Quality Disparities in Child Care for At-Risk Children:

Comparing Head Start and Non-Head Start Settings

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Contributor's Statement Page

Marianne M. Hillemeier: Conceived of the idea for the focus of the manuscript; contributed to design of the analyses and interpretation of the results; took the lead in drafting the initial and subsequent versions of the manuscript; ensured that all authors approved of the final version of the manuscript submitted.

Paul L. Morgan: Made substantial contributions to the framing of the paper, design of the analyses, and interpretation of the results; revised drafts of the manuscript critically for intellectual content; approved the final version of the manuscript submitted.

George Farkas: Made substantial contributions in the conception of the manuscript; took the lead in the design of the analyses and interpretation of the results; provided substantial contributions, revisions, and comments on all drafts of the manuscript; approved the final version of the manuscript submitted.

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ABSTRACT

Objectives: Child care quality has an important influence on children's development, especially among those at risk due to low birthweight and/or socioeconomic disadvantage. This study describes types and quality of child care settings experienced by children at elevated risk compared to other children, examines differences in child care quality between Head Start and non-Head Start settings, and identifies factors associated with receiving higher-quality child care.

Methods: Child care and sociodemographic data were analyzed for 7,500 children aged 48 months in the Early Childhood Longitudinal Survey, Birth Cohort. Descriptive statistics and multivariate regression models are presented, weighted to produce nationally representative estimates.

Results: Less than one-third of poor children were in Head Start programs. Child care quality was higher in Head Start centers compared to other centers, particularly among poor children (4.75 vs. 4.28, $p<0.05$), Hispanics (4.90 vs. 4.45, $p<0.05$), and whites (4.89 vs. 4.51, $p<0.05$). African Americans experienced the lowest quality care in both Head Start and non-Head Start centers. A quality disadvantage was associated with Head Start in family day care settings, especially for low birthweight children (2.04 in Head Start vs. 3.58 in non-Head Start, $p<0.05$). Lower family day care quality was associated with lower maternal education and African American and Hispanic ethnicity.

Conclusions: Center-based Head Start programs provide higher quality child care for children at developmental risk, and expansion of center-based Head Start services is likely to facilitate school readiness in these populations. Quality disadvantages in Head Start family day care settings are worrisome and warrant investigation.

Over 60 percent of preschool children regularly receive some form of non-parental child care,[1] and the quality of this care has been shown to have a powerful influence on their development and well-being throughout childhood and beyond.[2] High-quality child care is associated with enhanced cognitive development, greater language and math proficiency, better social skills and interpersonal relationships, and improved behavioral self-regulation.[3-7] These skills and behaviors are components of optimal school readiness which, in turn, is predictive of higher educational attainment and more favorable economic and health status in adulthood.[8-10] A recent policy statement from the American Academy of Pediatrics Committee on Early Childhood, Adoption, and Dependent Care underscores the importance of consistent, developmentally sound, and emotionally supportive child care, and stresses that the negative effects of poor-quality child care on school readiness and subsequent school success are magnified for children from disadvantaged situations or with special needs.[11]

It is concerning that while young children at risk of developmental delay due to low birthweight and/or disadvantaged family circumstances have been repeatedly shown to experience sustained benefits from enriching child care environments,[12-14] these populations do not consistently receive care in such settings. Indeed, evidence from the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care suggests that children in economically disadvantaged and race/ethnic minority families tend to experience disproportionately poor quality child care. [3, 15] The NICHD study also found that school readiness outcomes systematically vary across different types of child care settings. Children who attended child care centers showed better cognitive and language development relative to those in family day care and other home-based settings, although they also exhibited somewhat more behavior problems. [16]

Head Start is the major federally subsidized program addressing differential child care access by providing programs that integrate educational and supportive services into care for young children,[17] and recent evaluations of samples of Head Start facilities characterize the quality of the child care provided as generally good.[18, 19] At the population level, however, it is not known how the quality of child care

received by children at developmental risk due to low birthweight and/or disadvantaged family circumstances compares with child care received by other children, and to what extent the Head Start program makes a difference in the quality of care available to these vulnerable sub-groups. Furthermore the Head Start program includes both center-based and family day care services, and while a demonstration project conducted in 2000 concluded that family day care homes "can meet Head Start standards of quality," [20] relatively little research has focused on evaluating Head Start family day care settings.

This study analyzes data from a new, nationally representative dataset, the Early Childhood Longitudinal Survey, Birth Cohort (ECLS-B). The research objectives are: 1) to determine the types and quality of child care settings currently experienced by populations of children at elevated risk of developmental delay as compared to child care settings experienced by other children; 2) to examine differences in child care quality between Head Start and non-Head Start settings for populations of children at elevated developmental risk; and 3) to identify individual and contextual characteristics that are associated with enrollment in higher-quality child care settings.

Methods

Data

The ECLS-B includes a national cohort of children born in 2001. The cohort was selected from birth certificates, and contains oversamples of low birthweight children. Sample weights provided in the ECLS-B are incorporated into the statistical analyses to produce nationally representative estimates. At 9, 24, 48, and 60 months of age, ECLS-B field staff interviewed children's parents and administered child assessments. Data from birth certificates and from the 48 month data collection are included in the present analyses. Information from parents about their primary child care arrangements at 48 months is available for 7,500 children who also have complete information on the key analytic variables of birthweight, poverty status, and race/ethnicity (see Table 1). Note that in accordance with ECLS-B data

confidentiality requirements (available at: http://nces.ed.gov/ecls/birthdatainformation.asp) this sample size and all other unweighted sample sizes reported have been rounded to the nearest 50. Standardized observational ratings of the quality of the primary child care settings were conducted for a randomly selected subsample of the ECLS-B cohort, and the analyses involving child care quality are restricted to those children with complete data on quality of child care and other study variables (n= 1,250).

Measures

Child Care Quality

Early Childhood Environmental Rating Scale, Revised Edition (ECERS): This observational measure of quality in center-based child care was developed and updated by Harms, Clifford, and Cryer.[21, 22] The scale consists of 43 items that yield an overall score and subscale scores measuring learning activities, listening and talking, program structure, interaction, personal care routines, and furnishings and display. Items are scored from 1 to 7 with descriptors for odd numbers such that 1=inadequate, 3=minimal, 5=good, and 7=excellent care; higher scores indicate higher quality care.

Family Day Care Rating Scale (FDCRS): This instrument, developed by Harms and Clifford,[23] measures quality in family day care settings and is similar in structure to the ECERS. It contains 40 items grouped in subscales that include learning activities, language/reasoning, social development, basic care, and space and furnishings. The FDCRS is scored in a manner similar to the ECERS on a 1 to 7 scale, with higher scores indicating higher quality care. The FDCRS and ECERS scores are not directly comparable, however, because the number and characteristics of some scale items differ, and previous research using principal components analysis identified slightly different underlying constructs.[24]

Individual and Contextual Characteristics

Low Birthweight: Children with birthweights <2500 grams were coded as low birthweight.

Poverty: Parents were asked whether their annual household income was $25,000 and less or greater than $25,000, and they were also asked detailed range questions within the broad range specified. Income and household size at the 48 month assessment were used to classify families as in poverty or not in poverty with reference to the Federal poverty level.

Race/Ethnicity: Race/ethnicity of the child was ascertained in the ECLS-B from parent responses to questions providing a fixed set of race/ethnic categories, with the option to choose more than one race. Race/ethnic categories included white, African American, Hispanic, Asian, Native American, and other/mixed race. In the analyses of child care quality, Native American and other/mixed race were excluded due to small numbers of children in some child care settings.

Child Sex: Females were the designated reference category (coded as 0), with male children coded as 1.

Child Age: Data come from the ECLS-B 48 month assessment. However, because in practice some children were assessed prior to or after 48 months of age, age in months was included as a control.

Mother's Education: Mother's education was classified as: 1) 8^{th} Grade or below; 2) 9^{th} to 12^{th} Grade; 3) High School graduate; 4) Some college; and 5) College graduate (reference category).

Marital Status: Mothers were coded as married or unmarried based on their responses at the 48 month assessment, with married designated as the reference category.

Mother's Employment: Mothers were classified as employed full time (35 or more hours per week), part time (<35 hours per week), or not employed outside the home (reference category).

Region of Residence: Residential location was classified as Midwest, South, West, or North (reference category).

Rurality: The ECLS-B data classifies residential location based on 2000 US Census definitions as either 1) urban inside an urbanized area; 2) urban inside an urban cluster; or 3) rural (outside of urbanized areas

and urban clusters). For this analysis, the two urban classifications were combined to create a dichotomous rural/urban variable, with urban as the reference category.

Analyses

Frequency distributions of primary child care setting at 48 months of age were computed by poverty status, race/ethnicity, and birthweight status. Mean quality of child care scores and associated standard deviations were computed for children in each of these risk categories, for the full sample and separately for Head Start and non-Head Start center and family day care facilities. The statistical significance levels of differences in means by Head Start/non-Head Start status and within risk type were determined by t-tests. To investigate in detail the determinants of quality care for children in family day care, ordinary least squares regression models were estimated with quality of family day care score (FDCRS) as the dependent variable. All analyses were weighted to produce nationally representative estimates, and were conducted using SAS version 9.1.8 statistical software.

Results

Table 1 displays the primary child care settings experienced by populations of children with different risk characteristics at 48 months. As expected based on program eligibility requirements, poor children were more likely to enroll in Head Start than non-poor children (28.7% vs. 8.0%), however it is notable that the Head Start program reached fewer than one-third of all poor children. Considerable race/ethnic variation was seen in child care settings. Those most likely to be enrolled in Head Start were African Americans (31.5%), and Native Americans (31.2%), while only 7.9% of the white population was enrolled. Although Hispanic families experience economic disadvantage at rates similar to African American families,[25] Hispanic children are much less likely to be enrolled in Head Start (22.0% vs. 31.5%). Approximately one-fifth of children born at low birthweight were enrolled in Head Start. The majority of white and non-poor children received childcare primarily in non-Head Start centers. The

largest percentages of children experiencing only parental care were seen among those in poverty (25.1%), Hispanics (24.7%), and Native Americans (23.6%).

Mean quality of care ratings are presented by risk category in Table 2. Overall quality scores for center-based care are similar for poor compared to non-poor children and for non-White compared to White children, but are somewhat lower for children born at low birthweight and/or preterm relative to other children (4.46 vs 4.58), although this difference is not statistically significant. In contrast, family day care settings show large differences that disadvantage at-risk children. The mean quality rating of 2.86 among poor children is nearly a full point lower than the rating among non-poor children of 3.65, and a similar discrepancy is found among non-White compared with White children (2.88 vs. 3.75). This is close to a one standard deviation difference in quality.

To more closely examine the impact of Head Start enrollment on child care quality for specific child populations, Table 3 presents mean quality scores for Head Start and non-Head Start center-based and family day care settings calculated separately by poverty status, race/ethnicity, and birthweight category. Looking first at center care in the upper half of the table, mean child care quality ratings are consistently higher in Head Start as compared to non-Head Start for all groups. Statistically significant differences are seen favoring Head Start centers among poor children (4.75 vs. 4.28), Hispanics (4.90 vs. 4.45), whites (4.89 vs. 4.51), and non-low birthweight children (4.77 vs. 4.48). Among race/ethnic groups, center care for African American children is rated lowest in quality in both Head Start and non-Head Start settings. Poor children in non-Head Start centers also experience care of significantly lower quality than non-poor children (4.28 vs. 4.47).

The lower part of Table 3 provides mean quality scores for family day care settings. In contrast to findings for centers, quality disadvantage is associated with Head Start in family day care. The quality gap is particularly large for low birthweight children in family day care, where the mean quality score of 2.04 in Head Start is significantly lower than the mean of 3.58 in non-Head Start settings. Non-poor

children in Head Start family day care also experience a significant quality disadvantage (2.75 vs. 3.70). As was the case for center care, family day care ranks among the lowest quality for African American children compared with white children in both Head Start and non-Head Start facilities; Head Start family day care settings for Hispanic children are also of significantly poorer quality than those of white children. A large disadvantage is also seen for poor children in non-Head Start facilities.

Because the overall disparities in child care quality by poverty and race/ethnicity were most pronounced in family day care settings (Table 2), regression models were estimated to quantify the association of various characteristics with receipt of higher quality family day care services. In Model 1 of Table 4, poverty status is included as the only covariate, and the negative and statistically significant coefficient is consistent with the quality disadvantage seen among poor children in the bivariate analysis. Model 2 adds a group of sociodemographic, birth-related, and child care variables to the regression. This model reveals that the association between poverty and lower quality child care can largely be accounted for by the included covariates. The strongest effects are seen for mothers' education, which shows a graded relationship such that increasing education is associated with higher quality child care. Race/ethnicity is also a significant factor, with African American and Hispanic children experiencing significantly lower care quality even after controlling for poverty, mother's education and the other covariates. After taking sociodemographic factors into account, Head Start enrollment remains significantly associated with lower quality care in family day care settings. In addition, location in the Southern region is significantly associated with lower quality family day care.

Discussion and Conclusions

Utilizing a nationally representative dataset, this study provides new information about the types and quality of child care settings currently experienced by populations of children at elevated risk of developmental delay, and how the quality of Head Start programs compares to other types of child care. Several key themes that emerge from the analyses are discussed below.

Head Start centers provide a means of accessing high quality child care for at-risk populations of children, but reach comparatively few children who could benefit from them

The analyses of center-based child care quality were remarkable in that not only did Head Start programs do as well as non-Head Start programs, they were superior and especially so for groups of children most likely to need them. Particularly among children in poverty, average care in the non-Head Start centers was significantly lower in quality than care in Head Start centers. Since high-quality child care has been shown to improve long-term developmental outcomes,[2] this is good news for potentially vulnerable children who are enrolled in Head Start centers. Unfortunately, however, the findings also underscore the comparative disadvantage experienced by many at-risk children who do not have access to Head Start centers. Our nationally representative estimates suggest that Head Start programs reach less than one-third of impoverished children and only about one-fifth of those born at low birthweight. Although funding for Head Start was recently increased by $122 million through enactment of Public Law 111-117 in December of 2009, those funds are designated to offset cost of living increases and existing operating expenses rather than to increase the enrollment capacity.

Race/ethnic disparities in child care quality are present across types of child care settings, with African American children most likely to experience lower-quality child care

Findings from the present study are consistent with previous research indicating that, on average, African American children are enrolled in child care that is of comparatively lower quality. For example, child care data from the Cost, Quality, and Outcomes Project and the NICHD Study of Early Child Care examined by Burchinal and Cryer[26] demonstrated that caregiving environments experienced by African American children received lower quality ratings than those of white children in both studies. Aspects of care quality evaluated included caregiver responsiveness and sensitivity, qualities known to be associated with optimal facilitation of child development and school readiness. Given the current emphasis on

reducing racial gaps in school achievement, increasing African American children's access to high quality child care should be an integral part of the policy approach to this issue.[27-29]

Head Start family day care programs do not appear to provide quality advantages for at-risk children, and this warrants further investigation

The delivery of Head Start services in family day care homes began in the mid-1980s to meet the needs of families facing constraints to center-based care including lack of transportation and incompatible work hours.[30] A federally-funded demonstration project evaluating Head Start services in family child care home settings published in 2000 concluded that family child care homes appeared to provide a viable option for delivering Head Start services, especially in more remote rural areas and among families who need extended hours of care for their children.[30] Findings from the present multivariate analyses that Head Start family day care programs had lower overall quality scores compared to non-Head Start family-based settings, even after taking family characteristics and residential location into account, suggest that further evaluation may be needed to identify potential areas for quality improvement.

The analyses presented are subject to limitations, including the size of the sample for some subgroups of interest. Although the ECLS-B oversampled children who were born at low birthweight, for example, the numbers of these children in each child care setting were comparatively small. This is the result of the ECLS-B collecting child care services data for only a modest number of (randomly selected) children. Larger sample sizes would allow calculation of more precise estimates and might reveal important differences experienced by low birthweight and other subgroups of children. It would also be very helpful to know more about variation among Head Start facilities, particularly regarding the degree to which they adhered to federally established program guidelines. Parents' preferences and decision-making processes regarding choice of child care arrangements are also important factors that were not assessed in the ECLS-B.

In conclusion, population-based evidence confirms that center-based Head Start programs generally provide comparatively higher quality child care for groups of children at developmental risk and particularly those in poverty. Expansion of these programs is likely to result in greater promotion of school readiness in at-risk child populations, which will in turn foster higher ultimate educational attainment and greater well-being throughout childhood and beyond. However, family day care facilities sponsored by Head Start were shown to be of lower quality than non-Head Start facilities, a finding that should be investigated further.

Table 1. Primary Child Care Setting among 48 Month Olds by Child Characteristics (n=7,500[a])

Child Care Setting	Poor	Non-Poor	African American	Hispanic	Asian	Native American	White	LBW	Not LBW
	N=2450	**N=5100**	**N=1200**	**N=1450**	**N=750**	**N=150**	**N=3350**	**N=2000**	**N=5550**
Head Start[b]	28.7 %[c]	8.0 %	31.5 %	22.0 %	8.5 %	31.2 %	7.9 %	21.6 %	14.8%
Non-Head Start Center Care	26.3 %	56.3 %	37.8 %	31.6 %	59.2 %	27.0%	54.9 %	43.8 %	46.4%
Relative Care	15.0 %	11.9 %	13.6 %	15.6 %	13.1 %	13.0 %	11.1 %	12.0 %	12.9%
Non-Relative Care	4.9 %	9.6 %	5.5 %	6.3 %	4.2 %	5.2 %	9.5 %	5.4 %	8.0%
No Non-Parental Care	25.1 %	14.2 %	11.6 %	24.7 %	15.0 %	23.6 %	16.6 %	17.2 %	17.9%
	100 %	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

[a] Sample sizes are rounded to nearest 50 per ECLS-B data confidentiality requirements (see text)
[b] Includes both center-based and non-center-based Head Start settings
[c] Percentages are weighted to represent nationally representative estimates

Table 2. Mean Overall Quality of Care By Child Characteristics in Center Care[a] and Family Day Care[b] Settings

	Center Care			Family Day Care		
	N[c]	Mean	STD	N	Mean	STD
Poor	285,199	4.55	0.97	52,810	2.86[d]	1.08
Non-Poor	369,373	4.58	1.05	119,503	3.65	1.06
Non-White	324,322	4.54	1.03	67,887	2.88[d]	0.99
White	330,240	4.60	0.99	104,426	3.75	1.06
Low Birthweight	55,941	4.46	0.98	10,974	3.40	1.22
Non-Low Birthweight	598,631	4.58	1.03	161,339	3.41	1.07

[a] Center-based quality of care measured by the Early Childhood Environment Rating Scale (ECERS)[21, 22]
[b] Family-based quality of care measured by the Family Day Care Rating Scale (FDCRS)[23]
[c] Sample sizes and corresponding means are weighted to represent national estimates
[d] $p<0.001$

Table 3. Comparison of Child Care Quality by Child Characteristics in Head Start and Non-Head Start Centers[a] and Family Day Care[b]

I. CENTER CARE

	Head Start (HS)			Non-Head Start (nonHS)			HS-non HS Difference
	N[c]	Mean	STD	N	Mean	STD	
Poor Children	167,786	4.75	0.87	117,413	**4.28**[d]	1.04	[e]
Non-Poor Children	66,972	4.74	1.02	302,401	*4.55*	1.05	
African American	77,596	**4.47**	1.00	57,671	4.32	1.17	
Hispanic	75,430	*4.90*	0.76	80,949	4.45	1.09	[e]
Asian	9,300	*4.76*	0.80	23,386	4.43	0.97	
White	72,432	*4.89*	0.79	257,809	4.51	1.02	[e]
Low Birthweight	23,119	4.55	0.92	32,822	4.40	1.01	
Non-Low Birthweight	211,639	4.77	0.90	386,992	4.48	1.07	[e]

II. FAMILY DAY CARE

Poor Children	10,930	2.74	1.21	41,880	**2.89**	1.05	
Non-Poor Children	6,884	2.75	0.67	112,619	*3.70*	1.07	[e]
African American	3,464	**2.37**	0.56	19,438	**2.82**	0.86	
Hispanic	4,653	**2.18**	0.50	30,928	2.96	1.05	
Asian	1,800	2.66	1.15	7,605	3.40	0.99	
White	7,897	*3.26*	0.85	96,529	*3.79*	1.07	
Low Birthweight	1,269	2.04	0.90	9,705	3.58	1.19	[e]
Non-Low Birthweight	16,545	2.80	0.97	144,794	3.48	1.07	

[a] Early Childhood Environment Rating Scale (ECERS)[21, 22]
[b] Family Day Care Rating Scale (FDCRS)[23]
[c] Sample sizes and means are weighted to represent national estimates
[d] Means that are bolded are significantly different from the italicized means in that particular risk group/child care setting, $p<0.05$
[e] $p<0.05$

Table 4. OLS Regression Modeling Child Care Quality in Family Day Care[a] (n=300[b])

	FDCERS	
	Model 1	Model 2
Intercept	3.64[e]	2.51[d]
Poor at 48 Months	-0.78[e]	-0.14
Head Start at 48 Months		-0.48[c]
Male		-0.07
Low Birthweight		0.12
Child Age in Months at 48 Months		0.03
African American		-0.56[d]
Hispanic		-0.54[d]
Asian		-0.34
Other/Mixed Race		-0.32
Mother's Education, 8th Grade or Below		-0.89[d]
Mother's Education, 9th to 12th Grade		-0.67[d]
Mother's Education, High School Grad		-0.64[e]
Mother's Education, Some College		-0.32[c]
Not Married at 48 Months		-0.11
Mother's Employment, part time		0.26
Mother's Employment, full time		0.28
Mid-West		-0.19
South		-0.49[c]
West		0.20
Rural		0.20
R^2	0.109	0.325

[a] Family-based quality of care measured by the Family Day Care Rating Scale (FDCRS)[23]
[b] Sample sizes are rounded to nearest 50 per ECLS-B data confidentiality requirements (see text)
[c] $p<0.05$
[d] $p<0.01$
[e] $p<0.001$

References

1. Federal Interagency Forum on Child and Family Statistics. *America's Children: Key Indicators of Well-Being, 2009.* Washington DC: US Government Printing Office;2009.
2. Vandell DL, Burchinal M, Vandergrift N, Belsky J, Steinberg L, NICHD Early Child Care Research Network. Do effects of early child care extent to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development.* 2010;81(3):737-756.
3. NICHD Early Child Care Research Network. Child-care effect sizes for the NICHD Study of Early Child Care and Youth Development. *Am Psychol.* Feb-Mar 2006;61(2):99-116.
4. Love JM, Harrison L, Sagi-Schwartz A, et al. Child care quality matters: how conclusions may vary with context. *Child Dev.* Jul-Aug 2003;74(4):1021-1033.
5. Belsky J. Early child care and early child development: Major findings of the NICHD study of early child care *European Journal of Developmental Psychology.* 2006;3(1):95-110.
6. Peisner-Feinberg ES, Burchinal MR, Clifford RM, et al. The relation of preschool child-care quality to children's cognitive and social developmental trajectories through second grade. *Child Dev.* Sep-Oct 2001;72(5):1534-1553.
7. Burchinal MR, Roberts JE, Riggin R, Jr., Zeisel SA, Neebe E, Bryant D. Relating quality of center-based child care to early cognitive and language development longitudinally. *Child Dev.* Mar-Apr 2000;71(2):339-357.
8. Duncan GJ, Dowsett CJ, Claessens A, Magnuson KA. School readiness and later achievement. *Developmental Psychology.* 2007;43(6):1428-1446.
9. Hertzman C, Power C. A life course approach to health and human development. In: Heymann J, Hertzman C, Barer ML, Evans RG, eds. *Healthier Societies: From Analysis to Action*. New York NY: Oxford University Press:83-106.
10. Belsky J, Vandell DL, Burchinal M, Clarke-Stewart KA, McCartney K, Owen MT. Are there long-term effects of early child care? *Child Dev.* Mar-Apr 2007;78(2):681-701.
11. American Academy of Pediatrics CoEC, Adoption, and Dependent Care. Quality early education and child care from birth to kindergarten. *Pediatrics.* Jan 2005;115(1):187-191.
12. Campbell FA, Pungello EP, Miller-Johnson S, Burchinal M, Ramey CT. The development of cognitive and academic abilities: growth curves from an early childhood educational experiment. *Dev Psychol.* Mar 2001;37(2):231-242.
13. McCormick MC, McCarton C, Tonascia J, Brooks-Gunn J. Early educational intervention for very low birth weight infants: results from the Infant Health and Development Program. *J Pediatr.* Oct 1993;123(4):527-533.
14. Schweinhart LJ, Montie J, Xiang Z, Barnett WS, Belfield CR, Nores M. *Lifetime effects: The HighScope Perry Preschool study through age 40.* Ypsilanti MI: Monographs of the HighScope Educational Research Foundation, 14;2005.
15. NICHD Early Child Care Research Network. Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care and Youth Development. *American Educational Research Journal.* 2002;39:133-164.
16. NICHD Early Child Care Research Network. Type of child care and children's development at 54 months. *Early Childhood Research Quarterly.* 2004;19(2):203-230.
17. USDHHS Administration for Children and Families. About the Office of Head Start. 2010; http://www.acf.hhs.gov/programs/ohs/about/index.html.
18. Administration for Children and Families. *Head Start Performance Measures: Second Progress Report*. Washington DC: US DHHS; 1998.
19. Administrations for Children and Families. *Faces Findings: New Research on Head Start Outcomes and Program Quality*. Washington DC: USDHHS; 2006.

20. USDHHS Administration for Children and Families. *Evaluation of Head Start Family Day Care Demonstration: Final Report.* Washington DC2000.
21. Harms T, Clifford RM, Cryer D. *Early childhood environmental rating scale-revised edition*. New York, NY: Teachers College Press; 1998.
22. Harms T, Clifford RM, Cryer D. *Early childhood environmental rating scale--revised edition*. New York, NY: Teachers College Press; 2005.
23. Harms T, Clifford RM. *Family day care rating scale*. New York, NY: Teachers College Press; 1989.
24. Fuller B, Kagan SL, Loeb S, Chang YW. Child care quality: centers and home settings that serve poor families. *Early Childhood Research Quarterly.* 2004;19:505-527.
25. US Census Bureau. *Current Population Survey, 2009 Annual Social and Economic Supplement.* Available at: http://www.census.gov/hhes/www/cpstables/032009/pov/new03_100.htm2009.
26. Burchinal MR, Cryer D. Diversity, child care quality, and developmental outcomes. *Early Childhood Research Quarterly.* 2003;18:401-426.
27. Magnuson KA, Waldfogel J. Early childhood care and education: effects on ethnic and racial gaps in school readiness. *Future Child.* Spring 2005;15(1):169-196.
28. Wolfe B, Vandell DL. Child care for low-income working families. *Focus.* 2002;22(1):106-111.
29. High PC. School readiness. *Pediatrics.* Apr 2008;121(4):e1008-1015.
30. Faddis BJ, Ahrens-Gray P, Klein EL. *Evaluation of Head Start Family Child Care Demonstration.* Washington DC: Administration on Children, Youth and Families;2000.