Preschool Enrollment in the United States: 2005-2019[1]

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INTRODUCTION

Preschool enrollment represents an important aspect of early childhood education. Unlike less formal child care options, preschool programs usually offer structure and academic components for young children. Previous research shows that there are social and academic benefits for children who enroll in preschool as well as for their families (Ansari 2018; Gray-Lobe, Pathak, and Walters 2021; Kesler 2020; Sabol and Chase Lansdale 2015). With this outcome in mind, all levels of government have engaged in policy related to preschool enrollment. States like Oklahoma and the District of Columbia launched universal preschool programs in the early 2000s. Recently, the federal government has proposed policy initiatives that would provide universal preschool for all 3- and 4-year-olds in the United States.

Since 2005, the American Community Survey (ACS) has collected data on school enrollment and grade attending for the population 3 years and older. This paper uses data from the ACS from 2005 to 2019 to examine current levels of preschool enrollment and changes in enrollment over the period. Specifically, this paper aims to accomplish three goals. First, we present the ACS as a source of data for early childhood education and assess its' validity by benchmarking it with other sources of Census Bureau data. Second, we examine national- and state-level changes in preschool enrollment from 2005 to 2019 in the ACS. Third, we identify factors that are associated with preschool enrollment. With this, we provide details on the demographic and geographic variation in preschool enrollment over a time when governments were devoting increasing attention and funding to early childhood education.[2]

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[1] The views expressed in this paper, including those related to statistical, methodological, technical, or operational issues, are solely those of the author and do not necessarily reflect the official positions or policies of the U.S. Census Bureau. The author accepts responsibility for all errors. More information on confidentiality protection, methodology, sampling and nonsampling error, and definitions within the American Community Survey (ACS) is available at < https://www.census.gov/programs-surveys/acs/technical-documentation.html>, within the Survey of Income and Program Participation (SIPP) is available at <https://www.census.gov/programs-surveys/sipp/tech-documentation.html>, and within the October School Enrollment Supplement to the Current Population Survey (CPS) is available at <www2.census.gov/programs-surveys/cps/techdocs/cpsoct17.pdf>.

[2] The U.S. Census Bureau's Disclosure Review Board and Disclosure Avoidance officers reviewed this data product for unauthorized disclosure of confidential information and approved the disclosure avoidance practices applied to this release. CBDRB-FY22-POP001-0016.

This period of analysis ends before the start of the COVID-19 pandemic so does not reflect any potential impacts of the pandemic on preschool enrollment. Future work should explore how the COVID-19 pandemic impacts school enrollment for young children.

DATA

Data for this project come from the ACS, a nationally representative survey that was fully implemented in 2005. The sample includes over 3 million addresses per year, allowing for the analysis of small geographies. The ACS includes data on the demographic, economic, and housing characteristics of people in the United States.

The ACS asks respondents whether each member of the household or group quarters was enrolled in school at any time in the 3 months prior to the interview. Those who were enrolled in school are asked whether they attended private or public school as well as the grade level they attended. With these data, we can assess descriptive trends in preschool enrollment from 2005 to 2019 as well as the demographic, economic, and geographic factors associated with preschool enrollment.

The ACS is the primary data source for this paper, but we also use data from the Survey of Income and Program Participation (SIPP) and the Current Population Survey (CPS) as benchmarks for the validity of the preschool enrollment estimates we present from the ACS. The SIPP is a household-based survey designed as a series of national panels. Each panel lasts 2.5 to 4 years with monthly data for some topics. The SIPP relies on a multi-stage, stratified sample of the civilian, non-institutionalized population of the U.S. Data on enrollment status, grade enrolled, and school type (public/private) are available through SIPP. Additionally, SIPP data are available by month, so we can assess monthly changes in preschool enrollment. The CPS samples households monthly and like the SIPP covers the civilian, non-institutionalized population of the U.S. The data used here are taken from the CPS October supplement, which asks detailed questions on school enrollment. Specifically, data are collected on enrollment status, grade enrolled, and school type (public/private).

There are some key differences between the three surveys that are important to be aware of before making comparisons. They differ in their modes of collection, the ACS collects data via the internet, computer-assisted telephone interviews (CATI), in-person interviews (CAPI), Mail, and Group Quarters (GQ) visits. By comparison, SIPP and CPS data are only collected via the CATI or CAPI modes. The surveys also differ in sample size with the ACS having samples around 2 million interviewed

households compared to 54,000 monthly for CPS and around 17,000 to 29,000 per year for SIPP.[3] Lastly, and specific to questions on school enrollment the question details are different across the surveys. The ACS asks respondents if they have been enrolled in school "anytime in the last three months" whereas SIPP and CPS ask about enrollment within the last calendar year. These differences across the surveys may result in differences in the estimates of preschool enrollment.[4]

In most cases, we use 3- and 4-year-old children as our universe and the percentage of three- and four-year-old children enrolled in preschool as a measure of enrollment. Though children beyond the age of four do report preschool enrollment in various surveys, we believe this measure best reflects overall preschool usage among the target population.

METHODS

To assess the current state of preschool enrollment and how that has changed from 2005 to 2019, this analysis proceeds in several steps. First, we perform some data quality checks and compare ACS estimates of preschool enrollment to those from other Census Bureau surveys. Specifically, we compare overall preschool enrollment numbers and the characteristics of children enrolled in preschool between the SIPP and the ACS.

Next, we present descriptive and multivariate national trends in preschool enrollment from 2005 to 2019 using the ACS. We examine national rates of preschool enrollment and changes in public and private school enrollment shares over the period. Following the descriptive statistics, we present logistic regression models examining child and parent characteristics associated with preschool enrollment using 2019 ACS data. We present three models, one for any preschool, public, and private enrollment. Together, these results will provide some detailed findings on preschool enrollment at the national level.

In the final part of the analysis, we examine current levels and changes in preschool enrollment from 2005 to 2019 at the state level. We present several maps that display state-level patterns in overall preschool enrollment, public and private preschool enrollment, and the total change in preschool enrollment from 2005 to 2019. Following the maps, we present state-level Ordinary Least Squares (OLS)

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[3] The SIPP sample sizes have varied across history ranging from 14,000 to 53,000. Refer to < https://www.census.gov/programs-surveys/sipp/about/sipp-introduction-history.html > for more details.

[4] For more information on each survey's methodology. Refer to the technical documentation for ACS <https://www.census.gov/programs-surveys/acs/technical-documentation.html >, SIPP <https://www.census.gov/programs-surveys/sipp/tech-documentation.html > and CPS <https://www.census.gov/programs-surveys/cps/technical-documentation/complete.html >.

regression models that examine the factors associated with state-level percentage-point changes in the percentage of 3- and 4-year-olds enrolled in preschool over the period. Independent variables for this model focus on state-level changes in other demographic and economic characteristics.

DATA VALIDATION AND ROBUSTNESS CHECKS

Before getting into the analysis of ACS data, we provide some comparisons of the ACS estimates of preschool enrollment to the corresponding SIPP and CPS estimates. Table 1 provides some national benchmarks for early childhood education using ACS, SIPP (fall and spring), and CPS data.[5] SIPP estimates are available for each month of the panel, so we present both spring and fall estimates because school enrollment may vary by month. Table 1 shows the percentage and counts of 3- and 4-year-olds enrolled in any level of school and enrolled in preschool from 2013 to 2017.[6]

The estimates of preschool enrollment in Table 1 range from 29 percent to 55 percent, depending on survey, year of data collection, time of year, and whether we are looking at all enrollment of 3-4-year-olds or only enrollment in nursery/preschool. The ACS enrollment estimates are in the middle of this range -- 45 to 48 percent.

The SIPP estimates vary considerably. They show enrollment in the fall to be higher than in the spring, the estimates vary year by year, and the difference between total enrollment and preschool enrollment in SIPP is large. Some of these differences may result from data collection procedures -- estimates vary across years of a panel, and some estimates are affected by the longitudinal nature of the survey. The SIPP estimates probably benefit from having more questions on childcare arrangements, which might make it easier for parents to distinguish preschool from other types of childcare.

The ACS estimates of total enrollment of 3-4-year-olds, collected year-round, were lower than the fall estimates from the SIPP in 2014 and 2016 and the CPS estimates for all years from 2013 to 2017. By contrast, they were higher than the spring estimates from the SIPP in all years.[7] The estimates of preschool/nursery school enrollment in the ACS fall between the estimates of the other two surveys. Overall, there are some notable differences in Table 1, particularly for the number of children enrolled (overall or in preschool) that may be attributable to differences in the surveys.

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[5] The estimates in Table 1 are presented in thousands.

[6] We focus on these years because it includes the most recent completed SIPP panel (SIPP 2014) and one wave of the 2018 panel. As of the time of writing, these are the most recent SIPP data available.

[7] SIPP Spring and ACS estimates were not statistically different in 2014.

Table 1: 3- and 4-Year-Olds School Enrollment Benchmarks for the ACS, SIPP, and CPS

Year	ACS							
	Total Enrolled				Nursery/Preschool			
	Count		Percent		Count		Percent	
	estimate	MOE	estimate	MOE	estimate	MOE	estimate	MOE
2013	3,824	28	46.2	0.28	3,607	28	44.7	0.29
2014	3,855	27	47.1	0.27	3,638	26	45.7	0.28
2015	3,860	29	47.6	0.28	3,649	30	46.2	0.30
2016	3,868	33	48.0	0.35	3,657	34	46.6	0.37
2017	3,907	30	48.0	0.30	3,682	30	46.5	0.30
	SIPP SPRING							
2013	2,777	171	34.1	1.9	2,232	159	29.4	1.9
2014	3,615	224	45.5	2.5	2,924	203	40.3	2.6
2015	3,388	249	43.8	3.0	2,726	252	38.5	3.2
2016	3,496	239	44.7	2.8	2,989	242	40.8	3.0
2017	3,234	172	39.7	2.0	2,486	150	33.6	2.0
	SIPP FALL							
2013	3,692	168	45.6	1.9	2,686	166	37.9	2.01
2014	4,054	194	50.6	2.2	3,084	211	43.8	2.53
2015	4,113	276	50.6	3.0	3,345	263	45.5	3.17
2016	4,251	269	51.9	2.9	3,331	281	45.8	3.38
2017	3,770	209	46.9	2.3	2,669	173	38.5	2.30
	CPS							
2013	4,449	123	54.9	1.34	4,023	122	49.7	1.35
2014	4,426	134	54.5	1.46	4,070	133	50.1	1.47
2015	4,203	134	52.7	1.47	3,855	132	48.4	1.47
2016	4,289	134	53.8	1.47	4,035	133	50.6	1.47
2017	4,319	134	53.8	1.46	3,966	133	49.4	1.47

Source: U.S. Census Bureau, American Community Survey 2013-2017 1-year data. For more information, refer to <census.gov/acs>.
Source : U.S. Census Bureau, Current Population Survey, October 2013-2017. U.S. Census Bureau, Survey of Income and Program Participation, 2013-2017.
Note: Counts are in thousands
Note: The 'Total Enrolled' columns include 3- and 4-year-olds enrolled in nursery/preschool and other higher levels of schooling.

In Table 2, we compare the characteristics of children (and their parents) who are enrolled in preschool from 2013 to 2017 using ACS and SIPP data.[8] This table provides a detailed breakdown of the demographic, social, and economic characteristics of the children enrolled in preschool on the two surveys. The numbers presented show percentage breakdowns of 3- and 4-year-olds enrolled in preschool by age, sex, race and Hispanic origin, parent's education, poverty status, mother's work status, household marital status, and family structure. Despite differences in the overall estimates of preschool enrollment, Table 2 shows that many of the characteristics of children enrolled in preschool are comparable and not statistically different across the SIPP and the ACS. One notable difference is that the SIPP estimates show a younger population enrolled in preschool compared to the ACS. The percentage of children with no mother present is slightly higher in the ACS, and in two of the years (2015 and 2017) the percentage of children in poverty was lower. Nonetheless, the broad agreement in characteristics of these children and their households gives some assurance that the population being measured is substantially the same.[9]

Overall, Tables 1 and 2 provide a comparison of ACS, CPS, and SIPP estimates of preschool enrollment. The remainder of the analyses focus on ACS data.

RESULTS

Descriptive National Trends

In Figure 1, we show the percentage of 3- and 4-year-olds enrolled in preschool from 2005 to 2019. Over the period, children enrolled in preschool increased by nearly 3.5 percentage points, from 44.0 percent to 47.4 percent. Notably, the rate of preschool enrollment among children declined from 2008 to 2013, dropping nearly three percentage points. This drop is likely related to the global recession during which many people, and more specifically parents, lost their jobs. With more parents at home than usual, it is not surprising that we see a drop-off in preschool enrollment during the period.[10] Despite the decline in the aftermath of the Great Recession, 2005 to 2019 can be characterized as period of modest growth for preschool enrollment.

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[8] For ease of comparison, we opt for one comparison with ACS here and focus on SIPP (over CPS) given the detailed focus on childcare arrangements on the survey.

[9] Table A-1 shows the percentage of each category in Table 2 that is enrolled in preschool. For example, it shows the percentage of children who are Hispanic or Latino (of any race) who are enrolled in preschool.

[10] To our knowledge, there is not research on the relationship between preschool enrollment and recessions. But, prior Census Bureau research does show the impacts of the Great Recession in 2008 on College Enrollment.

Table 2: Preschool Enrollment for 3- and 4-Year-Olds by Demographic and Economic Characteristics on ACS and SIPP 2013-2017

	2013				2014			
	ACS		SIPP		ACS		SIPP	
	Percent	MOE	Percent	MOE	Percent	MOE	Percent	MOE
Age								
3	35.6	0.41	42.2	3.02	36.1	0.41	39.9	3.76
4	64.4	0.41	57.8	3.02	63.9	0.41	60.1	3.76
Sex								
Male	51.6	0.38	50.0	3.13	51.6	0.40	50.0	3.25
Female	48.4	0.38	50.0	3.13	48.4	0.40	50.0	3.25
Race and Hispanic Origin								
White alone non-Hispanic	52.6	0.45	46.9	3.73	52.3	0.37	51.3	3.78
Black alone non-Hispanic	14.4	0.38	14.7	2.22	14.5	0.32	13.8	2.70
Asian alone non-Hispanic	5.0	0.18	7.8	1.82	5.2	0.20	3.8	1.58
Other, not Hispanic or Latino	6.3	0.21	7.5	2.33	6.3	0.19	7.1	2.41
Hispanic or Latino of any race	21.8	0.38	23.2	3.10	21.7	0.31	24.1	3.00
Parent's Education								
Less than High School	7.4	0.29	7.1	1.91	7.3	0.28	7.9	1.81
High School or Equivalent	14.9	0.37	17.4	2.48	14.7	0.33	17.8	3.10
Some College	29.9	0.46	26.8	3.93	29.1	0.38	23.4	3.87
Bachelor's Degree or Higher	47.8	0.53	48.7	4.23	48.9	0.48	50.8	4.66
Poverty Status								
In Poverty	19.8	0.47	20.7	3.14	19.4	0.39	22.1	3.10
Not in Poverty	80.2	0.47	79.3	3.14	80.6	0.39	77.9	3.10
Mother Work Status								
Mother working	65.5	0.44	64.3	4.23	65.5	0.44	63.6	3.99
Mother not working	28.0	0.42	33.7	4.22	28.1	0.43	34.6	3.82
Mother not present	6.5	0.25	2.0	0.97	6.5	0.25	1.8	1.10
Household Marital Status								
Married	70.0	0.47	69.0	3.14	70.2	0.44	67.2	4.14
Not married	30.0	0.47	31.0	3.14	29.8	0.44	32.8	4.14
Family Structure								
Both parents in household	67.2	0.48	71.3	3.21	67.6	0.47	70.4	3.81
Mother only	26.3	0.49	26.4	3.12	26.0	0.47	27.6	3.70
Father Only	6.5	0.25	2.3	1.02	6.5	0.25	2.1	1.17

Table 2: Preschool Enrollment for 3- and 4-Year-Olds by Demographic and Economic Characteristics on ACS and SIPP 2013-2017 (continued)

	2015				2016			
	ACS		SIPP		ACS		SIPP	
	Percent	MOE	Percent	MOE	Percent	MOE	Percent	MOE
Age								
3	36.2	0.45	42.6	3.86	36.4	0.51	38.3	4.07
4	63.8	0.45	57.4	3.86	63.6	0.51	61.7	4.07
Sex								
Male	51.0	0.41	48.5	3.56	51.2	0.41	53.9	4.41
Female	49.0	0.41	51.5	3.56	48.8	0.41	46.1	4.41
Race and Hispanic Origin								
White alone non-Hispanic	51.4	0.38	50.3	4.41	52.2	0.41	53.2	5.18
Black alone non-Hispanic	14.6	0.37	15.3	3.32	13.6	0.33	14.5	3.33
Asian alone non-Hispanic	4.9	0.18	4.9	1.71	5.2	0.18	6.5	3.23
Other, not Hispanic or Latino	6.5	0.21	9.1	2.60	6.8	0.23	5.2	2.05
Hispanic or Latino of any race	22.5	0.38	20.5	3.35	22.1	0.40	20.6	3.93
Parent's Education								
Less than High School	6.9	0.25	4.6	1.91	6.8	0.25	5.0	1.86
High School or Equivalent	14.9	0.36	19.1	4.06	14.9	0.38	14.5	3.32
Some College	28.7	0.40	22.6	3.56	28.2	0.42	26.8	4.43
Bachelor's Degree or Higher	49.4	0.45	53.7	4.99	50.1	0.47	53.6	4.78
Poverty Status								
In Poverty	18.4	0.46	22.9	3.58	16.7	0.38	19.1	3.50
Not in Poverty	81.6	0.46	77.1	3.58	83.3	0.38	80.9	3.50
Mother Work Status								
Mother working	66.0	0.43	62.4	5.14	66.4	0.47	72.3	4.70
Mother not working	27.5	0.40	36.0	5.10	27.2	0.45	24.4	4.42
Mother not present	6.5	0.28	1.6	1.21	6.4	0.27	3.3	1.93
Household Marital Status								
Married	70.9	0.46	69.6	4.03	71.5	0.46	72.4	4.99
Not married	29.1	0.46	30.4	4.03	28.5	0.46	27.6	4.99
Family Structure								
Both parents in household	68.0	0.45	68.7	4.12	68.6	0.45	73.8	4.22
Mother only	25.5	0.48	29.7	4.24	25.0	0.38	22.9	4.10
Father Only	6.5	0.28	1.6	1.21	6.4	0.27	3.2	1.93

Table 2: Preschool Enrollment for 3- and 4-Year-Olds by Demographic and Economic Characteristics on ACS and SIPP 2013-2017 (continued)

	2017			
	ACS		SIPP	
	Percent	MOE	Percent	MOE
Age				
3	37.1	0.41	41.9	2.92
4	62.9	0.41	58.1	2.92
Sex				
Male	51.2	0.39	49.0	2.83
Female	48.8	0.39	51.0	2.83
Race and Hispanic Origin				
White alone non-Hispanic	51.9	0.41	49.3	3.77
Black alone non-Hispanic	13.8	0.33	12.8	2.61
Asian alone non-Hispanic	5.5	0.16	4.9	1.63
Other, not Hispanic or Latino	6.7	0.23	7.4	1.80
Hispanic or Latino of any race	22.1	0.34	25.5	2.76
Parent's Education				
Less than High School	5.8	0.27	5.4	1.62
High School or Equivalent	15.1	0.38	15.3	2.93
Some College	27.8	0.44	25.6	3.41
Bachelor's Degree or Higher	51.4	0.55	53.7	4.00
Poverty Status				
In Poverty	15.7	0.37	20.9	2.87
Not in Poverty	84.3	0.37	79.1	2.87
Mother Work Status				
Mother working	66.9	0.51	66.7	3.97
Mother not working	26.6	0.44	31.1	3.94
Mother not present	6.5	0.30	2.2	1.11
Household Marital Status				
Married	72.3	0.43	66.8	3.62
Not married	27.7	0.43	33.2	3.62
Family Structure				
Both parents in household	69.6	0.47	67.8	3.54
Mother only	23.9	0.40	29.7	3.45
Father Only	6.5	0.30	2.5	1.16

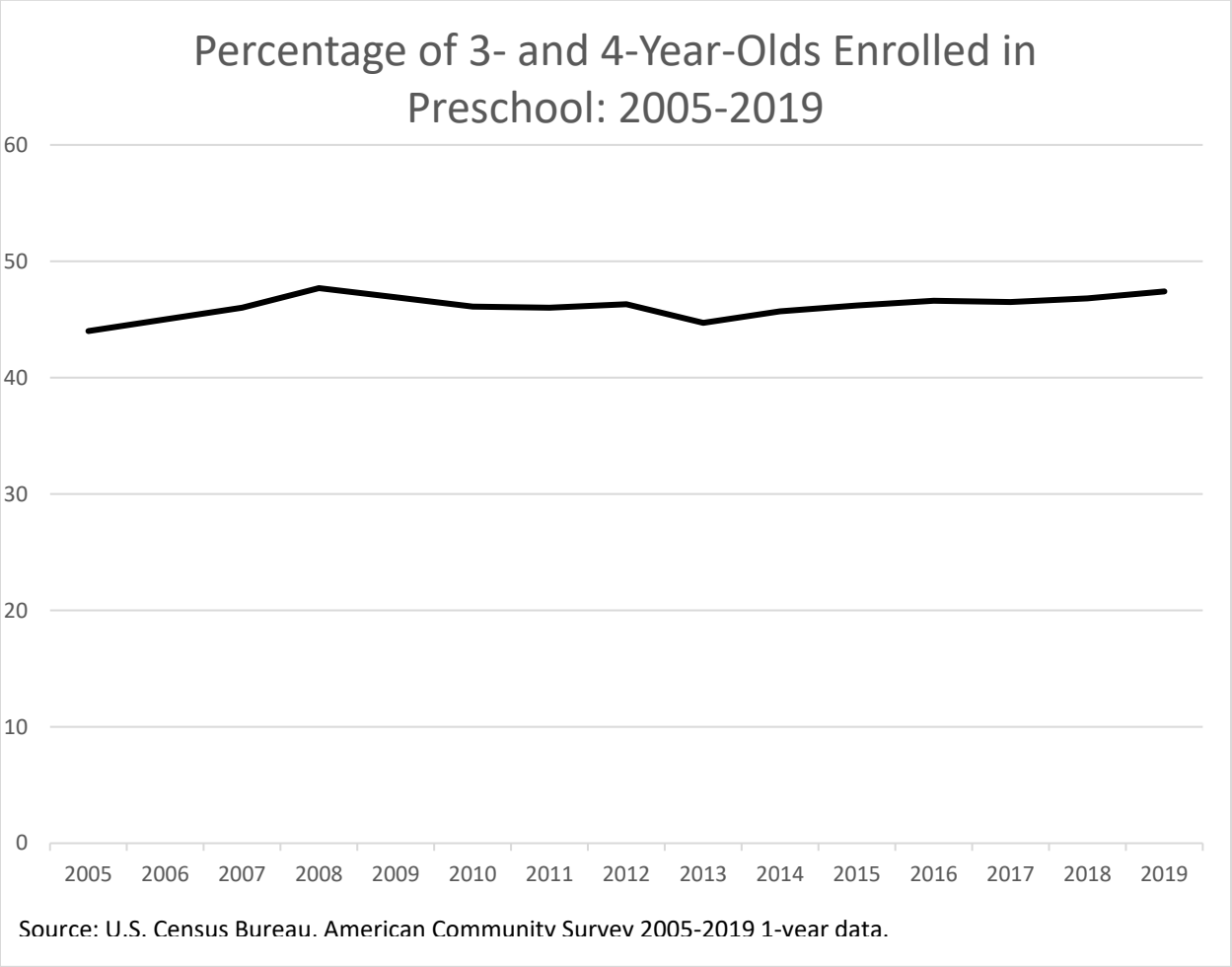
Source: U.S. Census Bureau, American Community Survey 2013-2017 1-year data. For more information, refer to <census.gov/acs>.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2013-2017.

Note: Universe includes 3- and 4-year-olds who have not enrolled in kindergarten or higher.

Note: Parent's education is measured as the highest level of education between both parents.

Figure 1



Source: U.S. Census Bureau, American Community Survey 2005-2019 1-year data.

Figure 2 shows the share of preschool enrollees in public and private school from 2005 to 2019. Public preschool has become more common for preschool enrollees, increasing from 53 percent of enrollees in 2005 to roughly 60 percent in 2019.

Together, Figures 1 and 2 show that preschool enrollment is increasing in the United States, and public preschool enrollment is more common than it was in the past. Yet, even with these changes, over half of 3- and 4-year-olds in the United States do not enroll in preschool. In the next section, we explore the factors associated with overall preschool enrollment as well as public and private preschool enrollment.

Logistic Regression Models

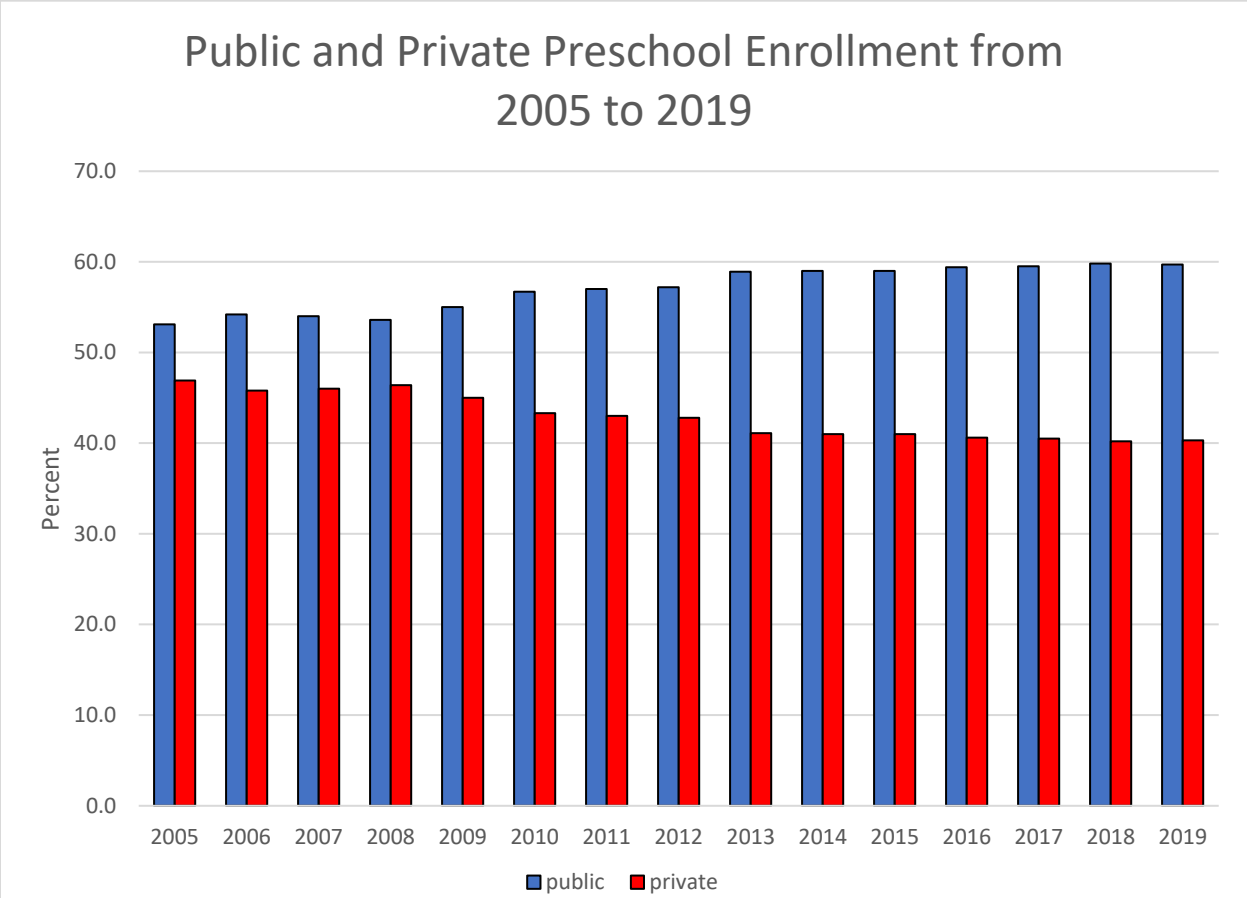
In Table 3, we present a set of logistic regression models on the likelihood of enrollment in preschool and, more specifically, enrollment in public or private preschool. These models use data from 3- and 4-year-olds (all preschool enrollees) from the 2019 ACS 1-year dataset.[11] Children who have already enrolled in kindergarten or higher are excluded from the models.

One factor associated with preschool enrollment is mothers' work status. Broadly, children with working mothers are more likely to be enrolled in any preschool. This is particularly true for children enrolling in public preschool, as children with working mothers are 1.3 times more likely to be enrolled in public preschool than those with non-working mothers.

Another factor associated with preschool enrollment is socioeconomic status. Measured via parents' education (measured as the highest education of either parent) and household income quintile, Model 1.1 shows that children with higher socioeconomic status are more likely to enroll in preschool than their less advantaged counterparts. Interestingly, the odds ratio for the second income quintile is less than one (showing a negative effect) and statistically significant. This suggests that, among children in the lower end of the income distribution, those with the lowest household incomes are more likely to enroll than those in the 2nd income quintile. Models 1.2 and 1.3 show that socioeconomic status is related to the type of preschool children enroll in. Results from Model 1.2 show that as household income increases, individuals' odds of being in public preschool decrease. Similarly, Model 1.3 shows that children with higher household incomes and higher parental education are more likely to enroll in private preschool than those with lower levels of income and education.

[11] For reference, the same logistic model on preschool enrollment in 2005 is in the appendix Table A-2.

Figure 2



Source: U.S. Census Bureau, American Community Survey 2005-2019 1-year data.

Table 3: Logistic Regression Models on Preschool Enrollment in 2019

		Model 1.1 Total Preschool Enrollment		Model 1.2 Public Preschool		Model 1.3 Private Preschool	
Parameter		Odds Ratio	P-value	Odds Ratio	P-value	Odds Ratio	P-value
Child Age (ref = 3)	*4*	3.05	<.0001	2.89	<.0001	1.47	<.0001
Mother Age		1.02	<.0001	1.01	0.0052	1.03	<.0001
Parent Education (ref = LTHS)	*HS*	1.20	0.0002	1.17	0.0008	1.39	0.0019
	SC	1.53	<.0001	1.29	<.0001	2.32	<.0001
	BD+	2.46	<.0001	1.07	0.1891	5.35	<.0001
Household Income Quintiles (ref = low)	*2nd*	0.90	0.0018	0.88	0.0002	1.15	0.0022
	3rd	0.97	0.4634	0.87	0.0005	1.44	<.0001
	4th	1.11	0.0015	0.79	<.0001	1.98	<.0001
	5th	1.72	<.0001	0.71	<.0001	3.21	<.0001
Mother Work Status (ref = mom not working)	*Working*	1.32	<.0001	1.30	<.0001	1.09	0.0027
	Not Present	1.00	0.9291	1.07	0.1683	0.94	0.4268
Race (ref = white alone)	*Black alone*	1.29	<.0001	1.71	<.0001	0.66	<.0001
	Asian alone	1.00	0.9782	0.91	0.0906	1.06	0.2484
	Other	1.03	0.2718	1.06	0.0622	0.97	0.4088
Hispanic Origin (ref = not)	*Hispanic or Latino*	0.91	0.0004	1.30	<.0001	0.57	<.0001
Parent Citizenship (ref = native parent)	*Foreign Parent*	1.02	0.4198	1.02	0.4874	1.01	0.7557
Household Marriage Status (ref = not married or single parent)	*Married*	0.87	<.0001	0.87	<.0001	0.98	0.5654
Census Region (ref = northeast)	*Midwest*	0.71	<.0001	0.86	<.0001	0.73	<.0001
	South	0.73	<.0001	0.71	<.0001	1.00	0.9787
	West	0.73	<.0001	0.75	<.0001	0.92	0.0293

Source: U.S. Census Bureau, American Community Survey 2019 1-year data. For more information, refer to <census.gov/acs>.

Region is also associated with preschool enrollment. All three logistic models in Table 3 show that children living in the Northeast are more likely to enroll in any preschool, and they are specifically more likely to be enrolled in public and private preschool.[12] This shows that the geographic places where children grow up are associated with their likelihood of preschool enrollment.

State Maps

In this section, we examine the geographic variability of preschool enrollment by exploring a series of state-level maps for 3- and 4-year-olds showing the percentage of overall preschool enrollment, public and private preschool enrollment, and overall changes in preschool enrollment from 2005 to 2019.

Figure 3 shows the percentage of 3- and 4-year-olds enrolled in preschool in 2019. The map shows that preschool enrollment is the highest in the Northeast. Yet, there is not a clear geographic pattern to enrollment, as we see relatively high levels across the country. Figure 4 shows the percentage-point change in preschool enrollment across states from 2005 to 2019. The Northeast and West can be characterized as high growth areas, but we see relatively high levels of growth in states throughout the country. States like Florida, Illinois, Mississippi, and Oklahoma have all seen relatively large increases in the percentage of 3- and 4-year-olds enrolled in preschool.

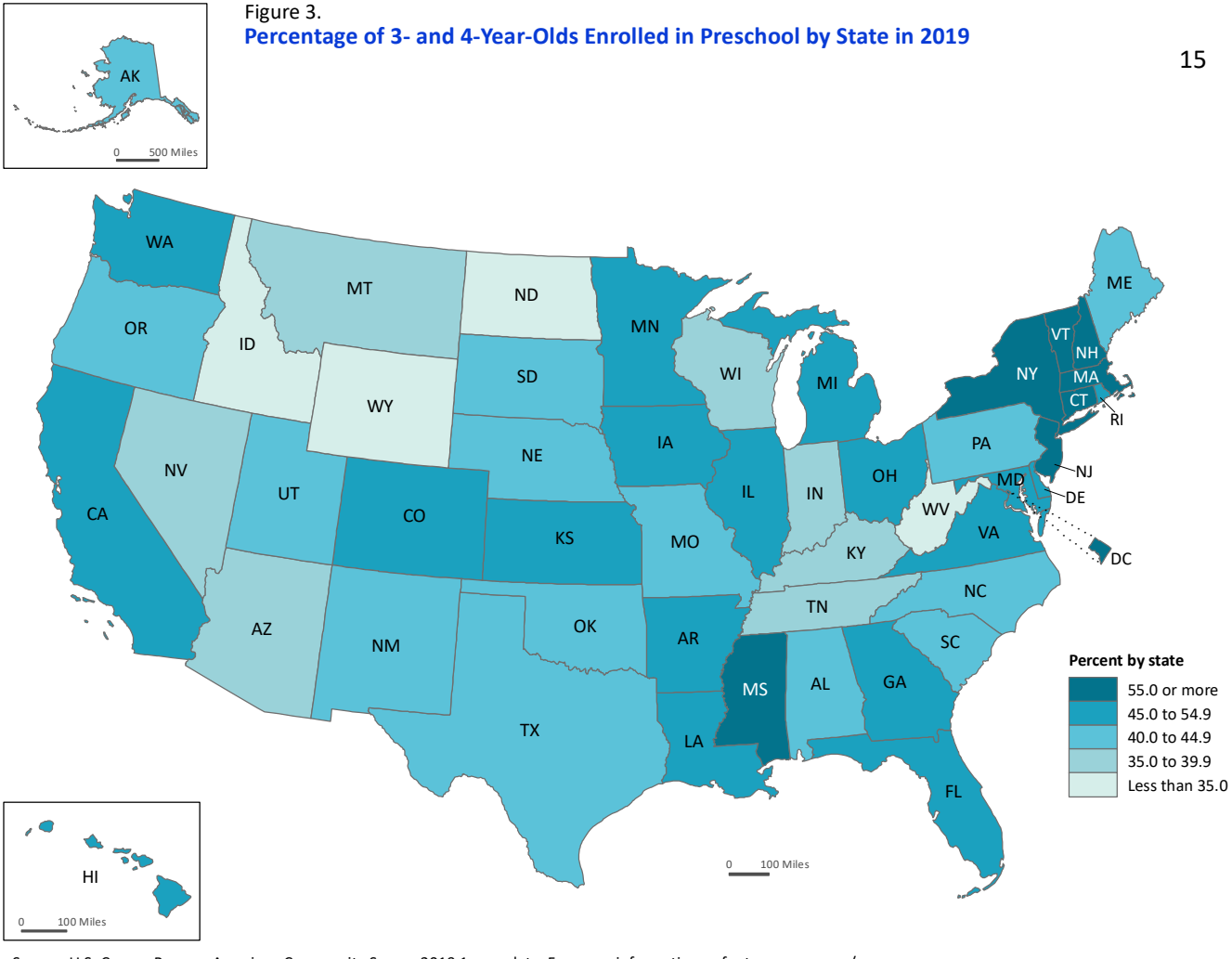
Next, we examine changes in public and private preschool enrollment from 2005 to 2019. Panels *a* and *b* in Figure 5 show the percentage of 3- and 4-year-olds enrolled in public preschool in 2005 and 2019, respectively. Panels *c* and *d* do the same for private preschool. Examining all panels in Figure 5 concurrently, the major shift towards public preschool from 2005 to 2019 is apparent. Despite the national declines, private preschool enrollment is still relatively high in the Northeast compared with other regions.

In looking at the state-level trends in preschool enrollment from 2005 to 2019, there is not a clear geographic pattern to growth in preschool enrollment over time. Overall, there has been a growth in preschool enrollment, and a shift from private to public enrollment, but no obvious pattern of shift among the states.

[12] There is no statistical difference in the odds of private school enrollment (Model 1.3) when comparing children from the Northeast and the South regions.

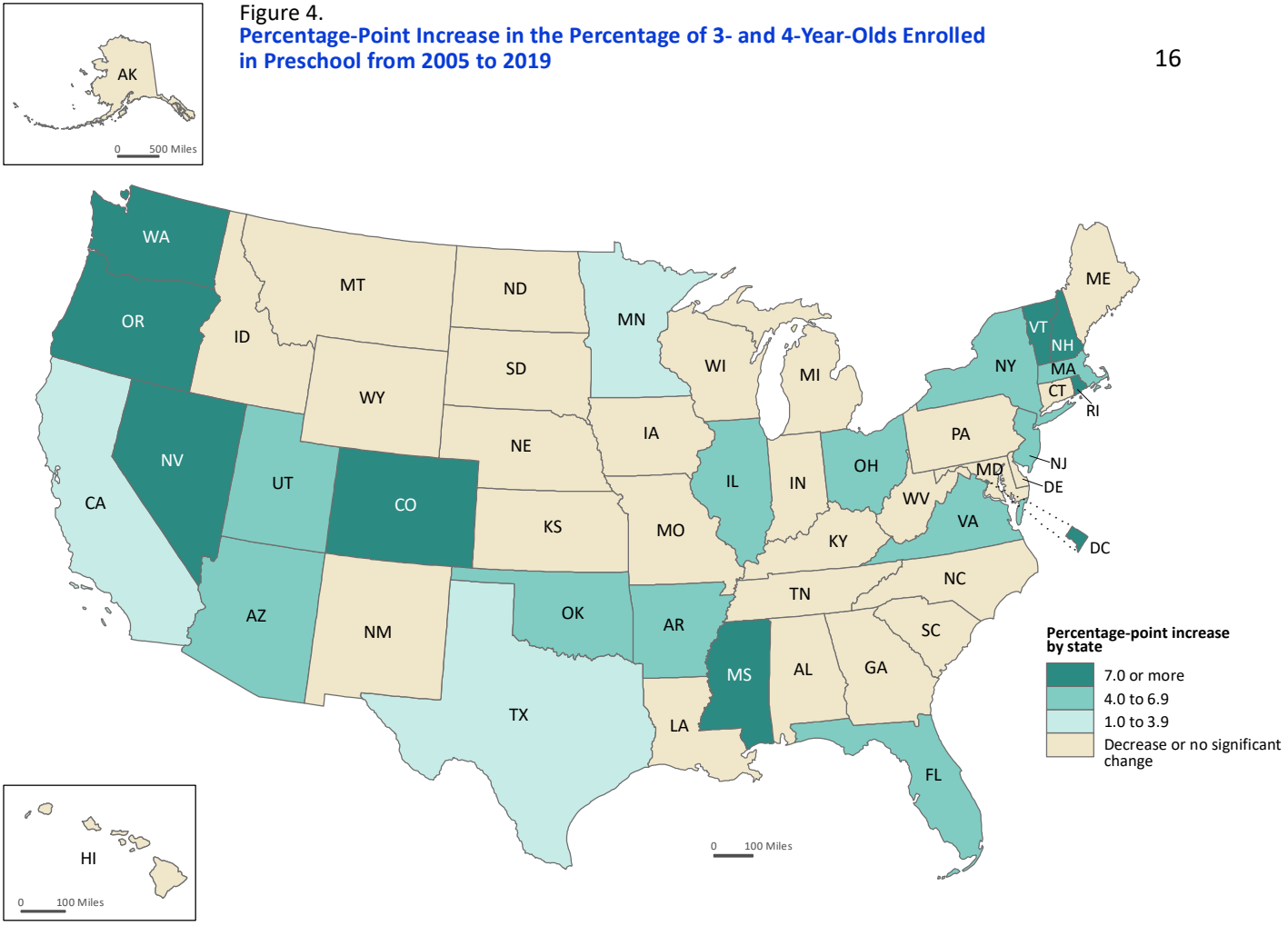
Figure 3.

Percentage of 3- and 4-Year-Olds Enrolled in Preschool by State in 2019



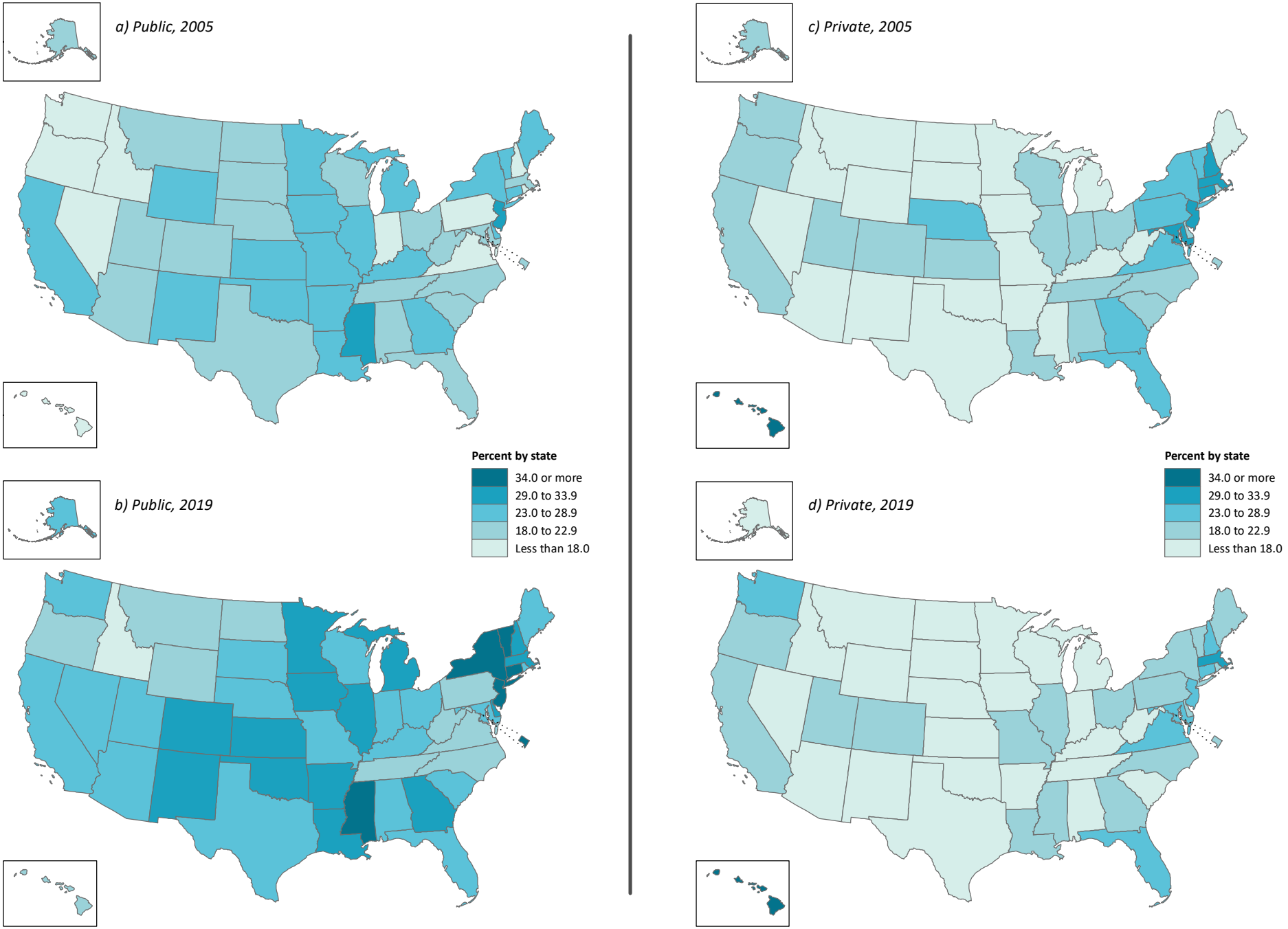
Source: U.S. Census Bureau, American Community Survey 2019 1-year data. For more information, refer to <census.gov/acs>.

Figure 4.
Percentage-Point Increase in the Percentage of 3- and 4-Year-Olds Enrolled in Preschool from 2005 to 2019



Note: Kentucky was the only state with a statistically significant decrease.
Source: U.S. Census Bureau, American Community Survey 2005 and 2019 1-year data. For more information, refer to <census.gov/acs>.

Figure 5. **Percentage of 3- and 4-Year-Olds Enrolled in Public and Private Preschool By State**



Source: U.S. Census Bureau, American Community Survey 2005 and 2019 1-year data. For more information, refer to <census.gov/acs>.

State-Level OLS Regression Models

What state-level changes are associated with changes in preschool enrollment from 2005 to 2019? To explore this, Table 4 presents results from a state-level OLS regression model using percentage-point change in 3- and 4-year-olds enrolled in preschool from 2005 to 2019. All independent variables are also measured as the percentage-point change from 2005 to 2019 aside from median home value, which is measured as the dollar change from 2005 to 2019.

The results from Table 4 are quite clear: there are few characteristics whose changes are associated with changes in preschool enrollment.[13] The only statistically significant change that we identify is that changes in the percentage of 3- and 4-year-olds with working mothers is positively associated with preschool enrollment.

Table 4: State-Level OLS Regression Model on Percentage-Point Change in Preschool Enrollment from 2005 to 2019

Variable	Estimate	SE	P-value
Intercept	-0.40	3.76	0.916
3- and 4-year-old children with working mothers (percentage change, 2005-2019)	0.50	0.20	0.015
Urban (percentage change, 2005-2019)	0.07	0.33	0.835
Bachelor's degree or higher (percentage change, 2005-2019)	-0.13	0.65	0.838
Median home value (dollar change, 2005-2019)	0.00	0.00	0.471
Poverty rate (percentage change, 2005-2019)	-0.64	0.76	0.410

Source: U.S. Census Bureau, American Community Survey 2005 and 2019 1-year data. For more information, refer to <census.gov/acs>.

DISCUSSION AND CONCLUSION

From 2005 to 2019, preschool enrollment underwent several changes in the United States. Over time, preschool enrollment expanded despite declines during the aftermath of the Great Recession. Further, a major shift towards public school took place for preschool enrollees, and today roughly 60 percent of preschool enrollees are in a public program. These changes align with state and local

[13] For a list of additional independent variables that we examined, see Table A-2.

governments' efforts to expand preschool programs over the last couple of decades. According to the National Institute for Early Education Research, state financial investments in preschool have more than doubled since 2002, with nearly $9 billion spent during the 2018-2019 school year (Friedman-Krauss et al. 2020).

Looking at the effect of socioeconomic status on preschool enrollment, we see that public preschools play the role expected of them. Educational attainment and household income are not as important in determining who enrolls (as compared to private school), while mother's employment does have a strong impact. The expansion of public preschool, therefore, may have an overall beneficial impact for families with limited resources.

When looking at states' changes in preschool enrollment, we see no specific geographic pattern, as states across the country saw increases in preschool enrollment from 2005 to 2019. State plans for preschool enrollment vary significantly, but some states do offer universal preschool for all eligible children (although age requirements vary from state to state). Oklahoma and the District of Columbia both offer universal preschool, and both saw relatively large increases in preschool enrollment from 2005 to 2019. Increases in DC were far larger than states, as enrollment of 3- and 4-year-olds increased by 38 percentage points from 2005 to 2019. Yet, beyond some regional differences between the Northeast and the rest of the country, we find few geographic patterns when looking at preschool enrollment at the state level.

This paper examined factors associated with preschool enrollment at the individual level and change in preschool enrollment at the state level. Mother's work status is a key factor when analyzing preschool enrollment. Despite the expansion of dual-earner households and cultural shifts to gender equality, women still tend to take on more childcare responsibilities than men among opposite-sex households (Zamarro and Prados 2021). Our findings are in line with this, as we find that children with working mothers are more likely to be enrolled in preschool than children whose mothers are not working. Additionally, at the state level we find that increases in the percentage of preschool age children with working mothers is associated with state-level increases in preschool enrollment. Thus, in addition to the benefits that preschool enrollment provides for children (Ansari 2018; Gray-Lobe, Pathak, and Walters 2021), our findings suggest that it may have a positive effect on parents' labor force access (Kesler 2020; Sabol and Chase Lansdale 2015).

As the federal government explores policy initiatives involving universal preschool and states continue to expand funding for early childhood education, it is important to understand the demographic and geographic variation in preschool enrollment. In doing this, scholars and policymakers

alike can identify groups that struggle to obtain access to preschool and hopefully identify ways to expand enrollment. This working paper highlights the utility of ACS data in understanding preschool enrollment across the country.

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APPENDIX

Table 5: Percentage Enrolled in Preschool By Demographic and Economic Characteristics for SIPP and ACS 2013-2017

	2013				2014			
	ACS		SIPP		ACS		SIPP	
	Percent	MOE	Percent	MOE	Percent	MOE	Percent	MOE
Age								
3	31.8	0.39	29.5	2.50	32.8	0.35	31.4	3.42
4	57.7	0.42	47.7	3.12	58.7	0.42	59.4	3.98
Sex								
Male	45.1	0.38	37.2	2.74	45.9	0.40	43.5	3.63
Female	44.3	0.43	38.6	3.06	45.5	0.46	44.1	3.46
Race and Hispanic Origin								
White alone non-Hispanic	47.2	0.43	36.4	3.26	47.7	0.40	44.8	3.99
Black alone non-Hispanic	47.2	1.09	42.5	5.48	49.2	1.03	42.7	8.02
Asian alone non-Hispanic	52.4	1.49	49.7	10.14	52.5	1.63	35.0	16.10
Other, not Hispanic or Latino	47.0	1.27	45.1	10.75	47.1	1.26	51.2	11.90
Hispanic or Latino of any race	36.9	0.57	33.9	3.98	38.3	0.49	42.3	4.74
Parent's Education								
Less than High School	29.7	0.92	24.9	5.13	30.7	0.85	39.9	7.32
High School or Equivalent	34.1	0.78	31.1	4.09	35.3	0.64	36.2	6.19
Some College	41.9	0.56	36.6	4.28	42.8	0.53	40.1	5.19
Bachelor's Degree or Higher	58.0	0.57	46.5	3.83	57.9	0.48	51.4	4.44
Poverty Status								
In Poverty	36.7	0.65	31.8	3.94	38.0	0.62	38.1	4.67
Not in Poverty	47.4	0.37	39.9	2.43	48.2	0.31	45.7	3.04
Mother Work Status								
Mother working	48.7	0.36	41.7	2.91	49.8	0.40	49.5	3.41
Mother not working	39.8	0.55	33.5	3.52	40.7	0.50	37.5	4.54
Mother not present	37.0	1.10	25.5	10.02	37.1	1.16	32.2	16.87
Household Marital Status								
Married	46.9	0.33	40.0	2.63	47.8	0.31	43.8	3.36
Not married	41.0	0.57	34.3	3.20	41.9	0.55	45.1	4.77
Family Structure								
Both parents in household	47.5	0.34	40.1	2.67	48.2	0.31	44.5	3.26
Mother only	41.5	0.62	33.9	3.28	43.0	0.67	42.7	4.43
Father Only	37.0	1.10	28.0	9.84	37.1	1.16	35.9	16.61

Table 5: Percentage Enrolled in Preschool By Demographic and Economic Characteristics for SIPP and ACS 2013-2017 (continued)

	2015				2016			
	ACS		SIPP		ACS		SIPP	
	Percent	MOE	Percent	MOE	Percent	MOE	Percent	MOE
Age								
3	33.3	0.43	35.9	4.34	33.5	0.46	33.0	3.91
4	59.4	0.40	56.6	4.37	60.0	0.53	60.3	5.03
Sex								
Male	46.4	0.47	43.8	4.19	46.4	0.47	47.0	4.42
Female	46.1	0.42	47.1	4.26	46.8	0.51	44.4	5.52
Race and Hispanic Origin								
White alone non-Hispanic	47.7	0.37	44.8	4.59	48.6	0.39	48.1	4.61
Black alone non-Hispanic	50.5	0.96	46.4	9.22	49.2	1.09	44.8	10.33
Asian alone non-Hispanic	51.5	1.53	44.2	10.68	53.0	1.51	50.3	17.21
Other, not Hispanic or Latino	47.6	1.17	60.3	12.68	48.5	1.36	40.3	14.19
Hispanic or Latino of any race	40.0	0.67	42.0	5.47	39.6	0.70	41.5	6.93
Parent's Education								
Less than High School	31.0	1.07	25.6	9.07	32.7	1.04	29.5	10.17
High School or Equivalent	36.1	0.75	42.8	6.39	36.3	0.79	35.3	7.41
Some College	42.8	0.54	40.7	6.08	42.7	0.60	43.3	6.25
Bachelor's Degree or Higher	58.4	0.48	54.5	5.26	58.3	0.50	54.5	4.94
Poverty Status								
In Poverty	38.1	0.84	42.9	5.40	38.1	0.77	40.6	6.54
Not in Poverty	48.7	0.35	46.3	3.69	48.9	0.38	47.2	3.93
Mother Work Status								
Mother working	50.2	0.40	48.6	5.22	50.7	0.47	48.7	4.85
Mother not working	40.9	0.54	42.9	4.63	41.0	0.56	37.5	5.09
Mother not present	38.7	1.32	36.0	21.05	38.8	1.22	66.3	21.59
Household Marital Status								
Married	48.4	0.38	45.4	4.43	48.7	0.43	46.8	4.07
Not married	42.2	0.65	47.7	6.17	42.6	0.63	43.5	6.98
Family Structure								
Both parents in household	48.8	0.39	44.5	3.90	49.2	0.44	46.6	3.82
Mother only	43.0	0.70	49.3	5.53	43.3	0.63	40.8	6.58
Father Only	38.7	1.32	36.0	20.96	38.8	1.22	65.8	21.66

Table 5: Percentage Enrolled in Preschool By Demographic and Economic Characteristics for SIPP and ACS 2013-2017 (continued)

	2017			
	ACS		SIPP	
	Percent	MOE	Percent	MOE
Age				
3	33.8	0.40	29.6	2.49
4	59.8	0.45	48.9	3.92
Sex				
Male	46.6	0.44	37.4	2.66
Female	46.5	0.45	39.6	3.32
Race and Hispanic Origin				
White alone non-Hispanic	48.9	0.39	37.5	3.15
Black alone non-Hispanic	48.4	1.05	35.4	6.93
Asian alone non-Hispanic	54.6	1.36	46.2	11.76
Other, not Hispanic or Latino	47.3	1.42	48.1	10.05
Hispanic or Latino of any race	39.5	0.60	38.6	4.13
Parent's Education				
Less than High School	30.1	1.05	27.0	7.06
High School or Equivalent	36.3	0.81	29.3	4.84
Some College	42.8	0.63	38.4	4.77
Bachelor's Degree or Higher	58.3	0.47	44.9	3.33
Poverty Status				
In Poverty	37.4	0.71	33.6	4.24
Not in Poverty	48.9	0.34	40.0	2.57
Mother Work Status				
Mother working	51.0	0.38	41.7	2.99
Mother not working	40.6	0.60	33.8	3.77
Mother not present	38.0	1.37	32.6	12.94
Household Marital Status				
Married	49.0	0.35	38.9	2.96
Not married	41.9	0.64	38.6	4.07
Family Structure				
Both parents in household	49.5	0.37	38.7	2.83
Mother only	42.7	0.65	38.5	4.24
Father Only	38.0	1.37	34.2	12.40

Source: U.S. Census Bureau, American Community Survey 2013-2017 1-year data. For more information, refer to <census.gov/acs>.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2013-2017.

Note: Universe includes 3- and 4-year-olds who have not enrolled in kindergarten or higher.

Note: Parent's education is measured as the highest level of education between both parents.

Note: The numbers presented reflect SIPP Fall enrollment estimates (October)

Table 6: Logistic Regression Models on Preschool Enrollment in 2005

		Model 3.1 Total Preschool Enrollment		Model 3.2 Public Preschool		Model 3.3 Private Preschool	
Parameter		Odds Ratio	P-value	Odds Ratio	P-value	Odds Ratio	P-value
Child Age (ref = 3)	*4*	3.02	<.0001	2.68	<.0001	1.80	<.0001
Mother Age		1.01	<.0001	1.00	0.0437	1.02	<.0001
Parent Education (ref = LTHS)	*HS*	1.30	<.0001	1.15	0.0003	2.27	<.0001
	SC	1.84	<.0001	1.27	<.0001	3.95	<.0001
	BD+	2.92	<.0001	1.01	0.8312	7.86	<.0001
Household Income Quintiles (ref = low)	*2nd*	0.96	0.2333	0.88	0.0009	1.31	<.0001
	3rd	1.05	0.1154	0.79	<.0001	1.85	<.0001
	4th	1.27	<.0001	0.77	<.0001	2.40	<.0001
	5th	1.89	<.0001	0.70	<.0001	3.69	<.0001
Mother Work Status (ref = mom not working)	*working*	1.24	<.0001	1.10	<.0001	1.24	<.0001
	not present	0.91	0.0241	0.97	0.5974	0.88	0.0207
Race (ref = white alone)	*black*	1.39	<.0001	1.74	<.0001	0.81	<.0001
	asian	0.90	0.0476	0.96	0.5064	0.92	0.1319
	other	1.06	0.0861	1.16	0.0001	0.88	0.0042
Hispanic Origin (ref = not)	*Hispanic or Latino*	0.95	0.1105	1.29	<.0001	0.63	<.0001
Parent Citizenship (ref = native parent)	*foreign parent*	0.91	0.0019	0.94	0.0453	0.93	0.0435
Household Marriage Status (ref = not married or single parent)	*married*	0.80	<.0001	0.83	<.0001	0.86	<.0001
Census Region (ref = northeast)	*midwest*	0.74	<.0001	1.04	0.1316	0.62	<.0001
	south	0.81	<.0001	0.85	<.0001	0.92	0.0023
	west	0.77	<.0001	0.88	0.0001	0.81	<.0001

Source: U.S. Census Bureau, American Community Survey 2005 1-year data. For more information, see <census.gov/acs>