

Education Freedom and Student Achievement:

Is More School Choice Associated with Higher State-Level Performance on the NAEP?

Patrick J. Wolf

Jay P. Greene

Matthew Ladner

James D. Paul

March 2021



**Education Freedom and Student Achievement: Is More School Choice
Associated with Higher State-Level Performance on the NAEP?**

Patrick J. Wolf

Jay P. Greene

Matthew Ladner

James D. Paul

March 2021

School Choice Demonstration Project
Department of Education Reform
University of Arkansas
201 Graduate Education Building
Fayetteville, AR 72701

<https://scdp.uark.edu/education-freedom-and-naep-scores.pdf>

The University of Arkansas

was founded in 1871 as the flagship institution of higher education for the state of Arkansas. Established as a land grant university, its mandate was threefold: to teach students, conduct research, and perform service and outreach.



The College of Education and Health Professions established the Department of Education Reform in 2005. The department's mission is to advance education and economic development by focusing on the improvement of academic achievement in elementary and secondary schools. It conducts research and demonstration projects in five primary areas of reform: teacher quality, leadership, policy, accountability, and school choice.

The School Choice Demonstration Project (SCDP), based within the Department of Education Reform, is an education research center devoted to the non-partisan study of the effects of school choice policy and is staffed by leading school choice researchers and scholars. Led by Dr. Patrick J. Wolf, Distinguished Professor of Education Reform and Endowed 21st Century Chair in School Choice, SCDP's national team of researchers, institutional research partners and staff are devoted to the rigorous evaluation of school choice programs and other school improvement efforts across the country. The SCDP is committed to raising and advancing the public's understanding of the strengths and limitations of school choice policies and programs by conducting comprehensive research on what happens to students, families, schools, and communities when more parents are allowed to choose their child's school.

Education Freedom and Student Achievement: Is More School Choice Associated with Higher State-Level Performance on the NAEP?

Introduction

School choice is on the rise in many states. Since the start of the new millennium, many states have launched or expanded private school choice options, permitted and expanded independently operated public charter schools, eased restrictions on homeschooling, and enacted policies that allow and encourage various forms of public school choice. One thing that is not on the rise, unfortunately, is average student scores on the National Assessment of Education Progress (NAEP). Student performance on the assessments, typically called “The Nation’s Report Card,” were flat from 2001 until 2015 and have dropped slightly in both 2017 and 2019.

What do these two trends signal? Is greater educational freedom failing to contribute to learning gains for students? Might other popular education reforms be more effective than school choice at raising student test scores across the country? While it is impossible to determine the causal effect on student achievement of all the deliberate decisions of state policymakers to expand or restrict the various forms of

We find that higher levels of education freedom are significantly associated with higher NAEP achievement levels and higher NAEP achievement gains in all our statistical models.

school choice, it is possible to describe the extent to which more educational freedom does or does not correlate with state-level changes in student academic performance. That is our project. In this study we construct a comprehensive index of educational freedom that

measures the availability and accessibility of private, charter, homeschool, and public school choice across the 50 U.S. states and the District of Columbia (DC). We call it the 2021 Education Freedom Index (EFI), as it is modeled after a similar measure of comparative educational freedom introduced in 2000. We present the rankings of the 50 states plus DC on each of the four major components of the 2021 EFI, individually, as well as their rankings on the complete index. We then run a series of statistical regression models

Acknowledgements

This report was made possible by support from the American Federation for Children (AFC) Growth Fund. We thank Kathleen Wolf for editorial assistance and Marlo Crandall for graphic design and formatting support. The opinions expressed in this report are entirely those of the authors and do not necessarily represent the views of the AFC Growth Fund, the University of Arkansas, or the University of Arkansas System.

on state-level data that test the correlation between the 2021 EFI and student performance on the NAEP. In those statistical models, we control for a variety of state-level conditions that we expect to correlate with NAEP outcomes, including per-pupil expenditures, student/teacher ratios, median household incomes, the proportion of the student population that is white, previous NAEP scores, teacher quality, and the extent to which private and charter forms of parental choice are regulated.

We find that higher levels of education freedom are significantly associated with higher NAEP achievement levels and higher NAEP achievement gains in all our statistical models. Our state-level index of teacher quality also correlates with NAEP scores and gains. The extent to which school choice programs are regulated by state governments, along with per-pupil spending amounts and class sizes, in contrast, have no consistent significant association with state-level student NAEP outcomes. This descriptive analysis supports the idea that expanding

This descriptive analysis supports the idea that expanding parental options in education, in all its forms, is consistent with improvements in average student performance for U.S. states.

parental options in education, in all its forms, is consistent with improvements in average student performance for U.S. states. First, some background.

The 2000 Education Freedom Index

In 2000, Jay Greene published a study called the Education Freedom Index (EFI). The study ranked all 50 states according to the amount of K-12 choice provided to families and evaluated whether or not states with more schooling options experienced better academic outcomes. The data demonstrated a positive association between education freedom and student

outcomes by state while controlling for other factors.¹

Since the turn of the millennium, policymakers have expanded the opportunity for families to choose schools other than their zoned options, but progress has been uneven across states. State lawmakers have passed dozens of charter school and private choice laws, although of widely varying levels of scope and impact. Some states have liberalized homeschooling statutes, while others have retained more restrictive practices. Some states have seen a flourishing of open enrollment within and between district schools, while others have not.

Since the turn of the millennium, policymakers have expanded the opportunity for families to choose schools other than their zoned options, but progress has been uneven across states.

The 2000 EFI was composed of measures of five types of educational options: the availability of charter schools; the availability of government assisted private school choice (e.g. vouchers and tax credits); the ease with which families could homeschool; the ease with which families could choose a different public school district by relocating; and the ease with which families could send a child to a different public school district without changing residence.

The 2000 EFI was computed as the equally weighted average of measures of these five components. Table 1 presents the EFI ranking of each state based on the 2000 data.

In the 2000 study, Arizona was the highest-ranked state in education freedom, with Hawaii the lowest-ranked state. By the turn of the century, Arizona lawmakers had already passed one of the nation's most expansive charter school laws, a statewide open enrollment law and the nation's first scholarship tax credit program. In 2000, Hawaii had a highly restrictive charter school law, no private school choice

Table 1: 2000 Education Index Ranking by State

State (Rank Order)	2000 EFI Ranking	State (Alphabetical)	2000 EFI Ranking
Arizona	1	Alabama	39
Minnesota	2	Alaska	42
Wisconsin	3	Arizona	1
New Jersey	4	Arkansas	17
Oregon	5	California	21
Texas	6	Colorado	8
Delaware	7	Conn	10
Colorado	8	Delaware	7
Maine	9	Florida	35
Connecticut	10	Georgia	41
Michigan	11	Hawaii	50
Idaho	12	Idaho	12
Nebraska	13	Illinois	24
Iowa	14	Indiana	25
South Dakota	15	Iowa	14
New Hampshire	16	Kansas	30
Arkansas	17	Kentucky	47
Ohio	18	Louisiana	26
Missouri	19	Maine	9
Washington	20	Maryland	46
California	21	Massachusetts	22
Massachusetts	22	Michigan	11
New Mexico	23	Minnesota	2
Illinois	24	Mississippi	34
Indiana	25	Missouri	19
Louisiana	26	Montana	37
New York	27	Nebraska	13
Vermont	28	Nevada	48
Utah	29	New Hampshire	16
Kansas	30	New Jersey	4
Oklahoma	31	New Mexico	23
North Dakota	32	New York	27
Pennsylvania	33	North Carolina	38
Mississippi	34	North Dakota	32
Florida	35	Ohio	18
Tennessee	36	Oklahoma	31
Montana	37	Oregon	5
North Carolina	38	Pennsylvania	33
Alabama	39	Rhode Island	45
Wyoming	40	South Carolina	43
Georgia	41	South Dakota	15
Alaska	42	Tennessee	36
South Carolina	43	Texas	6
Virginia	44	Utah	29
Rhode Island	45	Vermont	28
Maryland	46	Virginia	44
Kentucky	47	Washington	20
Nevada	48	West Virginia	49
West Virginia	49	Wisconsin	3
Hawaii	50	Wyoming	40

In the 2000 study, Arizona was the highest-ranked state in education freedom, with Hawaii the lowest-ranked state.

program and a single school district covering the entire state, precluding inter-district transfers.²

Did education freedom levels affect student achievement in 2000? Using the EFI measure as an independent variable in a regression analysis, the 2000 study found a statistically significant association between education freedom and state-level average student proficiency on the National Assessment of Educational Progress (NAEP). The positive association between more educational choice and higher NAEP proficiency rates held even after controlling for key state-level variables including per-pupil spending, average class size, average household income, and the racial/ethnic composition of each state's student body.

"Even after controlling for these other factors, EFI is a significant predictor of student achievement. We would expect that a one-point rise in EFI for a state would increase the percentage performing proficiently on NAEP by 5.5%,"

the study found. "In contrast, a one percentage point increase in minority population would lead to a 0.3% decline in the percentage of students performing proficiently, while

NAEP proficiency rates. It also included states such as Wisconsin which have since increased educational freedom while failing to improve on the NAEP. Moreover, states such as

The 2000 study found a statistically significant association between education freedom and state-level average student proficiency on the National Assessment of Educational Progress.

a \$1,000 boost in median household income would lead to a 0.3% increase in the percentage of students performing proficiently on NAEP."³

Times have changed. The 2000 EFI study included states such as Arizona and Florida which have since expanded educational freedom while also improving their

North Dakota and Washington have continued to score high on NAEP proficiency, despite providing their residents with limited educational freedom. Is educational freedom still associated with academic performance in the states, or do other state characteristics and policy reforms better predict where students are and are not learning?

Is educational freedom still associated with academic performance in the states, or do other state characteristics and policy reforms better predict where students are and are not learning?

Updating the Education Freedom Index

The current analysis develops an updated version of the Education Freedom Index. The 2021 EFI comprises four components, each with multiple subparts and equally weighted in the overall index.⁴ The data sources used between the 2000 and current study are broadly similar but not identical due to a discontinuation of some information sources. The data are the best available within the range of 2015-2018 so that all EFI components precede the 2019 NAEP outcomes by as few years as possible.⁵ Comparisons between 2000 and the rankings developed below should be viewed as approximate rather than precise. Moreover, these rankings represent a moving target. State lawmakers have passed numerous choice programs since 2000, producing substantial movements up and down in the relative

educational freedom of the various states. Finally, the 2000 study did not include the District of Columbia in the rankings, whereas the 2021 ranking does.

Private School Choice

The calculation of the Education Freedom Index makes use of multiple data sources, listed in Appendix A. Table 2 below ranks each state by the prevalence of private choice options. The index score for private choice represents an average between the total private school choice program enrollment as a percentage of total enrollment in public and private schools and separately the proportion of taxpayers taking personal tax deductions for private school expenses. Private school choice enrollments include “town tuitioning” programs in Maine and Vermont.

Box 1: The Components & Subcomponents of the 2021 EFI

Private Choice

- ▶ Proportion of the total public & private school K-12 enrollment in Private Choice Programs in 2016-2017
- ▶ Proportion of taxpayers receiving personal tax credits or deductions for private school expenses in 2016-17

Charters

- ▶ Proportion of public schools that are chartered in 2016-17
- ▶ Quality of charter law according to the Center for Education Reform in 2018

Homeschooling

- ▶ Homeschool enrollment as a percentage of the total public & private school K-12 enrollment in 2016-17
- ▶ Quality of homeschool law according to the Home School Legal Defense Association

Public Choice (district-run schools)

- ▶ Open enrollment policies according to the National Center for Education Statistics in 2017
- ▶ Students per school district in 2017
- ▶ Average square miles per school district in 2017

Table 2: Private School Choice Ranking

State (Rank Order)	Private Choice Ranking
Iowa	1
Minnesota	2
Arizona	3
Indiana	4
Florida	5
Wisconsin	6
Louisiana	7
Vermont	8
Illinois	9
Maine	10
Pennsylvania	11
Ohio	12
District of Columbia	13
Georgia	14
Alabama	15
North Carolina	16
Rhode Island	17
South Carolina	18
Maryland	19
South Dakota	20
Oklahoma	21
Virginia	22
Utah	23
Nevada	24
New Hampshire	25
Mississippi	26
Colorado	27
Kansas	28
Montana	29
Arkansas	Tied for Last
Alaska	Tied for Last
California	Tied for Last
Connecticut	Tied for Last
Delaware	Tied for Last
Hawaii	Tied for Last
Idaho	Tied for Last
Kentucky	Tied for Last
Massachusetts	Tied for Last
Michigan	Tied for Last
Missouri	Tied for Last
Nebraska	Tied for Last
New Jersey	Tied for Last
New Mexico	Tied for Last
New York	Tied for Last
North Dakota	Tied for Last
Oregon	Tied for Last
Tennessee	Tied for Last
Texas	Tied for Last
Washington	Tied for Last
West Virginia	Tied for Last
Wyoming	Tied for Last

State (Alphabetical)	Private Choice Ranking
Alabama	15
Alaska	Tied for Last
Arizona	3
Arkansas	Tied for Last
California	Tied for Last
Colorado	27
Connecticut	Tied for Last
Delaware	Tied for Last
District of Columbia	13
Florida	5
Georgia	14
Hawaii	Tied for Last
Idaho	Tied for Last
Illinois	9
Indiana	4
Iowa	1
Kansas	28
Kentucky	Tied for Last
Louisiana	7
Maine	10
Maryland	19
Massachusetts	Tied for Last
Michigan	Tied for Last
Minnesota	2
Mississippi	26
Missouri	Tied for Last
Montana	29
Nebraska	Tied for Last
Nevada	24
New Hampshire	25
New Jersey	Tied for Last
New Mexico	Tied for Last
New York	Tied for Last
North Carolina	16
North Dakota	Tied for Last
Ohio	12
Oklahoma	21
Oregon	Tied for Last
Pennsylvania	11
Rhode Island	17
South Carolina	18
South Dakota	20
Tennessee	Tied for Last
Texas	Tied for Last
Utah	23
Vermont	8
Virginia	22
Washington	Tied for Last
West Virginia	Tied for Last
Wisconsin	6
Wyoming	Tied for Last

The top-ranked states for private school choice include those with large or multiple school choice programs, those with popular personal tax credit/deduction policies, or both.

The top-ranked states for private school choice include those with large or multiple school choice programs, those with popular personal tax credit/deduction policies, or both. Arizona, Florida, Vermont, Maine, Pennsylvania, and Ohio enroll a substantial number of their K-12 students in private schools through choice programs. Minnesota's personal tax-deduction for private school expenses is claimed by over 200,000 taxpayers annually, making it second only to Illinois in popularity.⁶ Illinois, Iowa, Indiana, Wisconsin, and Louisiana all have both private school choice programs and personal tax-credits or deductions for private school expenses, placing them among the top 12 states for the availability of private school choice. Twenty-two states tied for last in private school choice availability as they neither

enrolled students in a choice program nor offered personal tax credits/deductions as of 2016-17.

Charter School Choice

Minnesota lawmakers passed the nation's first charter school law in 1991 allowing for the creation of non-district public schools without attendance boundaries.⁷ By 2019, more than 7,000 charter schools served more than 3.2 million students across all but a small number of predominantly rural states. Charter laws vary considerably in their ability to produce actual seats for students. Almost half of the students in the District of Columbia attend charter schools, and Arizona has the highest statewide percentage at nearly 20%. Other state charter school laws however have produced very few actual charter schools.

The Center for Education Reform (CER) publishes an annual ranking of charter school laws for states and the District of Columbia. We use the CER ranking instead of other subjective rankings of charter school laws because it ranks state laws higher if they are designed in ways that promote the growth of and easy access to public charter schools, thus supporting educational freedom. For the purposes of the 2021 EFI, we took grades from the 2018 CER rankings and converted grades of A, B, C, D and F into numeric values of 4, 3, 2, 1 and 0. We averaged these values along with the percentage of public schools in each state that were charters with equal weighting in order to create the charter ranking presented in Table 3 below.

Table 3: Charter School Choice Ranking

State	CER/Market Share Ranking
District of Columbia	1
Arizona	2
Florida	3
Colorado	4
California	5
Indiana	6
Michigan	7
Minnesota	8
South Carolina	9
New York	10
Utah	11
New Mexico	12
Massachusetts	13
Louisiana	14
Wisconsin	15
Ohio	16
Texas	17
Idaho	18
Nevada	19
North Carolina	20
Pennsylvania	21
Tennessee	22
Delaware	23
Hawaii	24
Georgia	25
New Jersey	26
Oregon	27
Missouri	28
Oklahoma	29
Rhode Island	30
Arkansas	31
New Hampshire	32
Connecticut	33
Illinois	34
Maine	35
Wyoming	36
Washington	37
Mississippi	38
Alabama	39
Kentucky	40
Alaska	41
Maryland	42
Kansas	43
Virginia	44
Iowa	45
Montana	Tied for last
Nebraska	Tied for last
North Dakota	Tied for last
South Dakota	Tied for last
Vermont	Tied for last
West Virginia	Tied for last

State (Alphabetical)	CER/Market Share Ranking
Alabama	39
Alaska	41
Arizona	2
Arkansas	31
California	5
Colorado	4
Connecticut	33
Delaware	23
District of Columbia	1
Florida	3
Georgia	25
Hawaii	24
Idaho	18
Illinois	34
Indiana	6
Iowa	45
Kansas	43
Kentucky	40
Louisiana	14
Maine	35
Maryland	42
Massachusetts	13
Michigan	7
Minnesota	8
Mississippi	38
Missouri	28
Montana	Tied for last
Nebraska	Tied for last
Nevada	19
New Hampshire	32
New Jersey	26
New Mexico	12
New York	10
North Carolina	20
North Dakota	Tied for last
Ohio	16
Oklahoma	29
Oregon	27
Pennsylvania	21
Rhode Island	30
South Carolina	9
South Dakota	Tied for last
Tennessee	22
Texas	17
Utah	11
Vermont	Tied for last
Virginia	44
Washington	37
West Virginia	Tied for last
Wisconsin	15
Wyoming	36

The District of Columbia leads the nation in public charter school accessibility. Arizona is second,

followed by Florida, Colorado, California, Indiana, and Michigan. The state that pioneered chartered public schools, Minnesota, ranks eighth in the nation in charter school accessibility. Montana,

The District of Columbia leads the nation in public charter school accessibility.

Nebraska, North and South Dakota, Vermont, and West Virginia are the states that did not permit charter schooling, thereby tying each other for last place in the ranking.

Homeschooling

Homeschooling is the oldest form of school choice, predating not just charter schools or school vouchers but school districts themselves. The homeschool portion of the 2021 EFI is an average of the standardized scores for enrollment divided by the state’s combined public and private school

Missouri leads the nation in homeschooling accessibility.

enrollment as well as the quality of the state’s homeschool law according to the Home School Legal Defense Association.⁸ Table 4 presents the rankings of the 50 states plus DC regarding the accessibility of homeschooling.

Table 4: Availability of Homeschooling Options Ranking

State	Homeschool Ranking	State (Alphabetical)	Homeschool Ranking
Missouri	1	Alabama	14
Indiana	2	Alaska	20
Hawaii	3	Arizona	22
Idaho	4	Arkansas	32
Montana	5	California	28
Illinois	6	Colorado	47
Connecticut	7	Connecticut	7
Michigan	8	Delaware	11
Wisconsin	9	District of Columbia	51
Mississippi	10	Florida	38
Delaware	11	Georgia	27
New Jersey	12	Hawaii	3
Iowa	13	Idaho	4
Alabama	14	Illinois	6
New Mexico	15	Indiana	2
Kentucky	16	Iowa	13
Louisiana	17	Kansas	26
Ohio	18	Kentucky	16
Wyoming	19	Louisiana	17
Alaska	20	Maine	43
Nebraska	21	Maryland	24
Arizona	22	Massachusetts	49
South Dakota	23	Michigan	8
Maryland	24	Minnesota	39
North Dakota	25	Mississippi	10
Kansas	26	Missouri	1
Georgia	27	Montana	5
California	28	Nebraska	21
Oklahoma	29	Nevada	34
Tennessee	30	New Hampshire	35
North Carolina	31	New Jersey	12
Arkansas	32	New Mexico	15
Texas	33	New York	41
Nevada	34	North Carolina	31
New Hampshire	35	North Dakota	25
Pennsylvania	36	Ohio	18
Washington	37	Oklahoma	29
Florida	38	Oregon	45
Minnesota	39	Pennsylvania	36
Utah	40	Rhode Island	46
New York	41	South Carolina	44
Virginia	42	South Dakota	23
Maine	43	Tennessee	30
South Carolina	44	Texas	33
Oregon	45	Utah	40
Rhode Island	46	Vermont	50
Colorado	47	Virginia	42
West Virginia	48	Washington	37
Massachusetts	49	West Virginia	48
Vermont	50	Wisconsin	9
District of Columbia	51	Wyoming	19

Missouri leads the nation in homeschooling accessibility, according to the index. Indiana is second, followed by Hawaii, Idaho and Montana. Illinois, Connecticut, Michigan, Wisconsin, and Mississippi round out the top 10 states in the nation for homeschooling availability. Colorado, West Virginia, Massachusetts, Vermont, and the District of Columbia compose the bottom five states in homeschooling accessibility.

Inter-District and Intra-District Public School Choice

Finally, the opportunity for families to choose among district schools, whether within districts or between them, is a vitally important form of education freedom. In the 2021 EFI, this component is an average between the standardized scores of policy and jurisdictional factors. The National Center for Education Statistics (NCES) collected data regarding the presence of open enrollment policies by state in 2017.⁹ The NCES notes whether or not states have mandatory intra-district enrollment and mandatory inter-district enrollment, with the highest-scoring states having both mandatory inter- and intra-district policies and the lowest-scoring states having neither.

Another set of measures included in the public school choice component is the number of students per school district. A third measure is the average geographic size per district. States with fewer districts have reduced opportunities for students to select among them, and states with geographically larger districts require families to move longer distances to access

desirable public schools in another district.

The public school choice index represents an average of standardized scores for both policy and geographic factors in exercising choice among district schools. The states are ranked on their public school choice index score in Table 5.

Vermonters have the greatest ease of exercising district public school choice. Ohio is second in public school choice, followed by Indiana, Nebraska, and California. South Dakota, Delaware, Arizona, Idaho, and Colorado round out the top 10. Maryland, the District of Columbia, Nevada, Alaska, and Hawaii provide the least amount of public school choice in the nation.

Vermonters have the greatest ease of exercising district public school choice.

Table 5: Public School Choice Ranking

State	Ranking
Vermont	1
Ohio	2
Indiana	3
Nebraska	4
California	5
South Dakota	6
Delaware	7
Arizona	8
Idaho	9
Colorado	10
Louisiana	11
New Mexico	12
Oklahoma	13
Connecticut	14
Missouri	15
Wisconsin	16
Iowa	17
Michigan	18
Arkansas	19
Montana	20
Minnesota	21
Washington	22
Kentucky	23
Mississippi	24
Utah	25
Georgia	26
Florida	27
New Hampshire	28
Maine	29
New Jersey	30
Massachusetts	31
Illinois	32
Pennsylvania	33
Rhode Island	34
New York	35
Kansas	36
North Dakota	37
Texas	38
Tennessee	39
Alabama	40
Oregon	41
West Virginia	42
Virginia	43
South Carolina	44
North Carolina	45
Wyoming	46
Maryland	47
District of Columbia	48
Nevada	49
Alaska	50
Hawaii	51

State (Alphabetical)	Ranking
Alabama	40
Alaska	50
Arizona	8
Arkansas	19
California	5
Colorado	10
Connecticut	14
Delaware	7
District of Columbia	48
Florida	27
Georgia	26
Hawaii	51
Idaho	9
Illinois	32
Indiana	3
Iowa	17
Kansas	36
Kentucky	23
Louisiana	11
Maine	29
Maryland	47
Massachusetts	31
Michigan	18
Minnesota	21
Mississippi	24
Missouri	15
Montana	20
Nebraska	4
Nevada	49
New Hampshire	28
New Jersey	30
New Mexico	12
New York	35
North Carolina	45
North Dakota	37
Ohio	2
Oklahoma	13
Oregon	41
Pennsylvania	33
Rhode Island	34
South Carolina	44
South Dakota	6
Tennessee	39
Texas	38
Utah	25
Vermont	1
Virginia	43
Washington	22
West Virginia	42
Wisconsin	16
Wyoming	46

The Combined 2021 Education Freedom Index

Table 6 presents the 2021 EFI ranking for each state and the District of Columbia. This ranking is derived by combining the standardized scores for the four components described above: private choice, charter schools, homeschooling, and public school choice. We weight the four components equally because each one captures a distinctive form of parental school choice. We established the index without knowing what relationship it

We weight the four components equally because each one captures a distinctive form of parental school choice.

would have to NAEP outcomes. We committed to weighting each school choice component equally and only then observed the results. Since several states appear near the top of the rankings for multiple components of the EFI, and others appear near the bottom for multiple components, there are few surprises in the overall education freedom ranking.

Table 6: Combined Education Freedom Index, 2021

State	EFI Ranking	State (Alphabetical)	EFI Ranking
Arizona	1	Alabama	33
Indiana	2	Alaska	49
Minnesota	3	Arizona	1
Wisconsin	4	Arkansas	26
Iowa	5	California	12
Louisiana	6	Colorado	19
Florida	7	Connecticut	17
Ohio	8	Delaware	14
Idaho	9	District of Columbia	34
Michigan	10	Florida	7
Missouri	11	Georgia	18
California	12	Hawaii	51
Illinois	13	Idaho	9
Delaware	14	Illinois	13
New Mexico	15	Indiana	2
Pennsylvania	16	Iowa	5
Connecticut	17	Kansas	42
Georgia	18	Kentucky	25
Colorado	19	Louisiana	6
Mississippi	20	Maine	30
New Jersey	21	Maryland	46
Oklahoma	22	Massachusetts	41
Montana	23	Michigan	10
Utah	24	Minnesota	3
Kentucky	25	Mississippi	20
Arkansas	26	Missouri	11
South Dakota	27	Montana	23
Nebraska	28	Nebraska	28
Texas	29	Nevada	47
Maine	30	New Hampshire	37
North Carolina	31	New Jersey	21
Tennessee	32	New Mexico	15
Alabama	33	New York	35
District of Columbia	34	North Carolina	31
New York	35	North Dakota	44
South Carolina	36	Ohio	8
New Hampshire	37	Oklahoma	22
Washington	38	Oregon	45
Vermont	39	Pennsylvania	16
Wyoming	40	Rhode Island	43
Massachusetts	41	South Carolina	36
Kansas	42	South Dakota	27
Rhode Island	43	Tennessee	32
North Dakota	44	Texas	29
Oregon	45	Utah	24
Maryland	46	Vermont	39
Nevada	47	Virginia	48
Virginia	48	Washington	38
Alaska	49	West Virginia	50
West Virginia	50	Wisconsin	4
Hawaii	51	Wyoming	40

Arizona leads the nation in overall education freedom, as it ranks third in private school choice, second in charter school choice, and eighth in public school choice. Indiana ranks second in education freedom, as it places comfortably in the top 10 for all four components of the EFI. Minnesota is third in the nation in education freedom, as it ranks high in both private school choice, due to its longstanding personal tax credit/deduction policy, and charter schooling, which it pioneered. Wisconsin and Iowa are fourth and fifth, respectively. Louisiana, Florida, Ohio, Idaho, and Michigan round out the top 10. Idaho might seem to be a surprising finisher at ninth in education freedom. The Potato State lacks a private school choice program but cracks the top 10 in both homeschooling and public school choice.

The U.S. states with the least amount of education freedom are not surprising. Hawaii ranks the lowest in the 2021 EFI, with no private school choice policies, limited charter schooling options, and no public school choice. West Virginia has the second-least amount of education freedom, as it ranks near the bottom on all four components of the EFI. Both the geography and the public policies of Alaska leave its families nearly bereft of educational options. Virginia has only a tiny private school choice program and places heavy restrictions on its charter, homeschooling, and public school choice options. Nevada's ambitious private school education savings account initiative was strangled in its cradle by a combination of legal and political setbacks, leaving only a small tax-credit scholarship program and modest charter school sector as options, especially given heavy restrictions on homeschooling and limited public school choice in the Silver State.

Table 7 compares each state's education freedom ranking in 2000 to that in 2021.

Table 7: Education Freedom Rankings - 2000 and 2021

	2000 EFI Ranking	2021 EFI Ranking	Change 2000-2021
Alabama	39	33	+6
Alaska	42	49	-7
Arizona	1	1	0
Arkansas	17	26	-9
California	21	12	+9
Colorado	8	19	-11
Connecticut	10	17	-7
Delaware	7	14	-7
District of Columbia	NA	34	NA
Florida	35	7	+28
Georgia	41	18	+23
Hawaii	50	51	-1
Idaho	12	9	+3
Illinois	24	13	+11
Indiana	25	2	+23
Iowa	14	5	+9
Kansas	30	42	-12
Kentucky	47	25	+22
Louisiana	26	6	+20
Maine	9	30	-21
Maryland	46	46	0
Massachusetts	22	41	-19
Michigan	11	10	+1
Minnesota	2	3	-1
Mississippi	34	20	+14
Missouri	19	11	+8
Montana	37	23	+14
Nebraska	13	28	-15
Nevada	48	47	+1
New Hampshire	16	37	-21
New Jersey	4	21	-17
New Mexico	23	15	+8
New York	27	35	-8
North Carolina	38	31	+7
North Dakota	32	44	-12
Ohio	18	8	+10
Oklahoma	31	22	+9
Oregon	5	45	-40
Pennsylvania	33	16	+17
Rhode Island	45	43	+2
South Carolina	43	36	+7
South Dakota	15	27	-12
Tennessee	36	32	+4
Texas	6	29	-23
Utah	29	24	+5
Vermont	28	39	-11
Virginia	44	48	-4
Washington	20	38	-18
West Virginia	49	50	-1
Wisconsin	3	4	-1
Wyoming	40	40	0

"NA" means not available.

Several states made large positive moves in the rankings. Florida ranked 35th in the 2000 rankings but seventh in the updated rankings above. Florida still has large county-wide school districts, inhibiting intra-district choice, and few Floridians homeschool, but lawmakers have actively pursued school voucher and tuition tax credit programs,

Florida ranked 35th in the 2000 rankings but seventh in the updated rankings above.

and more recently passed the nation's largest Education Savings Account program. The Sunshine State also boasts a strong public charter school sector. Under former Governor Mitch Daniels' leadership, Indiana lawmakers passed both a scholarship tax credit and a school voucher program during the intervening period between rankings, raising the

Democrat-dominated California improved in the rankings, from 21st in 2000 to 13th in 2021, while Republican-led Texas slid from sixth to 29th.

Hoosier State from 25th to second in education freedom. Democrat-dominated California improved in the rankings, from 21st in 2000 to 12th in 2021, while Republican-led Texas slid from sixth to 29th. Lawmakers in neither state have passed a private school choice law. California's strong growth in the charter school sector certainly contributed

to its move up in the rankings, as the Golden State's charter-schooled population increased from 1.9% of all public school students in 2000 to 10.1% in 2017-18. The Lone Star State's charter sector increased from 3% to 6% of public school enrollments during the same period, but that doubling of the charter sector could not keep pace with California. In

addition to inaction on private school choice, Texas also saw a decline in its ranking for homeschooling.

While the District of Columbia did not receive a ranking in the 2000 EFI, if it had been ranked then, that ranking would have been low. The District, at the turn of the millennium, had no charter schools, no private school choice program, and only a single large school district serving K-12 students. Today the nation's capital has a small private school choice program and 44% of public school students attend charter schools, more than twice the chartered percentage of the highest rated state (Arizona). If not for a very low homeschool score, the District would rank considerably higher than 34th in the above rankings. Still, the past two decades have witnessed a large increase in the overall amount of education freedom in Washington, DC, and its NAEP scores have increased as well. Is the nation's capital an outlier in that regard, or is the relationship between education freedom and student achievement systematic?

The Education Freedom Index and Academic Outcomes

Like the 2000 study, we have performed a regression analysis to discover whether or not higher levels of education freedom are associated with improved academic outcomes. Only random assignment statistical analysis can hope to definitively establish causality, and state adoptions of choice programs do not lend themselves to such an analysis. The regression analysis below will allow us to establish whether higher levels of education freedom are systematically associated with higher levels of academic achievement and improvement in academic achievement over time, though it cannot establish conclusively whether education freedom caused those changes.

Table 8 below presents the results from a series of statistical regressions in which the combined Math and Reading NAEP scores of each state serve as the dependent variable in each model. Model 1 regresses combined 2019 Math and Reading NAEP

scores of each state on the new Education Freedom Index (EFI) while controlling for state-level measures of per-pupil spending, student/teacher ratio, median household income, and the proportion of the student body that is white. Model 2 performs the same analysis while also controlling for the combined NAEP Math and Reading scores

from 2003, the first year all 50 states and the District of Columbia participated in NAEP. Including a control variable for the 2003 combined NAEP score for each state allows us to see if the EFI is associated with NAEP test score gains (Models 2-5) as well as NAEP test score levels (Model 1). A strong and statistically significant association is clear between education freedom and both academic scores and academic gains.

The performance of the per-pupil spending and student/

teacher ratio variables is interesting. Increased public school spending and reduced class sizes often are proposed as substitutes for school choice policies as instruments for increasing student achievement. While our analysis is not causal, we see that higher educational expenditures are negatively and significantly associated

with 2019 NAEP levels (Model 1) and NAEP gains (Model 2). While higher student/teacher ratios are negatively associated with state NAEP performance, as supporters of class-size reduction would predict, that association is only statistically significant regarding NAEP levels (Model 1) and not regarding any of the subsequent statistical models of NAEP gains.

Model 3 introduces an additional control variable for state teacher quality policy. The measure comes from

A strong and statistically significant association is clear between education freedom and both academic scores and academic gains.

the National Center for Teacher Quality, which graded state teacher quality policies in 2017 from A to F (with pluses and minuses). These grades were converted to ordinal numbers and included in the analysis as an additional control variable whose performance itself might be informative. The teacher quality variable demonstrates an association with NAEP score gains independent of the EFI variable, but education freedom remains positively and significantly associated with NAEP gains even controlling for the effect of teacher quality on those gains.

Model 4 replaces the teacher quality control variable with a variable that measures the degree to which public charter schools and private school choice programs are regulated in each state. The extent of government regulation of school choice is not systematically associated with NAEP gains; however, the EFI remains significantly associated with improvements in NAEP outcomes even after controlling for the level of school choice regulation in each state.

Finally, Model 5 includes both the teacher quality and the choice regulation factors as control variables. As is the case for the simpler models, in this more complete model, the degree of regulation of school choice has no consistent association with NAEP gains but a state's teacher quality policy rating does correlate with academic improvement. Importantly, higher levels of education freedom remain significantly associated with higher NAEP gains even in this most

complete statistical model, which explains 85% of the variation in NAEP outcomes. Teacher quality benefits students but so does education freedom. Since both the teacher quality and EFI variables are standardized, and their effects are of comparable size, we can conclude that school choice and teacher quality policies are similarly associated with state-level achievement gains as measured by the NAEP.

Education freedom remains positively and significantly associated with NAEP gains even controlling for the effect of teacher quality on those gains.

The extent of government regulation of school choice is not systematically associated with NAEP gains.

School choice and teacher quality policies are similarly associated with state-level achievement gains as measured by the NAEP.

Table 8: The Relationship between the EFI and State Combined 2019 NAEP Score

VARIABLES	(1) Simple	(2) Simple & 2003 NAEP	(3) (2) & Teacher Quality	(4) (2) & Joint Regulation	(5) (2) & Teacher Quality & Joint Regulation
EFI	0.29*** (0.09)	0.21*** (0.08)	0.17** (0.08)	0.19** (0.08)	0.15* (0.08)
Per-Pupil Spending	-1.74*** (0.62)	-0.87** (0.42)	-0.83* (0.41)	-0.85* (0.42)	-0.86** (0.42)
Student/Teacher Ratio	-0.11** (0.04)	-0.05 (0.03)	-0.03 (0.03)	-0.05 (0.03)	-0.02 (0.03)
Household Income	5.37*** (0.76)	2.99*** (0.56)	3.17*** (0.59)	3.02*** (0.56)	3.22*** (0.59)
Percent White Students	0.03*** (0.00)	0.01* (0.00)	0.01** (0.00)	0.01* (0.01)	0.01*** (0.01)
Combined NAEP 2003		0.61*** (0.08)	0.61*** (0.09)	0.61*** (0.10)	0.59*** (0.10)
Teacher Quality Index			0.16** (0.07)		0.18** (0.07)
Regulation of Charter & Private Choice				0.07 (0.07)	0.04 (0.06)
Constant	-42.77*** (6.18)	-24.37*** (4.30)	-27.14*** (4.37)	-25.05*** (4.17)	-27.68*** (4.30)
Observations	51	51	51	47	47
R-squared	0.71	0.82	0.84	0.82	0.85

Robust standard errors in parentheses.

Statistically significant at *** p<0.01, ** p<0.05, *p<0.1

The size of the relationship between the EFI and combined NAEP score levels is 29% of a standard deviation (Model 1). The size of the relationship between education freedom and NAEP gains varies between 15% of a standard deviation

(Model 5) and 21% of a standard deviation (Model 2). For context, the average size of the effect of every education intervention evaluated through a random-assignment study in the U.S. from 1995 to 2011 on student achievement

broadly measured was 8% of a standard deviation in elementary grades and 15% of a standard deviation in middle grades.¹⁰ Thus, the positive association between education freedom and state NAEP scores tends to be more than

three times as large as the average effect of an elementary school intervention on student test score gains and about twice as large as the average effect of a middle school intervention on student achievement gains. The positive association between education freedom and state NAEP gains tends to be about twice as large as the average effect of an elementary school intervention on student test score gains and equal to or slightly larger than the average effect of a middle school intervention on student achievement gains.

Most of the major components of the EFI are positively associated with NAEP levels and gains. As presented in Appendix B, when included in the statistical models in place of the EFI, the individual indices of charter school choice and public school choice are significantly

associated with higher NAEP outcomes in some or all of the statistical models. The private school choice index is positively associated with NAEP performance but none of the correlations are statistically significant.

The homeschooling index also is not significantly correlated with state-level NAEP scores or gains, and the association between it and NAEP outcomes is positive in some statistical models and negative in others. Homeschooled students do not participate in NAEP testing but their presence can affect the NAEP scores of tested students by applying competitive pressure to the schools whose students do participate in NAEP.

We conduct two robustness tests to gauge how sensitive our findings from our main analysis are to changes in our measure of education freedom or the sample of students that generate the NAEP outcomes. First, we exclude from our calculation of the EFI the personal tax deduction/credit programs in Iowa and Illinois, since they likely provide parents with too few resources (less than \$1000 per student per year) to meaningfully expand education freedom. This alternative measure of the EFI has a slightly stronger association with NAEP levels and gains than our original EFI measure (Appendix Tables C1 and C2). Second, we estimate the correlation between our original EFI measure and NAEP levels and gains only for low-income students. Education freedom has a slightly lower association with the NAEP levels of low-income

The positive association between education freedom and state NAEP scores tends to be more than three times as large as the average effect of an elementary school intervention on student test score gains and about twice as large as the average effect of a middle school intervention on student achievement gains.

students compared to the levels of all students, but it has a slightly higher association with the NAEP gains of low-income students compared to the gains of all students (Appendix Table C3).

Our robustness tests indicate that our findings regarding the association between education freedom and NAEP outcomes are not sensitive to minor changes in how education freedom

is measured or the kinds of students whose achievement outcomes are analyzed. If anything, our original EFI measure, preferred because it is both simple and comprehensive, yields a conservative estimate of the positive relationship between education freedom and student outcomes. Our analytic results suggest that increases in education freedom benefit all students but perhaps especially those with lower family resources.

Interactions Between Forms of Education Freedom – Arizona and Ohio

Readers should not think of the different forms of education freedom as merely additive, but rather as potentially dynamically interactive. Arizona, the state ranking first in education freedom in both the 2000 and 2021 rankings, demonstrates this phenomenon. Arizona shows the importance of choice programs that are large but also diverse and inclusive of various types of students.

The National Alliance of Public

Charter Schools listed Arizona as having 557 charter schools in 2018. Arizona's suburbs, towns and rural areas hosted 230 of these charters. Arizona had almost three times the number of charter schools operating in suburban, town and rural

Arizona shows the importance of choice programs that are large but also diverse and inclusive of various types of students.

communities as neighboring Nevada had statewide in 2018. The prevalence of charter schools creates a financial incentive for school districts in suburbs, towns and rural areas to participate in open enrollment.

Likewise, Arizona's private school choice initiatives include a mix of programs with universal eligibility, means-tested eligibility, and special program eligibility targeted to poorly-served student populations. As opposed to a choice program focused exclusively on a single urban area, these programs also serve students residing in districts across the state. In combination, Arizona's charter and private choice programs

have grown and districts have responded with open enrollment policies, presumably to try to retain enrollment.

While both the National Council of State Legislatures and the National Center for Education Statistics track statewide open

enrollment *policies*, which are important, open enrollment *practice* is even more vital. Data collection on the number of open enrollment transfers remains limited. The Thomas B. Fordham Institute researched Ohio district participation in open enrollment in 2017 and found that the state's urban centers were surrounded by suburban school districts that had chosen not to participate in open enrollment. This finding came despite significant academic benefits for African-American students allowed to exercise an open enrollment transfer.¹¹ The National Alliance for Public Charter Schools identified only 49 charter schools operating in Ohio suburbs, compared to 136

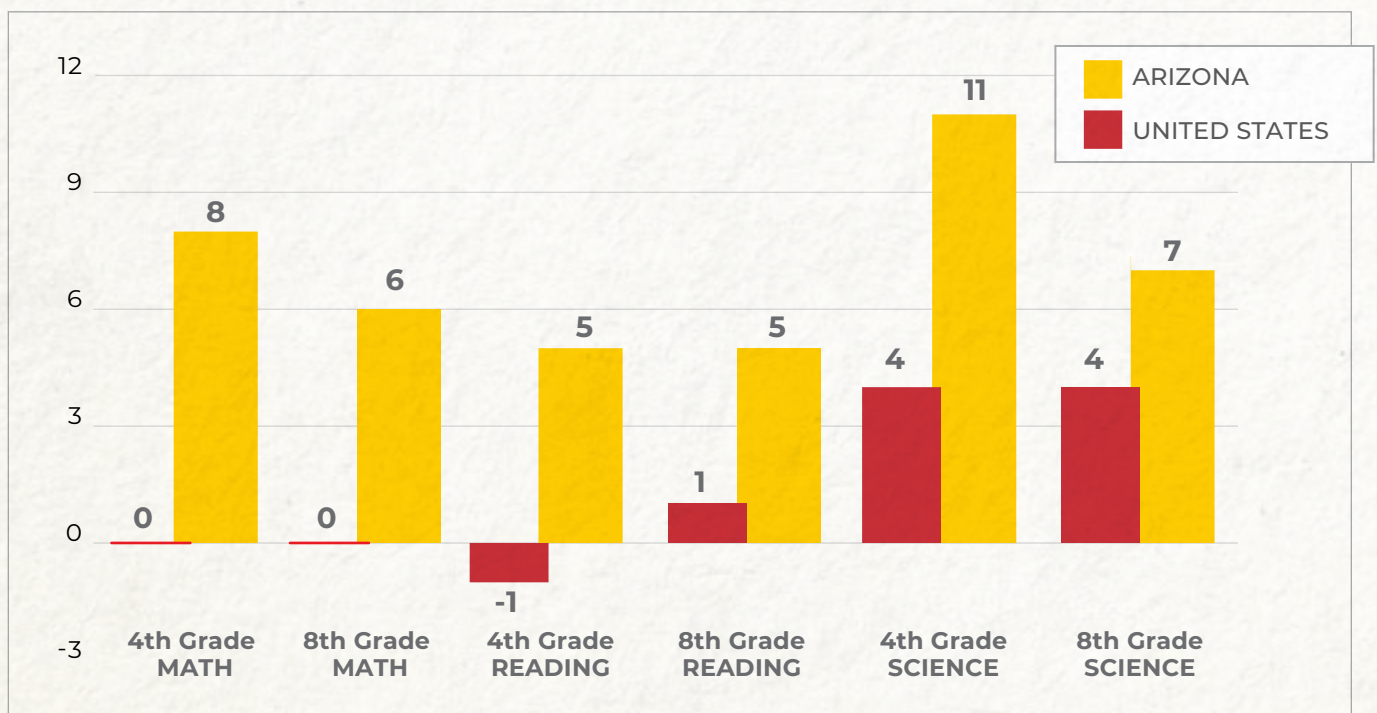
in Arizona suburbs. Except for programs for children with special needs, Ohio's private school choice programs also focus on urban students. Ohio's suburban districts have not yet received a powerful nudge towards participating in open enrollment. In Arizona, in contrast, open enrollment participation is nearly universal. A study of Phoenix area districts reveals that open enrollment transfers outnumber charter school students almost two to one. Through open enrollment, charters, private school choice or homeschooling, most students in the nine districts examined attend a school other than their zip-code-assigned district school.

Scottsdale Unified School District's demographic study found that a quarter of students living within the boundaries of the district attended schools outside the district.¹² In 2014, Scottsdale Unified lost 9,000 students to other options but

gained 4,000 students from other districts.¹³ Scottsdale Unified, unlike suburban districts in Ohio, is a school choice option for area students rather than a walled garden.

Arizona's charter schools also seem to have benefited from the competitive atmosphere for students. Arizona's charter school law grants charters 15 years to operate, initially. The average charter school that closes, however, operated for only four years and enrolled an average of 62 students in the final year of operation. Not coincidentally, Arizona charter schools produce high levels of average academic achievement. Only charter schools that parents value strongly are likely to survive competition from local districts, other charter schools and private schools. State officials do occasionally revoke an Arizona charter as part of a renewal process, but the parents far more commonly close schools based on their own prudential judgments.

Figure 1: Academic Gains by NAEP Exam in Scale Points – Arizona and United States 2009 to 2015



Importantly, Arizona students have shown statewide improvement in academic outcomes. The NAEP debuted new 4th and 8th grade Science exams in 2009, and last administered them in 2015. NAEP also tested students in 4th and 8th grade Math and Reading during this period. Arizona students were the

Arizona has experienced a virtuous cycle of some school choice begetting more school choice and resulting in above-average academic improvement. Charter and private school choice programs have grown alongside an active open enrollment system of public school choice. This dynamic developed over a

State officials do occasionally revoke an Arizona charter as part of a renewal process, but the parents far more commonly close schools based on their own prudential judgments.

only state group to show statistically significant gains in all six NAEP exams. As shown in Figure 1, Arizona students gained between 5 and 11 points on those NAEP tests, while the average national change ranged from a loss of 1 point to a modest gain of 4 points.

long period of time and with a consistently increasing amount of choice over two decades. During that time, Arizona's student body transitioned from being majority-Anglo to majority-minority, but the state's NAEP scores nevertheless improved across all student subgroups.

Arizona has experienced a virtuous cycle of some school choice begetting more school choice and resulting in above-average academic improvement.

Florida's Academic Improvement Driven by Disadvantaged Student Groups

Florida made large strides in expanding parental school choice between the first and second education freedom index reports. The Sunshine State now has five private school choice programs and an active and growing charter school sector. Florida lawmakers introduced charter schools during the 1990s, and private choice programs in 1999. Florida lawmakers adopted a suite of education reforms in 1999, making isolating the individual impact of choice policies impossible. It is nevertheless striking that the largest academic gains in Florida are among disadvantaged student subgroups that have been eligible for private choice programs for approximately twenty years.

Florida lawmakers have focused on two broad student subgroups as priorities in the private choice programs – low-income families and students with disabilities. In 2001 Florida lawmakers passed

what became the nation's largest scholarship tax credit program for low-income families. Over 100,000 Florida students participated in the Florida Tax Credit Scholarship program during the Fall of 2020. The nation's first private choice program for students with disabilities—the McKay Scholarship program—started as a pilot program in 1999 and then went statewide in 2001. The McKay Scholarship Program grew to be the largest school choice program by student participation for many years after the passage of the statute, until recently when it was eclipsed by the Florida Tax Credit Scholarship Program. Florida lawmakers also created an additional private school

choice program for students with disabilities—the Gardiner Scholarship Program—in 2014 and another program—the Family Empowerment Scholarship Program—focusing on low-income students in 2019. In 2018, Florida enacted the first private school choice program for students who had been bullied in public schools, called the Hope Scholarship Program. NAEP allows for comparisons not only between states but also student subgroups. Since low-income students and students with disabilities were the main subgroups targeted by Florida's expansive school choice programs, we might expect to see especially high NAEP gains in those two disadvantaged student

subgroups in the Sunshine State. We would be right. Figure 2 shows a comparison between the academic gains of students eligible for a free or reduced price lunch under federal guidelines from the first NAEP exams given in all 50 states (2003) to the most recent tests available at the time of this writing. While the NAEP scores of low-income 4th- and 8th-graders averaged gains of three to seven points across the U.S. during those 16 years, scores for low-income students in Florida surged 10-17 points. Florida students who did not qualify for a free or reduced lunch made academic gains, but they were smaller and much closer to the national average for such students.

Figure 2: Academic Gains by NAEP Exam in Scale Points for Free and Reduced Lunch Eligible Students – Florida and United States, 2003 to 2019

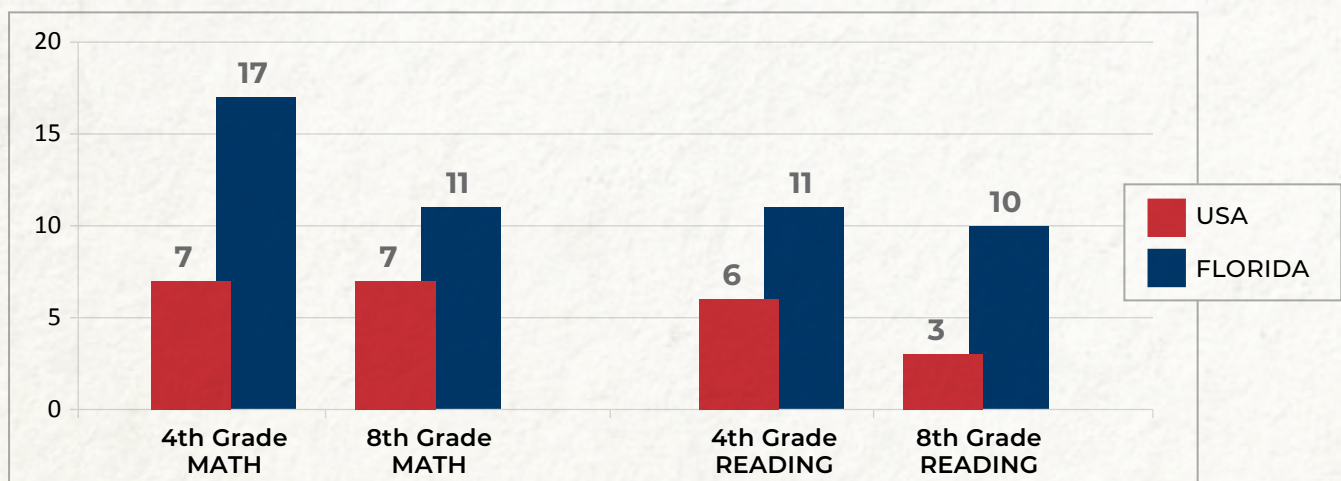
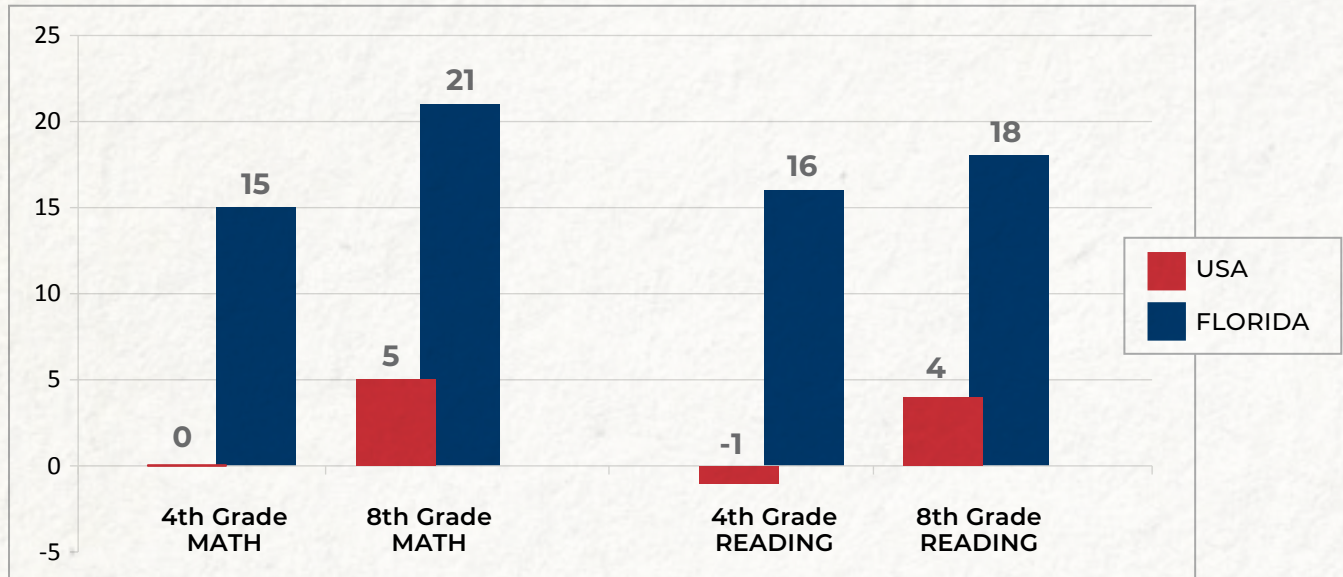


Figure 3: Academic Gains by NAEP Exam in Scale Points for Students with Disabilities – Florida and United States, 2003 to 2019



Florida's NAEP gains for students with disabilities are even more impressive than their strong gains for low-income students. As described in Figure 3, average NAEP scores for students with disabilities in the U.S. were flat in 4th grade and only increased by four-to-five scale points for 8th grade students from 2003-19. Students with disabilities in Florida, in contrast, scored 15-21 points higher on the NAEP on average over that same time period. The exciting surges in Florida's academic performance over the past two decades came among disadvantaged students eligible for private choice programs.

choice programs expand simultaneously. The evidence gathered here indicates that increased family options in K-12 education can be useful in spurring broad improvements in student learning along with being desirable in their own right.

Arizona ranked first among U.S. states in education freedom in both 2000 and 2021. Arizona circa 2000 probably would not have cracked the top 10 of educationally free states in 2020, given the broad expansion of school choice in various forms across the country over

Conclusion

Scholars should study more intensively the impact of various forms of school choice on student outcomes, especially when different

Increased family options in K-12 education can be useful in spurring broad improvements in student learning along with being desirable in their own right.

the past two decades. Charter school enrollment only constituted 5.4% of total public school enrollment in Arizona in 2000, which is less than the national average of 6% currently. Today, the Arizona charter school sector is on the brink of enrolling 20% of all public school students. Likewise, in 2000, Arizona had a single tax credit scholarship program to assist families seeking private school options. In 2021, that program has grown and lawmakers have created additional tax credit programs targeted at low/middle income families and students with disabilities, plus the nation's first Education Savings Account program for students with disabilities, students in low-performing public schools, and students living on Native American reservations. Arizona has served as the speedway pace-car as parental choice has accelerated around the country.

Florida made the largest leap in the education freedom rankings from 2000 to 2021, from 35th to seventh. Florida policymakers focused their many ambitious school choice initiatives on low-income students and those with disabilities. By 2019, those two disadvantaged subgroups of students in Florida had demonstrated dramatic gains compared to their similarly-disadvantaged peers nationally. Whether more universally available, like in Arizona, or more targeted, like in Florida, significant expansions of education freedom have tended to result in achievement gains for affected students.

The Education Freedom Index was more strongly and consistently associated with student achievement outcomes than were any of its individual parts. That pattern is not surprising. School choice has its best chance to influence NAEP scores and gains across an entire state by delivering competitive pressure to district-run public schools.¹⁴ When that competitive pressure is especially intense, because it comes from multiple sources of public and private school choice, the constructive response from affected public schools is likely to be most clear and consistent across the state. This reality suggests that education choice supporters should seek policy mixes that broadly promote district, charter, private and homeschool options

When educational freedom rings loudly and broadly, students, families, and communities benefit.

for families. When educational freedom rings loudly and broadly, students, families, and communities benefit.

Appendix A:

Data Sources

- Private Choice Enrollment 2016-17: EdChoice The ABCs of School Choice 2017 ([here](#)). This is a count of voucher, tax-credit scholarship, and ESA utilization.
- Total Public school Enrollment Fall 2016: NCES Digest Table 203.20 ([here](#))
- Total Private School Enrollment Fall 2015 (because 2016 not available from NCES): NCES Digest Table 205.80 ([here](#))
- Personal Tax Credits and Deductions: The ABCs of School Choice 2017 ([here](#)). The figures refer to the number of taxpayers who claimed these credits or deductions.
- Percent of public schools that are chartered 2016-17: NCES Digest Table 216.90 ([here](#)).
- Quality of charter school law: CER National Charter School Law Rankings 2018 ([here](#)). CER awarded grades of A, B, C, D, F which we converted into 4, 3, 2, 1, 0 respectively.
- Number of homeschoolers by state 2016-17: Coalition for Responsible Home Education ([here](#)).
- Quality of homeschool law: Home School Legal Defense Association ([here](#)). HSLDA identifies states as having “no notice/regulation” “low regulation,” “moderate regulation,” and “high regulation” which we converted into 3, 2, 1, 0 respectively.
- Open Enrollment policies: “NCES Table 4.2. Numbers and types of open enrollment policies, by state: 2017” ([here](#)). NCES notes whether states have mandatory intradistrict enrollment and mandatory interdistrict enrollment. If states require both, we code as 2. If states require one, we code as 1. If states require zero, we code as 0.
- Number of school districts: NCES Digest Table 214.30 ([here](#)).
- We calculate square miles per district by dividing land area per state (from Census, [here](#)) by number of school districts.
- Teacher quality comes from National Center for Teacher Quality ([here](#)). State policies in 2017 are ranked from A to F (with pluses and minuses) and converted into ordinal numbers.
- Charter regulation comes from NACSA ([here](#)).
- Private choice regulation comes from AFC ([here](#)). Accountability score average for each state.
- Per-pupil spending (2016-17) comes from NCES Digest Table 236.75 ([here](#)). We take the natural log.
- Median household income (2017) comes from NCES Digest Table 102.30 ([here](#)). We take the natural log.
- Student teacher ratio (2016) comes from NCES Digest Table 208.40 ([here](#)).
- Percent White (2016) comes from NCES Digest Table 216.90a ([here](#))
- NAEP scores are state averages.

Appendix B

Regression Results Using Separate Components of the EFI

Below are the results from the statistical models that substitute each individual major component of the EFI for the complete index. Accompanying each table is a brief discussion of the results.

Table B1: The Relationship between the Private School Choice Index and State Combined 2019 NAEP Score

VARIABLES	(1) Simple	(2) Simple & 2003 NAEP	(3) (2) & Teacher Quality	(4) (2) & Joint Regulation	(5) (2) & Teacher Quality & Joint Regulation
Private School Choice Index	0.12 (0.10)	0.09 (0.08)	0.08 (0.08)	0.05 (0.08)	0.05 (0.08)
Per-Pupil Spending	-1.75** (0.67)	-0.79* (0.47)	-0.77* (0.44)	-0.69 (0.43)	-0.75* (0.43)
Student/Teacher Ratio	-0.08* (0.04)	-0.03 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.00 (0.03)
Household Income	5.05*** (0.86)	2.53*** (0.55)	2.85*** (0.60)	2.51*** (0.51)	2.88*** (0.60)
Percent White Students	0.03*** (0.01)	0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.01** (0.01)
Combined NAEP 2003		0.68*** (0.10)	0.66*** (0.11)	0.65*** (0.11)	0.61*** (0.11)
Teacher Quality Index			0.19** (0.07)		0.21*** (0.08)
Regulation of Charter & Private Choice				0.09 (0.08)	0.04 (0.07)
Constant	-39.58*** (6.85)	-20.27*** (4.86)	-24.52*** (4.89)	-21.32*** (4.44)	-25.37*** (4.72)
Observations	51	51	51	47	47
R-squared	0.64	0.79	0.82	0.80	0.83

Robust standard errors in parentheses.

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

The correlation between more private school choice and NAEP outcomes is consistently positive but that positive association with state-level NAEP outcomes is not statistically significant in any of the models. One possible explanation for this set of results is that

private school choice, alone, is only a part of the education freedom story in each state. Partial measures of a factor such as education freedom are less likely to produce statistically significant results, since they bring less evidence to the analysis than is generated by the full measure of education freedom. Currently, fewer students participate in private school choice programs than in any of the other three forms of school choice. As private school choice enrollments grow in the future, the private school choice index itself might become significantly associated with better NAEP outcomes.

As presented in Table B2, the charter school index, alone, is not significantly associated with combined NAEP levels (Model 1) but is significantly associated with NAEP gains (Models 2-5). The positive correlation between more charter school choice and NAEP gains varies between 20% and 27% of a standard deviation across the statistical models.

Table B2: The Relationship between the Charter School Index and State Combined 2019 NAEP Score

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Simple	Simple & 2003 NAEP	(2) & Teacher Quality	(2) & Joint Regulation	(2) & Teacher Quality & Joint Regulation
Charter Index	0.11 (0.18)	0.27*** (0.09)	0.22*** (0.08)	0.26*** (0.09)	0.20** (0.08)
Per-Pupil Spending	-1.82*** (0.67)	-0.91** (0.44)	-0.86* (0.44)	-0.90** (0.44)	-0.90** (0.43)
Student/Teacher Ratio	-0.09* (0.05)	-0.05 (0.04)	-0.03 (0.03)	-0.05 (0.03)	-0.03 (0.03)
Household Income	5.04*** (0.87)	2.21*** (0.54)	2.50*** (0.58)	2.31*** (0.51)	2.64*** (0.58)
Percent White Students	0.04*** (0.00)	0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.01** (0.01)
Combined NAEP 2003		0.81*** (0.10)	0.77*** (0.10)	0.78*** (0.12)	0.72*** (0.11)
Teacher Quality			0.14** (0.06)		0.17** (0.07)
Regulation of Charter & Private Choice				0.07 (0.07)	0.04 (0.07)
Constant	-38.84*** (6.81)	-15.27*** (5.29)	-19.28*** (5.20)	-16.66*** (5.00)	-20.79*** (5.04)
Observations	51	51	51	47	47
R-squared	0.64	0.83	0.85	0.83	0.85

Robust standard errors in parentheses.

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

Table B3: The Relationship between the Homeschool Index and State Combined 2019 NAEP Score

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Simple	Simple & 2003 NAEP	(2) & Teacher Quality	(2) & Joint Regulation	(2) & Teacher Quality & Joint Regulation
Homeschool Index	0.13 (0.12)	-0.00 (0.08)	0.00 (0.08)	-0.01 (0.09)	0.01 (0.07)
Per-Pupil Spending	-1.49** (0.64)	-0.73 (0.49)	-0.71 (0.46)	-0.65 (0.43)	-0.71 (0.42)
Student/Teacher Ratio	-0.07 (0.04)	-0.02 (0.03)	-0.00 (0.03)	-0.02 (0.03)	-0.00 (0.03)
Household Income	4.93*** (0.85)	2.41*** (0.57)	2.77*** (0.62)	2.43*** (0.53)	2.86*** (0.57)
Percent White Students	0.04*** (0.00)	0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.02** (0.01)
Combined NAEP 2003		0.69*** (0.11)	0.67*** (0.12)	0.66*** (0.12)	0.61*** (0.12)
Teacher Quality			0.20** (0.07)		0.22*** (0.07)
Regulation of Charter & Private Choice				0.10 (0.08)	0.05 (0.07)
Constant	-40.95*** (7.19)	-19.65*** (6.07)	-24.30*** (5.52)	-20.86*** (5.62)	-25.55*** (5.09)
Observations	51	51	51	47	47
R-squared	0.65	0.78	0.82	0.79	0.83

Robust standard errors in parentheses.

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

As described in Table B3, the homeschool index, alone, is not significantly associated with combined NAEP levels (Model 1) or with NAEP gains (Models 2-5). It is possible that increases in the proportion of K-12 students being homeschooled in a state, and decreases in the amount of regulation of homeschooling, do not pressure other types of schools to improve their performance in ways reflected in higher state-level NAEP scores. Homeschooled students are a less visible source of competitive pressure for district-run public schools than are private, public charter and public schools in other districts. Homeschoolers also do not participate in NAEP testing so they cannot contribute directly to NAEP scores the way that private, charter, and public school students can.

Table B4: The Relationship between the Public School Choice Index and State Combined 2019 NAEP Score

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Simple	Simple & 2003 NAEP	(2) & Teacher Quality	(2) & Joint Regulation	(2) & Teacher Quality & Joint Regulation
Public School Choice Index	0.32*** (0.11)	0.18* (0.10)	0.14 (0.10)	0.16 (0.10)	0.10 (0.10)
Per-Pupil Spending	-1.71*** (0.62)	-0.87* (0.47)	-0.82* (0.45)	-0.76* (0.44)	-0.77* (0.43)
Student/Teacher Ratio	-0.10** (0.04)	-0.04 (0.04)	-0.02 (0.03)	-0.04 (0.03)	-0.01 (0.03)
Household Income	5.47*** (0.81)	3.06*** (0.65)	3.21*** (0.67)	3.02*** (0.63)	3.14*** (0.66)
Percent White Students	0.03*** (0.01)	0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.01** (0.01)
Combined NAEP 2003		0.60*** (0.09)	0.60*** (0.10)	0.59*** (0.10)	0.58*** (0.11)
Teacher Quality			0.17** (0.07)		0.19*** (0.07)
Regulation of Charter & Private Choice				0.10 (0.07)	0.06 (0.07)
Constant	-43.98*** (6.19)	-25.09*** (4.35)	-27.70*** (4.76)	-25.95*** (4.21)	-27.71*** (4.57)
Observations	51	51	51	47	47
R-squared	0.71	0.81	0.83	0.81	0.84

Robust standard errors in parentheses.

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

As presented in Table B4, the public school choice index, alone, is significantly associated with combined NAEP levels (Model 1) and NAEP gains (Model 2), while controlling for key state educational conditions. The positive correlation between more public school choice and NAEP outcomes loses statistical significance in the more elaborate models that control for teacher quality (Model 3), the level of choice regulation (Model 4), and both of those factors simultaneously (Model 5).

Appendix C

EFI Results Robustness Tests

Below are the results from two tests of the robustness of the EFI results from our primary analysis. For the first robustness test, we exclude from our private school choice index and ranking the personal deduction/credit programs in Iowa and Illinois. The maximum value from those two private school choice programs is less than \$1,000 per student, leading us to wonder if they affect behavior.

Table C1 presents the results of the estimation of our statistical models using this alternative EFI measure that excludes modest personal tax deduction/credit programs.

Table C1: The Relationship between the Alternative EFI and State Combined 2019 NAEP Score

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Simple	Simple & 2003 NAEP	(2) & Teacher Quality	(2) & Joint Regulation	(2) & Teacher Quality & Joint Regulation
EFI	0.31*** (0.08)	0.23*** (0.07)	0.19** (0.07)	0.20** (0.08)	0.16** (0.07)
Per-Pupil Spending	-1.74*** (0.62)	-0.88** (0.42)	-0.84* (0.41)	-0.87** (0.42)	-0.88** (0.41)
Student/Teacher Ratio	-0.11** (0.04)	-0.05 (0.03)	-0.03 (0.03)	-0.05 (0.03)	-0.03 (0.03)
Household Income	5.40*** (0.76)	3.03*** (0.55)	3.19*** (0.57)	3.05*** (0.55)	3.24*** (0.58)
Percent White Students	0.03*** (0.00)	0.01* (0.00)	0.01** (0.00)	0.01* (0.01)	0.01*** (0.01)
Combined NAEP 2003		0.61*** (0.08)	0.61*** (0.09)	0.61*** (0.09)	0.58*** (0.10)
Teacher Quality Index			0.15** (0.07)		0.18** (0.07)
Regulation of Charter & Private Choice				0.06 (0.07)	0.03 (0.06)
Constant	-42.99*** (6.24)	-24.65*** (4.30)	-27.27*** (4.37)	-25.15*** (4.33)	-27.73*** (4.36)
Observations	51	51	51	47	47
R-squared	0.71	0.83	0.85	0.83	0.85

Robust standard errors in parentheses.

Statistically significant at *** p<0.01, ** p<0.05, *p<0.1

The positive association between the EFI and NAEP scores increases slightly from 29% of a standard deviation to 31% of a standard deviation when this alternative version of the EFI is used. The association between this alternative EFI and NAEP achievement gains also is slightly stronger than was the case with our original EFI measure, ranging 16-23% of a standard deviation using the alternative metric compared to 15-21% using the original measure.

Table C2 presents the results of the estimation of our statistical models using the alternative measure of the Private School Choice component of the EFI that excludes

Table C2: The Relationship between the Alternative Private School Choice Index and State Combined 2019 NAEP Score

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Simple	Simple & 2003 NAEP	(2) & Teacher Quality	(2) & Joint Regulation	(2) & Teacher Quality & Joint Regulation
Private School Choice Index	0.15** (0.07)	0.12* (0.07)	0.11 (0.07)	0.09 (0.07)	0.07 (0.07)
Per-Pupil Spending	-1.76** (0.67)	-0.81* (0.45)	-0.78* (0.43)	-0.72* (0.43)	-0.77* (0.42)
Student/Teacher Ratio	-0.08* (0.04)	-0.03 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.01 (0.03)
Household Income	5.09*** (0.86)	2.57*** (0.54)	2.87*** (0.58)	2.54*** (0.51)	2.90*** (0.59)
Percent White Students	0.03*** (0.01)	0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.01** (0.01)
Combined NAEP 2003		0.68*** (0.10)	0.66*** (0.11)	0.65*** (0.11)	0.61*** (0.11)
Teacher Quality Index			0.19** (0.07)		0.21*** (0.08)
Regulation of Charter & Private Choice				0.08 (0.07)	0.03 (0.07)
Constant	-39.78*** (6.88)	-20.46*** (4.83)	-24.54*** (4.87)	-21.27*** (4.50)	-25.28*** (4.73)
Observations	51	51	51	47	47
R-squared	0.65	0.80	0.83	0.80	0.84

Robust standard errors in parentheses.

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

modest personal tax deduction/credit programs. The positive association between Private School Choice and NAEP scores increases slightly from 12% of a standard deviation to 15% of a standard deviation when this alternative version of the EFI is used. The statistical significance of that relationship also changes from non-significant using the original measure to statistically significant with 95% confidence using the alternative measure. The association between this alternative Private School Choice Index and NAEP achievement gains also is slightly stronger than was the case with our original Private School Choice measure, ranging 7-12% of a standard deviation using the alternative metric compared to 5-9% using the original measure.

Table C3: The Relationship between the EFI and State Combined 2019 NAEP Score, Low-income Students

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Simple	Simple & 2003 NAEP	(2) & Teacher Quality	(2) & Joint Regulation	(2) & Teacher Quality & Joint Regulation
EFI	0.23* (0.13)	0.27** (0.12)	0.25** (0.12)	0.27* (0.14)	0.23* (0.13)
Per-Pupil Spending	-1.53* (0.80)	-0.66 (0.61)	-0.56 (0.62)	-0.85 (0.63)	-0.76 (0.63)
Student/Teacher Ratio	-0.07 (0.06)	-0.02 (0.04)	-0.01 (0.05)	-0.02 (0.05)	-0.00 (0.05)
Household Income	2.00* (1.03)	0.96 (0.81)	1.00 (0.81)	1.10 (0.88)	1.13 (0.86)
Percent White Students	0.03*** (0.01)	0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Combined NAEP Low-income 2003		0.68*** (0.18)	0.73*** (0.19)	0.69*** (0.20)	0.75*** (0.21)
Teacher Quality Index			0.12 (0.13)		0.17 (0.13)
Regulation of Charter & Private Choice				0.00 (0.10)	-0.03 (0.10)
Constant	-7.97 (7.83)	-3.93 (6.59)	-5.60 (6.92)	-3.61 (6.92)	-5.20 (6.99)
Observations	51	51	51	47	47
R-squared	0.39	0.56	0.57	0.57	0.59

Robust standard errors in parentheses.

Statistically significant at *** p<0.01, ** p<0.05, *p<0.1

The fact that this minor change in the EFI merely improves its correlation with student outcomes underscores that, in designing our measure of education freedom to be simple and comprehensive, we likely are producing conservative estimates of the overall positive effect of school choice on state-level NAEP scores and gains.

As a second robustness test, we replace the NAEP outcomes for all students with the outcomes just for the subgroup of students eligible for free or reduced price lunch. As discussed in the section about Florida in the main text, many school choice initiatives are targeted to low-income households that otherwise lack the resources to homeschool or take advantage of public school choice via a residential move.

Table C3 presents the results of the estimation of our statistical models restricting the NAEP outcomes and the prior NAEP score control variable to the subgroup of students who qualify as low-income. The positive association between the EFI and NAEP scores for low-income students is somewhat lower than the association for all students, 23% of a standard deviation for the former and 29% of a standard deviation for the latter. The association between the EFI and NAEP *achievement gains*, however, is stronger for the subsample of low-income students compared to the sample of all students. For low-income students, a one standard deviation increase in education freedom is associated with NAEP gains that range 23-27% of a standard deviation. For the entire population of students, those gains only range 15-21% of a standard deviation. Our results suggest that increases in education freedom benefit all students but especially those with lower family resources.

Endnotes

- 1 [The Education Freedom Index, by Jay P. Greene \(PDF version\) \(manhattan-institute.org\)](#)
- 2 [Education Freedom Index | Manhattan Institute \(manhattan-institute.org\)](#)
- 3 Ibid, page 13.
- 4 The EFI and each subpart of it is standardized by subtracting the mean from each state's value and dividing that residual by the standard deviation of that variable across all states.
- 5 The exception is the Home School Legal Defense Association ranking of homeschooling laws, which is contemporary but likely still well-aligned with the 2019 NAEP outcomes because few states have changed their homeschool laws in the past 18 months.
- 6 EdChoice, *The ABCs of School Choice*, 2019 Edition, pp. 131-132.
- 7 Ember Reichgott Junge, *Zero Chance of Passage: The Pioneering Charter School Story* (St. Paul, MN: Beaver's Pond Press).
- 8 <https://hslida.org/legal>

- 9 https://nces.ed.gov/programs/statereform/tab4_2.asp
- 10 Mark W. Lipsey et al., *Translating the Statistical Representation of the Effects of Education Interventions Into More Readily Interpretable Forms*, Institute for Education Sciences, National Center for Special Education Research, NCSE 2013-3000, November, 2012, Table 9, p. 34.
- 11 [FORDHAM Open Enrollment Report_Online final_0.pdf \(fordhaminstitute.org\)](#)
- 12 [Primavera Online draws most students from Scottsdale district \(azcentral.com\)](#)
- 13 [PowerPoint Presentation \(susd.org\)](#)
- 14 The evidence that public and private school choice programs generate competitive pressure on district-run public schools to improve student outcomes is vast and definitive. See for example Anna J. Egalite and Patrick J. Wolf, "A Review of the Empirical Research on Private School Choice," *Peabody Journal of Education*, 91(4), 2016, pp. 441-454; and Caroline M. Hoxby, "The Rising Tide," *Education Next*, 1(4), 2001, pp. 68-74.

Authors



Patrick J. Wolf, Ph.D.

Dr. Wolf is a Distinguished Professor of Education Policy and 21st Century Endowed Chair in School Choice at the University of Arkansas in Fayetteville. He previously taught at Columbia and Georgetown. He has authored, co-authored, or co-edited five books and nearly 200 journal articles, book chapters, book reviews, and policy reports on school choice, civic values, public management, special education, and campaign finance. He received his Ph.D. in Political Science from Harvard University in 1995.



Jay P. Greene, Ph.D.

Dr. Greene is Distinguished Professor and Chair of the Department of Education Reform at the University of Arkansas. Greene's current areas of research interest include school choice, culturally enriching field trips, and the effect of schools on non-cognitive and civic values. Greene's work has been published in journals from a diverse set of disciplines, including education (Educational Researcher), sociology (Sociology of Education), public policy (Education Finance and Policy), psychology (Psychology of Music), political science (British Journal of Political Science), and economics (Economics of Education Review). He has also written or edited three books. His research on school choice was cited four times in the Supreme Court's opinions in the landmark *Zelman v. Simmons-Harris* case. Greene has been a professor of government at the University of Texas at Austin and the University of Houston. He received his B.A. in history from Tufts University and his Ph.D. from the Government Department at Harvard University.



Matthew Ladner, Ph.D.

Dr. Matthew Ladner is Director of the Arizona Center for Student Opportunity and Executive Editor of Step Up for Students weblog RedefinED. Previously Ladner served as a Senior Research Fellow at the Charles Koch Institute and Senior Advisor for Research and Policy at Excel in Ed and Vice President of Research at the Goldwater Institute. He has provided invited testimony to Congress, state legislatures, and the United States Commission on Civil Rights. Ladner has written numerous studies on school choice, charter schools and special education reform. He is a graduate of the University of Texas at Austin and received both a master's and a Ph.D. in Political Science from the University of Houston.



James D. Paul

James Paul is a Distinguished Doctoral Fellow and Graduate Assistant at the University of Arkansas' Department of Education Reform. Prior to joining the department, James worked for Excel in Ed as an Associate Policy Director. He is a graduate of Syracuse University (BA and MPA).