

What Explains the Relation between Foster Care and Children’s Academic Achievement?

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Abstract

Children experiencing foster care placement exhibit poorer average educational outcomes than other children. However, recent evidence suggests this largely reflect pre-existing disadvantage as children appear to score worse on standardized achievement tests prior to entering care than while in care. We compare child achievement prior to and during a foster care placement lasting a full school term or more, and examine three potential mediators—school attendance, school instability, and school quality—that may explain differences in achievement in the two periods.

We use linked Wisconsin administrative data on children observed in 1 337 foster care spells lasting a full school term or more. For 869 of these spells, children were also observed in-home for a full year prior to placement (total $N = 2\ 206$). We use ordinary least squares regressions with and without child-specific fixed effects to estimate associations of foster care placement with academic achievement, school attendance, school instability, and school quality. We then examine whether the latter factors mediate associations of placement with achievement.

We find little evidence that foster care is associated with achievement as measured by reading and math test scores. Moreover, foster care was associated with lower absenteeism. We do not find consistent evidence suggesting that attendance, school quality or school instability mediate the association between out-of-home placement and achievement.

INTRODUCTION

Children in out-of-home placement (OHP) as a result of child protective services (CPS) involvement exhibit poorer average educational outcomes than other children (Barrat and Berliner, 2013; Fantuzzo and Perlman, 2007; Scherr, 2007; Smithgall et al., 2004; Stone, 2007). Yet, potential practice and policy responses rest on whether OHP causes poor educational experiences and outcomes or is better understood as a marker of pre-existing disadvantage and associated adverse experiences. If differences in educational outcomes between children experiencing OHP and other children reflect that OHP does not compensate for pre-existing disadvantage, then policy and practice may be better served by addressing these pre-existing factors than by focusing on the role of OHP itself.

Recent research indicates that the association between OHP and poor school achievement is unlikely to be causal. Rather, differences in achievement between children experiencing OHP and economically disadvantaged children (those receiving Supplemental Nutrition Assistance Program or SNAP benefits) are considerably smaller than differences between children experiencing OHP and the general population of children. Moreover, children experiencing OHP and other CPS-involved children (who did not experience OHP) exhibit similar levels of achievement. In fact, children generally score worse on standardized achievement tests in the years prior to entering care than in the years in which they are in care (Berger et al., 2015). This latter finding raises questions regarding a potential positive relation between OHP and academic achievement in some circumstances.

To begin to address this possibility, we analyze the relation between OHP and academic achievement for children experiencing a full school term (September to June) in care using newly available Wisconsin longitudinal administrative data. We compare children's reading and

math standardized test scores after spending an entire school term at home to their later scores after spending an entire school term in OHP. We then examine the role of three potential mediators: school attendance, school instability (number of schools attended in a school term), and school quality. Each of these factors may (1) be influenced by OHP status, (2) be associated with academic achievement, and (3) fully or partially explain associations between OHP and achievement. For example, OHP may increase school attendance if it results in a less chaotic home environment that is more conducive to consistently attending school. Increased attendance may, in turn, lead to improved achievement (Conger and Rebeck, 2001). In addition, although OHP may be associated with increased school moves if placement itself (or changes in placement) mechanically necessitates school changes, children who experience OHP already tend to be quite disadvantaged and to experience considerable residential and housing instability. Finally, to the extent that OHP results in a (or more than one) school move, it may be associated with either an increase or a decrease in school quality.

These potential mechanisms have received limited attention in the existing literature linking OHP with academic achievement. However, some implications for our work can be drawn from both the OHP and child homelessness literatures. The few studies to examine school attendance have produced mixed results, suggesting that OHP is associated with increased attendance for some children—particularly those experiencing longer and more stable placements—and decreased attendance for others—particularly those experiencing shorter and unstable placements (Conger and Rebeck, 2001; Larson, 2010). Of additional relevance, recent research indicates that attendance mediates the link between child homelessness and achievement (Tobin, 2016). Turning to school stability, OHP is associated with changes in schools, particularly in a context of placement instability (Conger and Finkelstein, 2003; Fries,

Klein, and Ballantune, 2014; Smithgall et al., 2004). Whereas poor achievement for children in OHP is widely thought to reflect such instability, recent research suggests that, among children in OHP, school stability is more closely associated with child behavior than achievement (Fries, Klein, and Ballantune, 2014; Leonard and Gudino, 2016). Finally, OHP may be linked to school quality. Recent evidence suggests that children in OHP are less likely to live in poor households than otherwise similar children (Pac, Waldfogel, and Wimer, 2017). This may imply that OHP is associated with living in lower poverty neighborhoods and, relatedly, attending higher quality schools. This appears to be the case for black and Hispanic children, but not for white children, experiencing OHP (Fries, Klein, and Ballantune, 2014). It is unclear, however, whether school quality is necessarily associated with achievement among disadvantaged children. For example, recent research finds no link between school quality and academic achievement for homeless children (Tobin, 2016).

Given the relatively high frequency of CPS involvement and OHP—for example, among black children, over 1 in 5 will be confirmed for maltreatment, and over 1 in 10 will experience OHP by 18 years of age—and the fundamental public responsibility for children placed in state care, it is critical to better understand whether, how, and under what conditions OHP may be beneficial, harmful, or neutral for child development (Wildeman et al., 2014; Wildeman and Emanuel, 2014). This study begins to address these gaps by focusing on key potential mechanisms linking OHP to school achievement, which have largely been unexamined.

DATA

We use longitudinal linked administrative data from the Wisconsin Department of Public Instruction (DPI) and the 2014 Multi-Sample Person File (MSPF) data system housed at the Institute for Research on Poverty at the University of Wisconsin–Madison. The DPI data include

information on academic performance, attendance and behavior, school quality, and basic demographics for all children in Wisconsin public schools from the 2005–2006 through 2013–2014 school years. The MSPF includes linked individual-level administrative data from a host of public social welfare programs including Wisconsin’s CPS system. As such, we have data on the entire population of children in Wisconsin public schools who experienced OHP between 2007 and 2014.

We examine OHP spells for Wisconsin public school students who (1) experienced an OHP spell lasting an entire 10-month school term (September through June) for the first time between 2007 and 2014 and (2) in that year, were enrolled in grades 3 through 7, when our academic performance measures—the reading and math tests from the Wisconsin Knowledge and Concepts Examinations (WKCE)—are administered. From 2 064 OHP spells in our data, we excluded 250 spells for which children were not observed in their own home during our study period, and 477 spells for children who were missing educational data during the term spent in OHP, resulting in a sample of 1 337 OHP spells. We observe pre-OHP test scores for only 869 of these spells because a large number of children were in the second grade, and therefore were not administered achievement tests, in the pre-OHP period. Thus, our analytic sample includes an unbalanced panel in which not all students were observed prior to OHP, and a smaller, balanced panel. Our primary analytic sample consists of 2 206 observations: 1 337 observations during an OHP spell lasting a full school term and 869 observations in the last year a child spent entirely in-home prior to that OHP spell. Some children experienced more than one OHP spell; as such, the sample includes 1 321 children. We cluster the standard errors to adjust for multiple observations

We use mean imputation to replace missing values for attendance, number of schools attended during the term, and school quality. Data were missing for less than 1% of observations for each measure. We also use mean imputation to replace missing values on the control variables. Here, missing data ranged from 5% for mother's age at birth to 16% for having a child disciplinary incident. We include indicators that a given value was obtained through mean replacement for each relevant variable in our regression models.

MEASURES

Academic Achievement

We assess academic achievement in grades 3 through 8 using children's math and reading scores on the WKCE, standardized by grade and year to have a mean of 0 and a standard deviation of 1 for the entire population of Wisconsin public school students. Test scores were measured in October of the school term subsequent to the observation year. For example, if a student spent the entire 2006–2007 term in OHP (or in-home), we utilize their test scores from fall 2007.

Placement Status

Our key predictor is an indicator (1 = yes) that the child was in OHP for the entire 10-month school term (September through June) preceding their standardized test score.

Potential Mediators

We focus on three potential mediators: attendance (proportion of school days for which the child was present during the school term); number of schools attended during the term (measured both by total number of schools and an indicator [1 = yes] that a child attended more than one school during the term); and school quality (the average value-added assigned to the school by the Wisconsin DPI), which represents the difference between average test score

growth of students in a particular school and average test score growth of similar students across the state, adjusted for baseline reading and math test scores, disability (by severity level), special education (Section 504), gender, English proficiency, economic status, race/ethnicity, and mobility. We use the weighted (by number of days attended) average value-added for children attending multiple schools.¹

Control Variables

We control for OHP during the summer prior to the test; years between the last full year in-home and in OHP; disability status; sex; race (white, black, Hispanic, and another race/ethnicity); being above normative age for grade; experiencing a disciplinary incident (in-school or out-of-school suspension, expulsion) during the prior term; ever an English language learner; family structure (single-parent family, two-parent family, and missing); number of children in the household (indicators for one, two, three, four or more, and missing); mother's age at the child's birth (under age 20, 20 to 24, 25 to 29, 30 or older); eligibility for free school lunch; total family earnings reported to the Unemployment Insurance system (indicators for zero or missing and quintile of the earnings distribution of the sample); parental incarceration in the past 15 years; parental incarceration in the year prior to the test; grade enrolled at the beginning of the school term; and year of observation.

METHODS

We begin by presenting bivariate comparisons between the year prior to OHP and the year of OHP for reading and math test scores, the potential mediators, and control variables. We then present results from regression models examining the relation between OHP and school

¹ Wisconsin Department of Public Instruction. 2011–2012 value-added school summary report. Available at: <https://dpi.wi.gov/sites/default/files/imce/accountability/pdf/sample-sch-va.pdf>.

achievement, and the extent to which attendance, number of schools attended, and school quality may mediate this relation. We first regressed test scores on an indicator that a child is observed during a school term-long OHP spell (compared to prior to OHP) and the full set of control variables. This provides an estimate of the adjusted difference by OHP-spell status in children's test scores. Second, we regressed each potential mediator on the OHP indicator and full set of controls to gain insight into whether there are differences in school attendance, the number of schools attended, and school quality in a term in which a child is OHP relative to one in which a child is at home. Third, we regressed test scores on the OHP indicator, full set of controls, and each mediator. We estimate separate models that each included only one potential mediator. This allows us to gauge the extent to which the potential mediators individually may explain the association between OHP and test scores by assessing the extent to which the OHP coefficient is attenuated by the inclusion of these variables in the model. We used Sobel-Goodman mediation tests to determine statistical significance of the potential mediators.

For each analysis, we estimated three models. Model 1 is an ordinary least squares (OLS) regression using the full unbalanced panel. Model 2 is an OLS regression using the balanced panel, in which all children are observed both during a full school term in-home and a full school term in OHP. Model 3 is an OLS regression using the balanced panel and including child-specific fixed effects. This model allows each child to serve as her own comparison and estimates the difference in achievement associated with a difference in OHP status for the same child. Specifically, the model estimates the difference in a given child's test scores when the child took the test subsequent to a full school term in-home and subsequent to a full school term in OHP, net of changes in the control variables between periods. The method differences the regression equation across time periods, thus eliminating all time-invariant observed and

unobserved variables from the model and preventing the coefficients from being biased by such factors. However, the estimates are subject to bias if unobserved variables (or their effects on the outcome) are time-varying.

RESULTS

Descriptive statistics are presented in Table 1 and, for academic achievement and the potential mediators, in Figure 1. On average, sample children perform quite poorly on the reading and math tests both before and during OHP. Their reading (math) scores in the period before OHP were, on average, 0.79 (0.83) standard deviations (SDs) lower than those of the average Wisconsin public school student; they were 0.69 (0.79) SDs lower in the period of OHP. Notably, achievement scores were lower in the year prior to OHP than in the year of OHP (statistically significant for reading, but not math) suggesting that children perform better on the reading tests when in care than beforehand.

Turning to the potential mediators, on average, students were absent 9% of the school term prior to being in OHP and 6% of the term while in OHP. Neither the number of schools attended, nor the probability of attending more than one school, differed between the term prior to and the term of OHP. Finally, children attended higher quality schools, as measured by school value-added in reading (and math in the balanced sample), while in OHP.

Descriptive statistics for the control variables confirm that this is a highly disadvantaged sample that is characterized by high rates of disability, above normative age for grade, birth to a teen mother, eligibility for free school lunch, and parental incarceration.

Table 2 presents regression results for associations of OHP with academic achievement and each potential mediator. The achievement results indicate that children perform worse in reading (but not math) in the year prior to experiencing OHP than in the year of OHP. The

coefficient from Model 2 (balanced panel) is larger than that from Model 1 (unbalanced panel; .136 vs. .110). Moreover, the coefficient from Model 3, the within-child estimate attained by the inclusion of the child-specific fixed effect, is similar in size to that from Model 2. On the whole, these results suggest that children performed 0.11 to 0.14 SDs better on the reading test during the year in OHP compared to the year prior.

Turning to the potential mediators, we find a statistically significant association between OHP and greater attendance in all three models. Children attended school 4% to 5% more frequently in the year of OHP than the year prior. OHP was not associated with school stability or quality.

Mediation analysis results are shown in Table 3. Panel A replicates the unmediated estimates of the association of OHP with reading and math tests scores from Models 1 through 3 (see Table 2). These estimates can be compared to those in the subsequent panels to assess the extent to which the coefficients are attenuated when the potential mediators are added individually (panels B through F).

Given that OHP was significantly associated only with reading achievement, we focus our discussion on the reading results. Comparing results in Panels A and B for reading, we see that the OHP coefficients are reduced to nonsignificance in each of the three models once attendance is included. Moreover, the OHP coefficients are attenuated by 21% (Model 1), 12% (Model 2), and 15% (Model 3) with the inclusion of attendance in the model. Moreover, on the whole, we find a consistent association between attendance and reading scores. These results suggest that a 10% increase in attendance is associated with a 0.04 to 0.06 SD increase in reading scores. However, Sobel-Goodman mediation tests indicated that attendance is a significant mediator of the association between OHP and reading achievement in the OLS model for the

unbalanced panel. None of the other potential mediators were significantly associated with OHP status. As such, we do not find consistent evidences that increased attendance mediates the association of OHP with reading scores.

CONCLUSION

Our analyses suggest that children experiencing OHP score better on standardized achievement tests during their time in care than prior to entering care, at least with respect to reading. Expanding on earlier findings, we examine three potential mediators that may explain the association between OHP and reading achievement: school attendance, school stability, and school quality (Doyle, 2007). We find a strong positive association between OHP and attendance such that children attended school 4% to 5% more frequently during their time in care than prior to being in care. Attendance is positively associated with reading achievement, with a 10% increase in attendance being associated with a 0.04 to 0.06 SD increase in reading test scores. Finally, whereas the inclusion of attendance (but not school stability or quality) in the regression models functioned to attenuate the association between OHP and achievement, this potential mediation effect was not consistently statistically significant and we cannot conclude that increased attendance mediates the association of OHP and test scores.

These findings suggest that, at least for children experiencing a relatively long OHP spell (a full school term or more), OHP is, on average, associated with increased reading achievement and increased attendance (relative to the period before placement). These results are particularly salient in the context of recent federal policy innovations that aim to improve the coordination between the child welfare and educational systems. For example, the 2016 Comprehensive Child Welfare Information System (CCWIS) Regulations call for developing new information

exchanges with education (1355.5(e)(2)(vi)), with a goal of improving educational outcomes for foster care children and youth (Children's Bureau, 2017). The 2016 Every Student Succeeds Act (ESSA) also addresses coordination between child welfare and education agencies in support of improved school outcomes for children in OHP. Overall, our results point to the potential benefits for vulnerable children of the improved coordination between school and child welfare agencies embodied in recent policy change. Additional research is needed to further explore the factors associated with school outcomes and experiences for children in OHP, or at risk of OHP. Critical issues include the relationship between duration in OHP and school outcomes, and the relative importance of school and substitute-home characteristics. School outcomes for children returning home after OHP are another critical focus with implications for policy and practice.

REFERENCES

- Barrat V. X. and Berliner B. (2013). *The invisible achievement gap, part I: Education outcomes of students in foster care in California's public schools*. San Francisco: WestEd.
- Berger L.M., Cancian M., Han E., Noyes J., and Ríos-Salas V. (2015). Children's academic achievement and foster care. *Pediatrics* 135(1):e109–e116.
- Conger D. and Finkelstein M.J. (2003). Foster care and school mobility. *J Negro Ed.* 72(1):97–103.
- Conger D. and Rebeck A. (2001). *How children's foster care experiences affect their education*. Vera Institute of Justice, New York City Administration for Children's Services.
- Children's Bureau (2017). CCWIS final rule data exchange requirements, webinar slides presented on January 12, 2017, p. 36. Available at: https://www.acf.hhs.gov/sites/default/files/cb/ccwis_data_exchange_requirements.pdf.
- Doyle J.J. (2007). Child protection and child outcomes: measuring the effects of foster care. *Am Econ Rev.* 97:1583–1610
- Fantuzzo J. and Perlman S. (2007). The unique impact of out-of-home placement and the mediating effects of child maltreatment and homelessness on early school success. *Child Youth Serv Rev.* 29(7):941–960
- Fries L., Klein S., and Ballantyne M. (2014). Are foster children's schools of origin always best? School quality in birth vs. foster parent neighbourhoods. *Child Family Social Work* 21:317–327
- Larson A. (2010). Cross system comparisons of children in treatment foster care: Using agency data to study cross-system child outcomes. *Child Youth Serv Rev.* 32(1):89–97.
- Leonard S.S. and Gudino, G.O. (2016). Academic and mental health outcomes of youth placed in out-of-home care: The role of school stability and engagement. *Child Youth Care For.* 45(6):807–827
- Pac J., Waldfogel J, and Wimer C. (2017). Poverty among foster children: Estimates using the Supplemental Poverty Measure. *Social Service Rev.* 91(1):8-40
- Scherr T.G. (2007). Educational experiences of children in foster care: Meta-analyses of special education, retention and discipline rates. *School Psychol Int.* 28(4):419–436
- Smithgall C., Gladden R.M., Howard E., Goerge R., and Courtney M. (2004). *Educational experiences of children in out-of-home care*. Chicago: Chapin Hall Center for Children, University of Chicago.
- Stone S. (2007). Child maltreatment, out-of-home placement and academic vulnerability: A fifteen-year review of evidence and future directions. *Child Youth Serv Rev.* 29(2):139–161.

Tobin K.J. (2016). Homeless students and academic achievement: Evidence from a large urban area. *Urban Ed.* 51(2):197–220.

Wildeman C., Emanuel N., Leventhal J.M., et al. (2014). The prevalence of confirmed maltreatment among US children, 2004 to 2011. *J Pediatr.* 168(8):706–713

Wildeman C. and Emanuel N. (2014). Cumulative risks of foster care placement by age 18 for US children, 2000–2011. *PLoS One* 9(3):e92785

Wisconsin Department of Public Instruction. 2011–2012 value-added school summary report (fall 2011 WKCE to fall 2012 WKCE growth). Available at:
<https://dpi.wi.gov/sites/default/files/imce/accountability/pdf/sample-sch-va.pdf>.

TABLE 1. Descriptive Statistics

Variable	Year Prior to OHP (In-Home) <i>N</i> = 869	Year of OHP (Unbalanced Panel) <i>N</i> = 1 337		Year of OHP (Balanced Panel) <i>N</i> = 869	
<i>Achievement</i>					
Reading test score	-0.794 (1.18)	-0.741 (1.11)		-0.689 (1.04)	*
Math test score	-0.830 (1.09)	-0.811 (1.07)		-0.789 (1.05)	
<i>Attendance</i>					
Proportion attended	0.906 (0.09)	0.939 (0.10)	**	0.941 (0.09)	**
<i>School stability</i>					
Number of schools attended	1.291 (0.63)	1.279 (0.62)		1.284 (0.61)	
More than one school attended (Proportion)	0.204	0.204		0.206	
<i>School quality</i>					
Reading value-added	-0.203 (0.98)	-0.120 (0.99)	*	-0.082 (0.97)	**
Math value-added	-0.205 (0.93)	-0.178 (0.98)		-0.130 (0.94)	*
<i>Control variables</i>					
OHP, summer before test	0.290	0.955	**	0.951	**
Difference between year in OHP and year in-home					
1	0.313	0.238	**	0.313	NA
2	0.647	0.690	**	0.647	NA
3 or more	0.040	0.073	**	0.040	NA
Has a disability	0.509	0.506		0.509	NA
Female	0.489	0.475		0.489	NA
Race					
White	0.533	0.506		0.533	NA
Black	0.316	0.350		0.316	NA
Hispanic	0.097	0.095		0.097	NA
Other	0.054	0.049		0.054	NA
Age above the norm for grade	0.189	0.219	*	0.203	
At least one disciplinary incident	0.078	0.209	**	0.214	**
English language learner	0.037	0.034		0.035	
Family type					
Single parent	0.853	0.897	**	0.892	**
Both parents	0.086	0.100		0.104	
Missing	0.061	0.003	**	0.005	**

(table continues)

TABEL 1, continued

Variable	Year Prior to OHP (In-Home) <i>N</i> = 869	Year of OHP (Unbalanced Panel) <i>N</i> = 1 337	Year of OHP (Balanced Panel) <i>N</i> = 869	
Number of children				
1	0.089	0.076		
2	0.184	0.155	*	0.159
3	0.205	0.170	**	0.175
4 or more	0.306	0.226	**	0.231
Missing	0.216	0.373	**	0.357
Mother's age at birth				
Under 20 y	0.273	0.274		0.273
20–24 y	0.384	0.396		0.384
25–29 y	0.186	0.183		0.186
30 or more y	0.157	0.146		0.157
Eligible for school lunch	0.895	0.920	**	0.926
Family earnings the prior year				
Zero	0.414	0.445		0.444
First quintile	0.090	0.129	**	0.129
Second quintile	0.109	0.116		0.104
Third quintile	0.131	0.102	**	0.104
Fourth quintile	0.122	0.108		0.114
Fifth quintile	0.133	0.100	**	0.106
Parent incarcerated	0.138	0.171	**	0.159
Parent incarcerated past 15 years	0.290	0.273		0.290
Grade enrolled at beginning of term			NA	NA
2	0.251	0.000		0.000
3	0.276	0.239		0.068
4	0.196	0.215		0.252
5	0.215	0.186		0.245
6	0.062	0.162		0.200
7	0.000	0.198		0.235
School year			NA	NA
2005–06	0.181	0.000		0.000
2006–07	0.158	0.027		0.037
2007–08	0.161	0.176		0.176
2008–09	0.142	0.149		0.146
2009–10	0.145	0.175		0.169
2010–11	0.159	0.156		0.159
2011–12	0.055	0.147		0.139
2012–13	0.000	0.171		0.174

Means (and standard deviations) or proportions presented.

Difference between the year prior to OHP and year of OHP is statistically significant at ** $p < 0.05$ or * $p < 0.10$.

TABLE 2. Regression Results: Associations of OHP with Achievement and School Experiences

	Reading Test Score	Math Test Score	Attendance (% present)	# Schools Attended	>1 School Attended	Reading Value- Added	Math Value-Added
<i>Model 1: OLS, unbalanced panel (N = 2 206)</i>							
Year of OHP	0.110 [0.068]	0.027 [0.061]	0.043*** [0.006]	-0.066 [0.049]	-0.040 [0.031]	0.032 [0.071]	-0.051 [0.070]
<i>Model 2: OLS, balanced panel (N = 1 738)</i>							
Year of OHP	0.136* [0.071]	0.088 [0.064]	0.047*** [0.006]	-0.044 [0.053]	-0.026 [0.034]	0.019 [0.073]	-0.020 [0.072]
<i>Model 3: OLS with child-specific fixed effects, balanced panel (N = 1 738)</i>							
Year of OHP	0.131 [0.159]	-0.074 [0.131]	0.036** [0.018]	0.088 [0.164]	0.031 [0.091]	0.255 [0.179]	-0.126 [0.191]

Notes: Standard errors are clustered to account for multiple observations of some children. The unbalanced panel consists of 2 206 observations of 1 337 children. The balanced panel consists of 1 738 observations of 863 children. All models adjust for the full set of control variables presented in Table 1.
*p<.05; **p<.01; ***p<.001.

TABLE 3. Regression Results: Mediation Analyses

Variable	Reading Test Score			Math Test Score		
	Model 1: OLS, Unbalanced Panel	Model 2: OLS, Balanced Panel	Model 3: OLS with Fixed Effects, Balanced Panel	Model 1: OLS, Unbalanced Panel	Model 2: OLS, Balanced Panel	Model 3: OLS with Fixed Effects, Balanced Panel
<i>Panel A: Unmediated estimates (replicated from Table 2 for comparison)</i>						
Year of OHP	0.110 [0.068]	0.136* [0.071]	0.131 [0.159]	0.027 [0.061]	0.088 [0.064]	-0.074 [0.131]
<i>Panel B: Mediation test, attendance</i>						
Year of OHP	0.087 [0.069]	0.120 [0.073]	0.111 [0.159]	0.011 [0.061]	0.073 [0.065]	-0.088 [0.131]
Attendance (proportion present)	0.546* ^a [0.283]	0.350 [0.302]	0.547 [0.373]	0.375 [0.238]	0.320 [0.290]	0.377 [0.345]
<i>Panel C: Mediation test, # schools attended</i>						
Year of OHP	0.107 [0.068]	0.135* [0.071]	0.125 [0.161]	0.026 [0.061]	0.087 [0.064]	-0.076 [0.132]
# Schools attended	-0.050 [0.039]	-0.032 [0.043]	0.064 [0.063]	-0.017 [0.035]	-0.022 [0.039]	0.021 [0.061]
<i>Panel D: Mediation test, >1 school attended</i>						
Year of OHP	0.109 [0.068]	0.136* [0.071]	0.128 [0.159]	0.027 [0.061]	0.088 [0.064]	-0.076 [0.131]
>1 School attended	-0.041 [0.057]	-0.009 [0.062]	0.102 [0.087]	-0.001 [0.052]	0.002 [0.058]	0.064 [0.079]
<i>Panel E: Mediation test, reading value-added</i>						
Year of OHP	0.110 [0.068]	0.136* [0.071]	0.117 [0.159]	0.027 [0.061]	0.089 [0.065]	-0.079 [0.132]
Reading value-added	0.021 [0.022]	0.021 [0.025]	0.054 [0.034]	0.009 [0.022]	-0.010 [0.025]	0.021 [0.030]

(table continues)

TABLE 3, continued

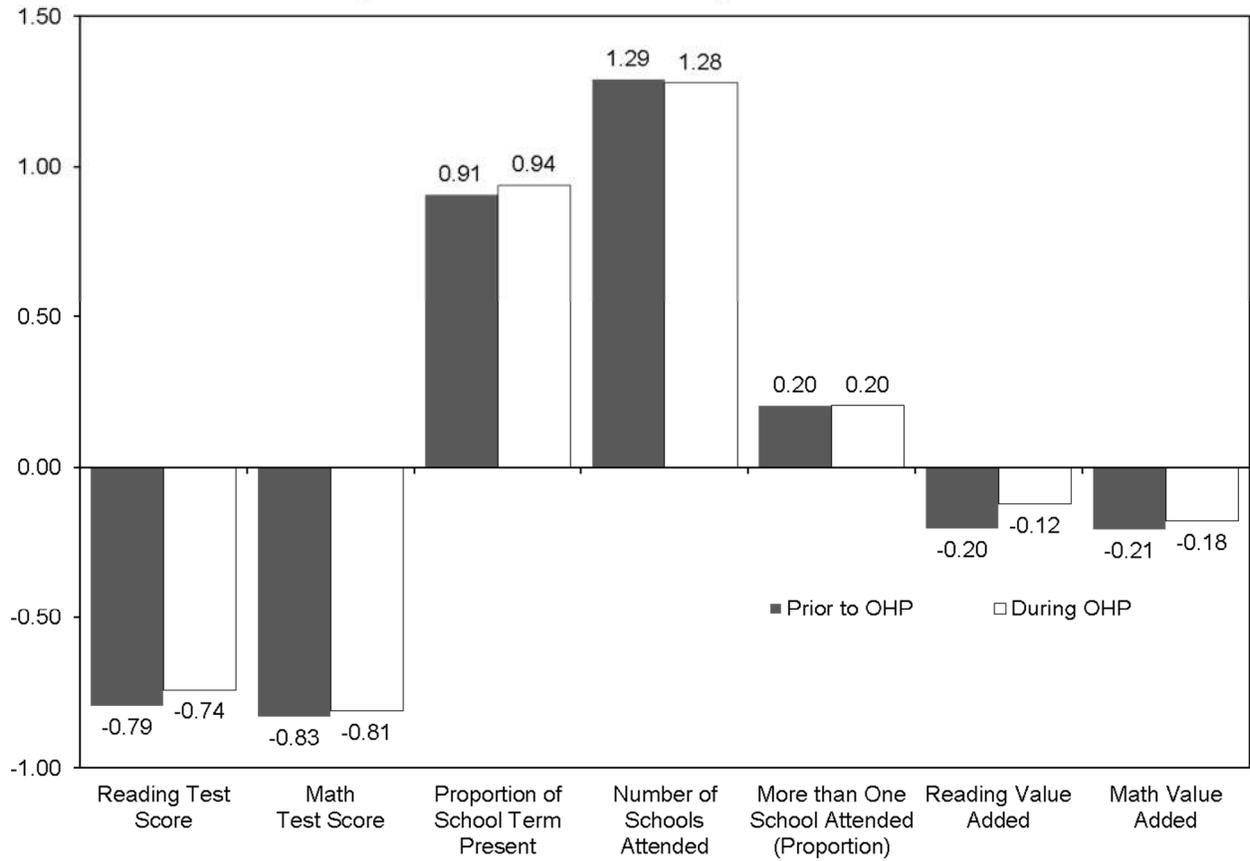
Variable	Reading Test Score			Math Test Score		
	Model 1: OLS, Unbalanced Panel	Model 2: OLS, Balanced Panel	Model 3: OLS with Fixed Effects, Balanced Panel	Model 1: OLS, Unbalanced Panel	Model 2: OLS, Balanced Panel	Model 3: OLS with Fixed Effects, Balanced Panel
<i>Panel F: Mediation test, math value-added</i>						
Year of OHP	0.109 [0.068]	0.136* [0.071]	0.131 [0.160]	0.029 [0.061]	0.089 [0.064]	-0.070 [0.130]
Math value-added	-0.018 [0.022]	-0.022 [0.026]	0.000 [0.033]	0.039* [0.022]	0.036 [0.026]	0.035 [0.030]
Observations <i>N</i>	2 206	1 738	1 738	2 206	1 738	1 738
Number of children	1 321	863	863	1 321	863	863

Notes: Standard errors are clustered to account for multiple observations of some children. All models adjust for the full set of control variables presented in Table 1.

* $p < .05$; ** $p < .01$; *** $p < .001$.

^aSobel-Goodman mediation test is significant at $p < .01$.

FIGURE 1
Achievement and School Experiences Before and During OHP.



Notes: Unadjusted means or proportions presented, calculated for unbalanced panel sample (N=2,206). Achievement test scores and value-added scores are measured in standard deviation units.