



Kentucky Invests in Developing Success

Early Care & Education Evaluation Final Report 2012-2014



University of Kentucky

Third Party Evaluation
Kentucky's Early Care and Education System
University of Kentucky

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Background

Kentucky has a history of successful, innovative initiatives in the field of early childhood development and education; the inception of Kentucky Head Start in 1965, the Kentucky Education Reform Act (KERA) in 1990, and the KIDS NOW initiative and legislation in 2000 (Governor's Task Force on Early Childhood Development and Education, 2010). In 2010, Governor Steve Beshear further advanced support for early childhood education by forming the Kentucky Early Childhood Advisory Council (ECAC) "to provide vision, leadership, oversight, collaboration, advocacy and accountability for the delivery of early childhood services to children from birth (including pre-natal services) to school entry" (p. 3). The goals of the ECAC are to 1) promote collaboration and coordination between entities that provide services to young children; 2) promote school readiness; 3) increase access to high quality early care and education; 4) develop and implement a professional development system; and 5) develop a longitudinal data-management system.

Concurrent with the implementation of the KIDS NOW Initiative, the University of Kentucky (UK) and the University of Louisville (U of L) launched an evaluation of the early care and education components of KIDS NOW in 2000-2001. Beginning in 2007, UK assumed the sole responsibility for implementing the evaluation of the early care and education components of KIDS NOW. The current longitudinal evaluation is conducted at the request of the ECAC and the Governor's Office of Early Childhood. Presented in this report are data from Year 1 and Year 2 of the longitudinal study. Additional information is presented on a small cohort of children who were individually assessed during fall 2014 upon entering first grade. Previous studies conducted by the KIDS NOW Evaluation Project can be found at: <http://kidsnow.ky.gov/Improving-Early-Care/Pages/Tools-and-Resources.aspx>

Third Party Evaluation 2012-2014

Overview and Research Questions

Previous evaluations of the early care and education components of the KIDS NOW Initiative have identified program quality differences between 1/2 STARS rated centers, 3/4 STARS rated centers, and centers not participating in the STARS program (Grisham-Brown, Gravil & Gao, 2008). These differences included better program quality as measured by the Classroom Assessment Scoring System Pre-K (CLASS Pre-K) (Pianta, La Paro & Hamre, 2008) and more growth on developmental measures on child outcome variables in 3/4 STARS rated centers than other programs. More recent research examined program quality differences in 3/4 STARS rated childcare centers, Head Start programs not participating in STARS, and public pre-kindergarten programs, and the relationship of program quality to child outcomes (Grisham-Brown, Gravil, Townley, & Danner, 2012). In these comparative studies, children attending all three program types performed similarly on outcome measures associated with kindergarten readiness, and classroom quality scores were similar across program types.

In FY 2012-13, representatives from the Early Childhood Advisory Council (ECAC) and the University of Kentucky (UK) research team initiated a longitudinal study to more closely examine Kentucky children's preparedness for kindergarten. Licensed 3 or 4 STARS-rated childcare centers, preschool classrooms from Head Start, and public prekindergarten were recruited as program level sample sites. A cohort of 355 children from study sites was recruited with the intent to follow those children into kindergarten classrooms in 2013-14. An additional cohort of 70 children with no child care or early learning experience prior to kindergarten entry was recruited fall 2013. With input from the representatives from the ECAC, the following specific research goals were addressed:

1. Determine children's progress toward key indicators of school readiness across program type.
 - Licensed 3/4 STARS rated programs
 - Head Start *and*¹
 - Public preschool programs that have completed the Preschool Program Review Process (P2R).
2. Determine quality of classrooms across program types.
3. Determine if children's progress is maintained into kindergarten (i.e., longitudinally) and if there are differential effects in progress depending on program type.
4. Determine the interaction effects between developmentally appropriate practices and teacher-child interactions on child outcomes/progress.

Classroom quality data were collected in preschool classrooms during spring 2013 and in kindergarten classrooms during spring 2014 using the *Classroom Assessment Scoring System Pre-K* (CLASS Pre-K; Pianta, LaParo & Hamre, 2008). Survey data were collected on the education level and degree major of participating program directors and public school principals. Survey data also were collected from teachers regarding their education and experience in childcare. Families of children in study classrooms completed surveys that included data for family income, maternal education level, and their perception of the importance of 10 indicators of children's readiness for kindergarten. Children participating in the study in both preschool and kindergarten were individually assessed during fall 2012 and spring 2013, and fall 2013 and spring 2014. An additional cohort of children was assessed fall 2013 and spring 2014.

Study Year 1

2012-2013

Preschool

Sample

Sampling Procedure. This study utilized a matched sampling methodology to represent 3/4 STARS centers, Head Start centers, and public pre-kindergarten programs statewide. Two criteria, a) prior participation in the Kentucky Department of Education preschool program monitoring system; or b) participation Kentucky's quality rating system (QRS) and 3/4 STARS rating on QRS, were used for program inclusion. More specifically, school districts whose preschool program had previously participated in the Public Preschool Program Review (P2R) process were recruited for the study yielding a sample population of 28 districts. Of those 28 districts, 15 were eliminated because their preschools were blended with Head Start resulting in 13 eligible districts. Thirteen invitations to participate were sent to public preschool coordinators. Once school districts were selected, 3/4 STARS centers and Head Start were recruited from the same community or a contiguous county. In addition, the names of seven Head Start Directors who had expressed interest in participation in the study were referred to the research staff by the Director of the Head Start Collaboration Office. Invitations were mailed to those seven Head Start Directors who then gave research staff names of local Head Start Programs to contact. Invitations to participate in the study were mailed to 45 directors of 3/4 STARS rated programs. The invitation described the parameters of participation, including the time involved and incentives for participating. Child care and Head Start directors and preschool coordinators were given contact information for study personnel, and informed that they would be contacted in the following weeks by research staff. The final sample consisted of 75 study sites, with 25 3/4 STARS rated programs, 25 Head Start programs, and 25 public preschool programs. Attrition was minimal with only two sites lost at mid-year. One director of a 3/4 STARS program chose to withdraw from the study and one Head Start closed.

Programs: Three/Four STARS centers. From the total 45 3/4 STARS center directors who were mailed letters and then contacted regarding the study, the resultant 3/4 STARS sample consisted of 25 centers for a response rate of 55.5%. Of the 45 directors invited to participate in the study, seven directors did not return the research team's phone calls, two directors gave no reason for refusal, and one director did not distribute parent consent forms after agreeing to participate. Three programs did not receive any returned parent consent forms, two directors indicated their staff was too busy, and one director stated she would not participate because the data would not be shared with her program. The phone number for one program was disconnected, and three directors stated they were new to their jobs and did not want to participate at this time. The refusal rate for 3/4 STARS centers was 44.4%.

Head Start. The Head Start sample was drawn from program directors who expressed interest in participation in the study. All seven Directors who volunteered for participation agreed to participate in the study for a participation rate of 100%. These seven Directors provided 25 classrooms as study sites.

Public PreKindergarten (hereafter referred to as PreK). Thirteen preschool coordinators were contacted about the study. The final sample consisted of eight districts participating for a response rate of 61.5%. Of the preschool coordinators invited to participate, three did not return phone calls from the research team, one indicated that administrative issues prohibited the district's participation, and one coordinator agreed to participate but no children in that district returned signed consent forms. The refusal rate for preschool coordinators was 30.7%. A total of 25 classrooms in the eight districts were identified for study.

Children. From among these 75 classrooms; a total of 355 children were assessed as part of the child outcomes study. For purposes of this reported analysis for year 1, only data from children who were assessed at both the fall and spring data collection points were included (N=278). The distribution of children among program types was as follows: 3/4 STARS (N=101), Head Start (N=82), PreK (N=95). Child characteristics are included in Table 1. Two differences are noteworthy. Higher numbers of children in Head Start and PreK were eligible for the free or reduced lunch program than children in 3/4 STARS centers. And PreK sites had the highest number of children with identified disabilities.

Table 1. Characteristics of Children

Characteristic ¹	Center Type					
	STARS (N=101)		Head Start (N=82)		Pre-K (N=95)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender						
Male	48	51.1	29	38.7	49	52.7
Female	46	48.9	46	61.3	44	47.3
Race/Ethnicity						
White	66	74.2	38	49.4	74	80.4
African American	10	11.2	22	28.6	5	5.4
Asian	4	4.5	0	0.0	0	0.0
Hispanic	2	2.2	9	11.7	10	10.9
Bi-Racial	5	5.6	7	9.1	3	3.3
Other	2	2.2	1	1.3	0	0.0
Eligible for Free/Reduced Lunch	24	23.8	61	74.4	57	60.6
Has a Disability	5 ²	5.3	5 ³	6.2	30 ⁴	32.3

¹Some data on child characteristics were missing.

²Speech.

³Speech.

⁴Speech 15; Developmental Delay 12; Other Disability 3.

Methodology and Measurement

Once programs were identified and administrator consent was obtained, classrooms were selected for participation in the study based upon the number of 4- and 5-year-old children enrolled and director preference. Teachers, in selected classrooms, sent consent forms to the parents of all 4- and 5-year-old children enrolled in the class for participation in the study. Children with signed and returned consent forms were selected for participation in the outcomes portion of the study.

Survey data were collected from directors, teachers, and families in participating classrooms. Observations also were conducted in one classroom from each center or school. Child outcome data were collected on an average of four children (range = 1-8 children) from each classroom. In addition to child outcome data, height and weight of study children were measured and recorded to calculate their Body Mass Index (BMI). Below is a description of the measures used in the study.

Administrator interview. Data for program administrators were collected during initial phone contact by the research coordinator or during the initial visit to study sites. This data for 3/4 STARS directors, Head Start preschool coordinators, and principals included their highest level of education, degree major, and whether their degree was in progress or completed. All administrators also were asked about the number of years working in the field of early childhood. The administrator interview took approximately two minutes to complete. Sixty-two of 73 administrators participating in the study answered the questions for a response rate of 84.9%. The 2012-2013 administrator survey questions, which were included in the program consent form, are provided in Appendix A.

Teacher survey. All lead teachers in observed classrooms responded to questions regarding their professional experience/education (i.e., time in early childhood, time in current position, education level). See Appendix B for a copy of these questions. In addition, teachers completed a survey of their perceptions of skills children need to be prepared for kindergarten entry. The survey asked teachers to rate each of 10 questions on a scale of 1 (not important) to 7 (very important). Lead teachers received the survey with the packet of child consent materials, and were asked to complete the survey prior to the scheduled classroom observation period. Seventy of 73 teachers (95.9%) completed the survey.

Family survey. A fifteen-question survey, located on the child consent form, was distributed to all parents/guardians of four- and five-year-old children enrolled in classrooms participating in the evaluation (N=1157). See Appendix C for a copy of the instrument. A total of 355 families gave written consent for their child to participate in the study for a response rate of 30.6%. Three hundred forty eight (348) of these 355 families completed and returned part or all of the survey for a response rate of 98%. Three hundred fourteen (314) of 355 families completed and returned the survey in its entirety for a response rate of 88.5%. The survey included information commonly collected for families (i.e., mother's level of education, marital status, family income, number of adults living in the household, and number of children living in the household). In addition, parents were asked 10 questions about the importance, in their perspective, of various skills and behaviors associated with preparedness for kindergarten. Families were then asked to select among these 10 three skills they considered important and to rank these three skills in order of importance.

Observational instruments. Observational data from two separate instruments were obtained to assess distinct aspects of program quality. Data collectors observed study

classrooms using an instrument that focused on teacher-child interactions. Previously collected data which examined the quality of the structural components of classrooms were made available to the research team from quality raters and those involved with the PreK P2R process. These instruments are described in the following sections.

Classroom Assessment Scoring System- Pre-K (CLASS Pre-K). Data collectors observed each study classroom, using the *Classroom Assessment Scoring System- Pre-K* (CLASS Pre-K; Pianta, La Paro & Hamre, 2008). The CLASS Pre-K is an observational tool that provides a detailed examination of how teachers use the materials provided in their classroom and focuses on the socio-emotional and instructional climate of the classroom. The CLASS, and its precursor, the Classroom Observation System (COS), has been used nationally in studies in over 4000 classrooms, including the Multi-State Study of Pre-kindergarten, and the State-Wide Early Education Program (SWEEP) studies (both from the National Center for Early Development and Learning at the University of North Carolina, University of Virginia and University of California-Los Angeles) as well as the My Teaching Partner Study (University of Virginia). Both the Multi-State and SWEEP studies examined children's growth in school-readiness and social skills over the course of the PreK year in a total of eleven states. The CLASS was also used in the Tulsa Public School Pre-K (TPS PreK) study and the Georgia Study of Early Care and Education. The Tulsa study was a comparison of classroom climate and exposure to academic instruction in 106 Tulsa PreK classrooms based on a multi-state sample of PreK and Head Start programs. The Georgia study examined quality in PreK programs in general with descriptions of the types of services provided to infants, toddlers and preschoolers across the state and their quality. Results from these studies

indicate a relationship between child outcomes at the end of the preschool year and classroom quality, as measured by the CLASS (Howes, et al., 2008).

The CLASS groups teacher/child interactions into three domains: *Emotional Support*, *Classroom Organization* and *Instructional Support*. These domains are further divided into ten dimensions, specific to their corresponding domain, as seen in Table 2. Each dimension is rated on a scale from one to seven (i.e. 1, 2 = Low, 3, 4, 5 = Middle, and 6, 7 = High) based on the presence or absence of behavioral markers and indicators. Higher scores are more desirable on the CLASS with the exception of the dimension “Negative Climate,” on which a lower score (1,2) indicates few or no instances of negativity and higher scores (6,7) indicate one or more instances of hostility, victimization, or physical punishment. Internal consistency, which describes the consistency that items assess a particular construct over a period of time, is generally considered acceptable at .60. Internal consistency is as follows for CLASS domains: *Emotional Support* .91, *Classroom Organization* .87 and *Instructional Support* .86. Inter-rater agreement on all CLASS items is .87.

Table 2. CLASS domains and corresponding dimensions.

Emotional Support	Classroom Organization	Instructional Support
<p><u>Positive climate</u></p> <ul style="list-style-type: none"> • relationships • positive affect • positive communication • respect <p><u>Negative climate</u></p> <ul style="list-style-type: none"> • negative affect • punitive control • sarcasm/disrespect • severe negativity <p><u>Teacher sensitivity</u></p> <ul style="list-style-type: none"> • awareness • responsiveness • addresses problems • student comfort <p><u>Regard for student perspectives</u></p> <ul style="list-style-type: none"> • flexibility and focus • support for autonomy and leadership • student expression • restriction of movement 	<p><u>Behavior management</u></p> <ul style="list-style-type: none"> • clear behavior expectations • proactive • redirection of misbehavior • student behavior <p><u>Productivity</u></p> <ul style="list-style-type: none"> • maximizing learning time • routines • transitions • preparation <p><u>Instructional learning formats</u></p> <ul style="list-style-type: none"> • effective facilitation • variety of modalities and materials • student interest • clarity of learning objectives 	<p><u>Concept development</u></p> <ul style="list-style-type: none"> • analysis and reasoning • creating • integration • connections to the real world <p><u>Quality of feedback</u></p> <ul style="list-style-type: none"> • scaffolding • feedback loops • prompting thought processes • providing information • encouragement and affirmation <p><u>Language modeling</u></p> <ul style="list-style-type: none"> • frequent conversations • open-ended questions • repetition and extension • self- and parallel talk • advanced language

In preparation for data collection using the CLASS, project staff of College of Education graduate students (N = 5) participated in a two-day training led by a certified CLASS trainer and subsequent reliability testing in January 2013. Following training each

data collector was required to become reliable on the administration and scoring of the CLASS upon Reliability testing required each data collector to independently watch and code classroom segments. These reliability tests yielded an average 82% inter-rater reliability (within one point of master or trainer's code). All data collectors achieved reliability within two testing attempts before collecting data.

Classroom observations using the CLASS occurred in January, February, and March 2013, and began at the beginning of the school day and lasted approximately three hours. During this time, project staff observed and took notes on all classroom activities for 20 minutes followed by ten minutes spent assigning scores to each of the 10 dimensions, resulting in six cycles throughout a three-hour observation.

Early Childhood Environment Rating Scale- Revised (ECERS-R; Harms, Clifford & Cryer, 2005). The ECERS-R is a comprehensive environmental classroom assessment tool widely accepted in the early childhood community as a measure of program quality. The ECERS-R is designed for use in preschool, kindergarten, and child care classrooms that serve children ages 2 to 5 years. The scale consists of seven areas relating to space and furnishings, personal care routines, language and reasoning, classroom activities, interactions, program structure, and parent and staff issues. Each item is rated on a scale from one to seven (i.e. 1 = inadequate, 3 = minimal, 5 = good, and 7 = excellent). The ECERS-R consists of 41 items totaling 470 indicators, and ECERS-R authors report agreement on 86.1% of all indicator scores given by their raters. The intra-class correlation of .915 for the entire scale indicates acceptable levels of reliability. Internal consistency, which measures the degree that the entire scale and subscales measure a common concept, is high, as indicated by a Cronbach's alpha of .92.

The research staff obtained ECERS-R program level scores for 3/4 STARS rated centers and Head Start programs that had STARS ratings from the Quality Initiatives Section staff in the Department of Community Based Services Division of Child Care (DCC). ECERS-R scores for public preschools were obtained from staff in the Division of Program Standards (DPS) in the School Readiness Branch (SRB) at the Kentucky Department of Education (KDE). The ECERS- R was administered by DPS in public preschools during the P2R process. *It is important to note that ECERS-R scores made available for use in this report are not specific to study classrooms in this evaluation. The scores were specific to the programs/schools in which study classrooms were located and not the actual classrooms that participated in the current study.*

Child outcomes measures. The Governor's Development and Early Education Task Force's definition of school readiness was used to guide the selection of child outcome measures. Three components of child outcomes were included in this study; academics, social-emotional, and physical. Study personnel assessed children using direct measures of academic preparedness. Preschool teachers rated indicators of children's social-emotional behaviors. In addition to readiness outcomes, children's height and weight measurements were collected to calculate their body/mass index as one indication of physical health.

Woodcock-Johnson III Normative Update Tests of Achievement (WJ III NU, McGrew, Schrank, & Woodcock, 2007). Select subtests of the WJ III NU were used to measure children's academic outcomes. The WJ III NU Tests of Achievement is comprised of 22 individually administered tests that consist of five clusters: reading, oral language, math, written language, and academic knowledge. The instrument can be administered to most individuals, with items ranging from preschool to adult level. The test is commonly

used by educators, clinicians, and researchers to assess students in the school-age population. The tests allow the calculation of average score changes that follow expected developmental growth. The WJ III NU was normed using a multi-stage, geographically diverse sampling procedure to ensure national representation for race, region, and socio-economic status. Specific to the preschool population, it was normed on 1143 preschool age children. Reliability coefficient alphas, which measure internal consistency, are high ranging from .81 to .94. (McGrew, Schrank, & Woodcock, 2007).

The subtests of the WJ III NU utilized for this study included: *Letter-Word Identification*, *Understanding Directions*, *Spelling*, *Applied Problems*, and *Sound Awareness*. *Letter-Word Identification* consists of 76 items and the child must identify printed letters and words. In the *Understanding Directions* subtest, the child listens to a sequence of instructions then must follow the directions for 57 items. The *Spelling* subtest includes 59 items, for which the child must print letters and words presented orally. The *Applied Problems* subtest includes 63 items and requires the child to perform mathematical calculations that are presented both visually and orally. The *Sound Awareness* subtest consists of four sections including *Rhyming*, *Deletion*, *Substitution*, and *Reversal*. The *Rhyming* section is comprised of 17 items requiring the child to match rhyming pictures and provide an additional word that rhymes with an orally presented word. *Deletion* consists of ten items and the child is orally presented with a word, then instructed to say the new word when a part of the original word is deleted. The *Substitution* section includes nine items and requires the child to change part of an orally presented word to make a new word. In the *Reversal* section, there are nine items for which the child is instructed to reverse the order of two orally presented words and to reverse the sounds in a word to make a new word.

For each subtest, the examiner started with the first item as a basal and stopped when the child failed to provide a predetermined number of correct answers consecutively, indicating that they had reached the ceiling. The WJ III NU uses standard scores with a mean of 100 (M=100) and standard deviation of 15 (SD=15) for test interpretation.

Basic self-knowledge: Social Awareness Task (Family And Child Experiences Survey [FACES] Research Team, modified from the Social and Communicative Competence tasks in: Jana M. Mason and Janice Stewart, 1989). The Social Awareness Task used in this study was adapted from a task used by the FACES Research Team. The task asks children to recall their first and last name, age, birthday, and home address. Responses for the four questions are scored either “yes” or “no.” The Social Awareness Task has been used in multiple prekindergarten studies to determine if children are able to communicate basic self-knowledge (see Peisner-Feinberg, Schaff, & LaForett, 2013).

Social Skills Improvement System, (SSIS; Gresham & Elliot, 2008). The SSIS Teacher Rating Scale (TRS) is a comprehensive measure of social skills and problem behaviors in the classroom setting. Included in the *Social Skills* subscale, the SSIS TRS assesses the broad domains of *Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control*. Within the *Problem Behaviors* subscale, the domains assessed are *Externalizing Problems, Internalizing Problems, Bullying, and Hyperactivity/Inattention*. The TRS uses a list of 46 statements in the Social Skills subscale and 30 statements in the Problem Behaviors subscale. The statements describe specific behaviors that are rated on a four-point scale of frequency, ranging from “Never” to “Almost Always”. Raw scores are used to generate the normative scores which are calculated for each

subscale. In addition, each domain within the subscales are scored based on a *Behavior Level* of “below average”, “average”, or “above average”. Table 3 provides definitions for each scale.

Table 3. Social Skill Improvement System (SSIS) scales and definitions

Scale	Definition
Social Skills	
Communication	Taking turns, making eye contact, using appropriate tone of voice and gestures, saying “please” and “thank you”
Cooperation	Helping others, sharing, complying with rules and directions
Assertion	Initiating behaviors such as asking for help, introducing oneself, responding to the actions of others
Responsibility	Showing regard for property or work, the ability to communicate with adults
Empathy	Showing concern and respect for others’ feelings and viewpoints
Engagement	Joining activities in progress and inviting others to join, initiating conversations, making friends, and interacting well with others
Self-Control	Responding appropriately in conflict (disagreeing, teasing) and non-conflict situations (taking turns, compromising)
Problem Behaviors	
Externalizing	Being verbally or physically aggressive, failing to control temper, and arguing
Bullying	Forcing others to do something, hurting people physically or emotionally, and not letting others join an activity
Hyperactivity/Inattention	Moving about excessively, having impulsive reactions, and becoming easily distracted
Internalizing	Feeling anxious, sad, and lonely; exhibiting poor self esteem

Children’s Body Mass Index (BMI). Measures of study children’s height and weight were taken at fall and spring data collection points by data collectors. Mean Body Mass Indices (BMI) were calculated using these measurements. The Center for Disease Control (CDC) age- and gender-adjusted norms for BMI and a cutoff of the 50th, 85th, and 95th percentile were used to classify children as average, overweight, or obese. Descriptions of all child outcome measures are provided in Table 4.

Table 4. Child Outcome Measures

Measure	Scoring
Language and Literacy	
Letter-Word Identification Woodcock-Johnson III Tests of Achievement Letter-Word	Standard Score, Mean=100 SD=15
Understanding Directions Woodcock-Johnson III Tests of Achievement Understanding Directions	Standard Score, Mean=100 SD=15
Spelling Woodcock-Johnson III Tests of Achievement Spelling	Standard Score, Mean=100 SD=15
Sound Awareness Woodcock-Johnson III Tests of Achievement Sound Awareness	Standard Score, Mean=100 SD=15
Math	
Applied Problem-Solving Woodcock-Johnson III Tests of Achievement Applied Problems	Standard Score, Mean=100 SD=15
General Knowledge	
Basic Self-Knowledge	Range = 0 - 4
Classroom Behavior	
Social Skills Social Skills Improvement System (SSIS) Social Skills Subscale	Standard Score, Mean=100 SD=15
Problem Behaviors Social Skills Improvement System (SSIS) Problem Behaviors Subscale	Standard Score, Mean=100 SD=15
BMI	
Body Mass Index: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$	

Results

Analyses for study year 1 include only data from classrooms for which there is complete observational data (N= 65 classrooms), and for children who were assessed at both fall and spring data points (N=278 children). Data are included for characteristics of classrooms, teachers, and study children in 3/4 STARS centers, Head Start centers, and PreK classrooms. Associations between children's outcome gains over time and family, teacher, and classroom characteristics are presented. Associations between classroom quality scores and teacher characteristics are also provided. As in the majority of prior KIDS NOW evaluations, a p-value of .05 was used for statistical significance. Instances in which statistical significance was found at higher p-values are indicated. Only associations of statistical significance are reported unless the lack of significance is deemed noteworthy.

Characteristics of study classrooms, teachers, and administrators. Classroom, teacher, and program administrator characteristics are detailed in Table 5. The average number of children present in the classroom on the day of the classroom observation was approximately 17 (M=16.76). The proportion of boys and girls present in classrooms was relatively similar. Head Start programs enrolled more children who qualified for the free or reduced lunch program than 3/4 STARS programs or PreK. More children with Individual Education Plans (IEPs) were enrolled in PreK than in Head Start or 3/4 STARS programs. In light of these data, an important note that identification of a disability is one criterion for children's participation in Kentucky's PreK program. The ECERS-R scores were similar across the three program types, which indicate they scored similarly on this measure of structural quality. ECERS-R means for program type are as follows: 3/4 STARS (M=5.32), Head Start (M=5.40), and PreK (M=5.88).

Teachers in PreK had slightly more years of experience in early care and education than their colleagues in 3/4 STARS and Head Start programs. The majority of PreK teachers reported a Masters degree as their highest level of education compared to their peers in 3/4 STARS and Head Start programs. The majority of teachers in 3/4 STARS and Head Start programs reported a Bachelors degree. PreK program administrators reported more years' experience working in early care and education than their colleagues in 3/4 STARS and Head Start programs.

Education levels among directors of 3/4 STARS rated programs were fairly evenly distributed among the categories "Associates," "BA," and "MA/MS." The majority of Head Start directors reported their education level as "MA/MS" followed closely by "BA." PreK administrators/principals primarily reported education levels as "Post Masters," followed closely by "MA/MS" and "BA."

Table 5. Characteristics of Centers

Characteristic	Center Type								
	STARS (N=24)			Head Start (N=21)			Pre-K (N=20)		
	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range
Classrooms									
Class Size ¹	15.30	4.30	8-22	17.40	2.50	11-20	17.60	2.20	13-23
Proportion Boys	.54	.14	.30-.79	.51	.10	.33-.67	.53	.10	.35-.74
Proportion ESL	.00	.01	.00-.05	.00	.01	.00-.06	.00	.01	.00-.05
Proportion Free/or/ Reduced Lunch	.29	.46	.00-1	.94	.50	.00-1	.71	.46	.00-1
Proportion with IEP	.08	.15	.00-.50	.12	.11	.00-.47	.45	.16	.15-.75
ECERS-R Total ²	5.32	.75	4.1-6.6	5.40	.61	4.3-6.1	5.88	.69	4.5-6.8
Teachers³									
Years Experience Early Childhood Teaching	13.9	8.4	1-33	15.5	10.4	3-42	17.2	7.3	2-28
Years Experience Teaching	10.0	6.2	1-23	8.4	6.8	.5-21	15.0	6.9	2-28
Directors⁴									
Years Experience Early Childhood	17.0	7.7	1-35	14.0	10.6	5-33	20.0	8.6	6-30
	STARS		Head Start		Pre-K				
	Frequency	Percent	Frequency	Percent	Frequency	Percent			
Teacher's Degree³									
HS Diploma	3	13.0	1	5.0	0	0.0			
CDA	3	13.0	1	5.0	0	0.0			
Some College	2	8.7	1	5.0	1	5.0			
Associate	3	13.0	5	25.0	0	0.0			
BA	8	34.8	8	40.0	5	25.0			
MA/MS	4	17.4	4	20.0	14	70.0			
Post Masters	0	0.0	0	0.0	0	0.0			
Director's Degree⁴									
HS Diploma	0	0.0	0	0.0	0	0.0			
CDA	2	8.3	0	0.0	0	0.0			
Some College	2	8.3	0	0.0	0	0.0			
Associate	6	25.0	0	0.0	0	0.0			
BA	6	25.0	7	43.8	5	27.8			
MA/MS	7	29.2	9	56.3	6	33.3			
Post Masters	1	4.2	0	0.0	7	38.9			

¹ Class size = number of children present on day of testing.² ECERS-R total score provided by state and based on the center rather than the particular classrooms from which child data were obtained.³ Source of data: Teacher survey.⁴ Source of data: Director survey.

Characteristics of families. Of the 278 children for whom data are included in these analyses, 246 (88.4%) parents or guardians responded to survey questions about their income level. Income level was reported by 107 (43.4%) of families in 3/4 STARS rated study sites, 96 (39%) of families in Head start study sites, and 43 (17.4%) of families in PreK study sites. The majority of families reported earning either below \$20,000 (N=89, 32%) or above \$50,000 (N=76, 27.3%).

Maternal education level was reported by 262 (94.2%) of survey respondents. Of the 262 respondents who reported this data, 112 (42.7%) had children in the 3/4 STARS sites, 107 (40.8%) had children in Head Start sites, and 43 (16.4%) had children in PreK. The majority of respondents indicated maternal education level as an Associates degree or higher (N=108, 38.8%), followed by “some college, no degree” (N=76, 27.3%). Table 6 depicts family income and maternal education level according to center type.

Table 6. Characteristics of study children’s families

Characteristic	Center Type					
	STARS		Head Start		Pre-K	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Family Income	(N=107)		(N=96)		(N=43)	
<20,000	11	10.2	65	67.7	13	30.2
20,000-29,999	17	15.8	19	19.7	8	18.6
30,000-39,999	8	7.4	4	4.1	7	16.2
40,000-49,999	9	8.4	4	4.1	5	11.6
50,000 and above	62	57.9	4	4.1	10	23.2
Maternal Education Level	(N=112)		(N=107)		(N=43)	
Less than HS	4	3.5	11	10.2	3	6.9
HS/GED	11	9.8	32	29.9	17	39.5
Some college, no degree	25	22.3	38	35.5	13	30.2
Associates	13	11.6	19	17.7	4	9.3
Bachelors	33	29.4	4	3.7	2	4.6
Graduate degree	26	23.2	3	2.8	4	9.3

Parents were asked to rank three skills associated with children's preparedness for kindergarten in order of their importance. Overall, 197 (70.8%) of parents ranked a skill as most important, 195 (70.1%) ranked a skill as second most important, and 190 (68.3%) ranked a skill as third most important. In other words, not all families ranked a second and third most important skill on the survey. Data aggregated across all programs indicate the skill parents perceive to be most important for kindergarten entry is "sits still and pays attention" (N=87, 44.2%), followed by "follows simple rules" (N=61, 31.3%), and "is motivated and curious" (N=95, 50%). When this data is disaggregated some differences appear but are not statistically significant. For example, the majority of parents of children in 3/4 STARS centers (N=39, 42.3%), Head Start centers (N=31, 44.2%), and PreK (N=17, 48.5%) selected "sits still and pays attention" as the most important school readiness skill for their children. Families of children in 3/4 STARS centers (N=27, 29.6%) and Head Start centers (N=24, 34.2%) selected "follows simple rules" as the second most important school readiness skill. Families of children in PreK (N=11, 15.7%) selected "knows letters" as the second most important skill. Parents of children in 3/4 STARS centers (N=50, 57.4%), Head Start centers (N=28, 40.5%), and PreK (N=17, 50%) ranked "is motivated and curious" as the third most important kindergarten readiness skill.

CLASS observation scores. CLASS dimensions are scored on a scale from 1-7 (1,2 = low range, 3, 4, 5 = middle range, and 6,7 = high range) based on the presence or absence of behavioral markers and indicators. CLASS data are reported at the domain level (Emotional Support, Classroom Organization, and Instructional Support). The average score across the three programs (PreK, 3/4 STARS and Head Start) for the Emotional Support and Classroom Organization domains was 5.33 and 4.74, respectively. These scores are in the middle range

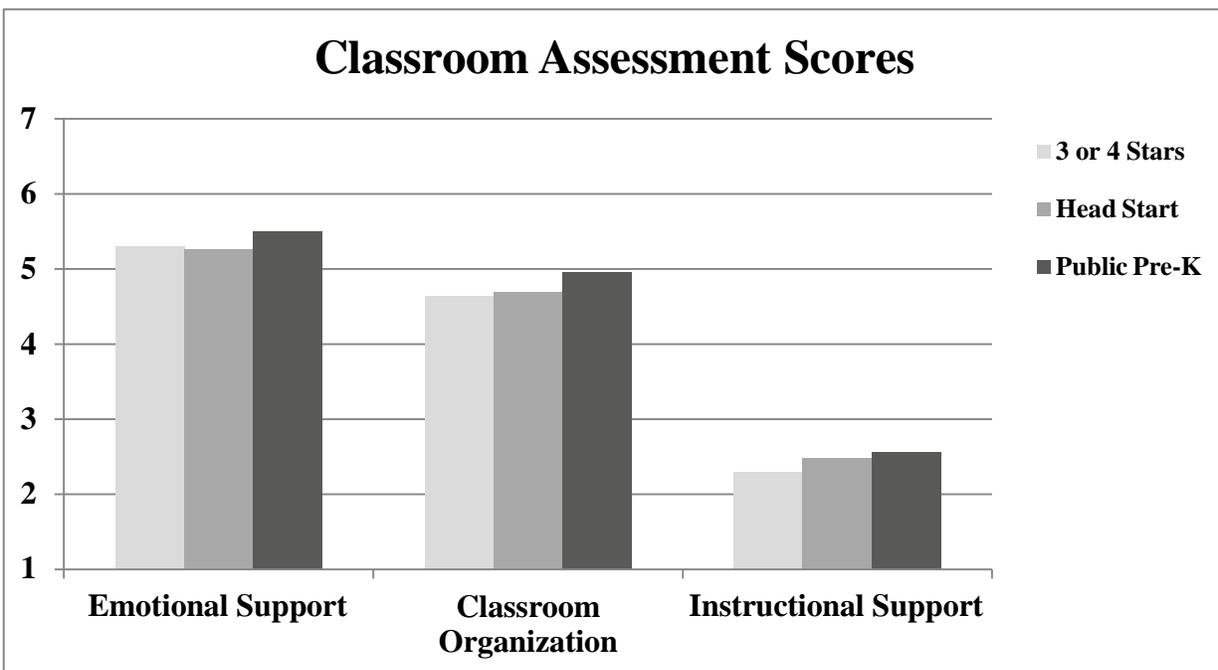
of quality on the CLASS instrument. Programs averaged a score of 2.43 on the Instructional Support domain, which is between the low and mid-range on the CLASS.

Emotional Support domain scores in 3/4 STARS study classrooms were in the middle range (M=5.24). On the Classroom Organization domain, 3/4 STARS classrooms scored in the middle range as well (M=4.62). Average scores for 3/4 STARS classrooms on the Instructional Support domain were in the low to mid-range (M=2.29).

Scores for Head Start classrooms in the study were in the middle range on both the Emotional Support and Classroom Organization domains (M=5.25; M=4.68). These classrooms also scored in the low to mid-range on average on the Instructional Support domain (M=2.48).

PreK classroom CLASS average scores were similar to those in 3/4 STARS and Head Start programs. PreK average scores were in the mid-range on Emotional Support (M=5.5) and Classroom Organization (M=4.94). PreK classroom scores averaged in the low to mid-range on Instructional Support (M=2.55). Differences in domain scores between program types were not significant. Figure 1 illustrates CLASS domain scores for each program type.

Figure 1. Classroom Assessment Scoring System (CLASS) Scores



CLASS scores and teacher education level. Regression analysis was used to determine if teacher education level was associated with CLASS scores. This analysis revealed that CLASS scores on all three domains, Emotional Support, Classroom Organization, and Instructional Support, were correlated with teacher education level. CLASS scores on these domains were higher in classrooms in which teachers reported a Masters degree or higher ($r=.58, p<.05$; $r=.67, p<.01$; $r=.63, p<.05$ respectively). These associations are depicted in Table 7.

Table 7. Classroom Quality Regression Results

	<i>N</i>	Emotional Support Est (<i>SE</i>)	Classroom Organization Est (<i>SE</i>)	Instructional Support Est (<i>SE</i>)
Intercept	69	5.11 (0.23)	4.35 (0.24)	2.12 (0.29)
Head Start ¹	69	-0.00 (0.21)	0.06 (0.22)	0.18 (0.27)
PreK ¹	69	-0.18 (0.25)	-0.19 (0.26)	-0.13 (0.32)
Teacher Years of Teaching	69	-0.01 (0.01)	0.02 (0.01)	0.01 (0.02)
Teacher Education < BA ²	69	-0.17 (0.22)	-0.11 (0.23)	-0.04 (0.28)
Teacher Education = MA ²	69	0.58 (0.23)*	0.67 (0.24)**	0.63 (0.29)*

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

¹Comparison Group is STARS center.

²Comparison Group is teacher has a BA.

Child outcomes. The WJ III NU, Social Awareness Task, children’s BMI, and SSIS were used as indicators to measure children’s academic outcomes and social-emotional behaviors. BMI for study children was calculated as one indicator of their physical health. Children’s fall and spring assessment scores on all measures, plus gains over time data, when applicable, are presented in Tables 8 - 11.

Woodcock-Johnson III NU Tests of Achievement (WJ III NU). The WJ uses standard scores to classify children’s ability. Across programs, children’s scores were in the “average” range on the four language and literacy measures included in the WJ III NU. On the Letter-Word Identification subtest, study children averaged a score of 100.92 in the fall and 101.6 in the spring (N=278). Children averaged 95.14 in the fall and 97.52 in the spring on Understanding Directions (N=277). On the Spelling subtest, children averaged 95.09 in the fall and 98.16 in the spring (N=277). Children averaged 90.56 in the fall and

96.38 in the spring on Sound Awareness (N=278). Children's scores across programs were in the "average" range at both testing points on the measure of math. Children averaged 104.37 in the fall and 105.12 in the spring on Applied Problem-Solving (N=277).

Study children showed statistically significant gains in scores from fall to spring assessment points on Understanding Directions, Spelling, and Sound Awareness. Children in 3/4 STARS study sites made statistically significant gains in Understanding Directions, Spelling, and Sound Awareness. Children in Head Start study sites made statistically significant gains in Sound Awareness. Children in PreK made significant gains in Understanding Directions, Spelling, and Sound Awareness.

Basic Self-Knowledge: Social Awareness Task. When averaged across all programs, children's mean scores on the test of basic self-knowledge was 2.17 in the fall and 2.42 in the spring data collection period (r=1-4). Children, on average, showed statistically significant growth over time on the measure of basic self-knowledge. Children in 3/4 STARS, Head Start, and PreK all showed significant gains over time on the basic self-knowledge task.

Social Skills Improvement System, (SSIS). Study teachers completed the SSIS to measure study children's social skills and problem behaviors during the spring of data collection. The SSIS uses standard scores (m = 100; SD = 15) to classify children's social skills and problem behaviors. The average SSIS score for social skills for study children in all programs was 97.76. The average SSIS score for problem behavior for study children in all programs was 102.36. These scores are in the average range using a comparison with the national sample.

Table 8. Child Outcomes Across All Three Center Types

Measure	N	Fall Mean (<i>SD</i>) Range	Spring Mean (<i>SD</i>) Range	Gains Over Time ¹
Language and Literacy				
Letter-Word Identification	278	100.92 (13.35) 68-164	101.60 (12.70) 71-159	0.68
Understanding Directions	277	95.14 (16.27) 27-127	97.52 (16.27) 39-132	2.38**
Spelling	277	95.09 (15.56) 46-137	98.16 (14.34) 46-137	3.07***
Sound Awareness	278	90.56 (17.80) 61-155	96.38 (19.78) 58-157	5.83***
Math				
Applied Problem-Solving	277	104.37 (11.69) 68-134	105.12 (11.58) 71-138	0.75
General Knowledge				
Basic Self-Knowledge	261	2.17 (.88) 0-4	2.42 (.84) 0-4	.24***
BMI	278	16.76 (2.40) 11.27-29.11	16.54 (2.39) 12.85 – 30.27	-.05
Classroom Behavior ²		Mean (<i>SD</i>) Range		
Social Skills (SSIS)		97.76 (12.94) 59-126		Not Applicable
Problem Behaviors (SSIS)		102.36 (14.85) 83-160		Not Applicable

¹* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

²Assessed one time during middle of school year.

Table 9. Child Outcomes 3/4 STARS Centers

Measure	N	Fall Mean (<i>SD</i>) Range	Spring Mean (<i>SD</i>) Range	Gains Over Time ¹
Language and Literacy				
Letter-Word Identification	101	106.04 (11.89) 75-155	106.12 (11.88) 76-157	0.08
Understanding Directions	100	97.68 (16.00) 59-127	102.22 (15.29) 60-128	4.54***
Spelling	101	99.63 (16.43) 46-133	103.26 (13.34) 61-126	3.62***
Sound Awareness	101	97.50 (19.40) 61-141	104.61 (17.26) 64-151	7.11***
Math				
Applied Problem-Solving	101	108.74 (12.11) 73-134	109.76 (11.48) 87-138	1.02
General Knowledge				
Basic Self-Knowledge	95	2.40 (.87) 0-4	2.59 (.83) 0-4	0.19***
BMI	60	15.85 (1.70) 13.08-22.96	15.78 (1.87) 12.85 – 25.13	-.07
Classroom Behavior ²		Mean (<i>SD</i>) Range		
Social Skills (SSIS)		100.23 (11.44) 75-126		Not Applicable
Problem Behaviors (SSIS)		105.64 (14.41) 83-146		Not Applicable

¹* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

²Assessed one time during middle of school year.

Table 10. Child Outcomes Head Start Centers

Measure	N	Fall Mean (<i>SD</i>) Range	Spring Mean (<i>SD</i>) Range	Gains Over Time ¹
Language and Literacy				
Letter-Word Identification	82	101.12 (13.20) 74-127	101.21 (12.37) 77-138	1.08
Understanding Directions	82	95.05 (15.51) 57-125	94.39 (14.99) 59-125	-0.66
Spelling	81	94.76 (15.32) 60-130	96.53 (14.48) 46-128	1.76
Sound Awareness	82	88.62 (16.43) 64-125	92.39 (19.04) 60-136	3.77**
Math				
Applied Problem-Solving	82	102.11 (10.27) 68-132	103.33 (10.56) 79-128	1.22
General Knowledge				
Basic Self-Knowledge	81	2.17 (.82) 0-4	2.46 (.84) 0-4	0.28**
BMI	74	16.51 (1.96) 11.27-25.71	16.67 (1.90) 13.31 – 24.97	0.15
Classroom Behavior ²				
		Mean (<i>SD</i>) Range		
Social Skills (SSIS)		98.18 (12.17) 62-126		Not Applicable
Problem Behaviors (SSIS)		101.70 (16.75) 83-160		Not Applicable

¹* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

²Assessed one time during middle of school year.

Table 11. Child Outcomes Pre-Kindergarten Centers

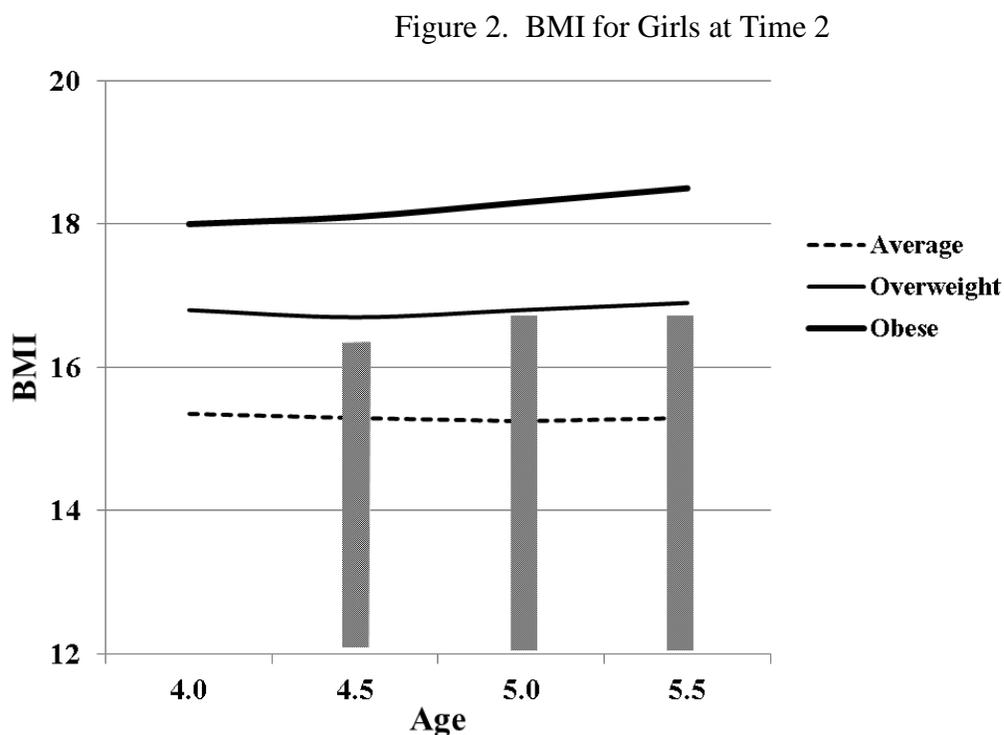
Measure	N	Fall Mean (SD) Range	Spring Mean (SD) Range	Gains Over Time ¹
Language and Literacy				
Letter-Word Identification	95	96.18 (13.15) 68-164	97.15 (12.30) 71-159	0.97
Understanding Directions	95	92.56 (16.94) 27-121	95.28 (17.34) 39-132	2.73*
Spelling	95	90.54 (13.44) 48-137	94.14 (13.79) 63-137	3.60**
Sound Awareness	95	84.84 (14.60) 62-155	91.08 (20.23) 58-157	6.24***
Math	95			
Applied Problem-Solving	95	101.67 (11.11) 76-131	101.74 (11.01) 71-124	0.06
General Knowledge	95			
Basic Self-Knowledge	95	1.92 (.90) 0-4	2.19 (.79) 0-4	0.27**
BMI	76	17.67 (2.96) 12.93-29.11	17.44 (2.97) 12.98-30.27	-0.23
Classroom Behavior ²		Mean (SD) Range		
Social Skills (SSIS)		94.85 (14.52) 59-126		Not Applicable
Problem Behaviors (SSIS)		99.49 (12.95) 83-147		Not Applicable

¹* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

²Assessed one time during middle of school year.

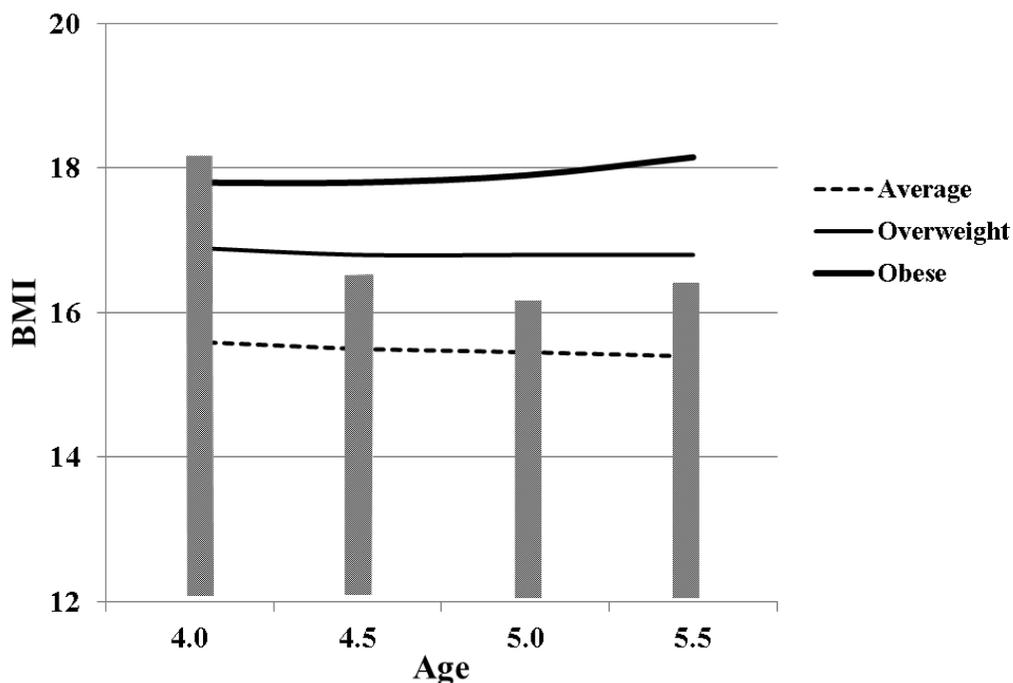
Children's Body Mass Index (BMI). Study children's BMIs were calculated from height and weight measurements taken at fall and spring data collection points. The average BMIs for children participating in the study was 16.76 in the fall and 16.54 in the spring.

These indices are approaching the “overweight” category according to the CDC rubric. Children’s BMI is presented for females and males in Figures 2 and 3, respectively for time 2 (spring). The age at the time of the assessment is depicted along the abscissa (X axis) and the BMI score is depicted at the ordinate (Y axis). The dashed line indicates the recommended BMI for national norms at each of the age categories. The thin solid line indicates a BMI in the overweight range, while the thick solid line indicates a BMI in the obese range. The bars represent the study sample of children at the time 2 assessment period.



Note. Average, Overweight, and Obese reference lines refer to the 50th, 85th, and 95th percentile age- and gender-adjusted norms taken from CDC national norms for US children.

Figure 3. BMI for Boys at Time 2



Note. Average, Overweight, and Obese reference lines refer to the 50th, 85th, and 95th percentile age- and gender-adjusted norms taken from CDC national norms for US children.

Child outcome gains and teacher, family, and classroom characteristics.

Hierarchical Linear Modeling (HLM) analyses were conducted to examine predictors of children's growth over time. Significant associations were found between children's Time 1 score the fall data collection period and children's growth on the WJ subtests Letter Word Identification, Understanding Directions, Spelling, Applied Problems, and Sound Awareness, as well as on the test of Basic Self-Knowledge. Children who scored lower on these tests at Time 1 made greater growth than their peers who scored higher at Time 1.

The analysis revealed that maternal education level was predictive of children's gain scores on Spelling and Applied Problems subtests of the WJ. Children whose mothers reported higher education levels made greater growth on these subtests. Program type was also found to be a predictor of children's growth on specific subtests. For example, children

in Head Start and PreK programs had lower gain scores than their peers in 3/4 STARS centers on Understanding Directions. In addition, children in Head Start had lower gain scores on sound awareness than their peers in 3/4 STARS centers. Child gains and significant associations are presented in Table 12.

Table 12. Child Gains Over Time as a Function of Characteristics of Children, Families, Teachers, Center Type, and Classroom Quality

	Letter word Identification Est. (SE)	Understanding Directions Est. (SE)	Spelling Est. (SE)	Applied Problems Est. (SE)	Sound Awareness Est. (SE)	Basic Self- Knowledge Est. (SE)
Time 1 Score	-0.23 (.04)***	-0.35 (.05)***	-0.43 (.05)***	-0.31 (.06)***	-0.23 (.05)***	-0.51 (.05)***
Child and Family Characteristics						
Gender ¹						
Family Income ²						
Mother's Education ³			1.54 (.61) *	1.00 (.40)*		
Child's Disability Status ⁴						
Child's Eligibility for Free Or Reduced Lunch ⁴						
Teacher and Classroom Characteristics						
Teacher's Education ⁵						
Less Than a BA						
MA or above						
Years Teaching						
Program Type ⁶						
Head Start		-6.22 (2.12)**			-5.38 (2.04)**	
Pre-K		-3.73 (1.64)*				
Classroom Quality						
CLASS Emotional Support						
CLASS Classroom Organization						
CLASS Instructional Support						

Note. Only significant associations with gain scores are entered in this table.

¹Gender: 0=male, 1=female.

²Family Income: 1= <\$20,000, 2= \$20,000-\$29,999, 3= \$30,000-\$39,999, 4= \$40,000-\$49,000, 5= \$50,000+

³Mother's Education: 0= None, 1= <HS, 2= HS or GED, 3= Some College, 4= Associates, 5= BA, 6= Grad Degree.

⁴Children's Eligibility for Free or Reduced Lunch was coded 0=No, 1=Yes.

⁵For Teacher's Education, the reference group was has a BA.

⁶For Program Type, the reference group was STARS Centers.

Study Year 2

2013-2014

Kindergarten

Sample

Programs. Children who participated in the outcomes portion of the study during the preschool year were followed into their kindergarten programs. Researchers asked children's parents and preschool teachers to indicate in which district and elementary school children were likely to enroll for kindergarten. Additional study children were located in kindergarten programs through the Infinite Campus© system, a statewide system that tracks students throughout their schooling years. Superintendents of districts in which study child were enrolled were mailed letters by the Kentucky Department of Education describing the research. Members of the research team then obtained superintendent consent to contact principals of schools believed to have study children enrolled in kindergarten. Child enrollment was confirmed with principals and permission obtained to contact teachers for participation in the study. A total 122 kindergarten teachers in 53 schools elected to participate in the study.

Children. Researchers attempted to locate all children enrolled in the study during the preschool year, including children with missing data that were not included in the preschool year analysis. Of the initial 355 children participating in study year 1, 305 children were located in the kindergarten year by study staff. Consent was obtained from principals to assess 169 of those children. In addition to the original sample of children that participated during the preschool year, the researchers also recruited a second cohort of children during the fall of study year 2. This cohort included children who participated in no formal or structured programming prior to kindergarten entry were targeted for study enrollment. This cohort of children (N = 70) was recruited to serve as a comparison group for study children who participated in organized early learning environments and programs (i.e., Head Start, child care, and preK) prior to kindergarten. Selection criteria for inclusion in the new cohort of children included, a) no formal, structured

educational experience prior to kindergarten enrollment, and b) eligibility for the free or reduced lunch program. The rationale for the second criterion was to locate and obtain data for a group of children with similar socioeconomic demographics as those of the children from study year 1 in order to make valid comparisons between the two groups. Child characteristics of the entire sample from study year 2 are exhibited in Table 13.

Table 13. Characteristics of Kindergarten Children

Characteristic ¹	Children Sampled in Preschool (<i>N</i> =169)		New Kindergarten Children (<i>N</i> =70)	
	Frequency	Percent	Frequency	Percent
Gender				
Male	76	45.0	35	50.0
Female	93	55.0	35	50.0
Race/Ethnicity				
White	99	81.8	35	79.5
African American	4	3.3	3	6.8
Asian	0	0.0	0	0.0
Hispanic	7	5.8	2	4.5
Bi-Racial	9	7.4	3	6.8
Other	1	0.8	1	2.3
Eligible for Free/Reduced Lunch	***	***	70	100.0
Has a Disability	17	13.8	2	2.9

¹Some data on child characteristics were missing.

*** Free/Reduced Lunch data excluded due to inaccuracies

Methodology and Measurement

The same measures were administered across the preschool and kindergarten years in order to make comparisons about classroom quality and children's academic outcomes. Survey data collected in the kindergarten year were collected from all kindergarten teachers and families of the new cohort of children participating in the outcomes portion of the study. Observations were conducted in a sample of kindergarten classrooms with administrator consent. Child outcome data were collected on an average 2 (range =1-7) children in each kindergarten study

classroom. Children's social skills and problem behaviors were again measured in the kindergarten year. In addition to academic outcome data, height and weight of study children were again measured and recorded to calculate their Body Mass Index (BMI) during the pre and post data collection periods.

Teacher survey. Lead kindergarten teachers in study classrooms completed a demographic survey similar to that which preschool teachers completed (e.g., education level, years of experience; see Appendix D). Kindergarten teachers also completed a survey on their perceptions of necessary kindergarten entry skills. The surveys were sent to teachers prior to the scheduled classroom observation period. Seventy-one of 122 kindergarten teachers (37.4%) completed the survey. Contributing factors to the low response rate include principals' refusal to allow teachers to complete the survey, and teachers opting out of this portion of the study.

Family survey. Families of children recruited for the new cohort in kindergarten were provided a survey similar to that administered during the preschool year (see Appendix E). This survey included questions about family demographics and parents'/guardians' perceptions of school readiness. Researchers omitted the family income question from the kindergarten survey. Respondents were instead queried whether the child was eligible for the free or reduced lunch program, which was a criterion for participation. All families of the new cohort of children (N = 70) completed and returned surveys.

Observational instruments. As in study year 1, observational data from two separate instruments were obtained in a limited number of kindergarten classrooms to assess aspects of program quality. Data collectors observed study classrooms using an instrument that focused on teacher-child interactions. A subscale of another instrument that examined the structural components of classrooms was also administered. Schools in which study children were enrolled

were randomly identified for participation in the observational component of the study. Once principal approval was secured, proportionate sampling methods were used to determine how many classrooms were observed. Data collectors observed in more than one classroom in schools with study children enrolled in multiple classrooms. Observations were conducted in 144 kindergarten classrooms.

Classroom Assessment Scoring System- K-3 (CLASS K-3). Data collectors observed classrooms using the *Classroom Assessment Scoring System- K-3* (CLASS K-3; Pianta, La Paro, & Hamre, 2008). Like the CLASS Pre-K, the CLASS K-3 provides a detailed examination of how teachers use the materials provided in classrooms and focuses on the socio-emotional and instructional climate of the classroom. Like the CLASS Pre-K, the CLASS K-3 groups teacher/child interactions into three domains: *Emotional Support*, *Classroom Organization* and *Instructional Support*. These domains on the CLASS K-3 are divided into the same ten dimensions as the CLASS Pre-K (see Table 2). The CLASS K-3 provides examples that are specific to classrooms with primary aged students. Scoring is consistent across both instruments, with each dimension rated on a scale from one to seven (i.e. 1, 2 = Low, 3, 4, 5 = Middle, and 6, 7 = High) based on the presence or absence of behavioral markers and indicators.

Assessment of Practices in Early Elementary Classrooms (APEEC). Data collectors administered one subscale of the Assessment of Practices in Early Elementary Classrooms (APEEC; Hemmeter, Maxwell, Ault, & Schuster, 2001) in classrooms participating in the observational study. The APEEC focuses on developmentally appropriate practices in primary grades. The tool is comprised of three domains: physical environment, curriculum and instruction, and social context. As with the ECERS-R, the APEEC items are rated on a scale from one to seven (i.e. 1 = inadequate, 3 = minimal, 5 = good, and 7 = excellent). The evaluation team

administered only the Physical Environment subscale of the instrument, as the remaining domains included content captured via use of the CLASS K-3. The indicators under the Physical Environment subscale include room arrangement, display of child products, classroom accessibility, and health and classroom safety. APEEC authors report an average 86% inter-observer agreement across the entire tool, and the median weighted KAPPA was .59. The internal consistency score of .86 indicates a high level of interrater agreement.

Child Outcome Measures. The identical battery of assessments that was administered in study year 1 to preschool students was administered in study year 2 to kindergarten students. Selection of child outcome measures was guided by the Governor's Development and Early Education Task Force's definition of school readiness, and measures that remained applicable to children longitudinally were deliberately chosen. Study personnel administered direct measures of academic preparedness to children, and kindergarten teachers rated children on indicators of social-emotional behaviors. As in the preschool year, children's height and weight were collected to evaluate body/mass indices.

The *Woodcock-Johnson III Normative Update Tests of Achievement* (WJ III NU, McGrew, Schrank, & Woodcock 2007) subtests administered to children included: *Letter-Word Identification, Understanding Directions, Spelling, Applied Problems, and Sound Awareness*. Data collectors also administered the *Basic Self-Knowledge: Social Awareness Task (Family and Child Experiences Survey [FACES] Research Team, modified from the Social and Communicative Competence tasks in: Jana M. Mason and Janice Stewart, 1989)*. Kindergarten teachers completed the *Social Skills Improvement System (SSIS; Gresham & Elliot, 2008)* for study children to assess social skills and problem behaviors in the classroom setting (see Table 3 for SSIS scales and definitions). Measures of study children's height and weight were again

collected during fall and spring data collection visits and mean Body Mass Indices (BMI) were calculated. Refer to Table 4 for details regarding the child outcomes measures used in both preschool and kindergarten.

Results

Analysis for study year 2 focuses on data in a longitudinal fashion. Comparisons between classroom quality in the preschool and kindergarten years are described. Correlations between classroom level data and child outcome data are described, and child outcomes as a function of children's preschool experience are illustrated. Hierarchical Linear Modeling (HLM) growth modeling was used with child outcome data so that occasionally missing data points could be accounted for in the analysis. HLM is an advantageous strategy for studying growth using longitudinal data with missing data points. "Unlike conventional methods, the approach can readily incorporate all participants who have been observed at least once" (Raudenbush & Bryk, 2002, p. 199). This allows for data to be analyzed and results to be interpreted as if no missing data were present. A p-value of .05 was used for statistical significance. Only associations of statistical significance are reported unless the lack of significance is deemed noteworthy.

Characteristics of study classrooms and teachers. Classroom and teacher level data for preschool and kindergarten are combined in Table 14. Principal data for study year 2 was omitted due to the lack of response. The average number of children present in classrooms on the date of observations was 22 in kindergarten compared to 15.3 in preschool. The proportion of boys and girls present was similar across study years. Eligibility for the free or reduced lunch program at the classroom level is available only for the preschool year. These data in kindergarten were based on report from families of children who opted to return the new child consent (N = 70), and kindergarten teacher report. Kindergarten teachers were typically unaware of children's free or

reduced lunch eligibility status. Teachers in kindergarten classrooms reported the most years teaching experience, followed by public prekindergarten teachers (15.7% and 15%, respectively). All kindergarten teachers reported a Bachelors degree or higher as their highest level of education completed. Forty-seven percent (47%) of kindergarten teachers reported a Masters degree, and 23.6% reported Post Masters degrees.

Table 14. Characteristics of Centers and New Kindergarten Children's Classrooms

Characteristic	Preschool Center Type						Kindergarten Classrooms N=153					
	STARS (N=24)			Head Start (N=23)			Pre-K (N=20)					
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Classrooms												
Class Size ¹	15.30	4.30	8-22	17.40	2.50	11-20	17.60	2.20	13-23	22.2	2.8	13-27
Prop. Boys	.54	.14	.30-.79	.51	.10	.33-.67	.53	.10	.35-.74	.51	.08	.35-.69
Prop. ESL	.00	.01	.00-.05	.00	.01	.00-.06	.00	.01	.00-.05	***	***	***
Prop. Eligible for Lunch Subsidy	.29	.46	.00-1	.94	.50	.00-1	.71	.46	.00-1	***	***	***
Teachers ²												
Years Experience	13.9	8.4	1-33	15.5	10.4	3-42	17.2	7.3	2-28	NA	NA	NA
Early Childhood Years Experience	***	***	***	***	***	***	***	***	***	13.2	9.2	1-38
Lead Teacher Years Experience	10.0	6.2	1-23	8.4	6.8	.5-21	15.0	6.9	2-28	15.7	9.2	1-40
Teacher's Degree ³												
	STARS			Head Start			Pre-K			New Kindergarten		
	Frequency	Percent		Frequency	Percent		Frequency	Percent		Frequency	Percent	
HS Diploma	3	13.0		1	5.0		0	0.0		0	0.0	
CDA	3	13.0		1	5.0		0	0.0		0	0.0	
Some College	2	8.7		1	5.0		1	5.0		0	0.0	
Associate	3	13.0		5	25.0		0	0.0		0	0.0	
BA	8	34.8		8	40.0		5	25.0		24	15.7	
MA/MS	4	17.4		4	20.0		14	70.0		72	47.1	
Post Masters	0	0.0		0	0.0		0	0.0		36	23.6	

¹Class size = number of children present on day of testing.²Source of data: Teacher survey.³Source of data: Teacher survey.

Parent and teacher school readiness skills survey. Participating families were asked to rank ten skills associated with children’s preparedness for kindergarten in order of their importance. This data was collected from the initial sample of prekindergarten children’s families and the new cohort of children who were recruited during fall of the kindergarten year. Teachers of study children in both preschool and kindergarten were posed the same ranking system for school readiness skills. Table 15 exhibits results from this survey. There was little variation in rank ordering between parents and teachers in the preschool and kindergarten years.

Table 15. Top-Rated Readiness Skills Parents and Teachers

	Parents	Teachers
Preschool		
	1. Expresses Needs	1. Motivated
	2. Motivated	2. Expresses Needs
	3. Identifies Similarities	3. Follows Rules
Kindergarten		
	1. Expresses Needs	1. Expresses Needs
	2. Motivated	2. Follows Needs
	3. Follows Rules	3. Motivated

Note: ALL 10 readiness skills were highly rated by both parents and teachers

CLASS observation scores. CLASS scores on both the PreK and K-3 versions are reported at the domain level (Emotional Support, Classroom Organization, and Instructional Support). CLASS scores on the Emotional Support and Classroom Organization domains were fairly consistent across preschool and kindergarten programs. Scores for preschool and kindergarten classrooms were in the middle range on both domains. CLASS scores on the Instructional Support domain were significantly higher in kindergarten classrooms than scores in preschool classrooms. See Table 16.

Table 16. CLASS Scores in Preschool and Kindergarten Classrooms

CLASS Scores	Time	<i>N</i>	<i>Mean</i>	<i>SD</i>
Emotional Support	Preschool	63	5.34	.75
	Kindergarten	40	5.36	.79
Classroom Organization	Preschool	63	4.76	.80
	Kindergarten	40	5.00	.97
Instructional Support	Preschool	63	2.46	.91
	Kindergarten	40	3.03	.91

Note. Only significant difference between Preschool and Kindergarten teachers highlighted in bold.

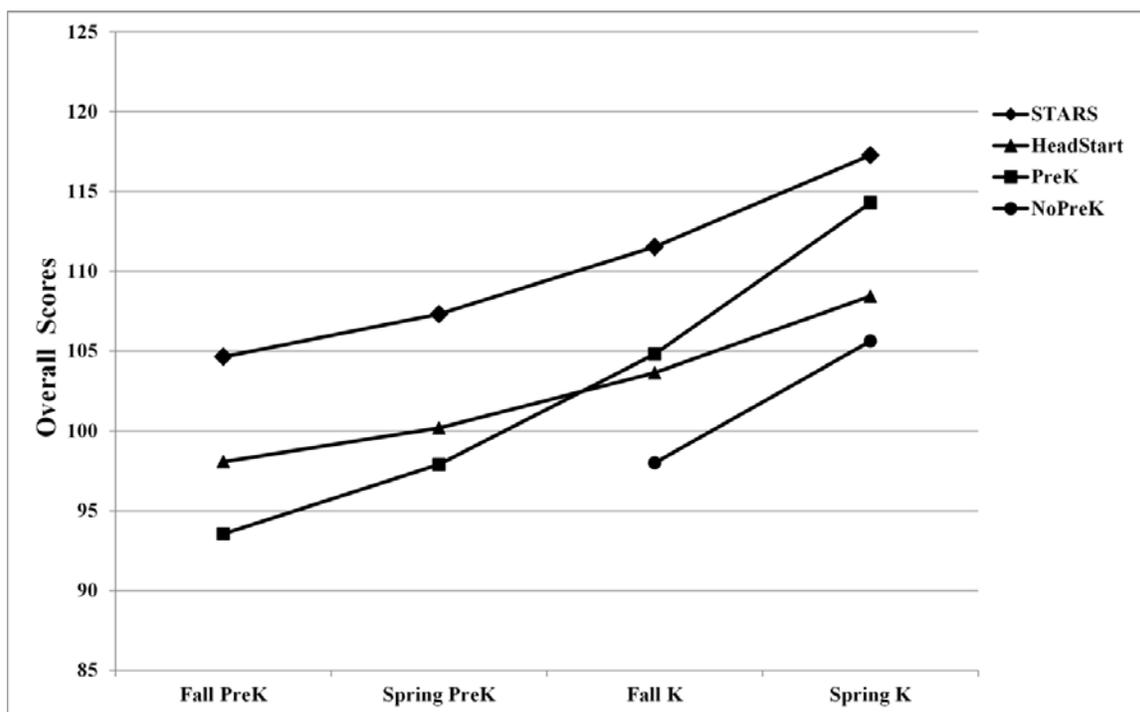
CLASS scores and teacher education level. In study year 1, preschool teachers' education level was correlated with CLASS scores on all three domains. CLASS scores were higher in classrooms in which teachers reported a Masters degree. In study year 2, kindergarten teachers' self-reported certifications were examined in relation to CLASS domain scores. An analysis of variance (ANOVA) indicated no significant differences in kindergarten CLASS scores as a function of teacher certification.

Child outcomes. The WJ III NU, Social Awareness Task, and SSIS were used as indicators to measure children's academic outcomes and social-emotional behaviors. BMI for study children was calculated as one indicator of physical health. WJ III NU, Social Awareness Task, and BMI data were collected fall and spring of preschool and fall and spring of kindergarten for study children. These data are presented with both years of child outcomes plotted on figures to illustrate children's growth throughout each of the two years, and growth from preschool to kindergarten. Children are grouped according to the type of preschool they attended (i.e., 3/4 STARS, Head Start, PreK). Children recruited in the kindergarten year are labeled "No PreK" on the figures.

Woodcock-Johnson III NU Tests of Achievement (WJ III NU). The WJ uses standard scores to classify children's ability. Children's scores remained in the "average" range on the five subtests

administered in preschool and kindergarten. There were statistically significant differences on WJ overall scores between children in 3/4 STARS programs and children in both Head Start and PreK at the first data collection point in fall of study year 1. Children in 3/4 STARS centers scored statistically significantly higher on WJ overall scores than children in Head Start and PreK programs. There were statistically significant differences on WJ overall scores at the fourth data collection point in spring of study year 2. Children who attended 3/4 STARS programs or PreK obtained statistically significantly higher WJ overall scores at the end of kindergarten than children who attended Head Start. Similarly, children who attended 3/4 STARS centers or PreK scored statistically significantly higher at the end of kindergarten on WJ overall scores than children who did not attend any type of preschool. Figure 4 illustrates WJ overall scores across the four data points.

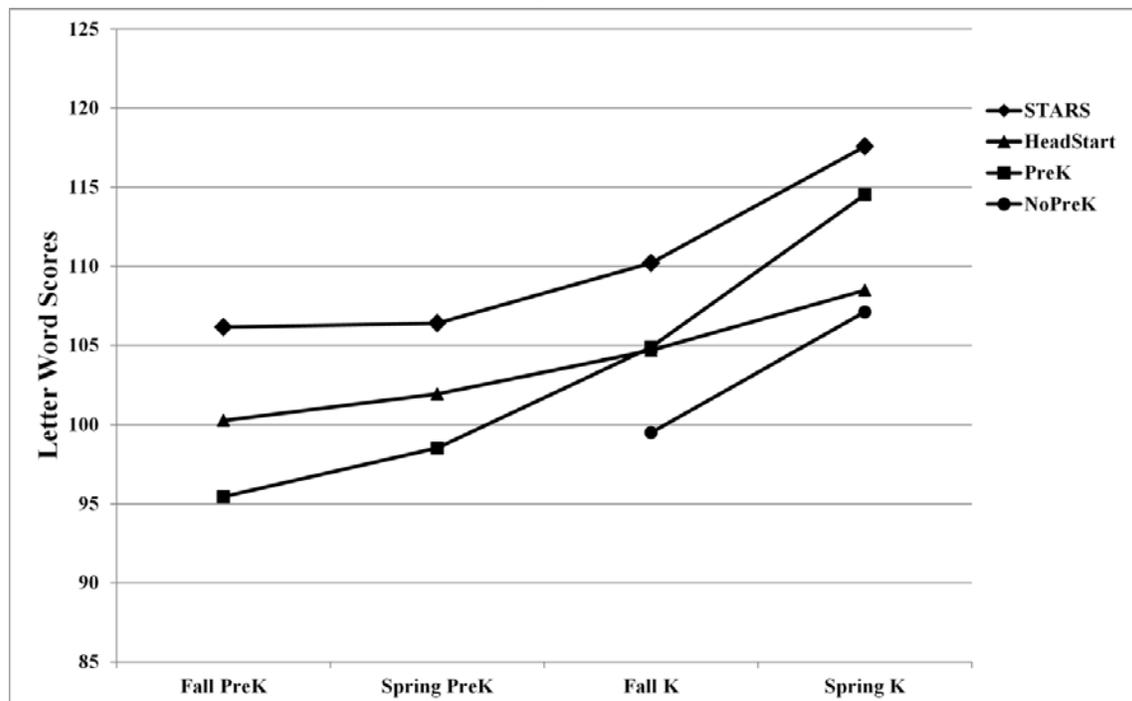
Figure 4. Standardized WJ Overall Scores
(By Center Type and No Preschool)



Children attending a 3/4 STARS center scored statistically significantly higher on the WJ Letter Word subtest in fall of preschool than their peers in Head Start and PreK. Children in Head Start also scored statistically significantly higher on this subtest at the initial data point than

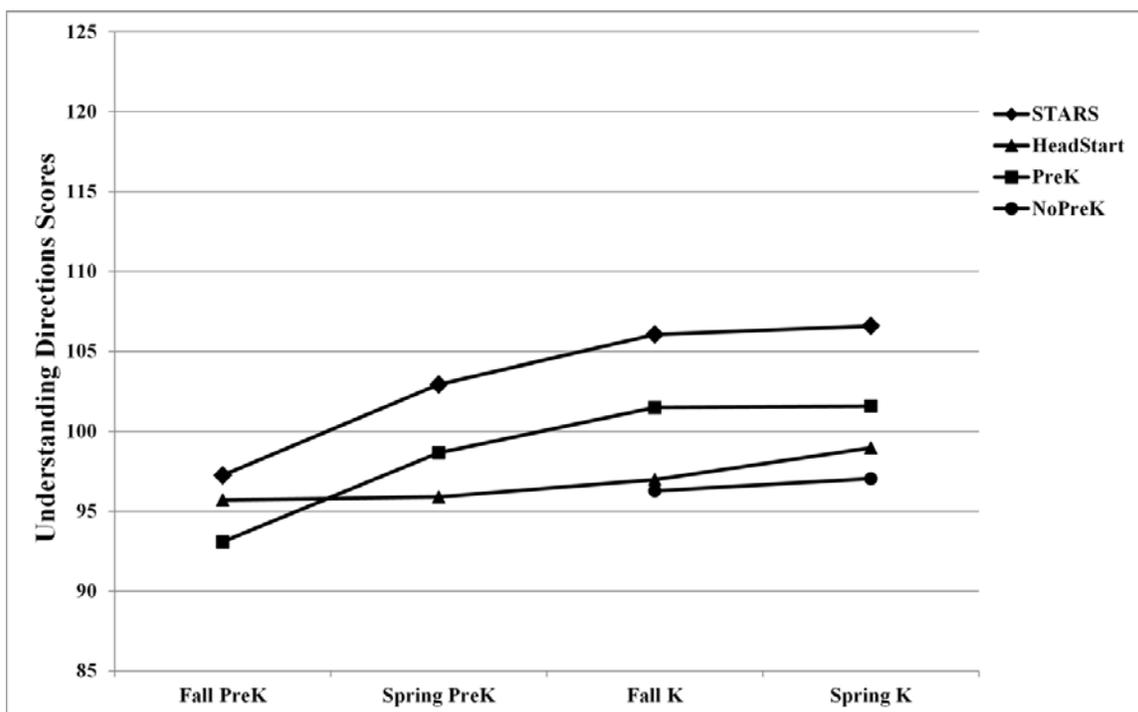
children enrolled in PreK. There were statistically significant differences on Letter Word scores at the end of kindergarten as well. Children who attended either 3/4 STARS centers or PreK had statistically significantly higher Letter Word scores at the end of kindergarten than their peers who attended Head Start or who did not attend any type of preschool. See Figure 5.

Figure 5. Standardized WJ Letter Word Scores
(By Center Type and No Preschool)



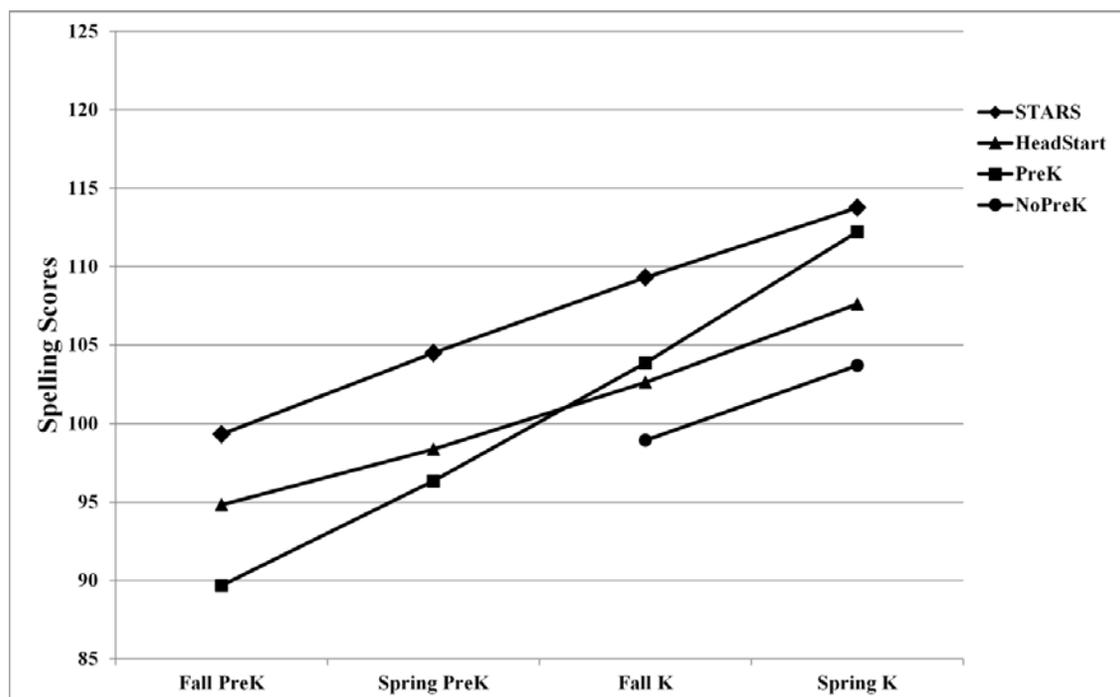
There were no statistically significant differences on WJ Understanding Directions scores between groups of children at the start of study year 1. Statistically significant differences in scores on this measure did emerge at the end of study year 2. Children who attended 3/4 STARS programs scored significantly higher on the Understanding Directions subtest than their peers who attended Head Start and those who did not attend any type of preschool. Children who attended PreK scored statistically significantly higher on this subtest at the end of kindergarten than children who did not attend any type of preschool. Figure 6 exhibits Understanding Directions scores across the two study years.

Figure 6. Standardized WJ Understanding Directions Scores
(By Center Type and No Preschool)



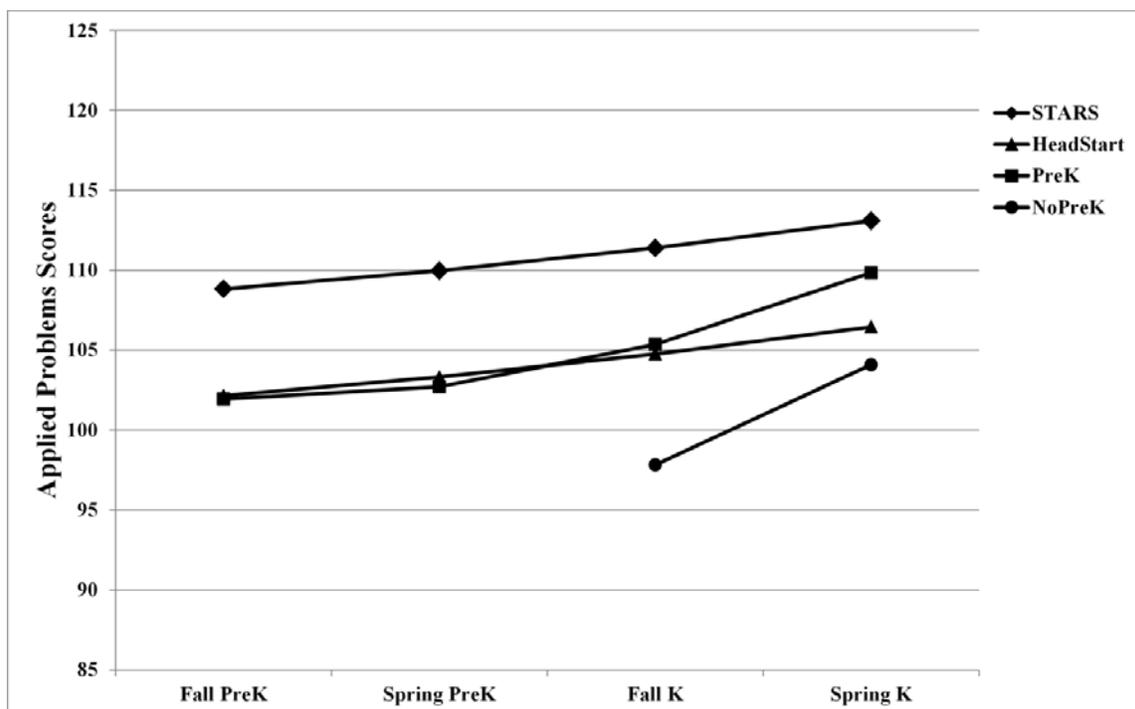
Study children in both 3/4 STARS programs and Head Start scored statistically significantly higher on the WJ Spelling subtest at the beginning of study year 1 than children who attended PreK. At the end of kindergarten, children who attended 3/4 STARS programs or PreK scored statistically significantly higher on Spelling than their peers who attended Head Start and children who did not attend any type of preschool. See Figure 7.

Figure 7. Standardized WJ Spelling Scores
(By Center Type and No Preschool)



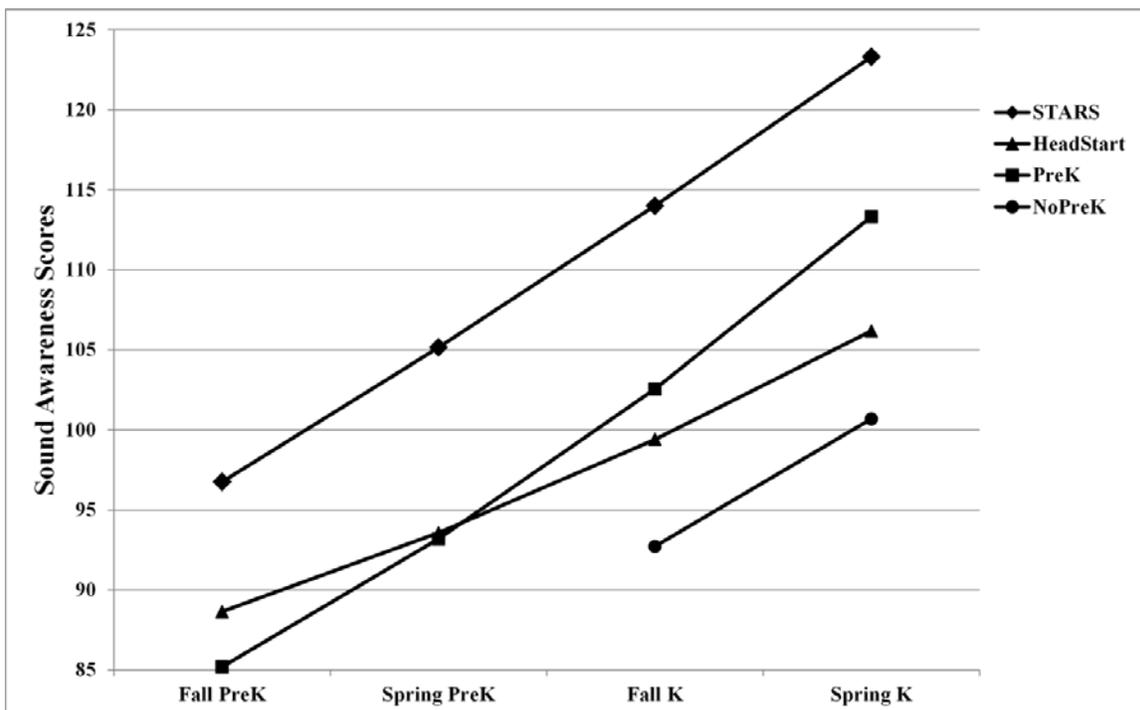
Statistically significant differences on Applied Problems subtest scores were found between groups and across the two study years. Children who attended 3/4 STARS programs scored statistically significantly higher on Applied Problems at the beginning of study year 1 than children who attended with Head Start or Prek. Children who attended 3/4 STARS programs also scored statistically significantly higher on this subtest at the end of kindergarten than children who attended Head Start. Both groups of children who attended 3/4 STARS and PreK had statistically significantly higher Applied Problems subscale scores at the end of study year 2 than children who did not attend any type of preschool. Figure 8 illustrates Applied Problems subscale scores.

Figure 8. Standardized WJ Applied Problems Scores
(By Center Type and No Preschool)



Children who attended 3/4 STARS programs scored statistically significantly higher on the Sound Awareness subtest at the beginning of study year 1 and at the end of study year 2 than children who attended either Head Start or PreK. These children also scored higher on Sound Awareness at the end of kindergarten than children who did not attend any type of preschool. Children who attended PreK scored statistically significantly higher on Sound Awareness at the end of kindergarten than children who attended Head Start and children who did not attend any preschool prior to kindergarten. Figure 9 illustrates these results.

Figure 9. Standardized WJ Sound Awareness Scores
(By Center Type and No Preschool)



Correlational analysis with WJ Overall scores and classroom level data were conducted in addition to the HLM growth analysis. The relationships between WJ Overall scores and CLASS scores during preschool and kindergarten were examined. A statistically significant positive correlation between the Standardized WJ Overall score at the beginning of the preschool year and the Standardized WJ Overall score at the end of the preschool year was found ($r = .80$). Higher WJ Overall scores at the beginning of preschool were correlated with higher WJ Overall scores and the end of the preschool year. Other correlations were found with Standardized WJ Overall scores and CLASS and APEEC Physical Environment scores from the kindergarten year. The CLASS domain Classroom Organization was positively correlated with the APEEC total ($r = .17$). Higher scores on Classroom Organization were correlated with higher APEEC subscale scores in kindergarten. Classroom Organization was also positively correlated with WJ Overall scores at the beginning of the kindergarten year ($r = .23$). The APEEC subscale score was

negatively correlated with WJ Overall scores at the end of kindergarten ($r = -.25$), and WJ Overall scores at the beginning of kindergarten were positively correlated with WJ Overall scores at the end of kindergarten ($r = .84$). At the end of the kindergarten year, higher APEEC subscale scores were associated with lower WJ Overall scores, and higher WJ Overall scores at the beginning of the school year were correlated with higher WJ Overall scores at the end of the year.

Social Skills Improvement System (SSIS). Study teachers in both preschool and kindergarten classrooms completed the SSIS on children who participated in the outcomes portion of the evaluation. The SSIS includes an Academic Competence subscale that is applicable to children beginning in kindergarten. Kindergarten teachers were asked to complete the Academic Competence subscale in addition to the Social Skills and Problem Behaviors subscales. Children's SSIS data were analyzed several different ways. Kindergarten SSIS scores were examined as a function of children's type of preschool experience, and indicated in Table 17. ANOVA indicated a significant difference between groups on Academic Competence scores. Children who attended 3/4 STARS programs prior to kindergarten received significantly higher Academic Competence scores than children who did not attend any type of preschool.

Table 17. Kindergarten SSIS Scores As a Function of Type of Preschool Experience

	<i>N</i>	<i>Mean</i>	<i>SD</i>
Social Skills			
STARS	52	100.38	17.79
Head Start	33	93.70	14.06
PreK	62	100.48	17.37
No PreSchool	56	95.29	16.10
Problem Behaviors			
STARS	52	97.96	12.30
Head Start	34	100.41	20.07
PreK	65	100.75	19.21
No PreSchool	56	95.86	12.31
Academic Competence			
STARS	47	103.72	16.36
Head Start	34	94.76	17.73
PreK	65	95.15	15.67
No PreSchool	55	91.33	16.27

Correlational analyses were used to examine relationships between children's SSIS scores and indicators of program quality in both the preschool and kindergarten years. Children's preschool SSIS scores were analyzed in relation to CLASS PreK scores, as indicated in Table 18. Several significant negative correlations were found between the Problem Behaviors subscale and CLASS PreK scores across all three domains. Higher Emotional Support, Classroom Organization, and Instructional Support scores were correlated with lower Problem Behaviors subscale scores in preschool ($r = -.20$, $r = -.16$, $r = -.16$, respectively). The Social Skills subscale score was also negatively correlated with Problem Behaviors subscale scores in preschool. Higher Social Skills scores were correlated with lower Problem Behaviors subscale scores ($r = -.55$).

Table 18. Correlations between CLASS and SSIS Scores
Preschool

	Emotional Support	Classroom Organization	Instructional Support	Social Skills
Emotional Support				
Classroom Organization	.89			
Instructional Support	.74	.82		
Social Skills				
Problem Behaviors	-.20	-.16	-.16	-.55

Note: Only significant correlations shown

Correlational analysis was used to examine kindergarten children's SSIS scores and CLASS K-3 and APEEC scores. Results are exhibited in Table 19. A negative correlation was found between kindergarten children's Problem Behaviors subscale scores and Social Skills subscale scores. Higher Problem Behaviors scores were correlated with lower Social Skills scores ($r = -.32$). Academic Competence subscale scores were positively correlated with Social Skills subscale scores, and negatively correlated with Problem Behavior subscale scores. Higher Academic Competence scores were correlated with higher Social Skills scores ($r = .50$) and lower Problem Behaviors scores ($r = -.28$).

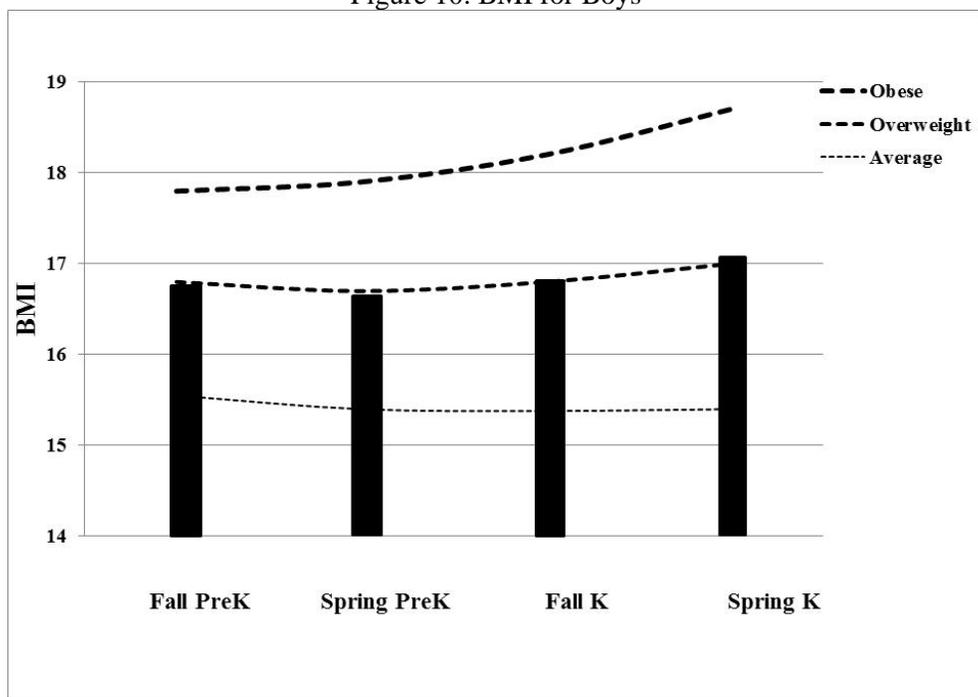
Table 19. Correlations between CLASS, APEEC, and SSIS Scores
Kindergarten

	Emotional Support	Classroom Organization	Instructional Support	Social Skills	Problem Behaviors	Academic Competence
Emotional Support						
Classroom Organization	.82					
Instructional Support	.72	.71				
Social Skills						
Problem Behaviors				-.32		
Academic Competence				.50	-.28	
APEEC Total		.17				

Note: Only significant correlations shown

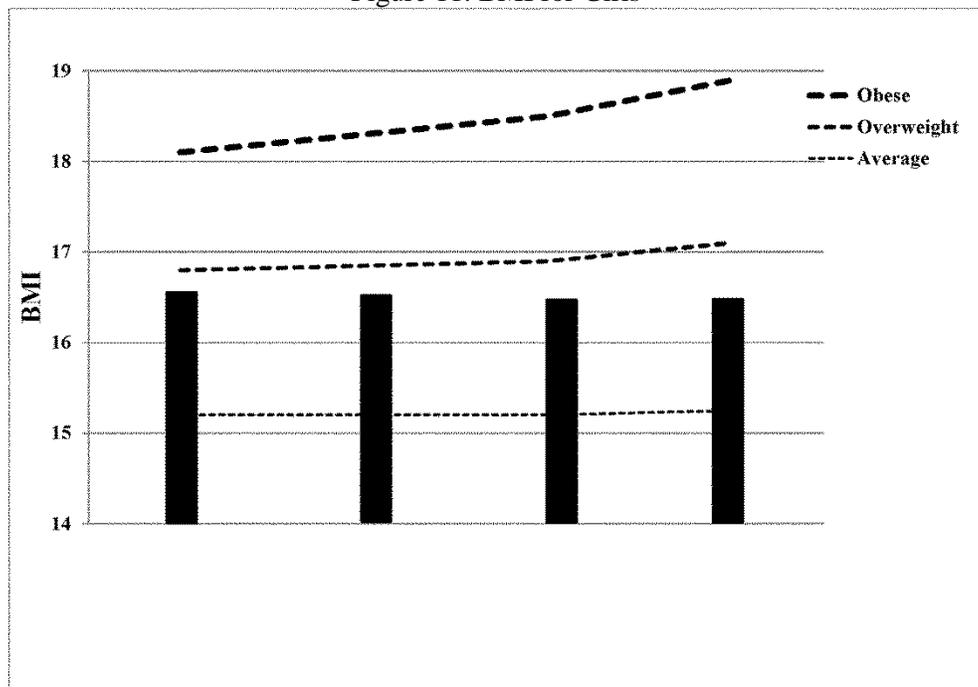
Children's Body Mass Index (BMI). Study children's BMI were calculated from height and weight measurements taken at fall and spring data collection points in the fall and spring of both the preschool and kindergarten years. Figures 10 and 11 (boys and girls, respectively) display study children's BMI data across both study years. The average BMI trajectories for study children indicate they are on the edge of the "overweight" classification at all four measurement times. Normal BMI trajectories would more closely track the CDC line for "average" (i.e., 50th percentile line).

Figure 10. BMI for Boys



Average, Overweight, and Obese reference lines refer to the 50th, 85th and 95th percentile age- and gender-adjusted norms taken from CDC national norms for US children.

Figure 11. BMI for Girls



Average, Overweight, and Obese reference lines refer to the 50th, 85th and 95th percentile age- and gender-adjusted norms taken from CDC national norms for US children.

Growth trajectories of STARS children who did/did not qualify for free or reduced lunch. Analysis of the child outcome data from this evaluation evidences a pattern wherein children attending 3/4 STARS programs scored higher than children from other types of preschools on most WJ measures from the initial data collection point in fall of preschool. Most WJ subtest scores for these children also remained significantly higher than scores for children who attended Head Start and PreK, though PreK children's scores often caught up with those of 3/4 STARS children's. Analysis from previous KIDS NOW Early Care and Education Evaluations indicate that children in 3/4 STARS centers typically come from families whose income level is higher than that of the Kentucky median family income (Grisham-Brown, Gravil, Townley, & Danner, 2012). This may be due to a sampling bias (reliance on a volunteer sample), or it may reflect the actual makeup of 3/4 STARS program enrollment. To further explore these differences the study population of 3/4 STARS children were divided into two groups for additional analysis: those who qualified for the free or reduced lunch program and those who did not qualify. Based on family income reported by study children's families and teachers' report of study children's subsidy status, 31 children classified for free or reduced lunch eligibility and 75 were deemed ineligible. Figures 12 through 17 illustrate longitudinal WJ outcome scores specifically for these two groups of children. Data from this analysis show that children eligible for subsidized lunch had lower scores on all WJ measures but their growth trajectories were parallel to those of non-subsidized children. It is important to note that the only significant differences in data at the beginning of the study were for Applied Problems and Sound Awareness.

Figure 12. Standardized WJ Overall Scores
(By Subsidized vs. Non-Subsidized Lunch at STARS Centers)

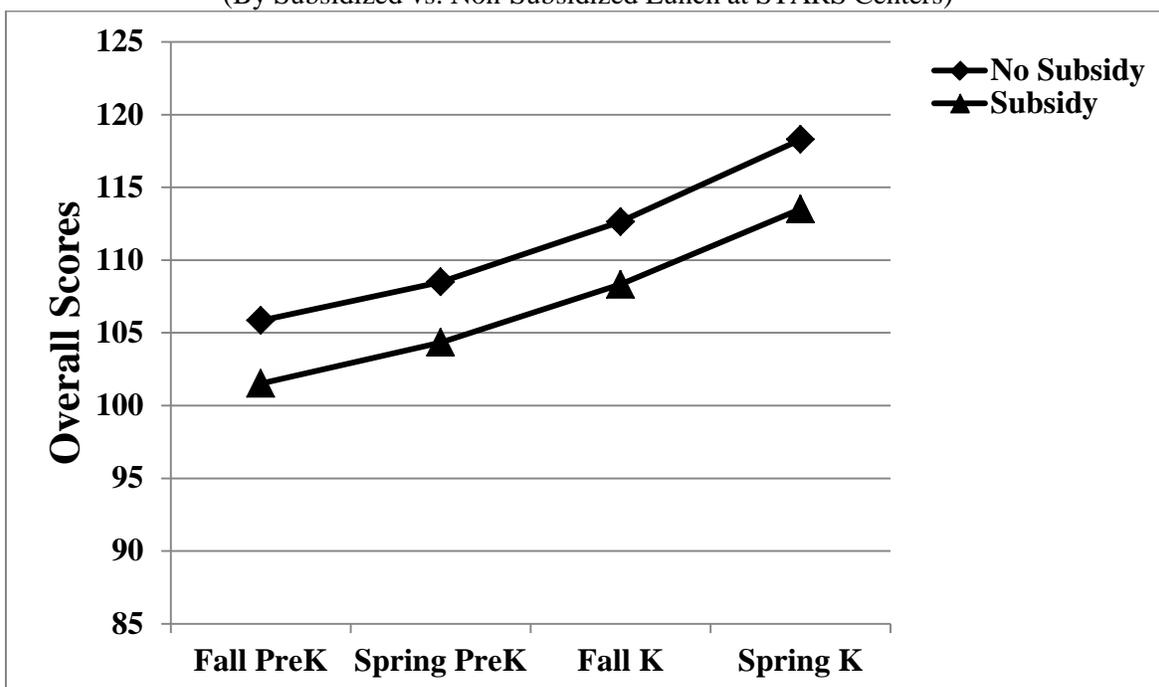


Figure 13. Standardized WJ Letter Word Scores
(By Subsidized vs. Non-Subsidized Lunch at STARS Centers)

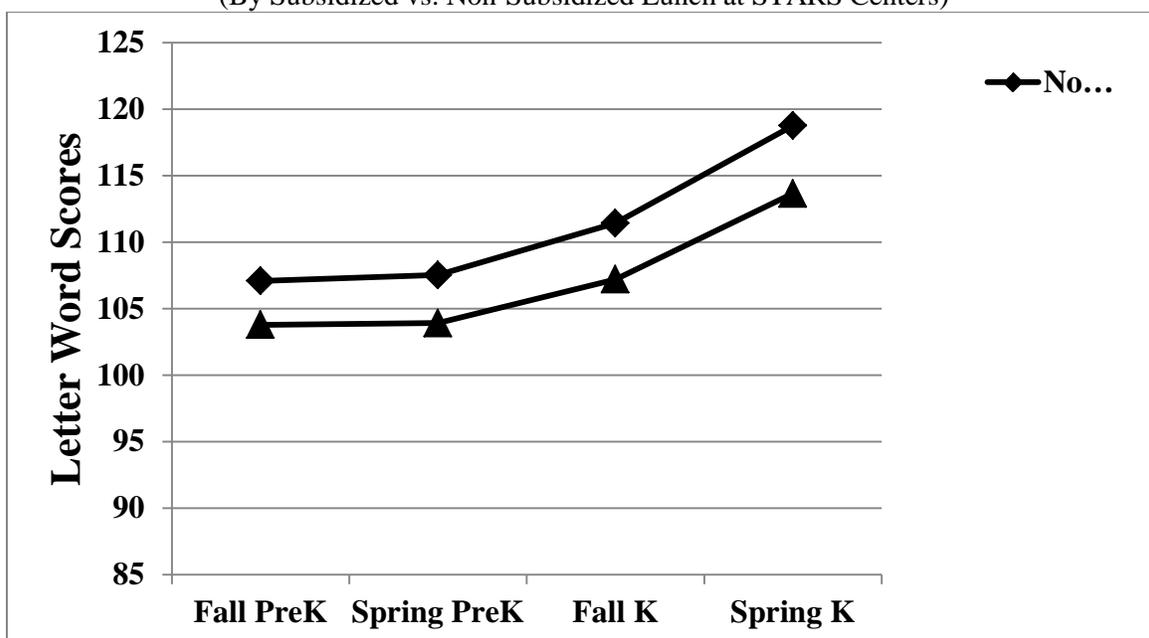


Figure 14. Standardized WJ Understanding Directions Scores
(By Subsidized vs. Non-Subsidized Lunch at STARS Centers)

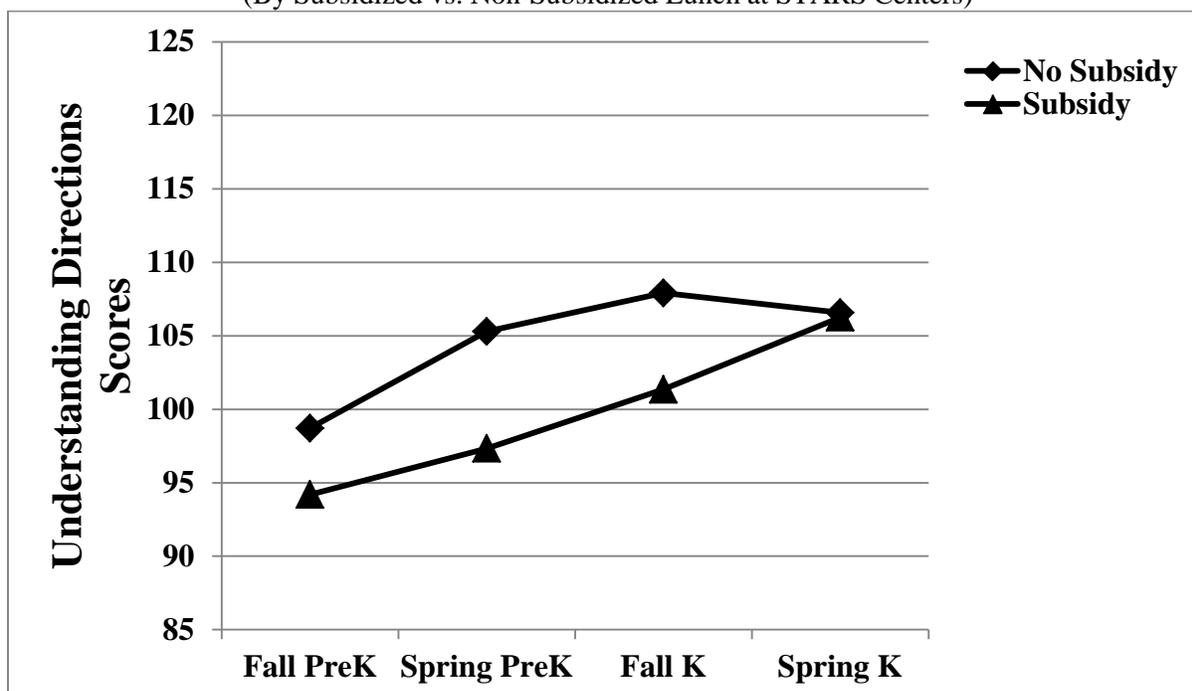


Figure 15. Standardized WJ Spelling Scores
(By Subsidized vs. Non-Subsidized Lunch at STARS Centers)

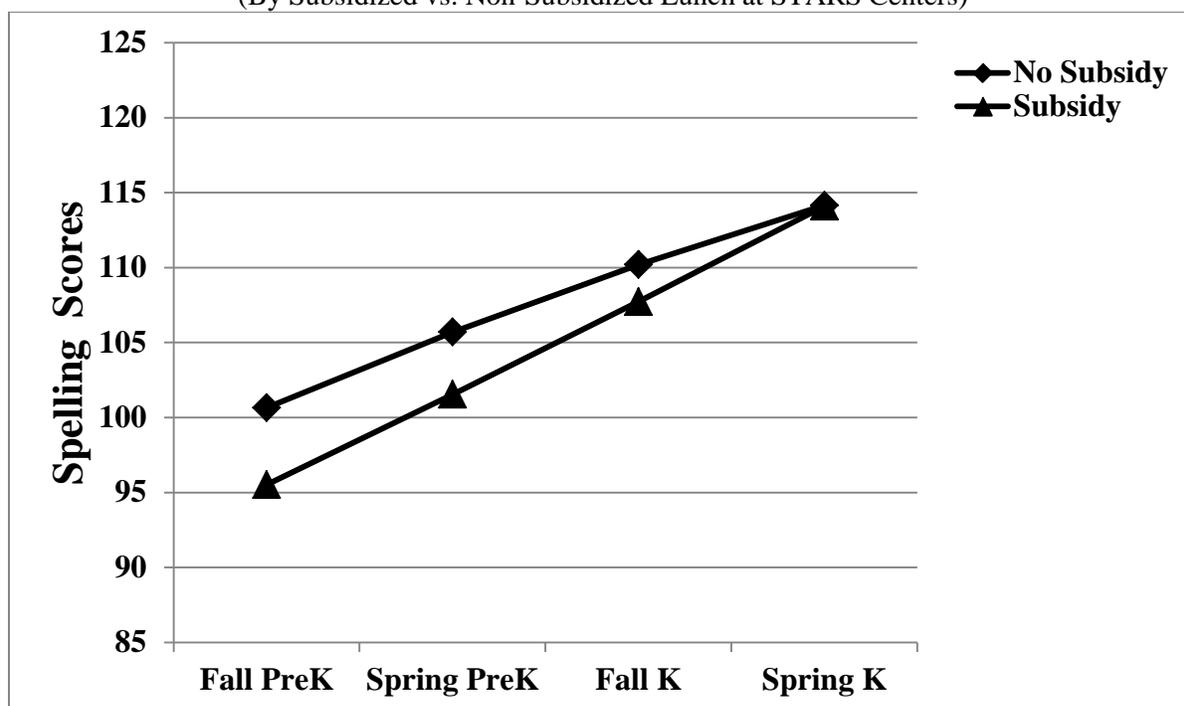


Figure 16. Standardized WJ Applied Problems Scores
(By Subsidized vs. Non-Subsidized Lunch at STARS Centers)

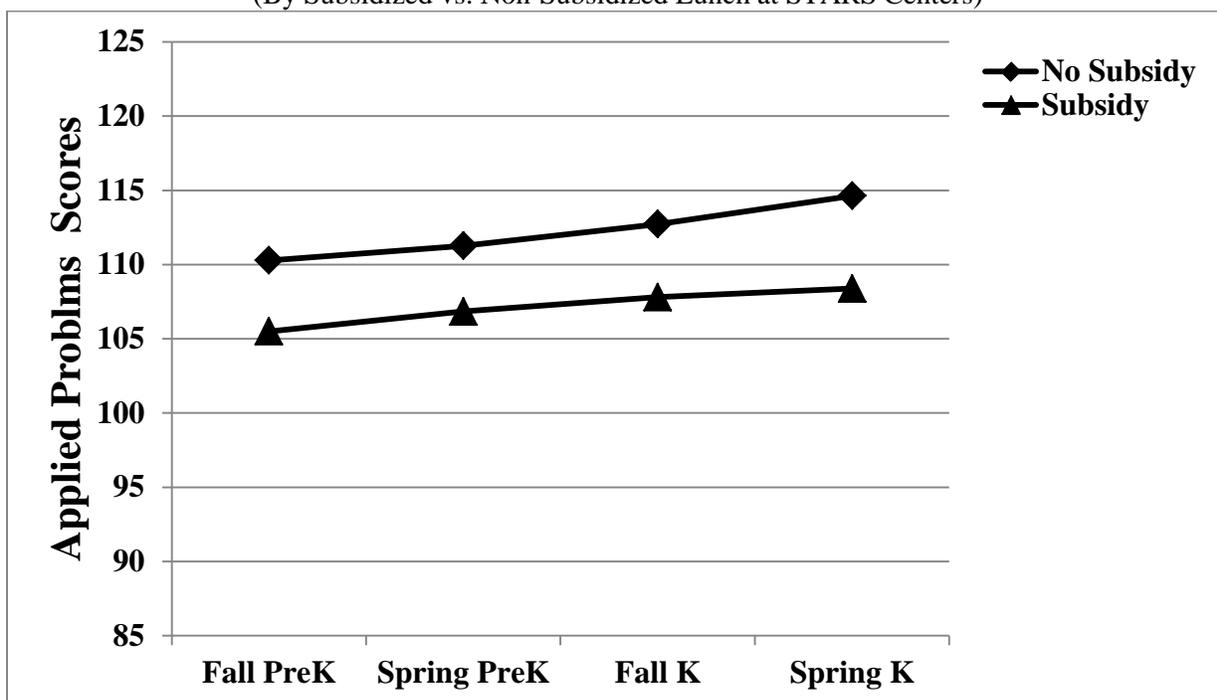
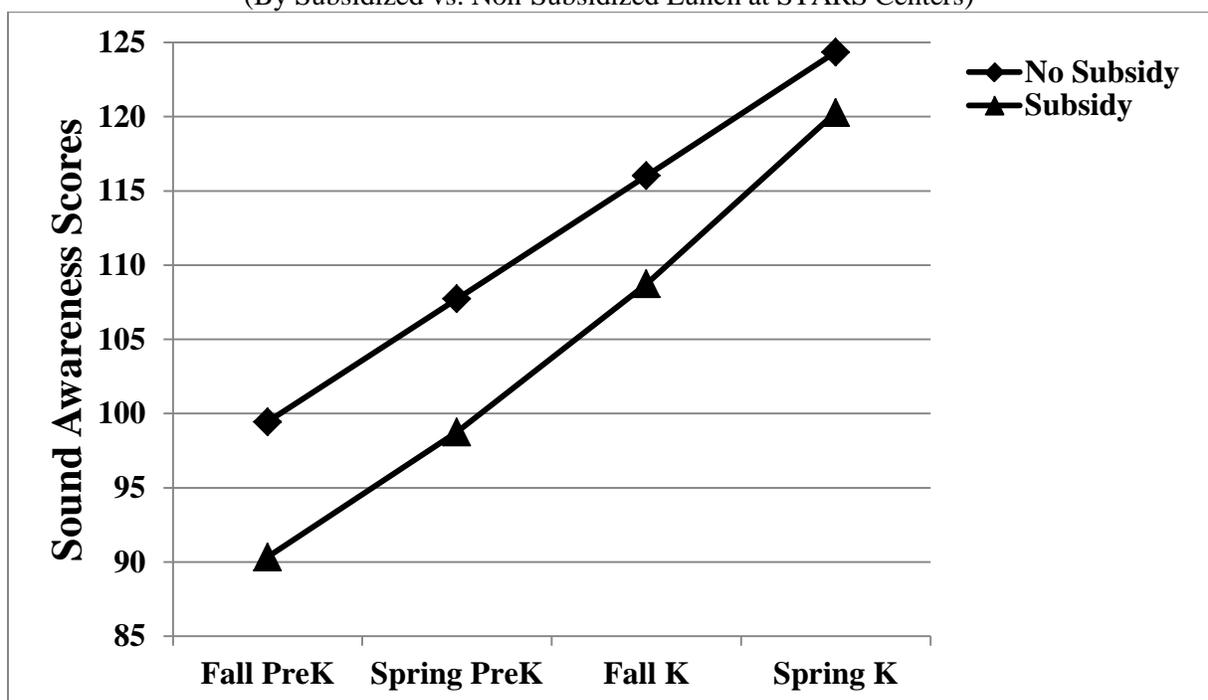


Figure 17. Standardized WJ Sound Awareness Scores
(By Subsidized vs. Non-Subsidized Lunch at STARS Centers)



Additional Child Outcomes Data Point

Fall 2014

First Grade

Overview

Under advisement of representatives of the Early Childhood Advisory Council, the research team extended the study with limited resources remaining from the two-year project. The objective of the extension was to locate a sample of study children in first grade classrooms and repeat the battery of outcome assessments administered in preschool and kindergarten. This design provided an additional child outcome data point for researchers to analyze and determine if differences in outcomes data related to children's preschool experiences prevailed into first grade. Available resources allowed only for the collection of child outcome data, with no survey or observational data collected for first grade teachers and classrooms. Two trained data collectors, graduate students in the College of Education, administered child assessments during the fall of 2014 with a small sample of study children who previously participated in the study.

It is imperative to note that no inferences or conclusions can be drawn from these data due to the small sample size of children in the study. The forthcoming data provide a glimpse into first grade outcome data and are to serve only as a follow-up for preliminary exploration.

Sample

Children. Outcome data for fall of first grade was not based on a random sample of previously enrolled study children. Researchers employed targeted sampling procedures based on the outcome data from the kindergarten year. Researchers targeted recruitment of two groups of children: a) children who had attended 3 and 4 STARS centers during preschool, and b) children who did not attend any structured learning program prior to kindergarten entry (the new cohort of kindergarten children). Differences in outcome scores between these two groups of children were the most pronounced in kindergarten. The differences in data between these two groups were deemed worthy of additional analysis and recruitment of children from these

categories was prioritized.

Additional parent consent was required to collect additional child data. Researchers identified where children from these two groups were likely to be enrolled for first grade based on kindergarten data. Principals of those schools were contacted and study staff explained the continuation of the study. Principals were asked if study children were currently enrolled in their respective schools and if parent consent forms could be sent home with those children. Information regarding principal participation and parent consent response rate is incomplete. Signed parent consent forms were received from 36 families, and all of these children were assessed by data collectors (N = 36).

Methods and Measurement

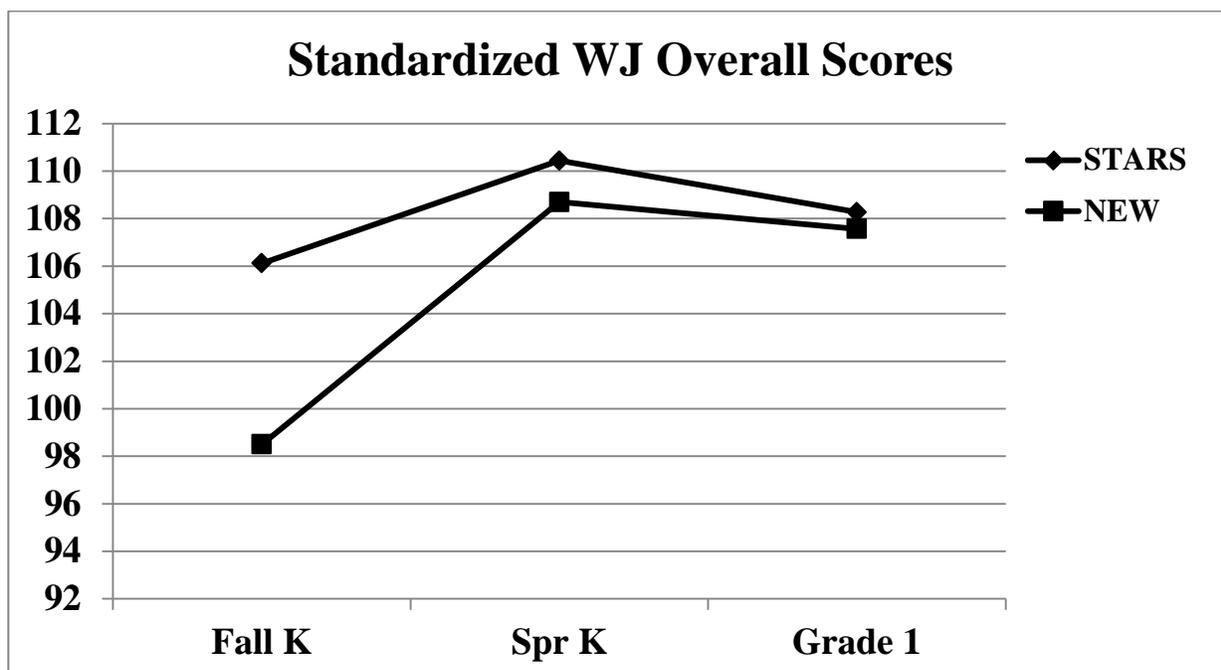
Child outcome measures. Data collectors administered the same battery of child outcome measures that were utilized in the preschool and kindergarten years. This included the *Woodcock-Johnson III Normative Update Tests of Achievement* (WJ III NU, McGrew, Schrank, & Woodcock 2007) subtests: *Letter-Word Identification, Understanding Directions, Spelling, Applied Problems, and Sound Awareness*. Data collectors also administered the *Basic Self-Knowledge: Social Awareness Task (Family and Child Experiences Survey [FACES] Research Team, modified from the Social and Communicative Competence tasks in: Jana M. Mason and Janice Stewart, 1989)*. First grade teachers completed the *Social Skills Improvement System* (SSIS; Gresham & Elliot, 2008) for study children to assess social skills and problem behaviors in the classroom setting (refer to Table 3 for SSIS scales and definitions). Measures of study children's height and weight were again collected during the fall data collection visits and mean Body Mass Indices (BMI) was calculated. Refer to Table 4 for details regarding the child outcomes measures used in preschool, kindergarten, and first grade.

Results

As with previous years' data, results from fall 2014 are presented in longitudinal fashion to illustrate children's outcome scores throughout the duration of the study. The WJ III NU, Social Awareness Task, and SSIS were used as indicators to measure children's academic outcomes and social-emotional behaviors. BMI for study children was calculated as one indicator of physical health. These data are presented with all five child outcome data points plotted on figures to illustrate children's growth over time. Children are grouped according to preschool experience (i.e., 3 and 4 STARS and "No PreK" on the figures). *Too few children were included in fall 2014 data collection to analyze the data for meaningful or statistical differences. The small sample of children located and assessed may not be representative of the larger pool of children who originally entered the study. The results can only be viewed as descriptive.*

Woodcock-Johnson III NU Tests of Achievement (WJ III NU). The WJ uses standard scores to classify children's ability. Children's scores remained in the "average" range on the five subtests administered during fall of the first grade year. WJ Overall outcome scores are presented two ways in the following figures. Figure 18 illustrates WJ Overall scores for 3 and 4 STARS children and the "No PreK" cohort for kindergarten and fall of first grade only. This figure includes data specifically for study children participating in fall 2014 data collection (N = 36) and is backtracked to fall of kindergarten. Preschool data are not included in this figure as this data is not available for children in the "No PreK" or new kindergarten cohort of children. Figure 19 includes WJ outcome data for all of the study children enrolled in the preschool and kindergarten years (N = 303), data from the cohort of children recruited in kindergarten (N = 70), plus data from the small sample of children located and assessed in first grade (N = 36).

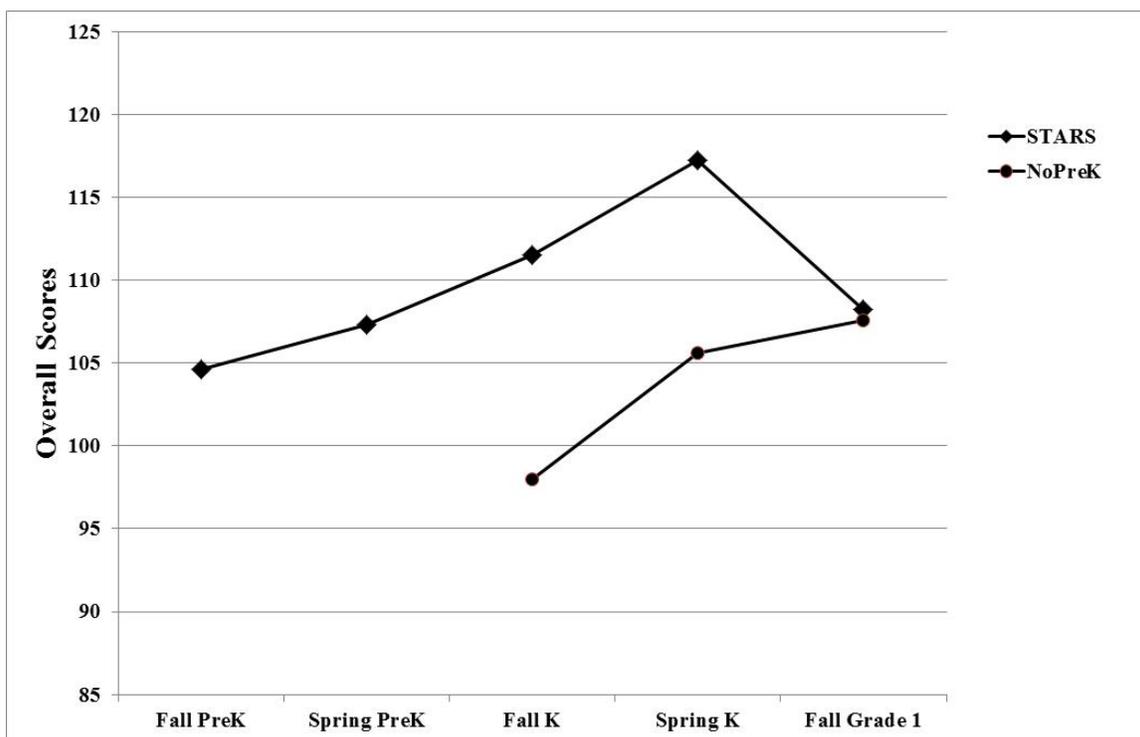
Figure 18. Standardized WJ Overall Scores



Number of children assessed at each data point:

N: STARS	8	9	15
N: New Kids	6	20	21

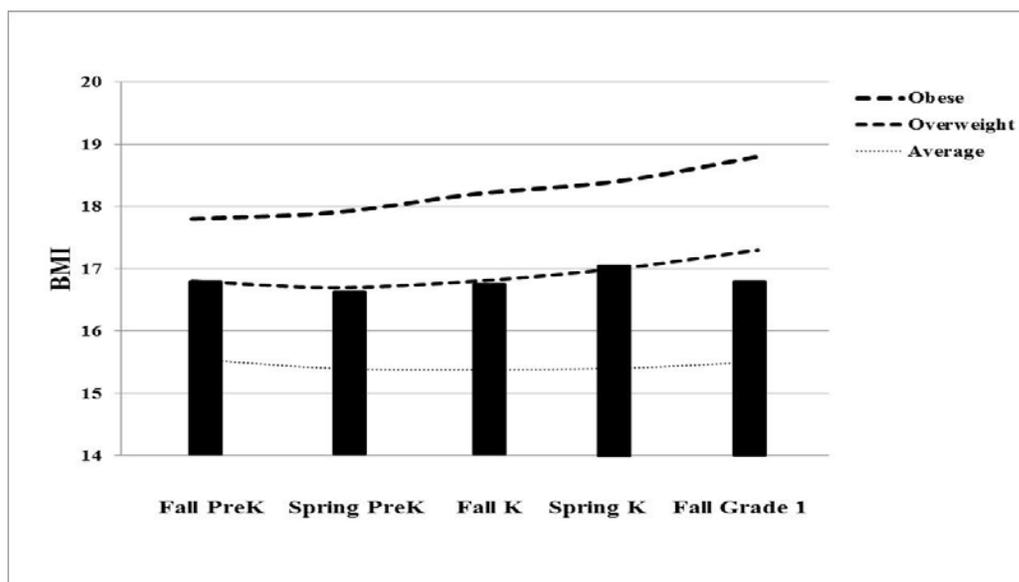
Figure 19. Standardized WJ Overall Scores



Note: Fall Grade 1 represents only 15 STARS children and 21 No PreK children.

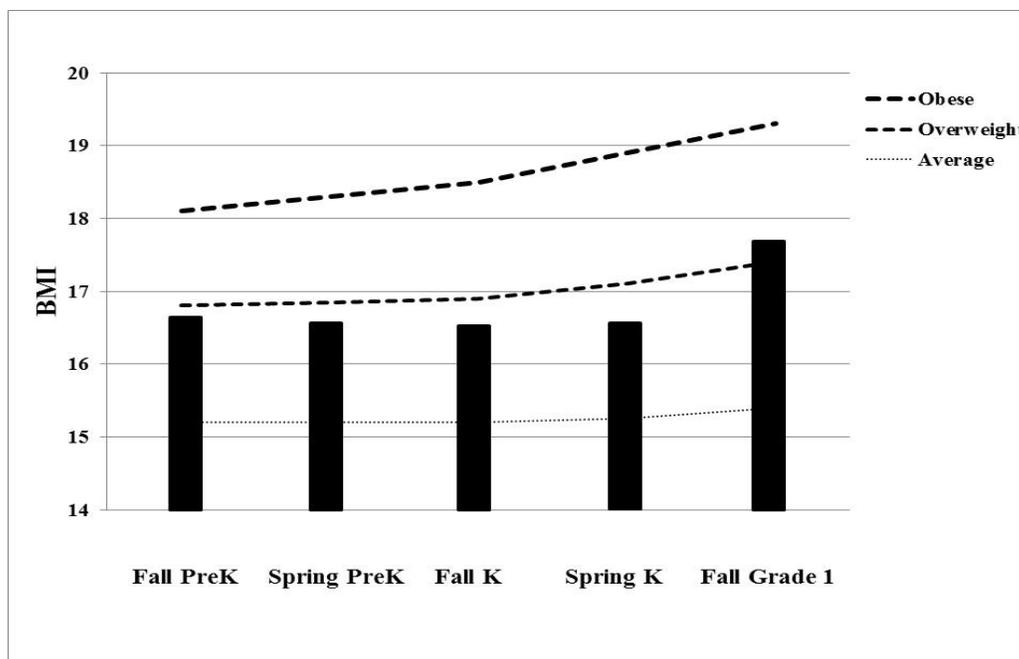
Children's Body Mass Index (BMI). Study children's BMI were calculated from height and weight measurements taken at the fall 2014 data collection point. Figures 20 and 21 (boys and girls, respectively) display study children's BMI data throughout the entire study. Normal BMI trajectories would closely track the CDC line for "average" (i.e., 50th percentile line). Conclusions regarding the variation in BMI data for fall 2014 cannot be made due to the small sample of children from which these data were collected.

Figure 20. BMI for Boys



Dashed reference lines represent the age-and gender-adjusted 50th, 85th, and 95th Percentile BMI scores for average, overweight, and obese, respectively.
 Note: Fall Grade 1 represents only 21 Boys

Figure 21. BMI for Girls



Dashed reference lines represent the age-and gender-adjusted 50th, 85th, and 95th Percentile BMI scores for average, overweight, and obese, respectively.
 Note: Fall Grade 1 represents only 15 Girls

Discussion

There were two purposes of the KIDS NOW Early Care and Education Third-Party Evaluation. First, the evaluation examined the status of kindergarten readiness for children attending Kentucky's highest quality early care and education programs and how those children fared in kindergarten relative to a matched sample of children. Second, the evaluation sought to determine the relationship between classroom quality and child outcomes in high quality preschool programs throughout the state of Kentucky, and compare children's preschool experiences with those during kindergarten. In order to address these purposes, the evaluation included investigating structural and process quality in classrooms across preschool and kindergarten, as well as child outcomes across the academic, socio-emotional, and physical domains. Results indicate both similarities and key differences in preschool and kindergarten classrooms that may impact children's outcomes at the end of the kindergarten year. The results of this report mirror findings from other national studies and provide validity for the participation of at-risk children in high quality early care and education experiences prior to, and during kindergarten.

Classroom quality

Classroom quality, as measured by the CLASS, showed that across all three preschool program types, the highest score was in the emotional support subdomain, followed by classroom organization, with the lowest score being in the instructional support domain. These trends are similar to those found in other early care and evaluation studies. Table 13 provides a comparison of Kentucky's early care and education program with to the Multi-State Study and State-Wide Early Education Program (SWEEP) conducted by NCEDL and the Georgia Study of Early Care and Education. Although no relationships between classroom quality and

academic performance were found, relationships between the emotional support, classroom organization, and instructional support subdomains of the CLASS and higher ratings of social skills in preschool were found. Preschool classrooms with higher scores on all three subscales of the CLASS had lower problem behaviors than those classrooms with lower scores. This finding is similar to what Pianta, LaParo, Payne, Cox, & Bradley (2002) found, although their study was conducted in kindergarten classrooms.

Table 21. Comparison of Kentucky PreK CLASS Scores with National Studies

CLASS Domains	Kentucky	Multi-State and SWEEP	Georgia (center-based care)
Emotional Support	5.33	5.14	5.8
Classroom Organization	4.74	4.71	5.4
Instructional Support	2.43	2.75	2.3

Classroom quality remained relatively consistent across the preschool and kindergarten year with the exception of Instructional Support domain scores. Scores in this domain were significantly higher in kindergarten classrooms. Analysis of these data did not reveal a relationship between teacher education or experience and CLASS scores in kindergarten, though CLASS scores in preschool were higher when teachers reported a Masters degree. Kindergarten teachers in this sample did have higher education levels and more years average teaching experience than preschool teachers. Higher Instructional Support scores in kindergarten may also be attributable to the emphasis on academic achievement upon school entry, as opposed to developmentally appropriate practice that is embraced by quality early childhood programs (Ray & Smith, 2010). Results of this evaluation are different from those found in LaParo, et al. (2009) of classroom quality in kindergarten. Below is a comparison

between the current investigation and a study conducted in 730 kindergarten classrooms across the country. Whereas the emotional support and classroom organization scores are similar, the instructional support scores in Kentucky kindergarten classrooms are over a point higher than the scores in the NCDEL Multi-state study (LaParo, et al.). Given the importance of the behaviors associated with the instructional support area of the CLASS (i.e., evaluative feedback, instructional conversation, and child responsibility), this is a positive finding for Kentucky.

Table 22. Comparison of Kentucky Kindergarten CLASS Scores with Multi-State Study.

CLASS Scores Kindergarten	KY	NCDEL Multi-State Study
Emotional Support	5.36	5.58
Classroom Organization	5.0	4.65
Instructional Support	3.03	1.97

Child outcomes

Academic outcomes. Child outcome scores reveal that preschool children in all three program types made significant growth in one or more subtests of the WJ III. It is important to note that the scores reported are standard scores, with a mean/ average of 100. **If no change was noted, this outcome would** indicate that the children stayed on target developmentally on the subscale. In other words, if children's standard scores remained constant then they have retained their status in relation to the normative sample. However, *growth on these subtests indicates that children in the sampled classrooms progressed at a greater rate than would be expected developmentally during this period of time.* Even more compelling is the fact that

some children who started lower made more significant gains than their peers who scored higher. These findings are especially compelling given that the majority of the sample were at-risk children (defined as low socio-economic or disability). As a result, they are at greater risk for school failure. In Kentucky, children who fall into an at-risk category (i.e., qualify for free or reduced lunch program, have an identified disability, or limited English proficiency) always fall below the state average in proficiency on state accountability assessments (Kentucky School Report Card, 2012). Therefore, not only did the children make greater gains than would be expected, but they did so despite their “at-risk status”. These findings, similar to those found in the Georgia Prekindergarten Evaluation (Peisner-Feinberg, Schaaf, & LaForrett, 2013), suggest that high quality programming ameliorates the negative impact of factors such as low SES and the presence of a disability on child outcomes. Further study is needed to determine if these findings remain consistent as the longitudinal study extends into first grade and beyond.

The longitudinal nature of this evaluation allowed for an examination of the relationship between children’s prekindergarten experiences and outcomes in the kindergarten year. Findings included that children’s preschool experiences were relevant when looking at later child outcomes. Study children who attended 3 and 4 STARS centers prior to kindergarten obtained higher WJ Overall scores than their peers in other types of preschool program types (i.e., Head Start and Prek) and those who had no preschool experience. These children who attended 3 and 4 STARS centers maintained higher WJ Overall scores throughout the duration of the study. Further analysis conducted after separating children, who attended 3 and 4 STARS centers, into two groups based on family socio-economic factors indicated that children from families of lower incomes grew at a rate parallel to that of their economically advantaged peers. Their WJ Overall scores remained lower, though not statistically significantly so. This is

an important finding demonstrating that low-income children in this study experienced academic growth at a rate similar to that of children residing with families of higher incomes.

Socio-emotional outcomes. The importance of children's socio-emotional development in the early years is supported by results from the correlational analyses between teachers reported SSIS scores for preschool and kindergarten children. Reports of higher Social Skills subscale scores were negatively correlated with Problem Behavior subscale scores in both preschool and kindergarten. Similarly, Academic Competence subscale scores for kindergarten study children were positively correlated with Social Skills subscale scores and negatively correlated with Problem Behavior subscale scores. This lends credence to other studies that impart the significance of children's social skill development in relation to school readiness (Robinson & Diamond, 2014; Logue, 2007). Relationships were found between emotional support, classroom organization, and instructional support and higher ratings of social skills in preschool.

Physical Outcomes. BMI percentiles indicate how study children's size and growth patterns compare to children of the same sex and ages on a national scale. While BMI is not a diagnostic tool, it is used to screen children for obesity, overweight, healthy weight, and underweight status. Average BMIs for study children across years indicate that children are approaching the 'overweight' category. This is particularly concerning given that Kentucky has the fifth highest rate of obesity in the nation, and 18% of Kentucky high school students are considered obese (Center for Disease Control and Prevention, 2013). A 2010 report from the National Resource Center for Health and Safety in Child Care and Early Education indicates that child care licensing regulations are lacking several components to prevent childhood obesity (2011). Opportunities to address children's physical health while in early care and

education settings are worthy of further consideration.

Perceptions of School Readiness

Preschool teachers and parents of preschool children who participated in the study perceive the development of social skills as key to children's successful transition to kindergarten, as evidenced by their responses to the school readiness survey. This finding is in keeping with what others agree are necessary skills for kindergarten preparedness. Early childhood professionals generally agree that children who lack necessary social skills (e.g., following directions) will have difficulty in kindergarten (Logue, 2007). However, other research has shown that parents of preschool aged children generally identify specific academic skills, instead of social skills as most important for kindergarten readiness (Hatcher, Nunan, & Paulsel, 2012). Of interest is the fact kindergarten teachers also rated social skills as the most important skills for school success, as did parents of kindergarten children. This finding is consistent with other research that has examined kindergarten teachers' perceptions of skills necessary for school success (Cappelloni, 2010). Kentucky's definition of school readiness recognizes that young children need to develop necessary social skills to be successful in kindergarten. Perhaps the state's emphasis on social skills in its school readiness definition has impacted kindergarten teachers' perceptions.

Limitations.

There are limitations to this study that must be addressed. The emergent pattern of children from 3 and 4 STARS centers scoring higher on academic measures throughout the study than children from other center types could be a result of sampling bias, as researchers relied on a volunteer sample. This pattern may also be partially explained by the composition of children attending 3 and 4 STARS centers in this particular sample. Of the 101 children

sampled from 3 and 4 STARS programs, less than 24% were reported as eligible for the free and reduced lunch program. These numbers may reflect the general enrollment characteristics of children attending 3 and 4 STARS programs, or the fact that only higher income families gave consent for study participation. An additional limitation related to the child sample of the study is the relatively small sample size. A larger child sample would lend to more sophisticated statistical analyses that could further explore the data in relation to the research questions.

Despite the trend revealed in the analysis of these data, caution must be taken when interpreting the findings. Results from this study could lend evidential support to the longitudinal cognitive benefits of quality early care and education experiences. However, additional research is necessary to make causal inferences. A similar study of this longitudinal nature with a larger sample is in order. The findings of the present study are not dissimilar to other studies that have employed similar measures of quality. In a meta-analysis of studies examining the relationship between early care and education experiences and child outcomes, small effect sizes were noted between the variables (Keys, et al. 2013). Even still data are compelling enough to warrant additional investigation into the effect children's early care and education experiences, or lack thereof, have on social skills development and academic achievement upon school entry. Future research should employ content specific measures of classroom quality, as recommended by Keys, et al (2013).

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Appendix A

Director Survey Questions

Director Education Level			Major	Yrs in field of EC
Complete	In Progress			
		HS Diploma/GED		
		Commonwealth Credential		
		CDA		
		Some college		
		Associate's Degree		
		Bachelor's Degree		
		Master's Degree		
		Specialist Degree		
		Doctorate		
		Other		

Appendix B
Preschool Teacher Survey &
Questionnaire

Teacher Survey

This questionnaire is designed to help us gain a better understanding of the skills teachers believe children need to be ready for kindergarten. Your answers are confidential.

What is your highest level of education completed? _____ **How many years have you been a lead teacher?** _____

What was your educational major? _____ **How many years have you worked in the field (in any position)?** _____

Directions: Please indicate your opinion about each of the characteristics below by circling one of the seven responses in the columns on the right side, ranging from (1) "Not important" to (7) "Very important."

Not important

Somewhat important

Very important

	1	2	3	4	5	6	7
1. Sits still and pays attention	1	2	3	4	5	6	7
2. Follows simple rules and routines	1	2	3	4	5	6	7
3. Starts things on his/her own	1	2	3	4	5	6	7
4. Can count to 20 or more	1	2	3	4	5	6	7
5. Know the letters of the alphabet	1	2	3	4	5	6	7
6. Is able to express his/her needs and wants	1	2	3	4	5	6	7
7. Know how to write first name	1	2	3	4	5	6	7
8. Identifies similarities and differences (e.g. big and small, sorts objects by type, such as fruits and vegetables)	1	2	3	4	5	6	7
9. Recognizes simple rhymes (e.g. child knows 'hat' rhymes with 'cat,' or 'cake' with 'rake')	1	2	3	4	5	6	7
10. Is motivated and curious to learn	1	2	3	4	5	6	7

Appendix C
Preschool Family Questions/School Readiness
Questionnaire

Family Income level

19,999 and below	30,000 to 39,999	50,000 and above
20,000 to 29,999	40,000 to 49,999	

Mother education level complete

Less than high school	Some college (no degree)	Bachelors degree
High school/GED	Associates	Graduate Degree

Marital Status

Single	Divorced	Living together not married
Married	Widow	Separated

How many adults living in home _____ How many children living in home _____

In your opinion, how important are the following skills for a child to be ready for kindergarten? We are **Not** asking about your child's skills, but the importance of these skills. Please circle responses

1	2	3	4	5	6	7
Not Important			Somewhat Important			Very Important
1	_____		Sits still and pays attention			1 2 3 4 5 6 7
2	_____		Follows simple rules and routines			1 2 3 4 5 6 7
3	_____		Starts things on his/her own			1 2 3 4 5 6 7
4	_____		Can count to 20 or more			1 2 3 4 5 6 7
5	_____		Knows the letters of the alphabet			1 2 3 4 5 6 7
6	_____		Is able to express his/her needs and wants			1 2 3 4 5 6 7
7	_____		Knows how to write first name			1 2 3 4 5 6 7
8	_____		Identifies similarities and differences (e.g. Big and small, put objects together by type, example fruits and vegetables)			1 2 3 4 5 6 7
9	_____		Recognizes simple rhymes (e.g. Child knows "hat" rhymes with "cat", or "cake" with "rake")			1 2 3 4 5 6 7
10	_____		Is motivated and curious to learn			1 2 3 4 5 6 7

From the above questions, please place a check mark next to the three most important skills for a child to be ready for kindergarten.

What is the name of the elementary school your child will attend for kindergarten in Fall 2013? _____

In what county is this school? _____

Appendix D
Kindergarten Teacher Survey
& Questionnaire

Teacher Survey

This questionnaire is designed to help us gain a better understanding of the skills teachers believe children need to be ready for kindergarten. Your answers are confidential.

What is your highest level of education completed? _____

How many years have you been a lead teacher? _____

What was your educational major? _____ IECE
 _____ Elementary Ed
 _____ other (_____)

How many years have you worked in the field (in any position)? _____

Directions: Please indicate your opinion about each of the characteristics below by circling one of the seven responses in the columns on the right side, ranging from (1) "Not important" to (7) "Very important."

Not important

Somewhat important

Very important

		1	2	3	4	5	6
1. Sits still and pays attention	7						
2. Follows simple rules and routines	7						
3. Starts things on his/her own	7						
4. Can count to 20 or more	7						
5. Know the letters of the alphabet	7						
6. Is able to express his/her needs and wants	7						
7. Know how to write first name	7						
8. Identifies similarities and differences (e.g. big and small, sorts objects by type, such as fruits and vegetables)	7						
9. Recognizes simple rhymes (e.g. child knows 'hat' rhymes with 'cat,' or 'cake' with 'rake')	7						
10. Is motivated and curious to learn	7						

Appendix E
Kindergarten Family Questions/School Readiness
Questionnaire

My child is eligible to participate in the free or reduced lunch program: (circle one)

Yes

No

Prior to kindergarten, did you child attend: (circle one)

Public preschool

Child care

Head Start

Home-based child care

None of the above

Mother education level complete: (circle one)

Less than high school

Some college (no degree)

Bachelors degree

High school/GED

Associates degree

Graduate degree

Marital Status: (circle one)

Single

Divorced

Living together not married

Married

Widow

Separated

In your opinion, how important are the following skills for a child to be ready for kindergarten? We are **Not** asking about your child's skills, but the importance of these skills. Please circle responses

1	2	3	4	5	6	7
Not			Somewhat			Very
Important			Important			Important
1	_____		Sits still and pays attention			1 2 3 4 5 6 7
2	_____		Follows simple rules and routines			1 2 3 4 5 6 7
3	_____		Starts things on his/her own			1 2 3 4 5 6 7
4	_____		Can count to 20 or more			1 2 3 4 5 6 7
5	_____		Knows the letters of the alphabet			1 2 3 4 5 6 7
6	_____		Is able to express his/her needs and wants			1 2 3 4 5 6 7
7	_____		Knows how to write first name			1 2 3 4 5 6 7
8	_____		Identifies similarities and differences (e.g. Big and small, put objects together by type, example fruits and vegetables)			1 2 3 4 5 6 7
9	_____		Recognizes simple rhymes (e.g. Child knows "hat" rhymes with "cat", or "cake" with "rake")			1 2 3 4 5 6 7
10	_____		Is motivated and curious to learn			1 2 3 4 5 6 7

From the above questions, please rank the three most important skills for a child to be ready for kindergarten. Only choose three, and write a one, two, or three next to each item with one being most important.

