, or group events. However, none of these ratios here are statistically significant enough to make it different from the reference group.

With respect to non-Asian students, homeschooled ones are more likely to go to six of those seven cultural activities. For example, the likelihood of them visiting a library is about 3.24 times of traditional schooled non-Asian students. And the likelihood of them visiting a bookstore, a museum, or a group event, is about two times of their peers (1.91, 1.89, and 2.2, respectively).

As for homeschooled Asian students, the likelihood of them participating in cultural events with family are much higher than that of traditional non-Asian students. This group of learners are much more likely to go to six of these seven cultural activities, except for going to the zoo. For example, they are about 4.75 times likely to visit a library; they are about 4.09 times likely to go to an art gallery, museum, or historical site; they are 2.85 times likely to go to events sponsored by their community, religious or ethnic group.

Table 5. Logistic regression predicting participation in cultural activities by parent highest education & homeschooling status

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Homeschool#<High School	3.032** (1.338)	1.707 (0.837)	1.808 (0.869)	1.309 (0.758)	4.090*** (2.084)	2.239* (1.020)	1.566 (0.739)
Homeschool#High School	1.164 (1.001)	1.376 (0.981)	0.742 (0.420)	0.495 (0.311)	0.555 (0.461)	1.139 (0.920)	0.570 (0.298)
Homeschool#Vocational	4.891***	2.912***	1.087	2.412***	2.256***	2.704***	0.631**

	(1.082)	(0.617)	(0.254)	(0.535)	(0.559)	(0.568)	(0.145)
Homeschool#College	5.561***	1.945***	1.438*	2.518***	1.234	3.571***	0.504***
	(1.219)	(0.433)	(0.300)	(0.554)	(0.309)	(0.839)	(0.112)
Homeschool#Graduate	2.626***	1.578**	1.122	2.727***	1.510	2.389***	0.686
	(0.567)	(0.339)	(0.240)	(0.573)	(0.401)	(0.528)	(0.160)

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Traditional schooled students with parents obtaining less than high school education is the reference category. Models include the same controls. Survey weights are applied.

Among students with parents who obtained the same education level in the reference category (parent or guardian's highest education is less than high school), homeschooled families are more likely to attend cultural activities with their children, especially going to the library, the zoo, or group events.

Compared with traditional schooled students with parents who obtained less than high school education, parents with vocational or technical education or some college, and parents with college education, have similar trends in attending these cultural activities: they are much more likely to go to library, bookstore, concert, museum, zoo, or group events with their children.

All of above findings from all the analyses were quite consistent with previous findings that reported comparatively homeschoolers' high participation in educational, religious, social, and civic activities outside the home (Isenberg, 2007; Phillips, 2010; Hamlin, 2019). They showed that homeschooled students participated in more extracurricular activities than their traditionally schooled peers to seek resources that generate more significant exposure to cultural capital.

To further explain this, homeschooling may strengthen familial bonds by ensuring family engagement that fosters positive social development. To many homeschooler families, this type of schooling could protect their children from a negative peer or social influences in traditional schools that undermine healthy social development. Numbers of other changes in the wake of COVID-19 could encourage homeschooling, such as job losses, which led to more stay-at-home parents not able to afford traditionally private or public institutions for children to attend. Some employers are willing to continue to allow their staff to work more flexibly with a lower salary, leaving home education possible for families that would love to have closer bonds and relationships, share education costs with other families in learning cooperatives, have children play together, and spread the burden of educating, many of which are strategies that home educators have used to improve learning and spread the responsibility of teaching.

Disclaimer and Data Limitation

The selection of the indicators of cultural capital is usually driven simply by what is available in the dataset. I am no exception to this rule. The best yardstick for me to judge the validity of the

measures of cultural capital is Bourdieu's discussion concerning this concept. The cultural activities here could reflect the dimensions and forms discussed by many researchers. I would suggest that these activities are relevant because parents involved in such culture activities can convey to their children a more general, transferable attitude of selfconfidence and familiarity towards culture that is highly appreciated at traditional school setting.

However, the conclusion on the cultural capital only reflects the culture outside of formal instructional time. More work needs to be done to understand how different cultural activities are within the family and developed through experience at traditional schools. Among homeschooling families, total household income is distributed across all income levels. It is worth mentioning that low-income categories are also well represented in our data in both homeschoolers and non-homeschooler groups. As socially less privileged parents have less educationally relevant capital, their parents will be less likely to support children with their schoolwork and with the particular challenges of homeschooling, for example, attending cultural activities, providing support with technical equipment, offering knowledge on online learning strategies, adaptation to changing learning environment or disrupted learning time, and so forth.

Conclusion

This study first explored the global trends of home education, the academic outcome of home-educated children, and the family background home-educated children come from in the United States. The legal status and specific homeschooling practices vary significantly by country and education systems globally. Many homeschoolers reside in North America, where homeschooling practices are permitted in the United States, Canada, and other countries. Although homeschooling is not explicitly forbidden in most countries in Europe and Asia, it is not encouraged or supervised. Education policy regarding home education is limited in both legalization and regulations.

Researchers from various social science fields have studied homeschoolers as a group of learners, analyzing this group's academic and family background. Supporters of the practice of home education addressed the advantages and benefits of homeschooling and pushed this practice to the legalization in state and local education laws and policies (Isenberg, 2007; Ray, 2010). They believe homeschooling better caters to a wider variety of needs and that homeschoolers have better learning outcomes. Advocates also argue that families want to spend more time with their children and develop closer family bonds by homeschooling their children.

On the flip side, critics charge that homeschooling is detrimental (Bartholet, 2020; Isenberg, 2007). They allege that it is academically harmful, socially harmful, and disturbs the public school

system. Many accused homeschooled children of lack of proper regulation, as this group of learners, seem to have achieved poorer learning outcomes that exacerbate education inequality. Child abuse happens in some homeschooled families, and it is unfeasible for institutions to offer help. In addition, intense homeschool and public school relationship are found in many places, when the public school lost their funding as their student enrollment decreased while homeschoolers were growing. In addition, certain countries do not encourage home education at the national level in fear of separatism and extreme views.

Today's schoolchild from nearly every corner of the world has experienced some home-based education, thus making issues around it complicated but inevitable to understand for education stakeholders worldwide.

This group of learners shared a few common motivations, which explained why families chose home education. The global trend of home education primarily reflects the legal status of home education—the education systems in countries where legal homeschooling usually reported a more significant number of homeschoolers. In countries where homeschooling is questioned or not recognized by national laws and policy, the practice could still exist in different numbers, usually smaller numbers. On the one hand, fewer people might choose this way of education for their children while more parents enroll children in traditional institutions. On the other hand, a small number might come from the difficulty and hesitation of reporting homeschooling children, all of which lead to the challenges of accurately tracking the accurate numbers of homeschoolers.

Homeschooling in the United States has been regarded as a grassroots movement. It traces the growing “fault lines” between two types of homeschoolers, called by Gaither “closed communion” and “open communion.” According to Gaither, the vast majority of homeschoolers were conservative Christians. Pew survey on the religious landscape in the South of the United States showed that residents in the South are highly religious, with 76 percent of respondents considered Christian, including 34 percent evangelical protestant, 14 percent mainline Protestant, 11 percent historically black protestant, and 15 percent Catholic (Pew Research Center, 2020). The political ideology among adults in the South is primarily conservative, with 40 percent of respondents indicating they are conservative, 32 percent indicating moderate, 21 percent liberal, and 7 percent unsure. This may explain our PFI-NHES findings with the homeschooler profile in the United States. A relatively high percentage of homeschoolers from the South region of the United States are identified from the data.

For homeschooler profiles that come from the U.S. national data of American households and the PFI-NHES program, the author reported a few fascinating numbers in terms of each highlighted

demographic category. In addition, home education is heavily shaped by non-state actors, such as religious and charitable organizations, nonprofit organizations, private online and cyber schools, and for-profit technology and curricula providers, as well as parents and caregivers, who have all been playing crucial roles in American K-12 home education.

This study then summarized and introduced empirical research comparing and measuring home-educated with traditionally schooled children in learning outcomes. Many cite the bright side of this research. Studies during the pandemic are limited. Some argue that homeschooling will become an excellent option for more families, and it will become a more appealing option for families struggling with the COVID-19 pandemic. The Hechinger Report, a nonprofit platform that reports education news and progress describes American education using, “Like it or not, we are suddenly a nation of homeschoolers.” Another survey by RealClear Opinion Research found one of the COVID-19 pandemic’s effects is that more parents seem to be interested in homeschooling, as they found in 2020 that a high percentage (40 percent) of parents more likely to consider alternative education, including homeschooling, after the end of the lockdown (Harden, 2020).

More and more minority parents choose to homeschool their children, considering the academic achievement of their Black homeschool students. Their reasons for homeschooling are similar to those of homeschool parents in general, adding that some families intended to use homeschooling to help their children understand Black culture and history (Ray, 2015).

From our data, being minority traditionally schooled student do not always render minorities in disadvantaged position regarding cultural capital acquisition. However, being homeschooled and minority at the same time might do so. Compared with non-Black student that go to traditional schools, families of Black traditional students are significantly more likely to visit a library (1.41 times), attend a group event (1.6 times), and watch sports (1.26 times). As for homeschooled Black students, they are less likely to go to a bookstore, concert, museum, sporting events, while they are more likely to go to library, zoo, or group events. However, none of these ratios here are significantly different enough to make comparison with traditional schooled non-black students.

In contrast, schooling type can explain the variation of cultural activities among different groups really well. For example, non-black homeschooled students are significantly more likely to go to almost all cultural activities compared with traditional schooled peers: the likelihood of them visiting a library is four times of traditional schooled non-black students; the likelihood of them visiting a bookstore (2.16), going to a play, concert or live show (1.29), visiting an art gallery, museum, or historical site (2.23), visiting a zoo or aquarium, going to a group or religious event (2.76) are all significantly higher than their traditional peers.

The rise in the number of homeschoolers has revived some long-lasting worries. Based on the homeschooler profile in the United States, a relatively high percentage of homeschoolers are religious fundamentalists. As part of the resistance to their surrounding culture, religious fundamentalists are in the opposite camp of government institutions and professional expertise. Conservative Christians in early twentieth-century America, for example, considered themselves as “cultural insiders” and the government and affiliated institutions, including schools, as their “enemy, something committed to the evils of secular humanism” (Gaither, 2008; Kunzman, 2010). Some are afraid that homeschooled parents use the home to shelter children from scientific concepts and prevent children from getting connected to the real world. Some families are charged to use the home as covers to send their children to unlicensed schools with the religious curriculum. The fiercest debates also relate to child abuse.

Examples from both the media and scholarly articles reflect concerns about keeping homeschooled children safe and raising questions about child mistreatment and abuse. A study in 2018 of six school districts in Connecticut showed that more than one-third of families who had withdrawn children from school in the previous three years had been the subject of at least one prior report for suspected child neglect or abuse (Connecticut Office of the Child Advocate, 2018). Evidence is growing that reports to Child Protective Services have plummeted nationwide because children are removed from the mandated reporters that schools provide (Batholet, 2020).

In addition, intense homeschool and public school relationship are also reported. In a recent working paper, researchers found that in Michigan and nationally in the United States, school systems that offered in-person instruction in the fall of 2020 had more significant increases in homeschooling rates than school systems that provided remote education. School systems that offered small instruction in the fall of 2020 witnessed relatively more substantial increases in private school enrollment (Musaddiq et al., 2021).

As home education became more prevalent during the COVID-19 pandemic, research struggled to keep pace with the rapid growth. Current research on home education suffered from a few major limitations. For example, the sampling from previous research mainly came from small datasets, and few previous studies employed large-scale random samples. Second, there was a severe lack of advanced methodology applied in quantitative homeschooling research. Most previous research could only publish fundamental descriptive analysis, and even they used large-scale datasets. Few inferential data was drawn from large-scale datasets across different years in this field. Third, no previous research has incorporated all the large-scale datasets from the past decade. While previous work did provide meaningful insight into homeschooling, additional statistical analyses may help strengthen the existing evidence base. The empirical research on many aspects of home education is

still in its early years. Rigorous empirical research on the effects of homeschooling remains scarce. In the Wiley Handbook of Home Education, “scientific research is best conducted by non-stakeholders,” the majority of the work studying the learning outcome of homeschooling was conducted by homeschooling groups, which leaves the educational success identified in those research studies questionable.

In addition, to explore the comprehensive studies around homeschooling and the debates on related issues, the author mainly examined the limited number of widely focused studies from peer-reviewed journals and national education reports. However, this study is not systematic regarding the scope and scale of the work, and analyses in other languages and education systems are not included.

By undertaking the study in the context of the COVID-19 pandemic, the author hopes to chart new territory in the international education literature. The work will add meaning to the ongoing conversations on education equity and equality globally. This study may contribute to the comparative research, as the PFI-NHES 2019 data has not yet been utilized in any published article for this writing.

RECOMMENDATIONS

Policymakers, practitioners, and activists have positioned school choices as ways to increase educational opportunities for historically marginalized students. At the same time, critics worry that the most disadvantaged families may be the least likely to participate in the school choice process, which will concentrate the neediest students in already disadvantaged and under-resourced neighborhood schools. It is therefore critical to understand how school choice shapes the composition and outcomes of all schools, regardless of the choice sector. Based on the discussions of this study, the author further presents some suggestions for stakeholders related to the issue of home education.

- Policymakers in each school district should understand the trends of homeschooling locally and find ways of evaluating student learning outcomes and academic progress. Public schools may consider cooperative policies for encouraging cultural activities outside of formal schooling, awarding credit, assisting with the transition for traditionally schooled and homeschooled students. Local education system could incorporate more opportunities for cultural events, especially the sporting events, and offer opportunities and equipment of relevant activities to homeschoolers, as they shortage of participation of this cultural activity based on our findings.

- Parents or legal guardians of homeschoolers need to recognize the risks of the learning outcomes when homeschooling their children, for example, the mathematics learning outcome, considering the implication from this study. Parents should also be aware of the educational approach, expectations, emotional relationship with children when they homeschool.
- International agencies and organizations shall lead and facilitate more comparative projects on home education, online learning, and parental involvement. Conversations between different countries across continents should be encouraged. Guidance on how to conduct comparative research should be provided to researchers.
- As for researchers, more advanced methods to analyze national data sets are needed. Systematic studies on local, state, national, and regional homeschooling regulations are necessary for more topics among home education. Longitudinal studies on homeschoolers are needed.
- With respect to issues around home educated student success, research should also address other essential categories regarding homeschooled student success, such as the love of learning, the ability to think critically, the communication skills, healthy relationships, strengths of characters, and spiritual security, and so forth.

Evidence in home education, especially during COVID-19, remains inconclusive. The author hopes this paper will incentivize more discussions around home education, parental involvement in education, and resources for education at home.

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APPENDICES

Appendix 1: A Technical Notes

The National Household Education Surveys Program (NHES) is a set of surveys sponsored by the U.S. Department of Education’s National Center for Education Statistics (NCES). This paper presents survey data released from the Parent and Family Involvement in Education (PFI) Survey of the 2019 NHES. Earlier administrations of the NHES—in 1996, 1999, 2003, 2007, 2012, and 2016—also focused on parent and family involvement in education.

The 2019 PFI data collection was conducted by the U.S. Census Bureau, from January through August of 2019. The NHES:2019 sample was selected using a two-stage, address-based, sampling frame. The first sampling stage selected residential addresses. To increase the number of Blacks and Hispanics in the sample, census tracts with higher percentages of Black and Hispanic households were sampled at a higher rate than other census tracts.

Sampled households were asked to complete a screener questionnaire to identify the presence of eligible children at the address. At the second stage, one child from each household was sampled to be the focus of a topical survey. The majority of data were collected using a web-based survey instrument that respondents accessed with credentials they received in a mailed invitation. Paper survey were used for nonresponse follow-up and for a small experiment.

The PFI sample is nationally representative of all noninstitutionalized students in the 50 states and the District of Columbia, ages 3 through 20, who were enrolled in kindergarten through grade 12 or homeschooled for these grades.

The respondent to the PFI questionnaire was a parent or guardian in the household who knew about the sampled child. The respondent was asked questions about school choice, homeschooling, virtual course-taking, school characteristics, student experiences, teacher feedback on school performance and behavior, family involvement in the school, school practices to involve and support families, satisfaction with different aspects of the school, family involvement in schoolwork, and family involvement in selected nonschool activities with students. The respondent was also asked basic demographic questions about the child as well as questions about the child’s health and disability status, parent/guardian characteristics, and household characteristics.

Those who did not respond to the first invitation that was mailed to them. The survey materials (both paper and online) were offered in both English and Spanish. The total number of completed PFI surveys was 16,446, representing a population of 53.1 million students when weighted to reflect national totals.

Appendix 2: The Glossary of Terms

The names of variables that are included in the data file and were used to produce estimates for this report appear in capital letters. In some cases, the variables have been used in the exact format in which they appear on the data file. In other cases, variables available on the data file have been modified, for instance, when the categories have been combined to create a smaller number of categories. Such collapsing of categories is noted in the descriptions. In other cases, new measures have been derived specifically for this report by combining information from two or more variables in the data file. In these instances, the variables used to create the new measure are noted. Unless otherwise noted, all data are based on either direct parent reports, imputed data when a parent report is missing, or derived measures.

Example Characteristics

Homeschool: This is the variable that classifies the homeschooling status for responded family. The variable is *qtype* (QTYPE) in 2012 and 2016 data sets, and *EDCHSFL* (What type of school does this child attend? h. Student is homeschooled, included co-ops) in 2019 data set. The variable are as follows: 1 = Yes; 2 = No. For the analyses, the variable is renamed to “homeschool” and re-coded with 0 = No and 1 = Yes.

Community Type of Children’s Household: *ZIPLOCL* is a household location variable that classifies the ZIP code into a set of community types. This variable was derived using the respondent’s ZIP code and census data. The values for *ZIPLOCL* are as follows:

1 = City—Large; 2 = City—Midsize; 3 = City—Small; 4 = Suburb—Large; 5 = Suburb—Midsize; 6 = Suburb—Small; 7 = Town—Fringe; 8 = Town—Distant; 9 = Town—Remote; 10 = Rural—Fringe; 11 = Rural—Distant; 12 = Rural—Remote

For the analyses, the first three categories from *ZIPLOCL* are combined to form the “City” category. Other categories from *ZIPLOCL* are combined to form the categories “Suburban” (categories 4, 5, and 6), “Town” (categories 7, 8, and 9), and “Rural” (10, 11, and 12).

Student’s Sex: The data for the variable *CSEX* are taken directly from responses to the topical interview. If values are missing for this variable, they are imputed from the screener interview where possible.

Student’s Race/Ethnicity: *RACEETH* indicates the race and ethnicity of the sampled student. This variable is used in this paper in the same format in which it appears on the data file and is derived from information in *CHISPAN*, *CWHITE*, *CBLACK*, *CAMIND*, *CASIAN*, and *CPACI*. The values of

RACEETH are as follows: 1 = White, non-Hispanic; 2 = Black, non-Hispanic; 3 = Hispanic; 4 = Asian or Pacific Islander, non-Hispanic; 5 = All other races and multiple races, non-Hispanic

Highest Education Level of Parent/Guardian: PARGRADEX indicates the highest level of education for either of the child's parents or nonparent guardians who reside in the household. This measure, which is used in this report in the same format in which it appears on the data file, is derived from P1EDUC and P2EDUC.

The values for PARGRADEX are as follows: 1 = Less than high school credential; 2 = High school graduate or equivalent; 3 = Vocational/technical education after high school or some college; 4 = Bachelor's degree; 5 = Graduate or professional school.

Appendix 3: Analysis for Homeschooling Effect on Cultural Capital

Table 1. Logistic regression predicting cultural activities participation by schooling

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Homeschool	3.239*** (0.678)	1.902*** (0.318)	1.182 (0.173)	1.917*** (0.291)	1.514** (0.315)	2.288*** (0.504)	0.648*** (0.0926)
Observations	16,446	16,446	16,446	16,446	16,446	16,446	16,446

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Models include the following controls: children's gender, children's age, children's race and ethnicity, region, community type, parental education, and parent immigration status (see table 6 for full results). Non-homeschooler student is the reference category in this table. Survey weights are applied.

Table 2. Logistic regression predicting cultural activities participation by gender

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Non-Homeschool & Female	1.218*** (0.0643)	1.376*** (0.0703)	1.373*** (0.0663)	0.979 (0.0546)	1.017 (0.0651)	1.136*** (0.0547)	0.883** (0.0435)
Homeschooler & Male	3.561*** (0.608)	2.362*** (0.396)	1.302 (0.235)	1.812*** (0.296)	2.301*** (0.464)	2.581*** (0.439)	0.707* (0.130)
Homeschool & Female	3.622*** (1.295)	2.179*** (0.578)	1.499* (0.326)	1.966*** (0.480)	1.046 (0.345)	2.342** (0.871)	0.527*** (0.113)

Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Traditional schooled male student is the reference category.

Models include the same controls. Survey weights are applied.

Table 3. Logistic regression predicting Black family participation in cultural activities

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Non-Homeschool & Black Students	1.409*** (0.113)	0.972 (0.0760)	0.939 (0.0713)	0.950 (0.0816)	1.085 (0.104)	1.600*** (0.121)	1.260*** (0.0959)
Homeschooled & Non-Black Students	3.995*** (0.540)	2.164*** (0.307)	1.286* (0.180)	2.234*** (0.295)	1.630*** (0.270)	2.757*** (0.398)	0.704** (0.0989)
Homeschooled & Black Students	1.594 (1.175)	0.956 (0.580)	0.728 (0.386)	0.755 (0.429)	1.037 (0.804)	1.440 (1.058)	0.526 (0.241)

Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Traditional schooled non-Black student is the reference category.

Models include the same controls. Survey weights are applied.

Table 4. Logistic regression predicting Asian family participation in cultural activities

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Non-Homeschool & ASIAN	1.355*** (0.131)	1.094 (0.0970)	0.866 (0.0763)	1.158 (0.109)	1.147 (0.129)	0.761*** (0.0707)	0.738*** (0.0726)
Homeschool & Non-ASIAN	3.239*** (0.648)	1.913*** (0.333)	1.188 (0.179)	1.893*** (0.294)	1.532** (0.316)	2.200*** (0.454)	0.623*** (0.0879)
Homeschool & ASIAN	4.749*** (2.454)	2.291 (1.234)	1.156 (0.607)	4.094** (2.613)	0.664 (0.441)	2.853* (1.721)	1.209 (0.855)

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Traditional schooled non-Asian student is the reference category.

Models include the same controls. Survey weights are applied.

Table 5. Logistic regression predicting participation in cultural activities by parent highest education

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Homeschool & Less than High School	3.032** (1.338)	1.707 (0.837)	1.808 (0.869)	1.309 (0.758)	4.090*** (2.084)	2.239* (1.020)	1.566 (0.739)
Homeschool & High School Graduate	1.164 (1.001)	1.376 (0.981)	0.742 (0.420)	0.495 (0.311)	0.555 (0.461)	1.139 (0.920)	0.570 (0.298)
Homeschool & Vocational Education	4.891*** (1.082)	2.912*** (0.617)	1.087 (0.254)	2.412*** (0.535)	2.256*** (0.559)	2.704*** (0.568)	0.631** (0.145)
Homeschool & College Graduate	5.561*** (1.219)	1.945*** (0.433)	1.438* (0.300)	2.518*** (0.554)	1.234 (0.309)	3.571*** (0.839)	0.504*** (0.112)
Homeschool & Graduate/Professional School	2.626*** (0.567)	1.578** (0.339)	1.122 (0.240)	2.727*** (0.573)	1.510 (0.401)	2.389*** (0.528)	0.686 (0.160)

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Traditional schooled students with parents obtaining less than high school education is the reference category.

Models include the same controls. Survey weights are applied.

Table 6. Full logistic regression predicting cultural activities participation by schooling

Cultural Activities VARIABLES	(1) Library	(2) Bookstore	(3) Concert	(4) Museum	(5) Zoo	(6) Group	(7) Sports
Homeschool	3.239*** (0.678)	1.902*** (0.318)	1.182 (0.173)	1.917*** (0.291)	1.514** (0.315)	2.288*** (0.504)	0.648*** (0.0926)
Child's sex	1.210*** (0.0639)	1.356*** (0.0685)	1.365*** (0.0650)	0.983 (0.0538)	0.985 (0.0625)	1.128** (0.0545)	0.878*** (0.0426)
Child's age (as of 2018)	0.897*** (0.00682)	0.957*** (0.00665)	0.994 (0.00634)	0.937*** (0.00706)	0.879*** (0.00768)	0.965*** (0.00665)	1.006 (0.00648)
Black	1.443*** (0.143)	0.904 (0.0846)	0.910 (0.0815)	0.905 (0.0962)	1.312** (0.152)	1.734*** (0.165)	1.310*** (0.117)
Mexican, Mexican American, or Chicano	0.806** (0.0779)	0.910 (0.0846)	0.880 (0.0797)	0.779** (0.0803)	1.095 (0.122)	1.074 (0.0928)	1.071 (0.0963)
Puerto Rican	0.911 (0.180)	0.847 (0.154)	1.204 (0.203)	1.640** (0.323)	1.881*** (0.368)	1.099 (0.191)	0.927 (0.157)
Cuban	0.595 (0.194)	0.963 (0.309)	1.060 (0.274)	1.874* (0.604)	1.332 (0.425)	0.498*** (0.129)	0.960 (0.282)
Other Hispanic	0.811** (0.0850)	0.983 (0.101)	0.941 (0.0949)	1.085 (0.118)	1.307** (0.160)	1.012 (0.0985)	1.086 (0.108)
Asian	1.347** (0.171)	0.930 (0.107)	0.811* (0.0916)	1.195 (0.147)	1.450** (0.213)	0.810* (0.0977)	0.751** (0.100)
Native Hawaiian or Pacific Islander	0.523 (0.261)	0.864 (0.402)	1.992 (0.996)	1.885 (0.811)	1.979 (1.375)	1.997 (0.989)	2.175 (1.052)
American Indian or Alaska Natives	0.514**	0.682	1.078	0.706	1.045	1.738*	0.837

	(0.165)	(0.221)	(0.382)	(0.275)	(0.407)	(0.548)	(0.243)
Other/Mixed Races	1.009	1.070	0.737***	0.845	0.861	1.037	0.826*
	(0.117)	(0.119)	(0.0749)	(0.0928)	(0.116)	(0.115)	(0.0892)
High school graduate or equivalent	0.946	1.016	1.266*	0.971	0.883	0.918	1.277*
	(0.139)	(0.152)	(0.177)	(0.154)	(0.136)	(0.122)	(0.185)
Vocational/technical education	0.996	1.411**	1.522***	1.290*	0.754**	1.238*	1.578***
	(0.131)	(0.190)	(0.198)	(0.183)	(0.106)	(0.151)	(0.212)
College graduate	1.226	1.973***	2.013***	1.610***	0.704**	1.653***	2.032***
	(0.163)	(0.266)	(0.261)	(0.228)	(0.100)	(0.204)	(0.275)
Graduate or professional school	1.600***	2.249***	2.832***	2.167***	0.714**	2.185***	2.125***
	(0.212)	(0.301)	(0.366)	(0.305)	(0.102)	(0.272)	(0.289)
South	0.908	1.047	0.913	1.169*	1.111	1.261***	0.915
	(0.0724)	(0.0810)	(0.0663)	(0.0952)	(0.109)	(0.0953)	(0.0682)
Midwest	1.196**	0.855*	0.981	0.979	1.016	1.123	0.961
	(0.103)	(0.0725)	(0.0768)	(0.0882)	(0.110)	(0.0911)	(0.0771)
West	1.092	0.973	0.908	1.087	1.044	1.047	0.940
	(0.0948)	(0.0828)	(0.0723)	(0.0970)	(0.110)	(0.0858)	(0.0789)
City – Midsize	0.693**	0.970	0.899	0.791*	0.683**	0.884	0.922
	(0.102)	(0.128)	(0.108)	(0.101)	(0.113)	(0.116)	(0.104)
City – Small	1.120	0.975	0.923	0.883	0.782	1.122	1.296*
	(0.154)	(0.120)	(0.104)	(0.115)	(0.121)	(0.139)	(0.180)
Suburb – Large	0.951	0.890	0.904	0.750***	0.776***	1.121	1.078
	(0.0732)	(0.0671)	(0.0655)	(0.0586)	(0.0692)	(0.0804)	(0.0794)
Suburb – Midsize	0.820	0.914	1.114	0.566***	0.765*	1.046	1.029
	(0.119)	(0.122)	(0.159)	(0.0870)	(0.121)	(0.132)	(0.146)
Suburb – Small	1.121	0.952	1.122	0.802	0.705*	1.114	1.407**

	(0.175)	(0.148)	(0.178)	(0.139)	(0.145)	(0.167)	(0.214)
Town – Fringe	0.930	0.716**	0.729*	0.792	0.786	1.085	1.133
	(0.147)	(0.114)	(0.121)	(0.128)	(0.153)	(0.162)	(0.178)
Town – Distant	0.794	0.680***	1.118	0.598***	0.886	1.106	1.201
	(0.117)	(0.0984)	(0.159)	(0.0898)	(0.153)	(0.154)	(0.167)
Town – Remote	1.015	1.060	0.925	0.751	0.596**	1.179	1.145
	(0.234)	(0.263)	(0.198)	(0.241)	(0.143)	(0.218)	(0.207)
Rural – Fringe	0.783**	0.859	0.761***	0.626***	0.706***	1.212**	1.132
	(0.0792)	(0.0848)	(0.0724)	(0.0657)	(0.0866)	(0.113)	(0.106)
Rural – Distant	0.601***	0.485***	0.696***	0.578***	0.577***	1.392***	1.093
	(0.0791)	(0.0612)	(0.0828)	(0.0853)	(0.103)	(0.172)	(0.132)
Rural – Remote	0.572**	0.471***	0.849	0.435***	0.365***	1.348	1.767***
	(0.130)	(0.122)	(0.179)	(0.125)	(0.123)	(0.286)	(0.367)
Parent 1stgeneration	1.307***	0.905	1.011	0.885	1.061	1.084	0.709***
	(0.125)	(0.0819)	(0.0899)	(0.0850)	(0.118)	(0.0921)	(0.0652)
Parent 1.5generation	1.241*	1.086	0.978	1.105	1.172	1.154	1.031
	(0.141)	(0.124)	(0.104)	(0.127)	(0.159)	(0.123)	(0.119)
Constant	1.127	0.371***	0.236***	0.570***	1.317	0.647**	0.411***
	(0.221)	(0.0746)	(0.0446)	(0.120)	(0.294)	(0.117)	(0.0777)
Observations	16,446	16,446	16,446	16,446	16,446	16,446	16,446

Robust standard errors in parentheses. For school type, traditional schooling is the reference category; for race, White is the reference category; for community type, large size city is the reference category; for parents' highest education, less than high school is the reference group; for the first parents' immigration status, parents with U.S. citizenship is the reference category. Survey weights are applied.

*** p < 0.01, ** p < 0.05, * p < 0.1.