

The Racial and Ethnic Composition of Pre-Kindergarten Classrooms and Children's Language Development

Jeanne L. Reid*

ABSTRACT

As public policy attention has focused on families' access to preschool, both federal and state policymakers are concerned with the quality of public preschool. Discerning the components of preschool quality, measured by how much children learn, is therefore an important task for early education researchers. Whether and how preschool class composition, and in particular, racial/ethnic diversity, may affect children's learning has important policy implications for the expansion of early childhood education. Employing a multi-level analysis, this paper explores the extent to which empirical data provides evidence of racial/ethnic diversity within 11 state pre-K classrooms, whether racial/ethnic composition was associated with children's language development during preschool, whether the racial and socio-economic composition of classrooms interacted to influence their growth in language skills, and whether aspects of classroom quality explained any relationship between racial/ethnic composition and children's learning. The results indicate that the racial and socio-economic compositions of pre-K classrooms represent potentially important and independent components of preschool quality. Both measures of classroom composition were reliable predictors of children's language learning, even with the inclusion of a measure of instructional quality. The findings have important policy implications for states that seek to expand access to high-quality preschool.

* Ed.D., National Center for Children and Families at Teachers College, Columbia University

Table of Contents

INTRODUCTION	647
I. BACKGROUND.....	647
A. The Causes of Disparities in Early Learning and Development ..	648
B. Mitigating Disparities with High-Quality Early Education and Care	650
C. Defining Quality in Preschool Programs	651
II. METHODS AND DATA.....	655
A. The Multivariate Analysis	656
B. The Data.....	657
C. Outcome Measures.....	659
D. Class-Level Measures	659
E. Child-Level Measures	660
III. DESCRIPTIVE RESULTS.....	661
A. Children in the Dataset by Their Family Income, Race/Ethnicity, and Skill Level.....	662
1. Children by Family Income	662
2. Children by Race/Ethnicity	662
3. Children by Skill Level	663
B. Children in the Dataset by the Characteristics of their Classrooms	664
1. Characteristics of Classrooms with Different Racial/Ethnic Composition.....	664
2. Distribution of Children in Classrooms with Different Racial/Ethnic and Income Composition.....	667
IV. MULTIVARIATE RESULTS.....	670
A. Unadjusted Child-level Models.....	670
B. The Relationship Between Racial/Ethnic Composition, Socio-Economic Composition, and Children's Learning	671
C. The Relationship Between Classroom Composition, Features of Classroom Quality, and Children's Learning	674
1. Receptive Language Learning.....	674
2. Expressive Language Learning	676
V. DISCUSSION AND LIMITATIONS.....	678
A. Are the Results Substantively Significant?	678
B. What Might Explain the Relationships Between Racial/Ethnic and Socio-Economic Composition and Children's Learning?	679
C. How Can States Foster Diversity in Their Preschool Programs?	681
D. Limitations	684
CONCLUSION	685

INTRODUCTION

Evidence that children experience remarkably rapid growth in the first five years of life, during which time they establish a foundation for their social, emotional, cognitive, and physical development and later academic achievement, has largely driven the dramatic expansion in state pre-K programs in the past decade. While public attention has focused on increasing families' access to preschool, many policymakers at both the federal and state level are equally concerned with the quality of public preschool, given that research indicates that dimensions of quality greatly affect the magnitude of preschool benefits. Discerning the components of preschool quality is, therefore, an important task for early education researchers, who wish to inform policy that fosters children's early learning and development. Whether and how preschool class composition and, in particular, racial/ethnic diversity, may affect children's learning has important policy implications for the expansion of early childhood education.

Although the academic and social advantages of racially diverse K-12 schools are well documented, whether these benefits extend down to preschool is not yet clear. Because racial and socio-economic disadvantage are highly correlated, disentangling their potential impact in the classroom is an important challenge for this area of research. From a methodological perspective, because families, schools, and neighborhoods may all affect children's learning and development, researchers must question whether any findings of school effects may be spurious reflections of other factors that influence young children's progress.

Employing a multi-level analysis, this Article explores the extent to which empirical data on 11 state pre-K classrooms provides evidence of racial/ethnic diversity, whether racial/ethnic composition was associated with children's language development during five months of preschool, whether the racial and socio-economic composition of classrooms interacted to influence children's growth in language skills, and whether aspects of classroom quality explained any relationship between racial/ethnic composition and children's learning. This Article discusses the policy implications of the findings in terms of what comprises "high-quality" preschool as well as the feasibility of fostering racial/ethnic diversity in state pre-K programs.

I. BACKGROUND

Advances in neuroscience and developmental research have produced compelling evidence that the first years of a child's life are

characterized by rapid, complex, and multi-domain learning.¹ Disparities in how much children learn are apparent at remarkably early ages, and by kindergarten entry, these disparities can be substantial.² In a 2002 study, Valerie E. Lee and David T. Burkam found that, on average, children in the lowest socio-economic status (“SES”)³ quintile scored a full standard deviation⁴ below children in the highest SES quintile on both math and reading assessments.⁵ On average, black and Hispanic children score less than a full standard deviation below white children on math and reading tests in kindergarten, but the gaps are still significant and troubling.⁶ When such disparities persist until third grade, they are rarely overcome.⁷

A. *The Causes of Disparities in Early Learning and Development*

An extensive literature explores the components of children’s early lives that may contribute to these disparities in early learning. The most prominent components are children’s SES and neighborhood context.

1. See NAT’L RESEARCH COUNCIL, FROM NEURONS TO NEIGHBORHOODS: THE SCIENCE OF EARLY CHILDHOOD DEVELOPMENT 1–2 (Jack P. Shonkoff & Deborah A. Phillips eds., 2000).

2. See VALERIE E. LEE & DAVID T. BURKAM, ECON. POLICY INST., INEQUALITY AT THE STARTING GATE: SOCIAL BACKGROUND DIFFERENCES IN ACHIEVEMENT AS CHILDREN BEGIN SCHOOL 18–19 (2002); see also Sean F. Reardon, *The Widening Academic Achievement Gap Between the Rich and the Poor: New Evidence and Possible Explanations*, in WHITHER OPPORTUNITY?: RISING INEQUALITY, SCHOOLS, AND CHILDREN’S LIFE CHANCES 91, 94–97 (Greg J. Duncan & Richard J. Murnane eds., 2011) (discussing socio-economic impact on the achievement gap); Greg J. Duncan & Katherine A. Magnuson, *Can Family Socioeconomic Resources Account for Racial and Ethnic Test Score Gaps?*, 15 FUTURE CHILD. 35, 45–47 (2005) (discussing economic impact on test scores).

3. SES is a measure of social class, commonly including a combination of family income, parents’ education, parents’ occupation status, and single parenthood.

4. Standard deviation is a measure of the variation in a set of data relative to the average. A high standard deviation suggests wide dispersion in the data, and a low standard deviation suggests the data points are generally close to the average. Standard deviation is used as a common metric to describe differences in scores between groups of children, and a full standard deviation indicates a very large gap.

5. See LEE & BURKAM, *supra* note 2, at 18 fig.1.3, 19.

6. Duncan & Magnuson, *supra* note 2, at 46 figs.3 & 4; LEE & BURKAM, *supra* note 2, at 16 fig.1.2, 17.

7. Ronald G. Fryer, Jr. & Steven D. Levitt, *The Black-White Test Score Gap Through Third Grade*, 8 AM. L. & ECON. REV. 249, 259–65 (2006); Sean F. Reardon & Claudia Galindo, *The Hispanic-White Achievement Gap in Math and Reading in the Elementary Grades*, 46 AM. EDUC. RES. J. 853, 3–4 (2009); see also DOUGLAS READY ET AL., THE EXPERIENCES OF ONE NEW YORK CITY HIGH SCHOOL COHORT: OPPORTUNITIES, SUCCESSES, AND CHALLENGES 3, 35 (2013), available at <http://edfundersresearch.com/sites/edfundersresearch.com/files/EdFunders%20Paper%20%232.pdf> (providing an example of the struggles of students with early testing disparities in high-school settings).

Early care and education outside the home can further strengthen or weaken children's developmental progress. An understanding of the connections in this complex web is needed to inform policy efforts to support children's early development.

Variations in family SES appear to account for at least half of the white-black and white-Hispanic gaps in average assessment scores among children at kindergarten entry.⁸ This cause of the gap is perhaps not surprising given that black and Hispanic children under age six are two times more likely than white children to live in poverty⁹ and black and Hispanic parents are much less likely than white parents to have a bachelor's degree or higher.¹⁰

Along with the detrimental effect of family-level poverty, neighborhood poverty appears to have a negative effect on children's early development, particularly when it is multi-generational.¹¹ Thus, recent increases in the number of census tracts with concentrated poverty (those with 40 percent or more of their residents living below the poverty line) are a serious concern, with census data putting the number of high-poverty areas at an all-time high.¹² Black and Hispanic families are more likely than white families to live in high-poverty neighborhoods, and black families' exposure to concentrated poverty is more likely to be multi-generational.¹³

Disentangling the influence of family and neighborhood poverty on early development is difficult. Reviewing the research that has tried to account for racial and ethnic disparities, Greg J. Duncan and Katherine A. Magnuson found that a handful of social class measures explain nearly all the gap in math skills and the entire gap in reading skills between black and white children and between Hispanic and white

8. Duncan & Magnuson, *supra* note 2, at 45–47.

9. SOPHIA ADDY ET AL., NAT'L CTR. FOR CHILDREN IN POVERTY, BASIC FACTS ABOUT LOW-INCOME CHILDREN 4 (2013), *available at* http://www.nccp.org/publications/pdf/text_1074.pdf.

10. SUSAN AUD ET AL., NAT'L CTR. FOR EDUC. STATISTICS, STATUS AND TRENDS IN THE EDUCATION OF RACIAL AND ETHNIC GROUPS 20 (2010), *available at* <http://nces.ed.gov/pubs2010/2010015.pdf>.

11. See PATRICK SHARKEY, STUCK IN PLACE: URBAN NEIGHBORHOODS AND THE END OF PROGRESS TOWARD RACIAL EQUALITY 7, 131 (2013); P. Lindsay Chase-Lansdale et al., *Neighborhood and Family Influences on the Intellectual and Behavioral Competence of Preschool and Early School-Age Children*, in 1 NEIGHBORHOOD POVERTY: CONTEXT AND CONSEQUENCES FOR CHILDREN 79, 111–112 (Jeanne Brooks-Gunn et al., eds., 1997); Jeanne Brooks-Gunn & Greg J. Duncan, *The Effects of Poverty on Children*, 7 FUTURE CHILD. 55, 66 (1997).

12. PAUL A. JARGOWSKY, CONCENTRATION OF POVERTY IN THE NEW MILLENNIUM, THE CENTURY FOUND. & RUTGERS CTR. FOR URBAN RESEARCH AND EDUC. 2 (2013), *available at* http://tcf.org/assets/downloads/Concentration_of_Poverty_in_the_New_Millennium.pdf.

13. SHARKEY, *supra* note 11, at 27–28, 38–39.

children.¹⁴ These measures include income, education, family structure, and neighborhood, as well as SES-related measures, such as birth-weight, age of the mother at the time of birth, and the number of books in the home. In all the studies reviewed, family SES was the most important measure.

B. Mitigating Disparities with High-Quality Early Education and Care

Federal and state funds support multiple early education and care programs, including Early Head Start (a federal program for infants and toddlers), Head Start (a federal program for preschool-age children), and state pre-Kindergarten (“pre-K”) programs. All share a goal of closing gaps in children’s “readiness” for school at kindergarten entry.¹⁵

High-quality preschool programs can narrow these learning gaps by promoting the early learning of children, particularly children from low-income families.¹⁶ An analysis of 84 preschool studies concluded that, on average, children who are enrolled in preschool gain about a third of a year of additional learning across language, reading, and math skills, an amount equal to nearly half of the race differences evident in kindergarten.¹⁷ Other studies have documented benefits to children’s social and emotional development.

While the cognitive benefits of preschool begin to fade when children enter elementary school (or when other children “catch up”), several studies find impressive long-term outcomes correlated with preschool enrollment, such as greater educational attainment, higher rates of employment, higher earnings, and lower rates of crime.¹⁸ The greatest

14. Duncan & Magnuson, *supra* note 2, at 45–47.

15. Definitions of “school readiness” generally include the early mathematics, language, and literacy skills that are correlated with later academic success. NAT’L EDUC. GOALS PANEL, RECONSIDERING CHILDREN’S EARLY LEARNING AND DEVELOPMENT: TOWARD COMMON VIEWS AND VOCABULARY 1–4 (Sharon Lynn Kagan et al. eds., 1995). The multi-domain nature of early development suggests that socio-emotional skills, physical development, and children’s approaches to learning are also critically important to children’s “readiness” for school. *Id.*

16. See Christina Weiland et al., *Associations Between Classroom Quality and Children’s Vocabulary and Executive Function Skills in an Urban Public Prekindergarten Program*, 28 EARLY CHILD. RES. Q. 199, 199–200 (2013); Christina Weiland & Hirokazu Yoshikawa, *Impacts of a Prekindergarten Program on Children’s Mathematics, Languages, Literacy, Executive Function, and Emotional Skills*, 84 CHILD DEV. 2112, 2112–113 (2013).

17. See Greg J. Duncan & Katherine Magnuson, *Investing in Preschool Programs*, 27 J. ECON. PERSP. 109, 113–14 (2013).

18. See Weiland et al., *supra* note 16, at 199.

benefit of high-quality preschool may be the long-term investment in human capital, well beyond short-term achievement gains.¹⁹

C. Defining Quality in Preschool Programs

Abundant research indicates that the quality of preschool programs influences how much children benefit.²⁰ Moreover, children from low-income families appear to benefit most from high-quality programs.²¹ Yet these same children often lack access to such programs.²²

What constitutes a “high-quality” program, therefore, becomes a central question when designing effective preschool programs with public resources. Research strongly suggests that the relational process of the preschool experience, characterized by effective instructional support from an emotionally sensitive teacher, contributes to children’s learning more than do structural inputs, such as the teacher-child ratio, teacher qualifications, and program location.²³ Some studies indicate

19. See James J. Heckman et al., *The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior*, 24 J. LAB. ECON. 411, 478 (2006).

20. See, e.g., COMM. ON EARLY CHILDHOOD PEDAGOGY, EAGER TO LEARN: EDUCATING OUR PRESCHOOLERS 307 (Barbara T. Bowman et al. eds., 2001); DEBORAH LOWE VANDELL & BARBARA WOLFE, INST. FOR RESEARCH ON POVERTY, CHILD CARE QUALITY: DOES IT MATTER AND DOES IT NEED TO BE IMPROVED? 98 (2000), available at <http://www.irp.wisc.edu/publications/sr/pdfs/sr78.pdf>; Robert H. Bradley & Deborah Lowe Vandell, *Child Care and the Well-Being of Children*, 161 ARCHIVE PEDIATRIC & ADOLESCENT MED. 669, 671 (2007); Eric Dearing et al., *Does Higher Quality Early Child Care Promote Low-Income Children’s Math and Reading Achievement in Middle Childhood?*, 80 CHILD DEV. 1329, 1329 (2009); Carollee Howes et al., *Ready to Learn? Children’s Pre-Academic Achievement in Pre-Kindergarten Programs*, 23 EARLY CHILD. RES. Q. 27, 45–46 (2008); Ellen S. Peisner-Feinberg et al., *The Relation of Preschool Child-Care Quality to Children’s Cognitive and Social Developmental Trajectories Through Second Grade*, 72 CHILD DEV. 1534, 1549 (2001).

21. See Katherine A. Magnuson & Jane Waldfogel, *Early Childhood Care and Education: Effects on Ethnic and Racial Gaps in School Readiness*, 15 FUTURE CHILD. 169, 187–88 (2005); Ellen S. Peisner-Feinberg & Margaret R. Burchinal, *Relations Between Preschool Children’s Child-Care Experiences and Concurrent Development: The Cost, Quality, and Outcomes Study*, 43 MERRILL-PALMER Q. 451, 472 (1997); Peisner-Feinberg et al., *supra* note 20, at 1549–50.

22. See Margaret Burchinal et al., *Neighborhood Characteristics and Child Care Type and Quality*, 19 EARLY EDUC. & DEV. 702, 705–06 (2008); Bruce Fuller et al., *Child Care Quality: Centers and Home Settings that Serve Poor Families*, 19 EARLY CHILD. RES. Q. 505, 508 (2004) (comparing quality of home-based childcare with center-based programs); Bridget E. Hatfield et al., *Inequities in Access to Quality Early Care and Education: Associations with Funding and Community Context*, 30 EARLY CHILD. RES. Q. 316, 318 (2015).

23. See Margaret Burchinal et al., *Predicting Child Outcomes at the End of Kindergarten from the Quality of Pre-Kindergarten Teacher-Child Interactions and Instruction*, 12 APPLIED DEV. SCI. 140, 140 (2008); Gregory Camilli et al., *Meta-Analysis of the Effects of Early Education Interventions on Cognitive and Social Development*, 112 TCHRS. C. REC. 579, 602–03 (2010); Andrew J. Mashburn et al., *Measures of*

that smaller class size and the use of a comprehensive curriculum further support children's learning.²⁴

Another plausible component of preschool quality is the composition of children's classrooms. As educational researchers have employed the tools of multi-level modeling, their ability to discern the importance of school composition, above and beyond a child's own race/ethnicity or SES, has grown. At the high-school level, several studies have found that SES composition is equally or more influential on students' learning than their own SES.²⁵ Low-SES schools have a harder time retaining the best teachers; enjoy fewer institutional resources; and may be characterized by peer norms, behaviors, and expectations that do not support academic achievement. These studies are consistent with research that has linked high school concentrations of racial/ethnic minorities to lower achievement.²⁶

Early childhood researchers who have used multi-level models to explore whether socio-economic composition may relate to early

Classroom Quality in Prekindergarten and Children's Development of Academic, Language, and Social Skills, 79 CHILD DEV. 732, 744 (2008).

24. See COMM. ON EARLY CHILDHOOD PEDAGOGY, *supra* note 20, at 309; Nat'l Inst. of Child Health & Human Dev. Early Child Care Research Network, *Social Competence with Peers in Third Grade: Associations with Earlier Peer Experiences in Childcare*, 17 SOC. DEV. 419, 445–46 (2008) (exploring the lasting effects of preschool childcare class sizes with competence in school); see also Yange Xue & Samuel J. Meisels, *Early Literacy Instruction and Learning in Kindergarten: Evidence from the Early Childhood Longitudinal Study: Kindergarten Class of 1998–1999*, 41 AM. EDUC. RES. J. 191, 198 (2004) (“[T]here is a growing consensus among researchers to move away from the ‘great debate’ to a comprehensive approach to early literacy instruction.”).

25. See Geoffrey D. Borman & Maritza Dowling, *Schools and Inequality: A Multilevel Analysis of Coleman's Equality of Educational Opportunity Data*, 112 TCHRS. C. REC. 1201, 1206 (2010); Spyros Konstantopoulos & Geoffrey D. Borman, *Family Background and School Effects on Student Achievement: A Multilevel Analysis of the Coleman Data*, 113 TCHRS. C. REC. 97, 120 (2011); Russell W. Rumberger & Gregory J. Palardy, *Test Scores, Dropout Rates, and Transfer Rates as Alternative Indicators of High School Performance*, 42 AM. EDUC. RES. J. 3, 25 (2005).

26. See, e.g., Geoffrey D. Borman et al., *Comprehensive School Reform and Achievement: A Meta-Analysis*, in PUTTING THE PIECES TOGETHER: LESSONS FROM COMPREHENSIVE SCHOOL REFORM RESEARCH 53, 56–57 (Christopher T. Cross ed., 2004); Mark Berends & Roberto Penaloza, *Increasing Racial Isolation and Test Score Gaps in Mathematics: A 30-Year Perspective*, 112 TCHRS. C. REC. 978, 993 (2010); Eric A. Hanushek et. al., *New Evidence About Brown v. Board of Education: The Complex Effects of School Racial Composition on Achievement*, 27 J. LAB. ECON. 349, 351 (2009); Christy Lleras, *Do Skills and Behaviors in High School Matter? The Contribution of Noncognitive Factors in Explaining Differences in Educational Attainment and Earnings*, 37 SOC. SCI. RES. 888, 900 (2008); Roslyn Arlin Mickelson et al., *Effects of School Racial Composition on K–12 Mathematics Outcomes: A Metaregression Analysis*, 83 REV. EDUC. RES. 121, 122 (2013); Roslyn Arlin Mickelson, *When Are Racial Disparities in Education the Result of Racial Discrimination? A Social Science Perspective*, 105 TCHRS. C. REC. 1052, 1053 (2003); Xiaoxia Newton, *End-of-High-School Mathematics Attainment: How Did Students Get There?*, 112 TCHRS. C. REC. 1064, 1080 (2010).

learning have focused on kindergarten and elementary school data that offers the requisite nested data structure for such analyses.²⁷ Nikki L. Aikens and Oscar Barbarin²⁸ examined children's reading trajectories from kindergarten through third grade and found that although family background made the largest contribution to initial reading disparities, school composition and neighborhood conditions appeared to be more influential in how much children's reading skills progressed during school. Specifically, a high poverty concentration and number of students with lower reading ability were associated with children learning less during school.

Other studies have similarly found significant relationships between both the socio-economic and racial/ethnic composition of schools and children's learning in elementary school after controlling for children's own family background.²⁹ James Benson and Geoffrey D. Borman³⁰ assessed neighborhood and school contexts and found a significant effect for socio-economic composition in the growth of reading skills during kindergarten and for socio-economic composition and racial/ethnic composition during first grade. Douglas D. Ready and Megan R. Silander found that children who attended high minority schools typically gained fewer math skills in both kindergarten and first grade and fewer literacy skills in first grade after accounting for school SES.³¹ Both studies distinguished school effects from family and neighborhood effects by comparing children's learning during the school year and summer months.³²

27. A "nested" data structure is one in which, for example, data is collected regarding individual children as well as the classrooms that they share (like nests).

28. See Nikki L. Aikens & Oscar Barbarin, *Socioeconomic Differences in Reading Trajectories: The Contribution of Family, Neighborhood, and School Contexts*, 100 J. EDUC. PSYCHOL. 235, 247 (2008).

29. See HEATHER SCHWARTZ, THE CENTURY FOUND., HOUSING POLICY IS SCHOOL POLICY: ECONOMICALLY INTEGRATIVE HOUSING PROMOTES ACADEMIC SUCCESS IN MONTGOMERY COUNTY, MARYLAND 8 (2010), available at <https://tcf.org/assets/downloads/tcf-Schwartz.pdf>; Douglas D. Ready & Megan R. Silander, *School Racial Composition and Young Children's Cognitive Development: Isolating Family, Neighborhood, and School Influences*, in INTEGRATING SCHOOLS IN A CHANGING SOCIETY 91, 91 (Erica Frankenburg & Elizabeth DeBray eds., 2011); James Benson & Geoffrey D. Borman, *Family, Neighborhood, and School Settings Across Seasons: When Do Socioeconomic Context and Racial Composition Matter for the Reading Achievement Growth of Young Children?*, 112 TCHRS. C. REC. 1338, 1367 (2010); Kirsten Kainz & Lynne Vernon-Feagans, *The Ecology of Early Reading Development for Children in Poverty*, 107 ELEMENTARY SCH. J. 407, 422–23 (2007); Kirsten Kainz & Yi Pan, *Segregated School Effects on First Grade Reading Gains: Using Propensity Score Matching to Disentangle Effects for African-American, Latino, and European-American Students*, 29 EARLY CHILD. RES. Q. 531, 535 (2014).

30. See Benson & Borman, *supra* note 29, at 1370.

31. Ready & Silander, *supra* note 29, at 101–105.

32. *Id.*; Benson & Borman, *supra* note 29, at 1340.

These studies are, nevertheless, subject to concerns regarding selection bias. Heather Schwartz answered this critique using a dataset of 850 low-income children who had been randomly assigned to elementary schools in Montgomery County, Maryland. She found that children who attended the district's most-advantaged schools (in which no more than 20 percent of the children were low-income) far outperformed in math and reading those children who attended the district's least-advantaged schools (in which 21 to 85 percent of the children were low-income).³³ Kristen Kainz and Yi Pan used propensity score matching, a method that closely approximates randomization, to address concerns regarding selection bias and found that African-American first-graders attending racially segregated schools made fewer gains in reading than African-American first-graders in non-segregated schools, controlling for the schools' percentage of children in poverty.³⁴

Researchers have expanded beyond this focus on elementary school to analyze preschool composition and children's learning in two ways. First, using a sample of 2966 children from 11 state pre-K programs, Jeanne L. Reid and Douglas D. Ready found that children in middle- or high-SES classrooms learned more language and math skills than those in high-poverty classrooms, regardless of children's own socio-economic background and race/ethnicity.³⁵ Second, with a small sample (85 children), Carlota Schechter and Beth Bye assessed the receptive language growth of two groups of low-income children, one attending preschools with high concentrations of low-income families and the other attending economically mixed preschools.³⁶ By the spring of preschool, children in the integrated programs learned more than children in low-income programs.³⁷ For children who spoke English at home, the gains in the diverse programs were enough to make their spring scores equal to those of their more affluent peers.³⁸

It is not yet clear how socio-economic composition may affect children's preschool learning. In examining the effects of peers on children's learning, several studies have found significant associations between the cognitive skills of children's peers in preschool and how

33. SCHWARTZ, *supra* note 29, at 5, 32.

34. Kainz & Pan, *supra* note 29, at 535.

35. Jeanne L. Reid & Douglas D. Ready, *High-Quality Preschool: The Socioeconomic Composition of Preschool Classrooms and Children's Learning*, 24 EARLY EDUC. & DEV. 1082, 1089, 1097–98 (2013).

36. Carlota Schechter & Beth Bye, *Preliminary Evidence for the Impact of Mixed-Income Preschools on Low-Income Children's Language Growth*, 22 EARLY CHILDHOOD RES. Q. 137, 140 (2007).

37. *Id.* at 142.

38. *Id.* at 143, 144.

much children learn.³⁹ Most of the research suggests that lower-skilled children learn more from such interactions and that higher-skilled peers are relatively immune to peer effects.⁴⁰ Because children's skill levels and socio-economic background are highly correlated, these studies suggest that interactions among peers could be a pathway for how socio-economically diverse classrooms may promote children's learning.⁴¹ While children may learn directly from peers, the impact of peers may also operate indirectly, with higher-skilled peers increasing teacher expectations and the curricular pace in the classroom.⁴² Another possibility is that teacher quality or class size differs by class composition.⁴³ If high-poverty classrooms attract fewer of the best teachers or tend to be larger, children's learning might be lower as a result.

Overall, after accounting for children's own backgrounds, high concentrations of poverty and racial isolation in kindergarten-through-twelfth-grade ("K-12") schools are consistently associated with negative social and academic student outcomes. Whether this is true in preschool classrooms is not as solidly determined. In addition, it is not clear whether racial and socio-economic composition interact in some way. This analysis examines these questions.

II. METHODS AND DATA

Using empirical data drawn from 2966 children in 704 classrooms across 11 state pre-K programs for four-year-olds, the analysis presented

39. See Eric A. Hanushek et al., *Does Peer Ability Affect Student Achievement?*, 18 J. APPLIED ECONOMETRICS 527, 541, 542 (2003); Gary T. Henry & Dana K. Rickman, *Do Peers Influence Children's Skill Development in Preschool?*, 26 ECON. EDUC. REV. 100, 111 (2007); Laura M. Justice et al., *Peer Effects in Early Childhood Education: Testing the Assumptions of Special-Education Inclusion*, 25 PSYCHOL. SCI. 1722, 1728 (2014) [hereinafter Justice et al., *Peer Effects in Early Childhood Education*]; Laura M. Justice et al., *Peer Effects in Preschool Classrooms: Is Children's Language Growth Associated with Their Classmates' Skills?*, 82 CHILD DEV. 1768, 1775, 1776 (2011) [hereinafter Justice et al., *Peer Effects in Preschool Classrooms*]; Andrew J. Mashburn et al., *Peer Effects on Children's Language Achievement During Pre-Kindergarten*, 80 CHILD DEV. 686, 695, 697 (2009).

40. Hanushek et al., *supra* note 39, at 541, 542; Justice et al., *Peer Effects in Early Childhood Education*, *supra* note 39, at 1728; Justice et al., *Peer Effects in Preschool Classrooms*, *supra* note 39, at 1775, 1776; Mashburn et al., *supra* note 39, at 695, 697.

41. Hanushek et al., *supra* note 39, at 542; Justice et al., *Peer Effects in Early Childhood Education*, *supra* note 39, at 1728; Justice et al., *Peer Effects in Preschool Classrooms*, *supra* note 39, at 1776; Mashburn et al., *supra* note 39, at 695, 697.

42. Henry & Rickman, *supra* note 39, at 101.

43. Robert Pianta et al., *Features of Pre-Kindergarten Programs, Classrooms, and Teachers: Do They Predict Observed Classroom Quality and Child-Teacher Interactions?*, 9 APPLIED DEV. SCI. 144, 144 (2005).

here uses hierarchical linear modeling⁴⁴ (“HLM”) to specify two-level models that explore to what extent the racial/ethnic composition of preschool classrooms is associated with children’s language learning, regardless of their own race/ethnicity and SES. After controlling for children’s background characteristics and aspects of classroom quality, the multivariate analysis estimated the main effects of racial/ethnic and socio-economic composition as well as interactions between the two, with one of two language-skills assessments as the dependent variable. In the descriptive analysis, this Article reports on the inequalities evident among children at pre-K entry and their distribution in classrooms of different racial/ethnic composition. The Article also examines how many children attended classrooms that could be considered racially and economically diverse.

A. *The Multivariate Analysis*

For the multivariate analysis, I considered two outcomes: receptive language skills and expressive language skills, measured on spring assessments. While multiple cognitive and non-cognitive outcomes can be considered at kindergarten entry, I focused solely on language learning, given its salience in the instructional curriculum during elementary school. Using an analysis of covariance (“ANCOVA”) with fall scores as covariates, I interpreted the coefficients as estimates of children’s learning during the five months, on average, between the two assessments. The data contain information on both children and their preschool classrooms. This combination permits a two-level approach in which children’s learning is modeled simultaneously as a function of their own characteristics and the characteristics of the classrooms they attended.

Three research questions guided the multivariate analysis. First, is there a relationship between the racial/ethnic composition of preschool classrooms and children’s language learning after accounting for children’s own background and other aspects of classroom composition? Second, does this relationship operate independently or in combination with socio-economic composition? Third, do aspects of classroom quality explain the relationship between racial/ethnic composition and children’s growth in language skills during the pre-K year?

The multivariate analysis began with a child-level (Level 1) model that established the relationship between children’s characteristics and their preschool learning unadjusted for classroom-level characteristics.

44. See generally STEPHEN W. RAUDENBUSH & ANTHONY S. BRYK, HIERARCHICAL LINEAR MODELS: APPLICATIONS AND DATA ANALYSIS METHODS (2d ed. 2002).

All measures were grand-mean centered with their effects fixed and held constant across schools. The classroom-level (Level 2) models explored the extent to which classroom racial/ethnic composition was associated with children's preschool learning on the two language outcomes, controlling for children's individual characteristics and the socio-economic composition of the classroom (RQ1). I also considered interaction terms between racial/ethnic and socio-economic composition (RQ2). I then added variables representing aspects of preschool quality to explore whether they explain the relationship between the racial/ethnic and socio-economic composition of the classroom and preschool learning (RQ3). I also included interaction terms between the measures of preschool quality and the measures of classroom composition.

The reliability and significance of HLM estimates strongly depends on the number of Level 2 units (704 in this sample). Although this number is sufficient to allow for a multi-level analysis, it nevertheless raises issues of statistical power. When the Level 2 sample is relatively small, extant literature that employs multi-level methods often uses somewhat less stringent parameters to denote statistical significance.⁴⁵ In keeping with this practice, my class-level models note when particular estimates are significant at the $p < .10$ level in addition to the conventional $p < .05$, $p < .01$, and $p < .001$ levels.⁴⁶

B. The Data

The data came from two studies conducted by the National Center for Early Development and Learning ("NCEDL"): the Multi-State Study of Pre-Kindergarten and the State-Wide Early Education Program Study ("SWEEP").⁴⁷ Incorporating data from 11 state pre-K programs, the two studies had the same research team and measures, similar sampling designs, and the common goal of understanding the relationship between

45. See, e.g., Valerie E. Lee & David T. Burkam, *Dropping Out of High School: The Role of School Organization and Structure*, 40 AM. EDUC. RES. J. 353, 373 (2003); Rumberger & Palardy, *supra* note 25, at 16 tbl.2, 21 tbl.4, 23 tbl.5; Xue & Meisels, *supra* note 24, at 209 tbl.7, 211 tbl.8, 215 tbl.9.

46. "P-values" denote statistical significance. The lower the p-value, the less likely it is that the estimate of the relationship between two variables is due to random chance.

47. I am very grateful to the scholars at the Frank Porter Graham Child Development Institute at the University of North Carolina for their generosity in sharing their data with me. The Multi-State Study of Pre-Kindergarten and SWEEP data were collected by the NCEDL, using funds from the U.S. Department of Education, National Institute for Early Education Research ("NIEER"), Pew Charitable Trusts, and Foundation for Child Development. The contents of this study do not necessarily represent the positions or policies of the NCEDL or the funding agencies, and endorsement by these agencies should not be assumed.

features of pre-K programs and child outcomes.⁴⁸ For both studies, “pre-K” programs included center-based programs that explicitly focused on “school readiness” for four-year-olds, at least partially funded by state education agencies, and operated in schools or under the direction of state and local education agencies.⁴⁹ Both studies included extensive classroom observations and child assessments in the fall and spring of the pre-K year.⁵⁰ The average number of days between the two assessments was 157.1.⁵¹

From 2001 to 2003, the Multi-State study took place in six states⁵² that were chosen from states that had devoted substantial resources to pre-K initiatives.⁵³ Within each state, NCEDL chose a stratified random sample of 40 centers or schools to maximize variation in teacher credentials, program setting, and intensity.⁵⁴ Within each center/school, NCEDL chose one classroom and randomly selected four children for study participation.⁵⁵ Children were eligible for assessment if they would be old enough for kindergarten in the fall of 2002, did *not* have an Individualized Education Plan (“IEP”), and their teacher believed they could follow simple instructions in English or Spanish.⁵⁶ Because the average class size was 17.55, the children assessed represent an average 22.8 percent of children in the class.⁵⁷

NCEDL collected the SWEEP data in 2003–2004 and followed a similar sampling procedure in five more states⁵⁸ with the goal of combining the two datasets.⁵⁹ The SWEEP data were collected for 100 programs in each state.⁶⁰ In both the Multi-State and SWEEP studies, NCEDL distributed a questionnaire to the parents of all children in the

48. Diane Early et al., *Pre-Kindergarten in Eleven States: NCEDL's Multi-State Study of Pre-Kindergarten & Study of State-Wide Early Education Programs (SWEEP): Preliminary Descriptive Report 3* (Nat'l Ctr. for Early Dev. & Learning, Working Paper, 2005), available at http://fpg.unc.edu/sites/fpg.unc.edu/files/resources/reports-and-policy-briefs/NCEDL_PreK-in-Eleven-States_Working-Paper_2005.pdf.

49. *Id.*

50. *Id.* at 25.

51. Average number of days between assessments was computed by the author from the data, including imputed data for missing values.

52. The six states are California, Illinois, Georgia, Kentucky, New York, and Ohio. Early et al., *supra* note 47, at 4.

53. *Id.* at 4.

54. *Id.*

55. *Id.* at 5.

56. *Id.*

57. Average class size was computed by the author from the data, including imputed data for missing values.

58. The NCEDL used SWEEP data that was collected in Massachusetts, New Jersey, Texas, Washington, and Wisconsin. Early et al., *supra* note 48, at 6.

59. *Id.* at 3, 6.

60. *Id.* at 4, 6.

classroom regarding their socio-demographic characteristics.⁶¹ The responses from this broader sample of parents were used to calculate classroom measures such as average family income, average level of mothers' education, the percentage of children who were racial/ethnic minorities, and the percentage of children who were DLLs.⁶²

As is typical with large datasets,⁶³ data were incomplete on some measures, most commonly on the outcome variables. I used SPSS software to impute five complete datasets with 2966 children in each.⁶⁴ I then conducted the multivariate analyses on each dataset, averaged the parameters, and computed the standard errors across the results.

C. Outcome Measures

In the fall and spring, children in the dataset participated in two direct assessments of their receptive and expressive language skills. The *Peabody Picture Vocabulary Test* ("PPVT") is a norm-referenced instrument for measuring children's receptive vocabulary. For each item on the assessment, the examiner showed the child four pictures and said a word; the child responded by selecting a picture that best illustrates the word's meaning. The *Oral Expression Scale* from the Oral and Written Language Scales ("OWLS") is a norm-referenced assessment of children's comprehension and use of spoken language.⁶⁵ During the assessment, children were shown a picture and offered a verbal stimulus; the child responded by completing a sentence, answering a question, or making new sentences.

D. Class-Level Measures

The primary variable of interest is racial/ethnic composition, which is defined as the percentage of children in the class who were non-Hispanic white. For the descriptive analysis, I divided children into three types of classrooms: low-minority, 0 to 20 percent minority; medium minority, 21 to 70 percent minority; and high minority, 71 to 100 percent minority. I refer to the "medium minority" classrooms as "racially diverse." To construct a measure of classroom socio-economic composition, I used two measures: the class-mean of family incomes

61. *Id.* at 7.

62. *Id.*

63. PAUL D. ALLISON, MISSING DATA 1 (2002).

64. See generally *id.*; John W. Graham, *Missing Data Analysis: Making It Work in the Real World*, 60 ANN. REV. PSYCHOL. 549 (2009) (summarizing missing data literature).

65. See generally ELIZABETH CARROW-WOOLFOLK, OWLS-II ORAL AND WRITTEN LANGUAGE SCALES (2d ed. 1995).

and class-mean of mothers' education levels. I averaged the two measures to produce a measure of class-mean SES or "socio-economic composition."

The models also employed a measure of the standard deviation of family income *within* classrooms as an indicator of income diversity. While high-poverty classrooms usually have a narrow distribution of family income, as class mean income rises so does the potential for income diversity. In the dataset, class mean income and the standard deviation of within-class income were moderately correlated.⁶⁶ By including both class mean SES and the standard deviation of income in the models, I was able to consider what portion of any compositional effects might relate to having higher-SES classrooms and what portion might relate to having a broader distribution of income within the class. To consider another aspect of classroom composition, I used a measure of the percentage of children in the classroom who were DLLs.

Measures of structural quality included class size⁶⁷ and whether the teacher used a comprehensive curriculum, such as the High/Scope or Creative Curriculum.⁶⁸ In the final models, I included only measures that were statistically significant. For process quality, I used two scales from the *Classroom Assessment Scoring System* ("CLASS"), an instrument that measures dimensions of teacher-child interactions in classrooms.⁶⁹ The CLASS observes social and emotional interactions, such as teachers' sensitivity and responsiveness, and instructional approaches, such as the extent to which teachers promote conceptual development and provide feedback and language modeling. The results of the CLASS provide two measures of classroom interactions: Emotional Support and Instructional Support.

E. Child-Level Measures

The child-level models included covariates that are associated with children's cognitive development or with the socio-demographic composition of their preschools. To account for a child's race/ethnicity,

66. To be precise, the moderate correlation was represented by a correlation coefficient of 0.473 and was significant at the $p < 0.001$ level.

67. Class sizes were designated as either (a) above or equal to, or (b) below the mean of 18 children per classroom. A number one indicates that the class size was less than 18 children, and a zero indicates that the class size was 18 or more children.

68. In the data sets, teachers who used a comprehensive curriculum are indicated by a number one. Teachers who did not use a comprehensive curriculum are indicated by a zero.

69. See generally ROBERT C. PIANTA ET AL., CLASSROOM ASSESSMENT SCORING SYSTEM (1st ed. 2007).

I used a series of dummy variables⁷⁰ that captured whether the child was black, Latino, Asian, or Other,⁷¹ with whites as the comparison group.

To control for SES, I averaged the measures of children's family income and their mother's education. The variable on family income was coded in \$5000 increments, from "zero to \$5000" to "more than \$85,000," rendering 18 categories; I treated it as a continuous variable. The measure was positively skewed, including a cluster in the "more than \$85,000" category that comprised 7.9 percent of the sample. The data on mothers' education were coded in two-year increments from eight to 22 years of education, rendering eight categories; I treated it as a continuous variable, while recognizing that mothers' education is not truly an interval scale. The child-level models also controlled for age, gender,⁷² single parenthood,⁷³ DLL,⁷⁴ IEP status in the spring,⁷⁵ days absent from preschool, and the number of days between the fall and spring assessments.

III. DESCRIPTIVE RESULTS

The descriptive analysis examined the composition of the sample, beginning with children's family income, race/ethnicity, and skill levels in the fall of the pre-K year, followed by the characteristics of children in classrooms of different racial/ethnic composition, and then how children were distributed among classrooms that differed by average family income and racial/ethnic composition.

70. A number one indicates that the child is black, Latino, Asian, or "Other," and a zero indicates that the child is white.

71. "Other" includes Native-Americans and individuals with a mixed racial heritage.

72. A number one indicates that the child is female, and a zero indicates that the child is male.

73. A number one indicates that the child comes from a single-parent family, and a zero indicates that the child does not come from a single-parent family.

74. To determine DLL status, parents reported whether the child first learned a language other than English. A number one indicates that the child first learned a language other than English, and a zero indicates that the child first learned English.

75. A number one indicates that the child had an IEP in the spring, and a zero indicates that the child did not have an IEP in the spring.

A. *Children in the Dataset by Their Family Income, Race/Ethnicity, and Skill Level*

1. Children by Family Income

The data in Figure 1 indicate that half⁷⁶ of the children in the dataset were from families with incomes of \$25,000 or below, which was just above 150 percent of the poverty line for a family of three at the time the data were collected.⁷⁷ A quarter⁷⁸ came from families whose incomes were from \$25,001 to \$45,000. Another quarter⁷⁹ came from families whose incomes exceeded \$45,000, just above the median family income of \$43,000 at the time the data were collected.⁸⁰



Figure 1. Children's Family Income (n=2966)

2. Children by Race/Ethnicity

The data also indicate, as shown in Figure 2, that less than half of the children in the sample are white, while about one out of four are Latino and one out of five are black.⁸¹ Very few are Asian, and a considerable number falls into the "Other" category.⁸² Altogether, 59 percent of the sample represents a racial/ethnic minority, which is a

76. To be exact, 49.2% of the children in the dataset were from families with incomes of \$25,000 or below.

77. Annual Update of the HHS Poverty Guidelines, 68 Fed. Reg. 6456, 6457 (Feb. 7, 2003).

78. To be exact, 25.4% of the children in the dataset were from families with incomes from \$25,001–\$45,000.

79. To be exact, 25.4% of the children in the dataset were from families whose incomes exceeded \$45,000.

80. CARMEN DENAVAS-WALT ET AL., U.S. CENSUS BUREAU, INCOME, POVERTY, AND HEALTH INSURANCE COVERAGE IN THE UNITED STATES: 2003, at 2, 4 tbl.1 (2004), available at <http://www.census.gov/prod/2004pubs/p60-226.pdf>.

81. White children composed 41% of the sample, while Latino children composed 27%, and black children composed 18%. *Infra* Figure 2.

82. Asian children composed 3% of the sample, while "Other" children composed 11%. *Infra* Figure 2.

larger percentage than found in the general population, where 50 percent of children under age five are racial/ethnic minorities.⁸³ Even so, the dataset represents an economic and racial mix of children that is unusual among public preschool datasets.

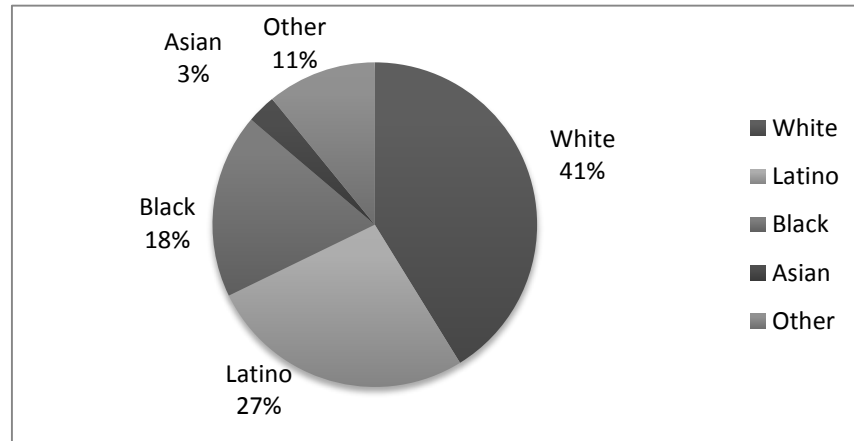


Figure 2. Children's Race/Ethnicity (n=2966)

3. Children by Skill Level

The results in Table 1 indicate that children in the dataset exhibited, on average, substantial disparities in language skills in the fall of the pre-K year when grouped by race/ethnicity. On the receptive language assessment, the average score for black children was almost a full standard deviation lower than the average score for white children; for Latino children, the skill disparity was somewhat less but still substantial. On the expressive language assessment, the average score for black children was almost two-thirds of a standard deviation lower than the average score for white children; for Latino children, the skill disparity was over three-quarters of a standard deviation. These results are consistent with other studies that have found wide gaps in skills that have emerged before children enter pre-K.

83. To be exact, 49.7% of children under the age of five and in the general population represented a racial/ethnic minority in 2001. Press Release, U.S. Census Bureau, Most Children Younger Than Age 1 Are Minorities, Census Reports (May 17, 2012), available at <http://www.census.gov/newsroom/releases/archives/population/cb12-90.html>.

Table 1. *Children's Assessment Scores in the Fall of Preschool by Race/Ethnicity (n=2966)*

	Receptive Language ^a	Expressive Language
Black	-0.470	-0.238
Latino	-0.393	-0.387
Asian	-0.374	-0.608
Other	0.081	0.044
White	0.469	0.382

^a All assessment measures are z-scored.

B. Children in the Dataset by the Characteristics of their Classrooms

1. Characteristics of Classrooms with Different Racial/Ethnic Composition

Further descriptive analysis indicates how children differed across classrooms of varying levels of racial/ethnic minority concentrations. The data in Table 2 compare children in three types of classrooms: high minority, 71 to 100 percent minority; medium minority or “racially diverse,” 21 to 70 percent minority; and low-minority, 0 to 20 percent minority. Just under half of all children attended classrooms that were predominantly or exclusively minority.⁸⁴ Almost one in three was enrolled in a racially diverse classroom, and almost one in four attended a classroom that was predominantly or exclusively white.⁸⁵ In high-minority classrooms, 94.9 percent of all children, on average, were minority, compared to 42.8 percent in racially diverse classrooms.⁸⁶ In low-minority classrooms, only 7.7 percent of children, on average, were minorities.⁸⁷

Across the three types of classrooms, children differed significantly in several ways. High-minority classrooms were much more likely to be high-poverty, with three out of four children living below 150 percent of the poverty line,⁸⁸ compared to one out of two in racially-diverse

84. To be exact, 47.1% of the children in the dataset attended classrooms that were predominantly or exclusively composed of minorities. *Infra* Table 2.

85. Precisely 32.2% of the children in the dataset were enrolled in racially diverse classrooms, and 22.7% of the children in the dataset were enrolled in predominately white classrooms. *Infra* Table 2.

86. This finding was significant at the $p < .001$ level. *Infra* Table 2. Significance levels reflect comparisons with medium-minority classrooms.

87. This finding was significant at the $p < .001$ level. *Infra* Table 2.

88. Exactly 75.4% of the children in high-minority classrooms were living below 150% of the poverty line. *Infra* Table 2. This finding was significant at the $p < .001$ level. *Infra* Table 2.

classrooms,⁸⁹ and one out of three in low-minority classrooms.⁹⁰ Mothers of children in high-minority classrooms were less likely to have more than a high school education,⁹¹ and children in high-minority classrooms were much more likely to be DLLs.⁹²

The average family income was significantly lower in high-minority classrooms than in racially diverse classrooms⁹³ and in low-minority classrooms.⁹⁴ The diversity of family incomes⁹⁵ in high-minority classrooms was lower as well, compared to that of racially diverse and low-minority classrooms.⁹⁶ Despite these disadvantages, high-minority classrooms were less likely than racially diverse or low-minority classrooms to have a very good teacher, with lower ratings in high-minority classrooms on both scales of teacher quality, that is, the scales of instructional support⁹⁷ and emotional support.⁹⁸ The average class size was also higher in high-minority classrooms,⁹⁹ and the ratio of children to teachers was likely to be higher¹⁰⁰ than in racially diverse classrooms and low-minority classrooms.

A more positive finding, however, is that differences in the likelihood that high-minority, racially diverse, and low-minority classrooms would have a teacher with a bachelor's degree were not statistically significant.¹⁰¹ High-minority classrooms were more likely to have a teacher who spoke Spanish,¹⁰² to have a teacher who used a comprehensive curriculum,¹⁰³ and to be a full-day program.¹⁰⁴

89. 49.7% of the children in racially-diverse classrooms were living below 150% of the poverty line. *Infra* Table 2.

90. 35.4% of the children in low-minority classrooms were living below 150% of the poverty line. *Infra* Table 2. This finding was significant at the $p < .001$ level. *Infra* Table 2.

91. This finding was significant at the $p < .001$ level. *Infra* Table 2.

92. Precisely 34.1% of the children in high-minority classrooms were DLLs. *Infra* Table 2. This finding was significant at the $p < .05$ level. *Infra* Table 2.

93. To be exact, the average family income in high-minority classrooms was \$22,578, which is much lower than the average family income of \$38,536 in racially diverse classrooms. *Infra* Table 2. This finding was significant at the $p < .001$ level. *Infra* Table 2.

94. The average family income in low-minority classrooms was \$45,094. *Infra* Table 2. This finding was significant at the $p < .001$ level. *Infra* Table 2.

95. The diversity of family income is measured by the standard deviation of incomes.

96. This finding was significant at the $p < .001$ level. *Infra* Table 2.

97. This finding was significant at the $p < .001$ level. *Infra* Table 2.

98. This finding was significant at the $p < .001$ level. *Infra* Table 2.

99. To be exact, the average class size in high-minority classrooms was 18.3 children. *Infra* Table 2. This finding was significant at the $p < .01$ level. *Infra* Table 2.

100. This finding was significant at the $p < .001$ level. *Infra* Table 2.

101. *Infra* Table 2.

102. This finding was significant at the $p < .001$ level. *Infra* Table 2.

103. This finding was significant at the $p < .001$ level. *Infra* Table 2.

104. This finding was significant at the $p < .001$ level. *Infra* Table 2.

Table 2. *Descriptive Statistics for Children and Classrooms by Racial/Ethnic Minority Composition of the Classrooms*

	High-minority ^a	Medium-minority ^a	Low-minority ^a
<i>Children (n=2,966)^b</i>	<i>n=1,397</i>	<i>n=896</i>	<i>n=673</i>
Percent of children in the sample	47.1	30.2	22.7
<i>Classrooms (n=704)^b</i>	<i>n=330 classrooms</i>	<i>n=211 classrooms</i>	<i>n=166 classrooms</i>
Class mean family income (\$)	22,578***	38,536	45,094***
(SD)	(9,961)	(19,896)	(19,846)
Standard deviation of incomes (\$)	14,466***	18,727	19,082
(SD)	(6,722)	(8,153)	(6,486)
Mothers' education (years)	12.2***	13.2	13.5
(SD)	(1.0)	(1.6)	(1.4)
Percent minority (%)	94.9***	42.8	7.7***
(SD)	(8.4)	(14.2)	(7.1)
Percent poor (%)	75.4***	49.7	35.4***
(SD)	(22.0)	(32.1)	(29.8)
Percent DLL (%)	34.1*	9.2	1.4*
(SD)	(35.7)	(16.3)	(5.7)
Percent IEP (%)	6.1***	10.7	15.5**
(SD)	(9.3)	(13.8)	(17.4)
Instructional quality (z-scored)	-0.166***	0.178	0.105
(SD)	(0.961)	(1.03)	(0.995)
Emotional support (z-scored)	-0.231***	0.204	0.204
(SD)	(1.04)	(0.951)	(0.867)
Teacher has a BA or more (%)	71.5	65.9	75.5
Teacher speaks Spanish (%)***	54.8	19.9	8.6
Class size***	18.3	17.0	16.6
(SD)	(4.7)	(4.2)	(4.3)
Child/Teacher 10 or less (%)***	80.6	91.5	90.8
Comprehensive curriculum (%)***	63.9	56.4	44.2
Full day program (%)***	55.2	42.2	32.5

*p < .05 **p < .01 ***p < .001

^a High-minority classrooms have 71-100% minority children. Medium-minority classrooms have 21-70% minority children. Low-minority classrooms have 0-20% minority children.^b Significance tests compared to medium-minority classrooms.

2. Distribution of Children in Classrooms with Different Racial/Ethnic and Income Composition

Further analyses allowed an examination of what percentage of children in the sample attended classrooms that could be considered racially diverse and low, medium, or high in average family income. The data in Table 3 indicate that 10.2 percent of all children attended classrooms that were both racially diverse, that is, the “medium-minority” category, *and* “medium” in average family income.¹⁰⁵ Another 11.6 percent attended classrooms that were both racially diverse and high-income.¹⁰⁶ Together, 21.8 percent of all children, about one in five, were enrolled in racially diverse classrooms that were medium or high in average family income. At the same time, almost one in three¹⁰⁷ were enrolled in high-minority, low-income classrooms, and 3.5 percent attended classrooms that were predominantly or exclusively white and low-income.¹⁰⁸ Another 8.4 percent of the children attended racially diverse classrooms that were low-income. In all, 42.3 percent of the children were enrolled in low-income/high-poverty classrooms.

105. The mean income for the “medium” category of average family income is \$30,874. *Infra* Table 3.

106. The mean income for the “high” category of average family income is \$58,362. *Infra* Table 3.

107. The precise percentage of students enrolled in a high-minority, low-income classroom was 30.4%. *Infra* Table 3.

108. The mean income for the “low” category of average family income is \$16,720. *Infra* Table 3.

Table 3. *Percentage of All Children in Different Types of Preschool Classrooms: Racial/Ethnic Minority and Income composition (n=2966 children)*

	Low-income classroom ^a (mean=\$16,720)	Medium-income classroom (mean=\$30,874)	High-income classroom (mean=\$58,362)
High-minority classroom ^b	30.4% (n=901)	14.1% (n=418)	2.6% (n=78)
Medium- minority classroom	8.4% (n=250)	10.2% (n=301)	11.6% (n=345)
Low-minority classroom	3.5% (n=103)	6.6% (n=197)	12.6% (n=373)

^a Low-income classrooms have average family incomes that are less than 0.5 standard deviations below the mean for all classrooms; high-income classrooms have average family incomes that are more than 0.5 standard deviations above the mean for all classrooms; middle-income classrooms have average family incomes between the two.

^b High-minority classrooms have 71–100% minority children. Medium-minority classrooms have 21–70% minority children. Low-minority classrooms have 0–20% minority children.

The standard deviation of income within classrooms gives a more precise estimate of how diverse classrooms were by family income. The data in Table 4 suggest that 6.9 percent of the children attended classrooms that were racially diverse and medium on income diversity.¹⁰⁹ Another 12.9 percent attended classrooms that were racially diverse and high on income diversity.¹¹⁰ Together the results indicate that 19.8 percent, or one in five children, were enrolled in classrooms that were fairly diverse in both the incomes and racial backgrounds of their families. However, one in four¹¹¹ were enrolled in high-minority, low income-diversity classrooms, and one in 20¹¹² were enrolled in classrooms that were predominantly or exclusively white and low on income diversity.¹¹³ Another 10.4% of the children were enrolled in racially diverse classrooms that were low on income diversity. In all,

109. The mean standard deviation is \$16,950. *Infra* Table 4.

110. The mean standard deviation is \$25,575. *Infra* Table 4.

111. The precise number of students enrolled in high-minority, low income-diversity classrooms was 24.6%. *Infra* Table 4.

112. The precise number of students enrolled in classrooms that were predominantly or exclusively white and low on income diversity was 4.8%. *Infra* Table 4.

113. The mean standard deviation is \$9306. *Infra* Table 4.

39.8 percent of the children attended classrooms in which family incomes were generally quite similar.

Table 4. *Percentage of all Children in Different Types of Preschool Classrooms: Minority Composition and Income Diversity (n=2966 children)*

	Low income-diversity classroom ^a (mean <i>SD</i> =\$9,306)	Medium income-diversity classroom (mean <i>SD</i> =\$16,950)	High income-diversity classroom (mean <i>SD</i> =\$25,575)
High-minority classroom ^b	24.6% (n=730)	13.0% (n=386)	9.5% (n=281)
Medium-minority classroom	10.4% (n=308)	6.9% (n=206)	12.9% (n=382)
Low-minority classroom	4.8% (n=142)	7.1% (n=212)	10.8% (n=319)

^aLow income-diversity classrooms have a SD of family incomes that is less than 0.5 standard deviations below the mean for all classrooms; high income-diversity classrooms have a SD of family incomes that is more than 0.5 standard deviations above the mean for all classrooms; middle income-diversity classrooms have a SD of family incomes between the two.

^bHigh-minority classrooms have 71–100% minority children. Medium-minority classrooms have 21–70% minority children. Low-minority classrooms have 0–20% minority children.

In sum, the data provide multiple reasons for concern about the substantial percentage of children in high-poverty classrooms with evidence of concentrated disadvantage and lower aspects of classroom quality. Children who come from backgrounds marked by poverty and its attendant stresses are at a double disadvantage if they arrive at lower-quality pre-K classrooms that are ill-prepared to help close wide gaps in children's learning that have already taken hold. However, the descriptive data on children's backgrounds and classroom composition suggest that state pre-K programs are not only attracting a fairly diverse population of children, racially and economically, but also enrolling at least some of them in classrooms that are reasonably diverse in both family income and race/ethnicity. I turn to the results of the multivariate analysis to address the question of whether these components of the classroom experience are associated with how much children learn.

IV. MULTIVARIATE RESULTS

A. *Unadjusted Child-level Models*

The first step in the multivariate analysis was to construct a within-classroom model unadjusted for any covariates at the class-level in order to establish the relationship between child-level characteristics and the outcome measures. As expected, I found a highly significant relationship between children's own SES and their pre-K language learning. A one standard deviation ("SD") increase in children's SES was associated with an almost 0.08 SD increase in both receptive and expressive language learning.¹¹⁴ The data in Table 5 also indicate that, on average, most racial/ethnic minority children learned significantly fewer receptive language and expressive language skills, on average, than their white peers during the pre-K year.

Table 5. *The Relationship Between Children's Characteristics and their Preschool Learning (n=2966)*

	Receptive Language Learning ^a	Expressive Language Learning ^a
Children's characteristics ^b		
Socio-economic status (z-scored) ^c	0.077***	0.078***
Black ^d	-0.293***	-0.142***
Latino ^d	-0.313***	-0.182***
Asian ^d	-0.108	-0.241**
Other ^d	-0.123**	-0.063
Single parent	-0.062~	-0.021
ESL	-0.119*	-0.103~
IEP	-0.171**	-0.224***
Age	-0.070	-0.091~
Female	0.018	0.059~
Fall skills (z-scored)	0.618***	0.640***
Intercept	0.0	0.0

~ p < .10 * p < .05 ** p < .01 *** p < .001

^a Outcome measures are z-scored spring assessment scores.

^b All variables are centered on the grand-mean; coefficients are empirical Bayes estimates.

^c Socio-economic status is the average of two z-scored variables: child's family income and mother's education.

^d Comparison group is white.

A common explanation for the finding that low-SES and minority children learned less on average than high-SES and white children while attending pre-K is that low-SES and minority children are more likely to attend lower quality programs; this argument finds support in the

114. This finding was significant at the p < .001 level. *Infra* Table 5.

descriptive findings here.¹¹⁵ For both researchers and policymakers, the obstacle is to identify the components of quality that allow low-SES and minority children to learn at least as much as high-SES and white children during pre-K. This Article explores the extent to which the composition of preschool classrooms may help address this challenge.

B. The Relationship Between Racial/Ethnic Composition, Socio-Economic Composition, and Children's Learning

The first models were used to evaluate whether the racial/ethnic composition of children's classrooms was significantly associated with the children's receptive and expressive language learning during the pre-K year, controlling for children's own background characteristics and the socio-economic composition of their classrooms. The results in Table 6 indicate that for both receptive language learning¹¹⁶ and expressive language learning,¹¹⁷ the racial/ethnic composition of children's classrooms was significantly related to how much they learn, after accounting for their own backgrounds and classroom average SES.

At the same time, the results indicate a significant relationship between socio-economic composition and children's learning of receptive language skills¹¹⁸ and children's learning of expressive language skills.¹¹⁹ It is noteworthy that for both outcomes, the effect size of socio-economic composition is similar to the coefficient associated with children's own SES.

In both models, the interaction term for racial and socio-economic composition was not significant,¹²⁰ suggesting that racial/ethnic composition and socio-economic composition operate independently on children's learning.

115. Magnuson & Waldfogel, *supra* note 21, at 170.

116. For receptive language learning, the effect size is 0.059, significant at the $p < .01$ level. *Infra* Table 6.

117. For expressive language learning, the effect size is 0.133, significant at the $p < .10$ level. *Infra* Table 6.

118. The relationship between socio-economic composition and children's learning of receptive language skills has an effect size of 0.042, significant at the $p < .10$ level. *Infra* Table 6.

119. The relationship between socio-economic composition and children's learning of expressive language skills has an effect size of 0.052, significant at the $p < .05$ level. *Infra* Table 6.

120. The interaction term for racial and socio-economic composition was not significant at the $p < .10$ level. *Infra* Table 6.

Table 6. *The Relationship between the Racial and SES Composition of Preschool Classrooms and Children's Language Learning (n=2966 children within 704 classrooms)*

	Receptive Language Learning ^a	Expressive Language Learning
Child-level equation: within-class effects ^b		
Socio-economic status (z-scored) ^c	0.051*	0.047*
Black ^d	-0.196***	-0.080
Latino ^d	-0.218***	-0.120~
Asian ^d	-0.062	-0.235**
Other ^d	-0.065	-0.040
Single parent	-0.056~	-0.017
ESL	-0.106*	-0.094
IEP	-0.165**	-0.219**
Female	0.016	0.061~
Age	-0.074	-0.095*
Fall skills (z-scored)	0.609***	0.637***
Class-level equation: between-class effects on adjusted mean spring skills		
Percent White (z-scored)	0.059**	0.133~
Quadratic of percent White (z-scored)		-0.108~
Socio-economic composition (z-scored) ^e	0.042~	0.052*
Intercept	0.0	0.0

~ p < .10 * p < .05 **p < .01 ***p < .001

^a Outcome measures are z-scored spring assessment scores.

^b All variables are centered on the grand mean; coefficients are empirical Bayes estimates adjusted for all child and class-level measures.

^c Socio-economic status is the average of two z-scored variables: child's family income and mother's education.

^d Comparison group is white.

^e Socio-economic composition is the average of two z-scored variables: class mean family income and class mean mothers' education.

Interestingly, on the expressive language outcome, the quadratic term for racial/ethnic composition was significant and negative, indicating that the relationship between racial/ethnic composition and expressive language learning is not linear. Because the coefficient is negative, the results suggest that the positive "benefit" of an increasing number of white children in the classroom dissipates as the percentage of white children rises above a certain point. This relationship is illustrated in Figure 3, with an optimal value of about one *SD* above the mean, or a racial/ethnic composition of 63.9 percent white children in the classroom.

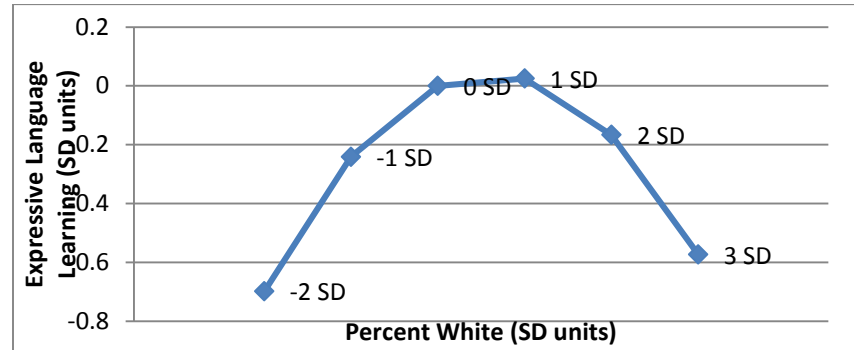


Figure 3. Classroom Racial/Ethnic Composition and Expressive Language Development (n=2966 children within 704 classrooms)

Given this relationship, the data in Figure 4 show how four different combinations of classroom SES and racial/ethnic composition relate to children's expressive language skills.

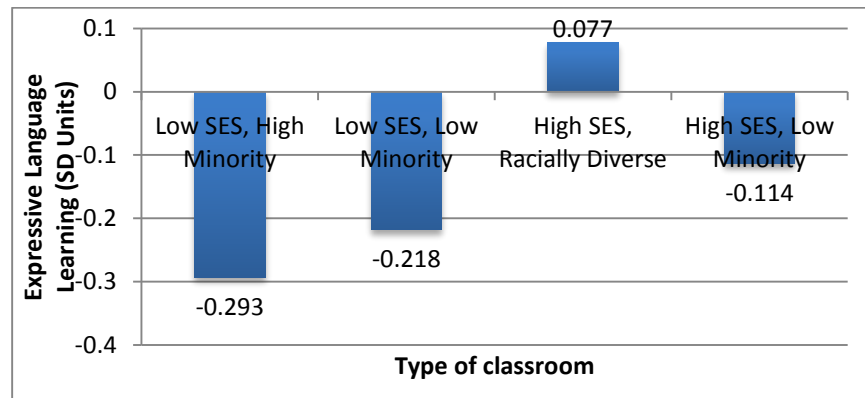


Figure 4. Classroom SES, Racial/Ethnic Diversity, and Expressive Language Development (n=2966 children within 704 classrooms)

Classrooms that are both low SES and high minority are associated with a .293 *SD* decrease in expressive language development, compared to classrooms with average SES and average racial/ethnic composition. Classrooms that are both low SES and low minority (predominantly or exclusively white) are associated with a .218 *SD* decrease in expressive language development. Classrooms that are high SES and low minority fare slightly better, but are still associated with a .114 *SD* decrease in expressive language development, compared to classrooms with average

SES and average racial/ethnic composition. Classrooms that are racially diverse and high SES have an advantage with an increase of .077 *SD* in expressive language development.

C. The Relationship Between Classroom Composition, Features of Classroom Quality, and Children's Learning

To explore what aspects of classroom quality may account for the apparent effect of attending a racially diverse and/or socio-economically diverse classroom, I added several measures for classroom quality to the models for each of the two language outcomes: instructional quality, class size, and the use of a comprehensive curriculum. I also included a measure of the percent of children who were DLLs to account for the particular challenges posed by dual-language learning. Because the measure for the teacher's level of emotional support was not significant, I did not include it in the final models. In addition, I tested interactions between racial/ethnic or socio-economic composition and the three measures of quality—instructional quality, class size, and the use of a comprehensive curriculum—to discern whether in addition to their main effects, particular aspects of the classroom might interact to further boost children's language development.

1. Receptive Language Learning

The results for receptive language learning in Table 7 indicate that even with the addition of the three aspects of classroom quality, the estimate for the racial/ethnic composition of the classroom did not change.¹²¹ This finding suggests that the relationship between racial/ethnic composition and children's receptive language learning is not explained by differences in teacher quality, class size, or the use of a comprehensive curriculum. None of the interactions tested between racial/ethnic composition and the aspects of classroom quality were statistically significant.¹²²

121. When adding aspects of classroom quality, estimates for the racial/ethnic composition of the classroom did not change, with an effect size of 0.060, significant at the $p < .05$ level. *Infra* Table 7.

122. None of the interactions between racial/ethnic composition and aspects of classroom quality were significant at the $p < .10$ level. *Infra* Table 7.

Table 7. *The Relationship Between the Racial/Ethnic and SES Composition of Preschool Classrooms, Classroom Quality, and Children's Receptive Language Learning (n=2966 children within 704 classrooms)*

Child-level equation: within-class effects ^a	
Socio-economic status (z-scored) ^b	0.049*
Black ^c	-0.192***
Latino ^c	-0.211***
Asian ^c	-0.064
Other ^c	-0.064
Single parent	-0.052~
ESL	-0.113*
IEP	-0.167**
Female	0.016
Age	-0.073
Receptive language skills (Fall; z-scored)	0.606***
Class-level equation: between-class effects on adjusted mean receptive language skills (Spring)	
Percent White (z-scored)	0.060*
Socio-economic composition (z-scored) ^d	0.053~
Income diversity (z-scored)	-0.007
Interaction: SES composition and Income diversity (z-scored)	0.046**
Percent DLL (z-scored)	0.000
Instructional quality (log-transformed) (z-scored)	0.033~
Class size (z-scored)	0.031~
Comprehensive curriculum	-0.015
Intercept	0.0

~ p < .10 * p < .05 ** p < .01 *** p < .001

^a All variables are centered on the grand mean; coefficients are empirical Bayes estimates adjusted for all child and class-level measures.

^b Socio-economic status is the average of two z-scored variables: child's family income and mother's education.

^c Comparison group is white.

^d Socio-economic composition is the average of two z-scored variables: class mean income and class mean mothers' education.

The results in Table 7 also indicate that socio-economic composition continues to be significant in the model.¹²³ Moreover, while income diversity in the classroom was not by itself significant, it interacted significantly with the classroom SES to promote receptive

123. Socio-economic composition continues to be important, with an effect size of 0.053, significant at the p < .10 level. *Supra* Table 7.

language learning.¹²⁴ Figure 5 illustrates these interactive effects for three hypothetical classrooms: a low-SES, low income-diversity classroom; a high-SES, low income-diversity classroom; and a high-SES, high income-diversity classroom. Classrooms with both high SES and high income-diversity were associated with an additional 0.099 *SD* in receptive language development compared to average-SES classrooms with average income diversity.

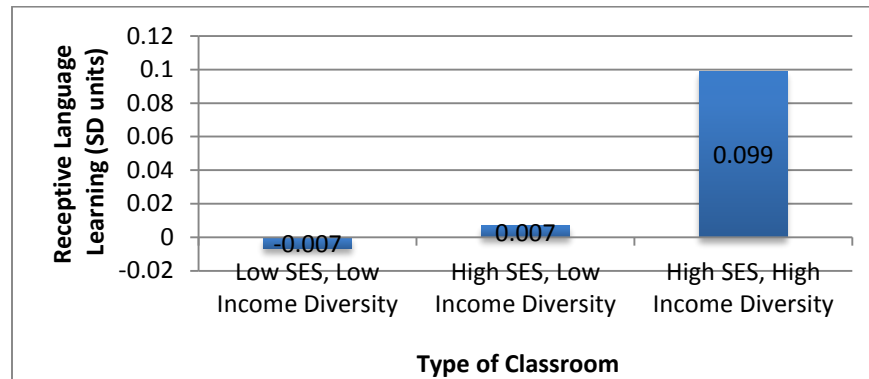


Figure 5. Interactions Between Classroom SES, Classroom Income Diversity, and Receptive Language Development (n=2966 children within 704 classrooms)

2. Expressive Language Learning

The results for expressive language learning in Table 8 indicate that, once again, even with the addition of components of classroom quality, the estimate for the racial/ethnic composition of the classroom did not change.¹²⁵ This suggests that the relationship between racial/ethnic composition and children's expressive language learning is not explained by differences in teacher quality, class size, the use of a comprehensive curriculum, or the percent of DLLs in the classroom. None of the interactions tested between racial/ethnic composition and the aspects of classroom quality were statistically significant.¹²⁶

124. Income diversity in the classroom interacted significantly with classroom SES to promote receptive language learning, with an effect size of 0.046, significant at the $p < .01$ level. *Supra* Table 7.

125. Adding components of classroom quality did not change the estimate for the racial/ethnic composition of the classroom, with an effect size of 0.125, significant at the $p < .10$ level. *Infra* Table 8.

126. The interactions between racial/ethnic composition and aspects of classroom quality were not statistically significant at the $p < .10$ level. *Infra* Table 8.

Table 8. *The Relationship Between the Racial/Ethnic and SES Composition of Preschool Classrooms, Classroom Quality, and Children's Expressive Language Learning (n=2966 children within 704 classrooms)*

Child-level equation: within-class effects ^a	
Socio-economic status (z-scored) ^b	0.048*
Black ^c	-0.070
Latino ^c	-0.127~
Asian ^c	-0.247**
Other ^c	-0.043
Single parent	-0.010
ESL	-0.107
IEP	-0.225**
Female	0.061~
Age	-0.094*
Expressive language skills (Fall; z-scored)	0.630***
Class-level equation: between-class effects on adjusted mean receptive language skills (Spring)	
Percent White (z-scored)	0.125~
Quadratic of percent White (z-scored)	-0.092
Socio-economic composition (z-scored) ^d	0.050*
Interaction: SES composition and instructional quality (z-scored)	0.033*
Percent ESL (z-scored)	0.020
Instructional quality (log-transformed) (z-scored)	0.061***
Class size (z-scored)	0.031*
Comprehensive curriculum	0.018
Intercept	0.0

~ p < .10 * p < .05 ** p < .01 ***p < .001

^a All variables are centered on the grand mean; coefficients are empirical Bayes estimates adjusted for all child and class-level measures.

^b Socio-economic status is the average of two z-scored variables: child's family income and mother's education.

^c Comparison group is white.

^d Socio-economic composition is the average of two z-scored variables: class mean income and class mean mothers' education.

The results in Table 8 also indicate that socio-economic composition again continues to be significant in the model.¹²⁷ Moreover, socio-economic composition and instructional quality¹²⁸ interact

127. The estimate for socio-economic composition is significant, with an effect size of 0.050, significant at the p < .05 level. *Supra* Table 8.

128. The estimate for instructional quality is significant, with an effect size of 0.061, significant at the p < .001 level. *Supra* Table 8.

significantly to promote children's learning.¹²⁹ When socio-economic composition and instructional quality were both one *SD* above the mean, expressive language learning increased by 0.144 *SD*, compared to learning in classrooms where both measures were only average.

V. DISCUSSION AND LIMITATIONS

The results suggest that the racial/ethnic and socio-economic compositions of pre-K classrooms represent potentially important and independent components of preschool quality. Both measures of classroom composition were reliable predictors of children's language learning, even with the inclusion of significant predictors of growth in pre-K classrooms, such as instructional quality. High-minority, low-SES classrooms appear to be at a significant disadvantage in promoting children's development, independent of the particular race/ethnicity or family income of each child, while higher-SES and racially or economically diverse classrooms offer distinct advantages. The findings have important policy implications for states that seek to expand access to high-quality preschool.

A. *Are the Results Substantively Significant?*

While the estimates for racial and socio-economic composition were statistically significant, they were small, that is, less than 0.10. This result is not surprising, however, given how little time children spent in their pre-K classrooms. On average, children experienced only five months of preschool between the fall and spring assessments, and more than half of them¹³⁰ were in preschool for half-days, an average of only 2.7 hours per day. This short dose of preschool is likely to have supported fewer cognitive gains than one of longer duration.¹³¹

129. Socio-economic composition and instructional quality interact significantly to promote children's learning, with an effect size of 0.033, significant at the $p < .05$ level. *Supra* Table 8.

130. 54.1% of children were in preschool for half-days.

131. Celene E. Domitrovich et al., *One Versus Two Years: Does Length of Exposure to an Enhanced Preschool Program Impact the Academic Functioning of Disadvantaged Children in Kindergarten?*, 28 EARLY CHILDHOOD RES. Q. 704, 711 (2013); Valerie E. Lee et al., *Full-Day Versus Half-Day Kindergarten: In Which Program Do Children Learn More?*, 112 AM. J. EDUC. 163, 169, 171 (2006); Weilin Li et al., *Timing of High-Quality Child Care and Cognitive, Language, and Preacademic Development*, 49 DEVELOPMENTAL PSYCHOL. 1440, 1449 (2013); Anita S. McGinty et al., *Does Intensity Matter? Preschoolers' Print Knowledge Development Within a Classroom-Based Intervention*, 26 EARLY CHILDHOOD RES. Q. 255, 265 (2011); Douglas D. Ready, *Socioeconomic Disadvantage, School Attendance, and Early Cognitive Development: The Differential Effects of School Exposure*, 83 SOC. EDUC. 271, 281 (2010).

Nevertheless, small effects may be substantively important when they compound over the years of children's early learning.¹³² Low-SES black and Hispanic children are likely to experience racial isolation as they move through elementary and middle school, while exhibiting wide skills gaps when compared to higher-SES children. Because this creates an urgent policy challenge of identifying the components of quality that support their learning, even small but significant effects deserve attention. Without due attention to the quality of their classrooms, the expansion of access to preschool may inadvertently aggravate these inequities, rather than mitigate them.¹³³

B. What Might Explain the Relationships Between Racial/Ethnic and Socio-Economic Composition and Children's Learning?

The finding that salient components of classroom quality, such as instructional quality, do not explain the relationships between racial/ethnic or socio-economic composition and children's language learning suggests that something else is at work. One plausible candidate is the effect of peers.

While the empirical base on preschool peer effects is growing, the theoretical research on how peer effects operate lags behind. We know that, during the early years, both cognitive and non-cognitive learning and language acquisition, in particular, is grounded in a social context.¹³⁴ Children may learn from peers who provide models of language use, vocabulary and syntax, and different discourse styles.¹³⁵ Early vocabulary growth, for example, is related to the amount and type of speech to which children are exposed, such as the use of open-ended questions, expansions, and recasts.¹³⁶ Peers provide more language interactions and more varied language interactions than do preschool

132. Douglas N. Harris, *Toward Policy-Relevant Benchmarks for Interpreting Effect Sizes: Combining Effects with Costs*, 31 EDUC. EVALUATION & POL'Y ANALYSIS 3, 8 (2009).

133. Sharon L. Kagan, *American Early Childhood Education: Preventing or Perpetuating Inequity?*, in 3 EQUITY MATTERS: RESEARCH REVIEW 1, 4–5, 10–12 (2009).

134. See DAVID W. CARROLL, PSYCHOLOGY OF LANGUAGE 6–8, 252–57 (Erik Evans et al. eds., 5th ed. 2008). See generally L. S. VYGOTSKY, MIND IN SOCIETY: THE DEVELOPMENT OF HIGHER PSYCHOLOGICAL PROCESSES (Michael Cole et al. eds., 1978).

135. See BEGINNING LITERACY WITH LANGUAGE 330–32 (David K. Dickinson & Patton O. Tabors eds., 2001); Justice et al., *Peer Effects in Early Childhood Education*, *supra* note 39, at 1728.

136. See BETTY HART & TODD R. RISLEY, MEANINGFUL DIFFERENCES IN THE EVERYDAY EXPERIENCE OF YOUNG AMERICAN CHILDREN 133–134 (1995); Laura M. Justice et al., *Quality of Language and Literacy Instruction in Preschool Classrooms Serving At-Risk Pupils*, 23 EARLY CHILDHOOD RES. Q. 51–52, 63 (2008).

teachers, who provide relatively little direct language stimulation.¹³⁷ By contributing to language-rich classrooms, peers may thus promote the receptive and expressive language skills of preschool children, particularly when they come from home environments with lower levels of language stimulation. Peer effects may also indirectly affect children's learning by raising teachers' expectations and hastening the pace of the instruction.

The uniquely relational nature of early development may magnify the effects of racial and socio-economic composition in preschool classrooms, where free play and collaborative activities are often emphasized more than the teacher-directed lessons found in K-12 settings.¹³⁸ In preschool classrooms, peers may initiate, model, and expand early language skills in the context of social interactions and play.¹³⁹ Children who are learning English as a second language may find opportunities with higher-skilled peers to hear and test communication skills and expand their understanding of the socio-linguistic rules of a particular culture, all in the context of play.¹⁴⁰

The finding here of a positive interaction between socio-economic composition and instructional quality suggests that the quality of teaching in a diverse classroom may be particularly important to support such positive interactions. Teachers can nurture the social skills and peer interactions that support children's learning in the social setting of preschool.¹⁴¹ Because differences in language use and culture can affect

137. See Justice et al., *Peer Effects in Early Childhood Education*, *supra* note 39, at 1728.

138. See COMM. ON EARLY CHILDHOOD PEDAGOGY, *supra* note 2, at 47–53, 215–22; Henry & Rickman, *supra* note 39, at 101.

139. See Rebecca J. Bulotsky-Shearer et al., *Peer Play Interactions and Readiness to Learn: A Protective Influence for African American Preschool Children From Low-Income Households*, 6 CHILD DEV. PERSP. 225, 227 (2012).

140. See Fred Genesee & Elena Nicoladis, *Language Development in Bilingual Preschool Children*, in 6 YEARBOOK IN EARLY CHILDHOOD EDUCATION: MEETING THE CHALLENGE OF LINGUISTIC AND CULTURAL DIVERSITY IN EARLY CHILDHOOD EDUCATION 18, 28–29 (Eugene E. Garcia et al. eds., 1995); R. Grant, *Meeting the Needs of Young Second Language Learners*, in 6 YEARBOOK IN EARLY CHILDHOOD EDUCATION: MEETING THE CHALLENGE OF LINGUISTIC AND CULTURAL DIVERSITY IN EARLY CHILDHOOD EDUCATION 1, 13–14 (Eugene E. Garcia et al. eds., 1995).

141. See Virginia Buyesse et al., *Friendship Formation in Inclusive Early Childhood Classrooms: What Is the Teacher's Role*, 18 EARLY CHILDHOOD RES. Q. 485, 495–97 (2003); Carollée Howes et al., *Classroom Dimensions Predict Early Peer Interaction When Children Are Diverse in Ethnicity, Race, and Home Language*, 26 EARLY CHILDHOOD RES. Q. 399, 405 (2011); Francisco Palermo et al., *Preschoolers' Academic Readiness: What Role Does the Teacher-Child Relationship Play*, 22 EARLY CHILDHOOD RES. Q. 407, 418–19 (2007).

how children learn, teachers who face a diverse classroom may require support to provide sensitive and effective preschool instruction.¹⁴²

The valuable experience of diverse peers is not necessarily limited to lower skilled children, who are disproportionately low-SES. By kindergarten, children have generally developed beliefs regarding racial, ethnic, and socio-economic identities,¹⁴³ as well as skills of social comparison.¹⁴⁴ Exposure to peers from varied racial, ethnic, and socio-economic backgrounds may inform these social categorizations and destabilize emergent prejudices.¹⁴⁵ Socio-economically and racially diverse classrooms could also diminish the social isolation that characterizes children living in demographically homogenous neighborhoods, whether they are high, middle, or low-SES.

C. *How Can States Foster Diversity in Their Preschool Programs?*

While racial segregation in K-12 schools has been on the rise in recent years, racial integration in preschool may be increasing where families seek high-quality options and states afford wider access to programs. The data here suggest that at least some states are already finding socio-economic and racial/ethnic diversity in their pre-K classrooms and not necessarily only in states that have “universal” access. Some states that target their pre-K to children from low-income families allow such families to enroll in state-licensed programs that also receive private funding. This makes it possible that children land in classrooms with a mixture of public and privately funded children who represent a variety of backgrounds.

Since the data for this analysis were collected,¹⁴⁶ state pre-K enrollment has doubled.¹⁴⁷ Though enrollment gains have slowed since

142. See LISA DELPIT, *OTHER PEOPLE’S CHILDREN: CULTURAL CONFLICT IN THE CLASSROOM* 52–56 (2005 ed.); SHIRLEY BRICE HEATH, *WAYS WITH WORDS: LANGUAGE, LIFE, AND WORK IN COMMUNITIES AND CLASSROOMS* 4–8 (1983).

143. See Rebecca S. Bigler & Lynn S. Liben, *Developmental Intergroup Theory: Explaining and Reducing Children’s Social Stereotyping and Prejudice*, 20 *CURRENT DIRECTIONS PSYCHOL. SCI.* 162, 162–66 (2007); Judith A. Chafel & Carin Neitzel, *Young Children’s Ideas About the Nature, Causes, Justification, and Alleviation of Poverty*, 20 *EARLY CHILDHOOD RES. Q.* 433, 433–50 (2005); Tobias Raabe & Andreas Beelmann, *Development of Ethnic, Racial, and National Prejudice in Childhood and Adolescence: A Multinational Meta-Analysis of Age Differences*, 82 *CHILD DEV.* 1715, 1715–37 (2011).

144. See Carollee Howes et al., *Peer Interaction of Young Children*, 53 *MONOGRAPHS SOC’Y FOR RES. IN CHILD DEV.* 1. v (1988); Drew Nesdale & Debbie Flessner, *Social Identity and the Development of Children’s Group Attitudes*, 72 *CHILD DEV.* 506, 507 (2001).

145. See Carollee Howes & Fang Wu, *Peer Interactions and Friendships in an Ethnically Diverse School Setting*, 61 *CHILD DEV.* 537, 537 (1990).

146. Data for this analysis were collected from 2001 to 2004.

2008, 41 percent of four-year-olds and 14 percent of three-year-olds are served in publicly funded pre-K, Head Start, or special education programs.¹⁴⁸ As access expands, the opportunities for fostering diversity also increase. Despite slower or no growth in funding, many states continue to develop systemic supports for quality, such as the use of early learning standards, professional development, and formative assessments.

In this context, if states wish to encourage diversity, they must make considered policy choices. The political and policy landscape for early education is quite different from that of public K-12 schooling. Foremost, early education is not compulsory, and the tradition of allowing families to choose whether to enroll their children in preschool is rarely contested. This practice makes parents the ultimate arbiters of quality within the constraints of supply; although, for low and middle-income families, the choices are often meager and low quality.¹⁴⁹

Research suggests that many families from different backgrounds conceptualize overall “quality” and the goal of “readiness” in similar ways.¹⁵⁰ Though little research has been done with middle-class parents, one study that included a mix of low, middle, and high-income parents found that elements of socio-economic status were not associated with significant differences in parental beliefs regarding the importance of school readiness, although employed parents were more likely than unemployed parents to cite inferential skills in addition to nominal skills as a measure of school readiness.¹⁵¹ Lower-income parents may also favor more didactic instruction of basic or nominal skills.¹⁵² Even so, families from different backgrounds may choose diverse programs due to

147. W. STEVEN BARNETT ET AL., NAT’L CTR. FOR EDUC. STATISTICS, THE STATE OF PRESCHOOL 2013, at 6–7 (2014), available at <http://nces.ed.gov/pubs2014/2014078.pdf>.

148. *Id.*

149. See Burchinal et al., *supra* note 22, at 705; Fuller et al., *supra* note 22, at 507; Hatfield et al., *supra* note 22, at 318.

150. See Oscar A. Barbarin et al., *Quality of Prekindergarten: What Families Are Looking for in Public Sponsored Programs*, 17 EARLY EDUC. & DEV. 619, 639, 640 (2006); Bruce Fuller et al., *How Do Mothers Choose Child Care? Alternative Cultural Models in Poor Neighborhoods*, 69 SOC. EDUC. 83, 96–97, 100 (1996); Chaya S. Piotrkowski, Michael Bostko & Eunice Matthews, *Parents’ and Teachers’ Beliefs About Children’s School Readiness in a High-Need Community*, 15 EARLY CHILDHOOD RES. Q., 537, 553 (2000).

151. See Oscar A. Barbarin et al., *Parental Conceptions of School Readiness: Relation to Ethnicity, Socioeconomic Status, and Children’s Skills*, 19 EARLY EDUC. & DEV. 671, 688 (2008).

152. See *id.* at 677; Fuller et al., *supra* note 150, at 97; Susan D. Holloway et al., *What is “Appropriate Practice” at Home and in Child Care?: Low-Income Mothers’ Views on Preparing Their Children for School*, 10 EARLY CHILDHOOD RES. Q. 451, 453 (1995); Deborah Stipek, *Teaching Practices in Kindergarten and First Grade: Different Strokes for Different Folks*, 19 EARLY CHILDHOOD RES. Q. 548 (2004).

common perceptions of their quality. Full-day programs with convenient locations are also in demand.¹⁵³

Beyond household economics, market supply, and perceptions of quality, cultural considerations may play an important role both in parents' decisions regarding preschool¹⁵⁴ and in the social climate of the school once they get there.¹⁵⁵ Cultural dissonance, manifested in program practice and language barriers, could contribute to the relatively low public preschool participation rates among Latino families.¹⁵⁶ Families may seek programs in which their culture predominates and where the services they require are offered.¹⁵⁷ Latino families, for example, may be particularly interested in dual language services. The duration of the program, or the availability of "wrap-around" child care services, may be especially relevant to low-SES parents with inflexible work demands.¹⁵⁸

Given the primacy accorded to parents in whether and where to enroll their children in preschool, policy that intends to expand enrollment in high-quality preschool while fostering diversity must consider elements of quality as defined by both research and the preferences of parents. This dynamic conception of quality reflects what Sharon L. Kagan and Nancy E. Cohen describe as a two-way dialogue between policymakers and parents regarding the meaning of quality.¹⁵⁹

States that are expanding access to pre-K, therefore, could support the development of diverse programs in several ways. States could: (1) allow funds for pre-K to "follow" children to the programs that parents choose, rather than relying on neighborhood public schools, which are likely to reflect predominant patterns of residential segregation; (2) offer higher levels of financial support to programs that serve a diverse and multi-lingual array of families; (3) strive to locate new programs on the boundaries of neighborhoods that might attract families with different

153. See Barbarin et al., *supra* note 151, at 634.

154. See Fuller et al., *supra* note 150, at 100.

155. See JENNIFER BURNS STILLMAN, GENTRIFICATION AND SCHOOLS: THE PROCESS OF INTEGRATION WHEN WHITES REVERSE FLIGHT 125–26 (2012).

156. See BRUCE FULLER, STANDARDIZED CHILDHOOD: THE POLITICAL AND CULTURAL STRUGGLE OVER EARLY EDUCATION 256–57 (2007); Bruce Fuller et al., *Rich Culture, Poor Markets: Why Do Latino Parents Forgo Preschooling?*, 97 TCHRS. C. REC. 400, 412–16 (1996); Xiaoyan Liang et al., *Ethnic Differences in Child Care Selection: The Influence of Family Structure, Parental Practices, and Home Language*, 15 EARLY CHILDHOOD RES. Q. 357, 357, 363–64 (2000).

157. See FULLER, *supra* note 156, at 412–416.

158. See Young Eun Chang et al., *The Effects of Welfare and Employment Programs on Children's Participation in Head Start*, 26 ECON. EDUC. REV. 17, 30 (2007).

159. See SHARON L. KAGAN & NANCY E. COHEN, NOT BY CHANCE: CREATING AN EARLY CARE AND EDUCATION SYSTEM FOR AMERICA'S CHILDREN: ABRIDGED REPORT 34 (1997), available at <http://files.eric.ed.gov/fulltext/ED417027.pdf>.

SES and racial/ethnic backgrounds; (4) consider locating programs in or near large employers, such as hospitals, universities, and corporate offices, where employees with children may represent a diverse array of SES and racial/ethnic backgrounds; (5) offer financial support for transportation to parents who choose a program that is not within walking distance; (6) support training and professional development for teachers who will or do work in diverse classrooms.

D. Limitations

As with any quasi-experimental study, the analysis has limitations. It is possible that the results are affected by selection bias, *i.e.*, that the parents who enroll children in higher-SES and/or more diverse programs support their children's learning in unmeasured ways that are different from parents who do not. I attempted to reduce this potential bias by (1) including a measure for mothers' education, which is embedded in the SES measure, and (2) using an ANCOVA approach, both of which help to account for the advantages that children experience prior to preschool entry. It is encouraging that the results here are consistent with other research that has used alternative strategies to account for selection bias, including randomization.¹⁶⁰

It is also possible that any "preschool effects" are confounded with the effects of a child's residential neighborhood. Although I cannot account for residential measures within the present dataset, other research has been able to identify significant effects for socio-economic and racial/ethnic composition in kindergarten and elementary school, independent of any neighborhood effects.¹⁶¹ While this lends support to the findings here, they nevertheless should be interpreted with due caution.

Finally, it is worth noting that I seek to have the findings replicated, and that because Reid and Ready used the same dataset, this study cannot be seen as a replication of those results.¹⁶² The obstacle remains of finding a preschool dataset with a nested data structure that allows multi-level modeling to identify class-level compositional effects. While many states are improving their early-education data collection, understandable concerns about privacy discourage them from collecting child-level and class-level measures of family income, education, and other background characteristics, as well as child assessment scores, in one dataset. This

160. See Kainz & Pan, *supra* note 29, at 533; SCHWARTZ, *supra* note 29, at 5.

161. See Benson & Borman, *supra* note 29, at 1376; Ready & Silander, *supra* note 29 at 103–05.

162. See Reid & Ready, *supra* note 35, at 1090–91.

2015] THE RACIAL AND ETHNIC COMPOSITION OF PRE-KINDERGARTEN 685

represents an impediment to policy research in this important area of early education.

CONCLUSION

If low-SES children attend high-poverty, racially segregated schools, they confront a double disadvantage if they arrive unprepared for the social and cognitive demands of schooling and yet, find that their schools are unprepared to address this disadvantage. High-quality preschool can help narrow the readiness gap, and socio-economic and racial/ethnic composition may be important components of its quality. States that have fostered the creation of higher-SES and racially diverse pre-K classrooms are already capturing the benefits. In the rapidly evolving field of early education, the opportunities to expand children's access to such classrooms deserve attention.