IES **Institute of Education Sciences**

APPENDIXES
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Regional Educational
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At Education Development Center

Center- and Program-Level Factors Associated with Turnover in the Early Childhood Education Workforce

Appendix A. Methods

Appendix B. Supporting analyses

See https://go.usa.gov/xspbT for the full report.

Appendix A. Methods

This appendix describes the study's data and analytic approach, including sensitivity analyses that were conducted to test the robustness of results.

Data

This study used data from the 2012 National Survey of Early Care and Education (NSECE), a nationally representative survey that characterizes the use and availability of early childhood education in the United States (NCECE Project Team 2017). The 2012 NSECE included four integrated surveys: households with children younger than 13, home-based providers of early childhood education, center-based providers of early childhood education, and the center-based early childhood education provider workforce.

Investigation of the research questions relied mainly on data from the center-based provider survey, which was administered to directors of centers that provide education and care to children not yet in kindergarten. Respondents answered questions about their center in general and for a randomly selected classroom from a selected age group. The primary variables of interest pertained to center characteristics—such as region, program type, age range of children served, and child–adult ratio—and the compensation, supports, and benefits provided to staff who cared for children (table A1).

Several analyses also drew on data from the workforce survey, which was administered to one randomly selected educator who worked at least five hours a week in a randomly selected classroom from each surveyed center. In addition to the variables described above, the analyses assessed individual characteristics such as wage, years of experience, highest educational attainment, role, and race/ethnicity.

The key data elements from the data files used to answer both research questions are presented are in table A1.

Table A1. Data sources for variables used in analyses

Data element	Data source
Center characteristic	
Region	Center-based provider survey
Program type	Center-based provider survey
Age group served	Center-based provider survey
Quality rating	Center-based provider survey
Child–adult ratio	Center-based provider survey
Number of staff who work with children younger than 13[a]	Center-based provider survey
Payer (family/public)	Center-based provider survey
Average hourly wage	Center-based provider survey
Nonwage benefits	
Health insurance	Center-based provider survey
Retirement benefits	Center-based provider survey
Financial support for professional development	Center-based provider survey
Share resources with other schools	Center-based provider survey
Individual characteristics	
Years of experience	Workforce survey
Highest level of educational attainment	Workforce survey
Race/ethnicity	Workforce survey

a. The National Survey of Early Care and Education includes only centers serving at least one child ages 0–5. About 44 percent of centers serve some school-age children as well.
Source: Authors' analysis of data from the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Because of item nonresponse, a nontrivial amount of data was missing from the dataset. Approximately 43 percent of centers surveyed did not provide complete data for all of the variables used in the analysis for research question 1, and 19 percent of educators did not provide complete data for all the variables used in the analysis for research question 2. The study team employed multiple imputations by chained equations over 20 cycles to impute missing data. To prevent estimation of imputed values beyond appropriate ranges for continuous variables (such as negative values for worker wage), predictive mean matching was used to select five cases that have the closest predicted values. Through predictive mean matching, one of the five nearest-neighbor cases is chosen at random, and its value is assigned to the case with missing data (Morris et al., 2014; Royston et al., 2011; White et al., 2011).

Sample

The sample for research question 1, which drew on center-level data, included 7,773 of the 8,265 respondents' centers from the center-based provider survey after centers that were determined not to have provided early childhood education (6 percent) were removed from the sample. For analyses that drew on individual-level data, the sample consisted of 4,916 early childhood education workforce members of the 5,556 respondents to the workforce survey (67 percent response rate), each of whom was employed at a different center. Educators who reported not having taught in an early childhood setting were excluded from the sample. Sampling weights were applied to all center-level and workforce analyses to account for nonresponse. Centers with missing data from workforce respondents are those for which no valid educator responded. The sample is representative of 129,283 centers and 1,042,531 early childhood educators across the nation.

Analysis

All early childhood education centers in the sample were classified into one of three categories based on statistical quantiles by the proportion of educators who left their center in the past 12 months. The bottom two quartiles of the sample were in the low-turnover category, with turnover rates below 5 percent in 2012; 95 percent of centers in the low-turnover category experienced no turnover in the year the survey was administered. The second

quartile included centers with medium-turnover rates of 5–20 percent. The top quartile included centers with high turnover rates of more than 20 percent. The study team opted for this approach instead of using average turnover rates because the high number of centers with no turnover skewed the average turnover variable, making it inappropriate for a typical ordinary least squares regression.

Chi-square tests were then conducted to determine differences in the proportion of educators within each turnover category by center characteristics and support offered, and *t*-tests were used to estimate differences between turnover categories by average educator wage and student racial/ethnic composition. Statistical tests were run on a survey-weighted, but not imputed, sample. Because weighting renders *n* counts less accurate, subsamples are accounted for in terms of their proportion of the sample after weighting.

Finally, for research question 2, a survey-weighted ordinal logistic regression was fitted to estimate the relationship between early childhood education educator turnover and center-based supports and characteristics. The dependent variable was the center turnover category, and low-turnover centers served as the base category for the model. The coefficients represent the likelihood of a center's being in a higher turnover category. Coefficients larger than 1 indicate a higher probability of being in a higher turnover category associated with increasing values of a given independent variable. In later models, interaction terms between center characteristics and the offering of health insurance or retirement benefits were included to assess whether the relationship between benefits and turnover varied depending on features of the centers that offered benefits.

Sensitivity analyses

To account for the multiple limitations in the dataset, the study team repeated the analyses for both research questions by center and by program type to examine whether the factors associated with turnover differed by program type and funding source. Regressions with interaction terms were employed to better understand variation in the relationship between wage/nonwage benefits and turnover at the center level. Specifically, an interaction term for low-wage status and benefits status at the center level was employed to reveal whether the relationship between benefits and turnover was conditioned on the wage-level of the center. Tables B14 and B15 in appendix B contain the results of these sensitivity analyses.

To enable a better understanding of the differences in turnover patterns by center characteristics, table B15 in appendix B displays survey-weighted median turnover rates for centers with varying characteristics employed in this analysis.

References

Morris, T. P., White, I. R., & Royston, P. (2014). Tuning multiple imputation by predictive mean matching and local residual draws. *BMC Medical Research Methodology*, *14*(1), 1–13.

NSECE Project Team (National Opinion Research Center). (2017). *National Survey of Early Care and Education (NSECE), 2012.* Inter-university Consortium for Political and Social Research. https://doi.org/10.3886/ICPSR35519.v13.

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Appendix B. Supporting analyses

The tables included in this appendix display the results of descriptive and correlational analyses described in the above report.

Table B1. Descriptive statistics across unweighted and weighted and nonimputed and imputed samples, 2012 (percent unless otherwise indicated)

Center characteristic	Unweighted pre-imputation		Survey weighted pre-imputation		Number of observations	Unweighted post-imputation	Survey weighted post-imputation
	Mean/ frequency	Standard deviation	Mean/ frequency	Standard deviation		Mean/ frequency	Mean/ frequency
Turnover rate	12.8	18.5	12.9	18.8	7,426	12.8	12.8
Average wage ($ per hour)	14.50	8.7	14.47	9.3	5,284	14.50	14.47
Hourly wage[a] ($)	6.98	8.7	7.01	9.3		7.40	7.3
Number of staff	13.2	12.8	12.8	13.9	7,700	13.2	12.8
Provides benefits[b]	67.1		66.5		7,648	66.7	66.3
Provides paid time off or funding for professional development	68.9		69.6		7,655	69.0	69.7
Shares resources with a school	60.1		60.1		7,653	60.9	60.8
Has a quality rating	49.1		48.5		7,539	49.0	48.5
Standardized child–adult ratio	0.0	1.0	0.1	0.1		0.0	0.0
Program type							
School-sponsored	7.7		8.4		7,773	7.7	8.4
Head Start	16.2		15.2		601	16.2	15.2
Public prekindergarten	20.9		18.2		1,256	20.9	18.2
Other[c]	55.3		58.2		1,621	55.3	58.2
Private-pay center serving ages 0–5	64.1		59.0		4,295	64.1	59.1
Region					7,773		
Northeast	19.6		17.3			19.6	17.3
Midwest	19.5		22.2			19.5	22.2
South	31.5		41.8			31.5	41.8
West	29.4		18.7			29.4	18.7
Student age group					7,771		
0–5	74.5		70.1		5,792	74.5	70.1
3–5	25.5		29.9		1,979	25.5	29.9
Student racial/ethnic composition							
Majority students of color	48.3		32.9		7,773	48.3	32.9
White	44.4	34.9	59.4	33.9	6,962	47.7	60.9
Black	25.6	30.3	20.3	27.8	6,595	23.1	18.3
Hispanic	25.6	30.0	17.8	26.1	7,393	25.3	17.8

Note: Frequencies reflect differences in means and frequencies across unweighted and weighted samples before and after imputation. Sample sizes vary across variables.
a. Centered on regional minimum wage.
b. Health insurance and retirement benefits.
c. Private, parochial, and other nonpublic centers.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B2. Distribution of early childhood education center characteristics across turnover categories, 2012 (percent unless otherwise indicated)

Center characteristic	Low-turnover centers	Medium-turnover centers	High-turnover centers	Percent of weighted sample	Chi-square statistic	*p*-value
Number of centers	3,692	1,796	1,938			
Percent of centers	49.7	24.2	26.1			
Weighted percent of centers	51.0	22.0	26.8			
Hourly wage ($)	16.74	13.10	11.94			
Student age group served					33.5*	0.000
0–5 years old	42.1	26.6	31.3	69.1		
3–5 years old	71.1	12.9	16.8	30.9		
Student racial/ethnic composition					0.9	0.400
Majority students of color	53.8	20.9	25.4	33.4		
Majority White	49.7	22.8	27.6	66.6		
Percentage Hispanic	19.5	15.8	14.8			
Program type					2.6*	0.021
School-sponsored center	59.5	12.1	28.5	8.7		
Head Start	55.6	26.3	18.1	15.3		
Public prekindergarten	46.8	25.0	28.3	18.2		
Other[a]	49.9	21.6	28.5	57.9		
Region					2.4*	0.031
Northeast	46.5	27.2	26.3	17.3		
Midwest	59.1	15.1	25.8	22.0		
South	48.4	23.9	27.7	41.8		
West	51.7	21.8	26.6	19.0		

* Statistically significant at *p* < .05 within group, as indicated by Rao-Scott chi-square statistic.
Note: Frequencies reflect survey weighted, pre-imputed values. Frequencies for low- , medium-, and high-turnover centers should sum to 100 for each row but may not because of rounding.
a. Private, parochial, and other nonpublic centers.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B3. Distribution of early childhood education centers, by age group served and program type, 2012 (percent unless otherwise indicated)

Program type	Serves children ages 0–5	Serves children ages 3–5	Percent of weighted sample	Chi-square statistic	*p*-value
School sponsored	48.2	51.8	8.4	135.3*	0.000
Head Start	39.0	61.0	15.2		
Public prekindergarten	72.2	27.8	18.2		
Other[a]	80.7	19.3	58.2		

* Statistically significant at *p* < .05 within group, as indicated by Rao-Scott chi-square statistic.
Note: Frequencies reflect survey weighted, pre-imputed values. Frequencies for centers serving children ages 0–5 and centers serving children ages 3–5 sum to 100 for each row.
a. Private, parochial, and other nonpublic centers.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B4. Mean turnover rate and wage, by early childhood education center–level wage group, 2012

Item	Low-wage centers		Higher-wage centers		
	Mean	Standard error	Mean	Standard error	*t*-statistic
Turnover rate (%)	19.2	21.6	11.5	17.8	6.2*
Hourly wage ($)	8.17	0.7	16.73	9.9	−16.9*

* Statistically significant at *p* < .05 within group, as indicated by *t*-statistic.
Note: Frequencies reflect survey-weighted, pre-imputed values.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B5. Average hourly wage, by early childhood education center characteristic, 2012 ($ per hour, unless otherwise indicated)

Program type and payer	All centers (standard deviation)	Percent of weighted sample	Serves children ages 0–5 (standard deviation)	Percent of weighted sample	Serves children ages 3–5 (standard deviation)	Percent of weighted sample
Overall	14.48	100	12.60	70.1	18.87	29.9
	(9.27)		(7.51)		(10.34)	
Program type						
School-sponsored	22.60	8.4	18.38	4.1	25.91	4.3
	(1.53)		(1.65)		(2.28)	
Head Start	14.29	15.2	13.56	5.9	14.76	9.3
	(0.73)		(1.61)		(0.60)	
Public prekindergarten	16.57	18.2	13.68	13.1	24.42	5.0
	(1.33)		(0.73)		(3.43)	
Other[a]	12.59	58.2	11.66	47.0	16.65	11.2
	(0.22)		(0.20)		(0.84)	
Payer						
Some or all families pay	12.20	70.0	11.60	59.0	15.62	11.0
	(6.07)		(5.54)		(6.88)	
No families pay	20.14	28.9	19.14	10.3	20.62	18.6
	(11.92)		(12.45)		(11.60)	

Note: Frequencies reflect survey weighted, pre-imputed values.
a. Private, parochial, and other nonpublic centers.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B6. Distribution of early childhood education centers across turnover categories, by payer and age group, 2012 (percent unless otherwise indicated)

Payer and age group	Low-turnover	Medium-turnover	High-turnover	Percent of weighted sample	Chi-square statistics	*p*-value
Payer					11.9*	0.000
Some or all families pay	44.6	24.8	30.6	70.0		
No families pay	66.6	15.0	18.3	29.4		
Don't know/refused	48.8	41.3	9.9	0.9		
Payer and age group					32.6*	0.000
Private-pay center serving ages 0–5	39.3	27.4	33.3	58.7		
All other centers	67.6	14.7	17.7	41.3		

* Statistically significant at *p* < .05 within group, as indicated by Rao-Scott chi-square statistic.
Note: Frequencies reflect survey weighted, pre-imputed values. Frequencies for low- , medium-, and high-turnover centers should sum to 100 for each row but may not because of rounding.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B7. Average turnover rate at early childhood education centers, by payer and age group served, 2012 (percent)

Payer	Serves children ages 0–5	Serves children ages 3–5	Percent of weighted sample
Overall	15.0	8.2	100
Some or all families pay	16.1	9.0*	70.0
No families pay	9.0*	7.7*	28.9
Don't know/refused to answer	5.2	13.3	1.0

* Statistically significant difference at *p* < .05 between reported mean and mean turnover rate of private-pay centers serving children ages 0–5.
Note: Frequencies reflect survey weighted, pre-imputed values; *t*-tests were used to compare mean turnover rates in centers with different characteristics.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B8. Distribution of early childhood education centers by supports offered: Nonwage benefits and paid time off for professional development, 2012 (percent unless otherwise indicated)

Center characteristic	Provides benefits[a]	Chi-square statistics	Funding/ paid time off for professional development	Chi-square statistics	Percent of weighted sample
Turnover category		12.7*		2.7	
Low-turnover	69.5		68.3		66.6
Medium-turnover	71.8		75.3		70.1
High-turnover	56.3		69.2		33.4
Program type		65.9*		22.9*	
School sponsored	91.4		67.8		8.7
Head Start	94.4		90.7		15.3
Public prekindergarten	70.4		63.2		18.2
Other[b]	54.2		66.3		57.9

* Statistically significant difference at *p* < .05 within group, as indicated by Rao-Scott chi-square statistic.
Note: Frequencies reflect survey-weighted, pre-imputed values.
a. Health insurance and retirement benefits.
b. Private, parochial, and other nonpublic centers.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B9. Characteristics of private-pay early childhood education centers serving children ages 0–5 compared with all other centers, 2012 (percent unless otherwise indicated)

Center characteristic	Private-pay centers serving ages 0–5		All other centers		Percent of weighted sample	Chi-square statistic
	Mean/ frequency	Standard error	Mean/ frequency	Standard error		
Average wage ($ per hour)	11.6	0.195	18.9	0.895		
Provides benefits[a]	52.4		86.6		66.5	206.6*
Size (number of staff)	11.1	1.127	13.9	0.446		
Majority students of color	29.6		37.7		33.0	7.5*
Percentage of Hispanic students	13.2	0.765	24.4	2.307		
Percent of educators with bachelor's degree or above	31.2		44.1			21.6*
Number of centers	4,983		2,790			

* Statistically significant at *p* < .05 within group as indicated by Rao-Scott chi-square statistic.
Note: Frequencies reflect survey-weighted, pre-imputed values.
a. Health insurance and retirement benefits.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B10. Distribution of center and educator characteristics across private-pay centers serving children ages 0–5 and all other early childhood centers, 2012 (percent unless otherwise indicated)

Characteristic	Private-pay centers serving ages 0–5	All other centers	Percent of weighted sample	Chi-square statistic
Program type				88.1*
School sponsored	25.8	74.2	8.4	
Head Start	16.5	83.5	15.2	
Public prekindergarten	56.3	43.7	18.2	
Other[a]	75.8	24.2	58.2	
Region				2.8*
Northeast	66.6	33.4	17.3	
Midwest	52.7	47.3	22.2	
South	61.6	38.4	41.8	
West	53.7	46.3	18.7	
Educator educational attainment				12.3*
High school or less	82.1	17.9	19.4	
Some college	72.3	27.7	45.7	
Bachelor's degree	65.9	34.2	25.5	
Graduate degree	57.0	43.0	9.5	
Educator experience				6.6*
0–5 years	78.4	21.6	18.5	
6–10 years	74.7	25.4	36.1	
11–20 years	66.4	33.6	29.9	
21+ years	64.7	35.3	17.7	
Educator race/ethnicity				5.4*
White	71.0	28.5	63.8	
Black	74.1	25.9	17.8	
Hispanic	61.3	38.7	13.6	
Other	80.7	19.3	4.8	
Number of centers	4,983	2,790		

* Statistically significant at *p* < .05 within group as indicated by Rao-Scott chi-square statistic.

Note: Frequencies reflect survey-weighted, pre-imputed values. Frequencies for private-pay centers and for all other centers should sum to 100 for each row but may not because of rounding.

a. Private, parochial, and other nonpublic centers.

Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B11. Distribution of educator characteristics across early childhood education center characteristics, 2012 (percent)

Educator characteristic	Low wage	Higher wage	Provides benefits[a]	No benefits	School-sponsored	Head Start	Public prekindergarten	Other[b]
Education								
High school	50.7	49.3	49.3	50.7	50.7	10.4	20.8	66.9
Some college	33.1	66.9	63.8	36.2	36.2	16.5	20.1	58.7
Bachelor's degree	10.8	89.2	75.2	24.9	24.9	15.2	19.2	56.3
Graduate degree	9.1	90.9	77.2	22.8	22.8	9.8	2.2	53.4
Experience								
0–5 years	46.2	53.8	58.9	41.1	41.1	13.7	18.0	64.3
6–10 years	30.4	69.6	60.8	39.2	39.2	11.1	21.5	61.2
11–20 years	23.1	76.9	69.1	30.9	30.9	16.3	22.6	54.6
21+ years	14.6	85.4	73.3	26.7	26.7	18.0	15.9	57.4
Race/ethnicity								
White	26.5	73.5	64.7	34.3	34.3	11.4	19.3	62.8
Black	38.7	61.3	60.7	38.5	38.5	20.6	21.0	54.0
Hispanic	25.6	74.4	73.1	26.4	26.4	21.8	24.4	45.9
Other	22.6	77.4	74.3	25.7	25.7	11.6	20.0	64.6

Note: Frequencies reflect survey-weighted, pre-imputed values. Frequencies for low- and high-wage centers; centers that provide and do not provide benefits; and program type should sum to 100 within comparison groups for each row but may not because of rounding.
a. Health insurance and retirement benefits.
b. Private, parochial, and other nonpublic centers.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B12. Distribution of educator characteristics across early childhood education center turnover categories, 2012 (percent unless otherwise indicated)

Educator characteristic	Low-turnover	Medium-turnover	High-turnover	Percent of weighted sample	Chi-square statistic	p-value
Education					4.25*	0.000
High school	34.6	32.0	33.4	19.4		
Some college	37.7	32.8	29.6	45.7		
Bachelor's degree	49.5	25.6	24.9	25.5		
Graduate degree	50.6	28.0	21.4	9.5		
Experience					9.27*	0.000
0–5 years	28.3	31.4	40.3	18.2		
6–10 years	38.3	30.9	30.8	34.3		
11–20 years	45.8	29.1	25.2	29.9		
21+ years	53.1	30.4	16.5	17.7		
Race/ethnicity						
White	40.5	32.1	27.4	63.8	1.33	0.244
Black	43.3	26.5	30.2	17.8		
Hispanic	43.2	29.0	27.8	13.6		
Other	37.2	24.7	38.2	4.8		

* Statistically significant at p < .05 within group, as indicated by Rao-Scott chi-square statistic.
Note: Frequencies reflect survey-weighted, pre-imputed values. Frequencies for low-, medium-, and high-turnover centers should sum to 100 for each row but may not because of rounding.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B13. Results of ordinal logistic regressions predicting relationship between early childhood education center characteristics and odds of being in a higher turnover category relative to the low-turnover category, by center wage level and size, 2012

| | Key predictor | | | | | |
| | Hourly wage | | Low-wage center | | Small center | |
Variable	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error
Wages and nonwage benefits						
Hourly wage[a] ($)	0.956**	0.013			0.957**	0.013
Provides benefits[b]	0.949	0.122	0.935	0.122	0.911	0.116
Provides paid time off for professional development	1.104	0.132	1.164	0.140	1.073	0.128
Low-wage center			1.512**	0.237		
Age group served (0–5 is the reference group)						
3–5	0.652	0.150	0.611*	0.142	0.697	0.163
Program type (school-sponsored is the reference group)						
Head Start	0.831	0.291	1.033	0.339	0.789	0.273
Public prekindergarten	0.821	0.269	0.912	0.285	0.842	0.283
Other[c]	0.579	0.196	0.669	0.217	0.594	0.204
Center type (all other centers is the reference group)						
Private-pay center serving 0–5	1.789**	0.401	2.008**	0.442	1.579*	0.358
Small center					0.546***	0.085
Region (northeast region is the reference group)						
Midwest	0.830	0.148	0.843	0.148	0.862	0.153
South	1.040	0.171	1.047	0.169	1.058	0.175
West	0.997	0.156	1.055	0.164	1.042	0.165
Student racial/ethnic composition						
Black	0.996	0.002	0.996	0.002	0.996	0.002
Hispanic	0.995*	0.002	0.995*	0.002	0.995*	0.002
Other center characteristics						
Number of staff	1.006	0.004	1.002	0.004		
Standardized child–adult ratio	0.994	0.053	0.946	0.046	0.999	0.053
Shares resources with school	1.089	0.111	1.120	0.114	1.068	0.109
Has a quality rating	0.976	0.102	0.986	0.102	0.964	0.098

*** Significant at $p < .001$; ** significant at $p < .01$; * significant at $p < .05$.

Note: N = 7,773; population size = 129,283. The columns represent different models that focus on specific center characteristics.

a. Centered on regional minimum wage.

b. Health insurance and retirement benefits.

c. Private, parochial, and other nonpublic centers.

Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B14. Results of ordinal logistic regressions predicting variation in relationship between the likelihood of being in a higher (relative to low) turnover category and nonwage benefits across early childhood education center characteristics, 2012

Variable	Low wage# benefits		Small center# benefits		Private-pay ages 0–5# benefits		Program type# benefits	
	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error	Odds ratio	Standard error
Wages and nonwage benefits								
Hourly wage[a] ($)			0.957***	0.013	0.957***	0.013	0.957**	0.013
Provides benefits[b]	0.767	0.127	0.934	0.118	0.595	0.225	0.180*	0.144
Provides paid time off for professional development	1.168	0.140	1.074	0.128	1.162	0.138	1.127	0.134
Low-wage center	1.136	0.242						
Benefits#Low-wage center	1.782*	0.510						
Benefits#Small center			0.901	0.292				
Benefits#Private-pay ages 0–5					1.545	0.618		
Benefits#School-sponsored							2.568	2.390
Benefits#Head Start							4.120	3.275
Benefits#Other[c]							6.229*	5.083
Age group served (ages 0-5 is the reference group)								
3–5	0.612*	0.142	0.701	0.165	0.585*	0.135	0.657	0.149
Program type (school-sponsored is the reference group)								
Head Start	1.024	0.336	0.787	0.273	1.086	0.359	0.357	0.303
Public prekindergarten	0.892	0.276	0.843	0.283	0.927	0.292	0.216*	0.162
Other[c]	0.660	0.213	0.592	0.204	0.673	0.221	0.118**	0.0928
Center type (all other centers is the reference group)								
Private-pay center serving ages 0–5	1.982**	0.436	1.578*	0.357	1.495	0.596	1.772*	0.394
Small center			0.580*	0.139				
Region (Northeast region is the reference group)								
Midwest	0.856	0.149	0.861	0.154	0.866	0.150	0.835	0.147
South	1.087	0.173	1.060	0.174	1.112	0.174	1.065	0.172
West	1.078	0.167	1.042	0.165	1.053	0.163	1.001	0.154
Student racial/ethnic composition								
Black	0.996	0.002	0.996	0.002	0.996	0.002	0.996	0.002
Hispanic	0.995*	0.002	0.995	0.002	0.995*	0.002	0.995	0.002
Other center characteristics								
Number of staff	1.003	0.004			1.002	0.004	1.006	0.004
Standardized child–adult ratio	0.946	0.047	1.001	0.054	0.935	0.047	0.992	0.054
Shares resources with school	1.126	0.115	1.070	0.109	1.093	0.109	1.092	0.110
Has a quality rating	0.990	0.103	0.965	0.098	0.982	0.099	0.959	0.099

*** Significant at $p < .001$; ** significant at $p < .01$; * significant at $p < .05$.

#Indicates an interaction term, which is used to understand variation in relationships of interest across different combinations of center characteristics.

a. Hourly wage is centered on regional minimum wage.

b. Health insurance and retirement benefits.

c. Private, parochial, and other nonpublic centers.

Note: $N = 7,773$; population size = 129,283. The columns represent different models that focus on different combinations of center characteristics.

Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B15. Sensitivity analyses comparing early childhood education–only centers and all centers: Results of ordinal logistic regressions predicting relationship between center characteristics and odds of being in a higher turnover category relative to the low-turnover category, 2012

Variable	All centers		Early childhood education–only centers	
	Odds ratio	Standard error	Odds ratio	Standard error
Wages and nonwage benefits				
Hourly wage[a]	0.956**	0.013	0.969*	0.0133
Provides benefits[b]	0.949	0.122	0.910	0.181
Provides paid time off for training	1.104	0.132	1.065	0.185
Age group served ages 0–5 is the reference group				
3–5	0.652	0.150	0.399**	0.116
Center type School-sponsored is the reference group				
Head Start	0.831	0.291	0.792	0.347
Public prekindergarten	0.821	0.269	0.772	0.328
Other[c]	0.579	0.196	0.609	0.255
Private-pay center serving ages 0–5	1.789**	0.401	0.972	0.286
Small center				
Region Northeast region is the reference group				
Midwest	0.830	0.148	0.594*	0.152
South	1.040	0.171	0.899	0.203
West	0.997	0.156	0.786	0.146
Student racial/ethnic composition				
Percentage Black	0.996	0.002	0.993*	0.003
Percentage Hispanic	0.995*	0.002	0.995	0.003
Other center characteristics				
Number of staff	1.006	0.004	1.001	0.005
Standardized child–adult ratio	0.994	0.053	0.954	0.084
Center shares resources with a school	1.089	0.111	1.214	0.170
Has a quality rating	0.976	0.102	0.968	0.136

** Significant at $p <0.01$; * significant at $p < .05$.

Note: N = 4,576; population size = 74,950.

a. Centered on regional minimum wage.

b. Health insurance and retirement benefits.

c. Private, parochial, and other nonpublic centers.

Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Table B16. Weighted median turnover rates across early childhood education centers, by comparison groups, 2012

Center characteristic	Median turnover
Age group served	
0–5	9.1
3–5	0
Student racial/ethnic composition	
Majority students of color	0
Majority White	5
Program type	
School-sponsored center	0
Head Start	0
Public prekindergarten	5.3
Other[a]	5
Region	
Northeast	7.1
Midwest	0
South	5.3
West	0
Payer	
Some or all families pay	8
No families pay	0
Don't know/refused to answer	5.3
Provides benefits[b]	
Yes	1.8
No	10
Provides paid time off for professional development	
Yes	5
No	0
Wage group	
Low wage	14.3
Higher-wage	0

Note: N = 7,773; population size = 129,283. Significance tests and standard errors are not reported because they are not appropriate for weighted estimates.
a. Private, parochial, and other nonpublic centers.
b. Health insurance and retirement benefits.
Source: Authors' analysis of the 2012 National Survey of Early Care and Education (NSECE Project Team, 2017).

Reference

NSECE Project Team (National Opinion Research Center). (2017). *National Survey of Early Care and Education (NSECE), 2012.* Inter-university Consortium for Political and Social Research. https://doi.org/10.3886/ICPSR35519.v13.