Children's Outcomes and Classroom Quality from Pre-K through Kindergarten

Findings from Year 2 of
Georgia's Pre-K Longitudinal Study

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Georgia's
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Purpose of the Evaluation Study

In 2011-2012, the Georgia legislature funded a series of ongoing studies to evaluate Georgia's Pre-K Program. The first study, conducted in 2011-2012, was designed to examine children's learning outcomes during pre-k, the factors that predict better outcomes, and the quality of children's experiences in Georgia's Pre-K classrooms based on a random sample of 100 classrooms and 509 children within those classrooms. The second study, conducted in 2012-2013, was designed to investigate the effects of participation in Georgia's Pre-K on children's school readiness skills, and whether those effects are similar for different groups of children. This study utilized a regression discontinuity design (RDD) to compare children who had and had not attended the program, and included 1,181 children (611 treated and 570 untreated). The third study, occurring from 2013-2018, involves a longitudinal design to follow a sample of 1,169 children from pre-k through third grade, in order to examine the short- and long-term learning outcomes for children who attended Georgia's Pre-K as well as the quality of their preschool and school experiences.

The current report focuses on the results of the second year of this longitudinal study—the 2014–2015 Georgia's Pre-K Program Evaluation. The purpose of this evaluation study was to examine initial longitudinal outcomes related to school readiness for children and the quality of their classrooms from pre-k through kindergarten. The primary evaluation questions addressed included:

- What are the learning outcomes through kindergarten for children attending Georgia's Pre-K Program?

- What factors predict better learning outcomes for children?

- What is the quality of children's experiences in pre-k and kindergarten?

To address these questions, the evaluation study included a sample of 1,169 children (139 Spanish-speaking dual language learners/DLLs) attending a random sample of 199 Georgia's Pre-K classrooms in year 1, and 1,034 of these children (118 Spanish-speaking DLLs) who were attending kindergarten in year 2. Researchers conducted individual child assessments near the beginning and end of each year to examine growth in children's skills. The assessment measures covered multiple domains of learning, including language, literacy, math, and general knowledge, and teacher ratings of behavior skills. For the DLL subsample, parallel assessments were conducted in both English and Spanish. Researchers also conducted observations of the quality of teacher-child instructional interactions using the CLASS in both pre-k and kindergarten classrooms attended by this sample. In addition, information about characteristics of the classrooms, teachers, and children was gathered from teacher and parent surveys and from existing statewide pre-k program data. Child/family characteristics, classroom/teacher characteristics, and classroom quality were examined as moderators of children's growth in skills.

Overview of Georgia's Pre-K Program

Georgia's Pre-K Program is a state-funded universal pre-kindergarten program for 4-year-olds. The program serves children from all income levels, with no fees charged to families for program participation. Georgia was one of the first states to offer such a universal program in 1995, currently serving over 80,000 children each program year in a variety of settings across the state, including public school systems, private providers, and blended Head Start/pre-k classrooms. Georgia's Pre-K Program is based on a school-year model with instruction for 180 days/year and 6.5 hours/day[a]. Class sizes are limited to 20–22 children with a lead and assistant teacher, and adult:child ratios of 1:11. Lead teachers are required to have at least a bachelor's degree in early childhood education or a related field (unless previously approved), and assistant teachers are required to have at least a Child Development Associate (CDA) credential. In addition, program guidelines provide minimum salary requirements for lead teachers based on credentials, with funding provided by the state, as well as minimum salary requirements for assistant teachers meeting the credential requirements.

Guidelines for classroom instruction are provided through the *Georgia Early Learning and Development Standards (GELDS)[i]*, which are aligned with *Georgia's Performance Standards for Kindergarten[ii]*. The program standards also require Georgia's Pre-K sites to use an approved curriculum; provide written lesson plans which include educational experiences in language and literacy, math, science, social studies, creative arts (music, art, and drama), social and emotional, and health and physical development; implement individual child assessments using the *Georgia's Pre-K Child Assessment—Work Sampling Online[iii]*, which is based on the *Work Sampling System[iv]*; offer meals, rest time, and both indoor and outdoor play time; and provide support services or referrals to families as needed. Bright from the Start: Georgia Department of Early Care and Learning (DECAL) oversees the program, and staff provide consultation, technical assistance, and monitoring visits throughout the year. (See 2015–2016 Georgia's Pre-K Program Operating Guidelines[v] for further information.)

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[a] Prior to 2011-2012, Georgia's Pre-K Program provided 180 instruction days per year, but budget restrictions led to a reduction to 160 days in 2011-2012. In 2012–2013, the program year was increased to 170 days and in 2013–2014, it was returned to 180 days.

Methods

In year 1 of the longitudinal study, data were gathered from a random sample of classrooms and children within classrooms to examine child outcomes and classroom quality in Georgia's Pre-K Program (2013-2014). This random sample of children was then followed into kindergarten (2014-2015) in year 2 of the study. At the beginning (fall) and end (spring) of both pre-k and kindergarten, researchers conducted individual assessments of children's language, literacy, math, and general knowledge skills and gathered teacher ratings of behavior skills. Researchers also conducted classroom observations of teacher-child instructional interactions. Program and classroom characteristics, as well as teacher and child demographic data, were obtained from teacher and parent surveys and existing statewide administrative data collected by DECAL.

Participants

Classrooms

Children in the study sample initially attended 199 Georgia's Pre-K classrooms in 2013–2014 (year 1) and 822 kindergarten classrooms in 2014–2015 (year 2). Information about pre-k settings and teacher certification was obtained from DECAL data. About half of Georgia's Pre-K classrooms attended by children in the study sample were in public school settings (49%) and about half were in private sites (51%). The kindergarten classrooms attended by children in the sample primarily were located in public school settings (796), with a few in charter schools (19) and private schools (7).

Information on characteristics of the pre-k classrooms and teachers included in the year 1 sample was based on teacher surveys (see Table 1). The average class size was 21 children, with half boys and half girls. Almost two-thirds (64%) of the teachers had a bachelor's degree and about one-third (34%) had a master's degree or higher. The majority (82%) were Georgia PSC Certified or Certified Temporary. Teachers reported having an average of 11 years of teaching experience. Approximately 70% of the teachers were White, 3% were of Latino ethnicity, and almost all were female.

Information on characteristics of the kindergarten classrooms and teachers included in the year 2 sample was based on teacher surveys (see Table 2). The average class size was about 20 children, with half boys and half girls. Approximately 38% of kindergarten classroom teachers had a bachelor's degree and 62% had a master's degree or higher. Teachers reported an average of almost 15 years of teaching experience. Nearly 80% of the teachers were White, 2% were of Latino ethnicity, and almost all were female.

Children

The study sample included 1,169 children in year 1 (pre-k) and 1,034 children in year 2 (kindergarten). These children included a subsample of Spanish-speaking dual language learners (DLL subsample)—139 children in year 1 (pre-k) and 118 children in year 2

(kindergarten). Parent permission forms were distributed to all children in each randomly-selected pre-k classroom, with an overall permission rate of 73% (3,136 of 4,270 eligible children). An average of 6 children with parent permission per classroom were randomly selected for inclusion in the study in year 1. Children were excluded from year 2 of the study for the following reasons: parent withdrew permission (n=4), child attending ineligible site (n=6), the research team was not able to locate the child in a school during kindergarten (n=30), child had moved out of state (n=33), or the school district or school was unwilling to participate (n=62).

Information about child and family characteristics for the study sample was obtained from DECAL data and parent survey data (see Table 3). The children in the sample in year 2 were about half boys (48%) and half girls (52%); from varied racial backgrounds, including about half (53%) White, about one-third African-American (38%), and the remainder from other or multiracial backgrounds (9%); almost one-fifth (15%) of these children were of Latino ethnicity. More than half (55%) of the children were from low-income families (as indicated by Category One status), approximately 10% of the children had limited English language proficiency, and 3% had an individualized education program (IEP). The only significant difference between the year 1 and 2 samples was that a higher percentage of Asian children were excluded from the year 2 sample (5.2%) vs included in the year 2 sample (2.1%), although in both cases they represented a relatively small percentage of the overall distribution [$t(1,052)=2.45$, $p=.014$].

Measures and Procedures

Child Assessments
Individual assessments to measure children's growth in skills were conducted in their pre-k and kindergarten settings. Children were assessed at four time points: 1) fall pre-k (9/10/13–12/10/13); 2) spring pre-k (3/8/14–5/25/14); 3) fall kindergarten (9/12/14–3/9/15); and 4) spring kindergarten (3/26/15–5/18/15). Only 10% of the sample (103 children) received fall assessments between January and March in kindergarten. The extended fall data collection period in kindergarten was a result of extended school closings due to inclement weather and an outbreak of the flu virus across the state. Project staff ensured a minimum 6-week gap between fall and spring assessments for all children. Assessments were conducted by trained data collectors, and children's verbal assent was obtained prior to the assessment. All children received assessments in English. Children who were reported by their parents or teachers to speak Spanish received a second set of parallel assessments using Spanish language versions of these measures. The Spanish assessments were conducted by a different, bilingual data collector on a separate day, approximately two weeks after the English assessments.

All of the child assessment measures were available in both English and Spanish versions, with the same measures used in both pre-k and kindergarten. Most of the measures used are norm-referenced, so that for most outcomes, standard scores could be used. These scores take into account children's age, so that the standardized mean score of 100 represents the expected performance for an average child at a given age.

Language and literacy skills were assessed with five measures (see Table 4). The Naming Letters task[vi] measures children's ability to recognize and name all 26 letters of the alphabet. Four subtests from the Woodcock-Johnson III Tests of Achievement[vii] (WJ-III) / Batería III Woodcock-Muñoz Pruebas de Aprovechamiento[viii] (Bat-III) also were used. The Letter-Word Identification subtest measures basic pre-reading and reading skills, including letter and word recognition and identification skills. The Picture Vocabulary subtest measures vocabulary skills, including aspects of both receptive and expressive language. The Sound Awareness subtest measures phonological awareness skills, including rhyming. The Word Attack subtest measures phonemic awareness skills, including knowledge of letter sounds and sound combinations.

Math skills were assessed with two measures. The Counting Task[ix] measures children's ability to count using one-to-one correspondence and the Applied Problems subtest of the WJ-III / Bat-III measures math problem-solving skills including simple comparisons, counting, addition, and subtraction.

General knowledge was assessed with the Social Awareness Scale[x] which measures whether the child knows and is able to communicate basic self-knowledge (full name, age, birthday). Behavior skills were assessed with two subscales of the Social Skills Improvement System[xi] (SSiS) completed by teachers. The Social Skills subscale rates behaviors that promote positive interactions while discouraging negative interactions. The Problem Behaviors subscale rates behaviors that interfere with social behavior performance or acquisition.

In addition, the preLAS 2000[xii] was used to measure oral language proficiency in English for all children as well as in Spanish for the DLL subsample in fall pre-k. Scores on this measure were used as covariates in the analyses in order to examine whether differences in children's growth on the various outcome measures were related to their initial level of language proficiency (1=Non-English/Spanish speaker, 2–3=Limited English/Spanish speaker, 4–5=Fluent English/Spanish speaker). (See Table 5.)

Classroom Observations
Observations of classroom practices were conducted in all 199 randomly-selected pre-k classrooms attended by the children in the sample in year 1 and in 296 randomly-selected kindergarten classrooms of the 822 attended by children in the sample in year 2. The focus of the classroom observations was on interactions between teachers and children. (See Table 4 for an overview of the classroom observation measure, including subscales and scoring.)

Teacher-child instructional interactions were assessed using the Classroom Assessment Scoring System[xiii] (CLASS) in pre-k and the CLASS K-3[xiv] in kindergarten. The CLASS measures teachers' interactions with children in the areas of social and emotional functioning, classroom organization and management, and curriculum implementation to support cognitive and language development. The CLASS/CLASS K-3 includes 10 dimensions organized into three domains, with separate scores calculated for each domain. The scale has demonstrated good interrater reliability (mean agreement within one point=87.1%, range=78.8%–96.9%)[xiii, xiv].

In year 1, observations of classroom practices were conducted during the second half of the program year (1/28/14–4/25/14). Observations typically lasted about 3 hours. Data collectors had to meet established reliability criteria prior to gathering data (i.e., 85% agreement within one point). Inter-rater reliability data were collected for 20% of the observations and intra-class correlations indicated that reliability was adequate[xv] (Emotional Support=.78, Classroom Organization=.68, Instructional Support=.43). (Intra-class correlations of .40–.59 are considered in the fair range, .60–.74 good, and .75–1.0 excellent.) In year 2, observations of kindergarten classrooms were conducted during the second half of the program year (2/23/15–5/13/15). Inter-rater reliability data were collected for 20% of the observations and intra-class correlations indicated that reliability was excellent (Emotional Support=.81, Classroom Organization=.83, Instructional Support=.77).

Parent and Teacher Surveys

Parents completed demographic surveys and both pre-k and kindergarten teachers completed online surveys that included information about their classrooms and demographic information. In year 1 and year 2, parents completed demographic surveys about their family and household. Information about parent education was used in the current study, coded as a three-level variable (1=less than high school, 2=high school to less than Bachelor's degree, 3=Bachelor's degree or above). Parent surveys were distributed to families along with the permission forms and returned to teachers. Parent surveys were received from 91% (1,067/1,169) of participating families in year 1 and 86% (888/1,034) of participating families in year 2. Teachers completed online surveys about characteristics of the classroom and their background, including classroom composition (number of boys and girls in class), length of teaching experience, and degrees earned. Teachers were asked to complete the online surveys via email requests sent during the spring semester, with a completion rate of 95% (189/199) in year 1 and 95% (777/822) in year 2.

Analysis Approach

Sample Description and Comparison

Descriptive analyses were conducted on teacher characteristics (teaching experience, teacher gender, ethnicity, race, and education level), classroom characteristics (classroom size, proportion of boys/girls, classroom quality), and children's outcomes. For children's outcomes, three sets of descriptive analyses were conducted: for the full sample of children, for the DLL subsample of children assessed in English, and for the DLL subsample assessed in Spanish. Additionally, the amount of missing data and zero-order correlations among the study variables were examined. T-test comparisons were conducted for child and family variables (child age, gender, ethnicity, race, limited English language proficiency status, IEP status, parent education and family income status) for those remaining in the sample and not in the sample during year 2 to examine potential selection bias and to estimate the size of attrition.

Child Outcomes

Changes over Time

To investigate whether significant levels of growth occurred in children's outcomes during the pre-k and kindergarten years, a series of three-level hierarchical linear models (HLM) were estimated, with separate models conducted for each outcome. Each of the outcome scores, collected at fall and spring of pre-k and fall and spring of kindergarten, served as the dependent variables. Children were nested within classrooms, and the Time variable (coded as 0, 1, 2, 3 for the four time points from fall pre-k to spring kindergarten) was used as an indicator of children's growth on each outcome over time. The base model included the following covariates: child gender (F=0, M=1), child race (Non-White=0, White=1), child ethnicity (Non-Latino=0, Latino=1), child IEP status (No=0, Yes=1), child English/Spanish language proficiency level assessed at fall of pre-k (1–5), family income (Category Two=0, Category One=1), program type at pre-k (public school system=0, private setting=1), lead pre-k teacher certification (Teacher not certified=0, Teacher certified=1), and class size (time varying for pre-k and kindergarten). PreLAS English language proficiency level was included for English outcome measures for the full sample and the DLL subsample English language outcomes, and Spanish language proficiency level for the DLL subsample Spanish language outcomes. All continuous covariates were centered. Additionally, the comparison of rates of change in each outcome, based on the full sample, tested the differences in the amount of growth in each outcome of interest between the pre-k year and kindergarten year. A FIML (Full Information Maximum Likelihood) procedure was used to estimate missing values for the regression analyses.

Moderators of Growth

To examine moderators of growth in children's outcomes over the two years of the study, the second series of three-level HLM models were conducted building upon the base model described above, using the full sample. Separate models were conducted for each outcome of interest, with particular child, family, and teacher characteristics tested as potential moderators of children's growth, after accounting for the covariates presented in the base model. These moderators included: child race, child English proficiency level, family income, pre-k teacher certification, class size (time varying for pre-k and kindergarten classrooms), and pre-k program type. A third series of three-level HLM models was conducted to examine classroom quality as a potential moderator of growth. These models built upon the second series of models and included the main effects of the CLASS Emotional Support, Classroom Organization, and Instructional Support domain scores, and the interactions of each of these quality domains with Time. A FIML procedure was used to estimate missing values for the regression analyses.

Quality of Classroom Practices

Analyses were conducted to examine the quality of instructional practices in pre-k and kindergarten classrooms for the observed samples of classrooms attended by children in the study. Descriptive analyses were conducted for pre-k CLASS and kindergarten CLASS K-3 scores on each domain, including means and frequency distributions. T-tests compared the CLASS domain scores between pre-k and kindergarten classrooms.

Results

Children's Growth over Time

Full Sample

Children who attended Georgia's Pre-K Program made significant gains on almost all measures from entry into pre-k through the end of kindergarten. They demonstrated significant growth across all domains of learning (based on regression results): Language/literacy skills (WJ-III Letter-Word Identification, WJ-III Sound Awareness, WJ-III Word Attack, Naming Letters Task), Math skills (WJ-III Applied Problems, Counting Task), General knowledge (Social Awareness Task), and Behavior skills (SSiS Social Skills). Two areas that showed no changes over this time period were WJ-III Picture Vocabulary and SSiS Problem Behaviors, which had scores around the population mean at both time points (see Table 6, Table 7, and Table 8).

In general, children showed consistent gains on many of the norm-referenced measures (WJ-III and SSiS), with average scores at or slightly below the population mean of 100 at the beginning of pre-k and slightly to somewhat above the mean (from about 0.2 to almost 1 SD higher) by the end of kindergarten. Growth on these measures indicates that children progressed at an even greater rate from their entry into Georgia's Pre-K through the end of kindergarten than would be expected for normal developmental growth. However, without a comparison group, it is not possible to establish a clear causal link between outcomes and program participation. Growth on the other measures showed substantial gains in knowledge. For example, at the beginning of pre-k, children on average could name 13 letters, count 18 items in one-to-one correspondence, and respond to 4 (of 6) items about basic self-knowledge (such as name and birthday). By the end of pre-k, children on average could name 20 letters, count 27 items, and respond to 5 self-knowledge items; and by the end of kindergarten, could name almost all 26 letters, count 37 items, and respond to almost all 6 of the self-knowledge items.

Comparisons of children's growth in pre-k and kindergarten showed that children made significant gains at both time points on most measures, with only two exceptions. On WJ-III Picture Vocabulary, a norm-referenced measure, children's scores remained consistent in pre-k but showed a small, significant decrease in kindergarten. Similarly, on SSiS Problem Behaviors, also a norm-referenced measure, children's scores remained consistent in pre-k, but showed a slight increase in kindergarten (i.e., more problem behaviors). Comparisons of the relative rates of growth showed that children made greater gains in pre-k than in kindergarten on measures of early skills in literacy, math, and self-knowledge, as well as social skills: Naming Letters Task, Counting Task, Social Awareness Task, and SSiS Social Skills. Conversely, children made greater gains in kindergarten than in pre-k on three measures of literacy and math skills: WJ-III Letter Word Identification, WJ-III Word Attack, and WJ-III Applied Problems. Rates of growth were not significantly different in pre-k and kindergarten on the remaining three measures: WJ-III Picture Vocabulary, WJ-III Sound Awareness, and SSiS Problem Behaviors. (See Table 9.)

DLL Subsample

For the subsample of Spanish-speaking DLLs who attended Georgia's Pre-K Program, growth in skills in both English and Spanish were examined from entry into pre-k through the end of kindergarten. Children in the DLL subsample made significant gains for all skills measured in English (based on regression results): Language/literacy skills (WJ-III Letter-Word Identification, WJ-III Picture Vocabulary, WJ-III Sound Awareness, WJ-III Word Attack, Naming Letters Task), Math skills (WJ-III Applied Problems, Counting Task), and General knowledge (Social Awareness Task). In general, children exhibited continued gains throughout this time period, with scores on norm-referenced measures slightly below the mean at the beginning of pre-k and close to or slightly above the mean by the end of kindergarten. The one area where scores tended to be consistently lower was vocabulary, with scores still about 1 SD below the population mean by the end of kindergarten. As described previously, growth on these norm-referenced measures indicates that children progressed at an even greater rate from entry into Georgia's Pre-K through kindergarten than would be expected for normal developmental growth. They also showed substantial growth on the other measures from pre-k through kindergarten. At the beginning of pre-k, children could on average name 7 letters, count 12 items in one-to-one correspondence, and respond to 2 (of 6) items about basic self-knowledge (such as name and birthday). By the end of pre-k, children on average could name 16 letters, count 22 items, and respond to 4 self-knowledge items; and by the end of kindergarten, could name 25 (of 26) letters, count 36 items, and respond to 5 of the self-knowledge items (see Table 10, Table 11, and Table 12).

Children in the DLL subsample also showed significant gains throughout this time period for most of the same skills measured in Spanish, including all domains of learning: Language/literacy (Bat-III Sound Awareness, Bat-III Word Attack, Naming Letters Task), Math (Bat-III Applied Problems, Counting), and General knowledge (Social Awareness). As described previously, growth on the norm-referenced measures indicates that children progressed at an even greater rate from entry into Georgia's Pre-K through kindergarten than would be expected for normal developmental growth. For two measures of Language/literacy skills (Bat-III Letter-Word Identification, Bat-III Picture Vocabulary), children showed significant decreases in Spanish scores from pre-k through kindergarten, suggesting that they were making less progress than expected in their home language for normal developmental growth. In general, for skills in Spanish, the average scores on norm-referenced measures were well below the mean (1-2 SD) at the beginning of pre-k and still remained somewhat below the mean by the end of kindergarten. For the other measures of skills in Spanish, children showed consistent growth, although at a slower rate with scores at a lower level than for the same skills measured in English. At the beginning of pre-k, children could on average name 1 letter, count 8 items in one-to-one correspondence, and respond to under 3 (of 6) items about basic self-knowledge (such as name and birthday). By the end of pre-k, children on average could name 2 letters, count 10 items, and respond to 3 self-knowledge items; and by the end of kindergarten, could name 6 letters, count 15 items, and respond to 4 self-knowledge items (see Table 13, Table 14, and Table 15).

Child/Family Characteristics

Specific child and family characteristics were examined as potential moderators of children's rates of skill growth from entry into Georgia's Pre-K through the end of kindergarten for the full sample. These included children's race, children's English language proficiency, and family income (see Table 16 and Table 17).

The most consistent factor predicting differences in children's rates of growth from pre-k through kindergarten was their level of English language proficiency, with moderating effects found for most measures. Generally, children with lower levels of English proficiency made greater gains compared to children with higher levels of language proficiency. However, their scores tended to be lower at entry into pre-k and remained lower through the end of kindergarten for most measures. In the area of Language/literacy skills, moderating effects were found on three measures. On WJ-III Letter-Word Identification, children at the lowest proficiency level exhibited greater growth from pre-k through kindergarten than children at higher levels (1>3,4,5); further, the literacy scores were consistently lower for children at lower proficiency levels than for children at the highest proficiency level (see Figure 1). A similar pattern was found on WJ-III Picture Vocabulary, where children at the lowest proficiency level exhibited greater growth from pre-k through kindergarten than children at higher levels (1>2,3,4,5); further, the language scores were lower for these children compared to their peers (see Figure 2). On the Naming Letters Task, children at lower proficiency levels exhibited greater growth from pre-k through kindergarten than children at the highest proficiency level (1,2,3,4>5); further, literacy scores tended to be lower for children at lower proficiency levels than for their peers at higher levels (1,2<3,4<5) from entry into pre-k through the beginning of kindergarten, but there were no differences in scores by the end of kindergarten (see Figure 3).

There also were moderating effects of English language proficiency for both measures of math skills, as well as for the measure of basic self-knowledge. On WJ-III Applied Problems, children at lower proficiency levels exhibited greater growth from pre-k through kindergarten than children at higher levels (1>2,3,4>5); math scores were generally lower for children at lower proficiency levels compared to peers at higher levels from pre-k through the beginning of kindergarten, although by the end of kindergarten, the differences among children at the three lowest levels were no longer significant (see Figure 4). On the Counting Task, children at lower proficiency levels made greater gains than their peers at higher proficiency levels (1,3,4>5); further, counting scores generally were lower for children at lower proficiency levels compared to those at higher proficiency levels (see Figure 5). On the Social Awareness Task, children at lower proficiency levels showed greater gains than their peers (1,2>3,4>5); however, social awareness scores tended to be lower for children with lower English proficiency levels from pre-k through kindergarten (see Figure 6).

Moderating effects of English language proficiency also were found for teacher ratings of behavior skills. On the SSiS Social Skills measure, children at the lowest proficiency level showed greater growth than their peers at higher proficiency levels (1>3,4,5); further, social

skills ratings were lower for children at the lowest proficiency level at entry into pre-k than for their more proficient peers, but by the end of kindergarten, these differences only existed in comparison to the highest proficiency level group (see Figure 7). On SSiS Problem Behaviors, children at the two lowest proficiency levels showed greater decreases in problem behaviors than children at the highest proficiency level (1,2>5); further, problem behavior ratings were higher at entry into pre-k through the beginning of kindergarten for children at lower proficiency levels compared to children at the highest proficiency level, but there were no differences in scores by the end of kindergarten (see Figure 8).

There were fewer differences on other child and family characteristics. In general, however, children who entered Georgia's Pre-K with lower scores based on these characteristics made greater gains through kindergarten than children who entered with higher scores. Further, in most cases, these differences in scores were no longer apparent by the end of kindergarten. With regard to race, white children scored lower at entry into Georgia's Pre-K compared to non-white children, but made greater gains through kindergarten on some language/literacy skills (WJ-III Letter-Word Identification, WJ-III Word Attack, Naming Letters Task) and on the Social Awareness Task (see Figure 9, Figure 10, Figure 11, and Figure 12). Children from lower-income families (Category One) exhibited greater growth than children from higher-income families (Category Two) on the Naming Letters Task and Counting Task (see Figure 13 and Figure 14). On SSiS Problem Behaviors, there was little difference in scores at the beginning of pre-k, but children from higher-income families showed greater decreases in scores through the end of kindergarten (see Figure 15).

Classroom/Teacher Characteristics

Specific classroom and teacher characteristics also were examined as potential moderators of children's rates of growth in skills from entry into Georgia's Pre-K through kindergarten for the full sample. These included pre-k program type (public school system vs private program), pre-k teacher Georgia PSC certification, and class size (in pre-k and kindergarten). (See Table 16 and Table 17.)

There were some effects for pre-k program type on children's rates of growth in language and literacy skills. Children who attended public school settings in pre-k exhibited greater growth through kindergarten on WJ-III Letter-Word Identification, WJ-III Sound Awareness, WJ-III Word Attack, and the Naming Letters Task compared to children who attended private settings in pre-k. Scores were lower at entry into pre-k for children who attended public school settings, but generally were similar to those who attended private settings by the end of kindergarten (see Figure 16, Figure 17, Figure 18, and Figure 19). There were no significant moderating effects on children's rates of growth for pre-k teacher certification or class size.

Classroom Quality Moderators

The quality of classroom instructional practices in pre-k and kindergarten were examined as potential moderators of children's rates of growth in skills from entry into Georgia's Pre-K through kindergarten for the full sample. Specifically, teacher-child instructional interactions, as

measured by the CLASS Emotional Support, Classroom Organization, and Instructional Support domains were examined (see Table 18 and Table 19).

Some positive associations were found for CLASS, with higher Classroom Organization and Instructional Support scores related to greater growth on WJ-III Word Attack (see Figure 20 and Figure 21). Also, higher CLASS Instructional Support scores were related to greater growth on teacher ratings on SSiS social skills (see Figure 22). These results indicate that children who experienced classrooms with higher-quality classroom organization and instructional support in pre-k and kindergarten made greater gains in these skills compared to children in lower-quality classrooms.

The moderating effects related to CLASS Emotional Support were more mixed, with positive effects for the Naming Letters Task and Counting Task, and negative effects for WJ-III Letter-Word Identification and WJ-III Word Attack (see Figure 23, Figure 24, Figure 25, and Figure 26). These results indicate that children who experienced classrooms with higher-quality emotional support in pre-k and kindergarten showed greater growth in letter naming and counting skills, but lower rates of growth in letter and word identification and phonemic awareness skills compared to children in lower-quality classrooms. It is important to note that the three domains on the CLASS are fairly highly correlated (ES-CO r=.80 PK, .78 K; ES-IS r=.59 PK, .46 K; CO-IS r=.57 PK, .52K) and that these results indicate the unique effects for CLASS Emotional Support after taking into account the variance attributable to the other two CLASS domains (Classroom Organization and Instructional Support).

Quality of Classroom Practices in Pre-K and Kindergarten

The quality of teacher-child instructional interactions in both pre-k and kindergarten was examined using the CLASS (see Table 20). Scores varied across the different domains, with similar patterns in pre-k and kindergarten. Classroom practices were stronger in Emotional Support (Pre-K=5.7, K=5.2) and Classroom Organization (Pre-K=5.5, K=5.3), with average scores in the middle to high quality range, than in Instructional Support (Pre-K=2.6, K=2.5), with an average score in the low to middle range. Average scores on the individual dimensions within each domain generally were in the same range as the overall domain scores, although there was some variability among individual classrooms. Most pre-k (72%) and about half of kindergarten (47%) classrooms scored in the high range (5.5–7.0) on Emotional Support, with most of the remainder (29% Pre-K, 52% K) scoring in the middle range (2.5–5.4). (See Figure 27.) On Classroom Organization, over half of all classrooms (59% pre-k, 51% kindergarten) scored in the high range (5.5–7.0) and the remainder (41% Pre-K, 49% K) scored in the middle range (2.5–5.4). (See Figure 28.) In contrast, about half of the classrooms (45% Pre-K, 53% K) scored in the low range (1–2.4) on Instructional Support and about half (54% Pre-K, 47% K) scored in the middle range (2.5–5.4). (See Figure 29.)

Comparisons indicated that the CLASS scores were slightly higher in the sample of Georgia's Pre-K classrooms than in the kindergarten classrooms for two of the three domains: Emotional Support [t(493)=7.30, p<.001], and Classroom Organization [t(493)=2.14, p=.033]. Scores were not significantly different between pre-k and kindergarten classrooms on Instructional Support.

Conclusions

This study examined findings through the second year of a longitudinal study of over 1,000 children who attended Georgia's Pre-K Program. The results showed significant growth in learning outcomes from entry into pre-k though the end of kindergarten across all domains of language (phonological awareness), literacy (pre-reading/reading skills), math (math problem-solving and counting), general knowledge (basic self-knowledge), and behavior skills (social skills). Gains on many of these outcomes which used norm-referenced measures indicated that children were progressing at an even greater rate than expected for normal developmental growth. For two measures (vocabulary and problem behaviors), scores remained around the population mean, which suggests that children were progressing as expected for their age. When examined by grade, children exhibited gains during both pre-k and kindergarten. Not surprisingly, however, children demonstrated greater gains in pre-k than in kindergarten on some early skills, while they showed greater gains in kindergarten on some more advanced literacy and math skills.

The subsample of Spanish-speaking DLLs showed growth from pre-k through kindergarten on all measures in English and most in Spanish, even though the language of instruction in these classrooms is primarily in English. Their skills tended to be more advanced in English than in Spanish, although the one area where scores were consistently lower in both languages was vocabulary. Given these findings, it may be worth considering further focus on instructional practices to support children's vocabulary development both in English and their home language.

When examining factors that predict better learning outcomes, there was a general pattern where children who entered pre-k with lower scores made greater gains through kindergarten. The most consistent predictor of greater growth in skills was English language proficiency. Children with lower proficiency levels made greater gains on the various outcome measures compared to their peers, although they still had not caught up to their peers by the end of kindergarten in most cases. These effects were less strong for other child/family characteristics (children's race, family income), with no differences by the end of kindergarten. The same pattern was seen for program type, where children in public school programs scored lower on some literacy skills at entry into pre-k than children in private programs, but made greater gains, with similar scores by the end of kindergarten.

The quality of teacher-child instructional interactions, as measured by the CLASS, showed a similar pattern across the randomly-selected pre-k and kindergarten classrooms attended by children in the study. Scores were generally in the middle to high range for Emotional Support and Classroom Organization, and in the low to middle range for Instructional Support—a common finding in early education classrooms [xvi, xvii, xviii]. Although the overall pattern was similar, scores were slightly, but significantly, higher on the Emotional Support and Classroom Organization domains in the pre-k classrooms than in the kindergarten classrooms. These findings suggest that between pre-k and kindergarten children are experiencing substantial continuity in the level of teaching and learning opportunities, on average, between pre-k and kindergarten.

Further, there was some evidence that children who attended pre-k and kindergarten classrooms with better quality classroom organization and instructional support had better learning outcomes, most consistently in terms of greater growth in phonemic awareness skills. In contrast, attending classrooms that were higher in emotional support had positive effects on gains in early literacy and math skills, but resulted in lower gains for more advanced literacy skills. Taken together, these findings suggest that these associations are somewhat nuanced, and that various aspects of quality may be more strongly associated with specific child outcomes, especially at different points in a child's schooling career. However, these contrasting results also may be a function of the unique variance of this particular aspect of quality, given the fairly high correlations among the various quality measures as well as the greater variability between pre-k and kindergarten in the emotional support measure.

In sum, these longitudinal findings suggest that children who attended Georgia's Pre-K Program continued to exhibit positive outcomes through the end of kindergarten across all domains of learning, including skills in English for all children and in English and Spanish for DLLs. One important distinction of this study is that classroom quality in both pre-k and kindergarten were assessed and taken into account as potential factors affecting children's growth. Moreover, when examining classroom quality, the similarities across both years are notable. These consistent patterns of child outcomes and classroom quality from pre-k through kindergarten offer some potential evidence of positive continuities in experiences for children who attended Georgia's Pre-K Program.

Table 1. Characteristics of Pre-Kindergarten Classrooms and Teachers

	n	Mean	Range
Classroom Characteristics			
Class size	189	21.1	14-23
Proportion of Boys	189	50.1%	18.2%-81.8%
Percent children with limited English language proficiency	199	11.2%	0.0%-100.0%
Teacher Experience			
Years of experience teaching pre-k	184	5.8	0-23
Years of experience at current school	184	5.1	0-21
Total years of teaching experience	179	11.1	1-38
	n	%	
Teacher Gender	189		
Female	186	98.4	
Male	3	1.6	
Teacher Ethnicity	189		
Hispanic/Latino	5	2.7	
Teacher Race	189		
White	132	69.8	
Non-White	57	30.2	
Teacher Highest Degree Earned	184		
Associate's Degree	4	2.2	
Bachelor's Degree	118	64.1	
Master's Degree	52	28.3	
Education Specialist	9	4.9	
PhD/EdD/PsyD	1	0.5	

Table 2. Characteristics of Kindergarten Classrooms and Teachers

	n	Mean	Range
Classroom Characteristics			
Class size	772	20.1	4-27
Proportion of Boys	768	51.3%	0.0%-100%
Percent children with limited English language proficiency	770	14.7%	0.0%-100.0%
Teacher Experience			
Years of experience teaching kindergarten	777	8.5	0-39
Years of experience at current school	774	8.8	0-33
Total years of teaching experience	777	14.5	0-46
	n	%	
Teacher Gender	777		
Female	762	98.1	
Male	15	1.9	
Teacher Ethnicity	777		
Hispanic/Latino	13	1.7	
Teacher Race	777		
White	621	79.9	
Non-White	156	20.1	
Teacher Highest Degree Earned	777		
High School Diploma/GED	1	0.1	
Bachelor's Degree	293	37.8	
Master's Degree	338	43.5	
Education Specialist	135	17.4	
PhD/EdD/PsyD	10	1.2	

Table 3. Characteristics of Children in the Sample

Characteristic[a]	In Year 2 Sample n=1034		Not in Year 2 Sample n=135	
	%	n	%[b]	n
Child's age on 9/1 of kindergarten year	5.5	1,034	5.5	135
Gender				
Male	48.0	496	53.3	72
Female	52.0	538	46.7	63
Ethnicity				
Hispanic/Latino	14.7	152	13.3	18
Race				
White	53.4	552	47.4	64
Black/African American	38.0	393	40.7	55
Multi-racial	4.7	48	5.2	7
Asian	2.1	22	5.2*	7
Native American/Alaskan Native	1.6	17	1.5	2
Native Hawaiian/Pacific Islander	0.2	2	0.0	0
Income[c]				
Category One	55.2	571	48.1	65
Category Two	44.8	463	51.9	70
Limited English language proficiency	10.4	108	5.9	8
Individualized Education Program	3.1	32	1.5	2
Parent education[d,e]				
Level 1	11.5	115	3.8	5
Level 2	61.8	619	68.7	90
Level 3	26.7	267	27.5	36

The table header "Original Year 1 Sample" spans both "In Year 2 Sample" and "Not in Year 2 Sample".

[a] Source of data: Bright from the Start: Georgia Department of Early Care and Learning (DECAL) for all characteristics except parent education, which was obtained from parent surveys.

[b] Significance levels are *$p< .05$, **$p< .01$, ***$p< .001$.

[c] Category One represents participation in one or more of the following programs: SNAP, TANF, SSI, CAPS, Medicaid, free or reduced-price meals.

[d] Level 1=less than high school; Level 2=high school diploma to less than bachelor's degree; Level 3=bachelor's degree or higher.

[e] Data were not reported for 37 children.

Table 4. Child Outcome and Classroom Quality Measures

Measure	Scoring
Language and Literacy Skills	
Letter knowledge[a]	Total score,
Naming Letters Task	Range=0–26
Letter-word identification[a]	
Woodcock-Johnson III Tests of Achievement Letter-Word Identification (Subtest 1) / Batería III Pruebas de Aprovechamiento Identificación de Letras y Palabras (Prueba 1)	Standard score, Mean=100, SD=15
Vocabulary[a]	
Woodcock-Johnson III Tests of Achievement Picture Vocabulary (Subtest 14) / Batería III Pruebas de Aprovechamiento Vocabulario sobre Dibujos (Prueba 14)	Standard score, Mean=100, SD=15
Phonological awareness[a]	
Woodcock-Johnson III Tests of Achievement Sound Awareness (Subtest 21) / Batería III Pruebas de Aprovechamiento Discernimiento de sonidos (Prueba 21)	Standard score, Mean=100, SD=15
Phonemic awareness[a]	
Woodcock-Johnson III Tests of Achievement Word Attack (Subtest 13) / Batería III Pruebas de Aprovechamiento Análisis de Palabras (Prueba 13)	W score, Range=360–545
Math Skills	
Math problem-solving[a]	
Woodcock-Johnson III Tests of Achievement Applied Problems (Subest 10) / Batería III Pruebas de Aprovechamiento Problemas Aplicados (Prueba 10)	Standard score, Mean=100, SD=15
Counting[a]	Total score,
Counting Task	Range=0–40
General Knowledge	
Basic self-knowledge[a]	Total score,
Social Awareness Task	Range=0–6
Classroom Behavior	
Social skills[b]	
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
Classroom Quality	
Teacher-child instructional interactions	
Classroom Assessment Scoring System (CLASS)	Domain score range=1.0–7.0
Emotional Support, Classroom Organization, Instructional Support	low (1–2); middle (3–5); high (6–7)

[a] These measures are individually administered to children. Both English and Spanish language versions of these measures were used with dual-language learners.

[b] These measures are teacher ratings of individual children's skills.

Table 5. Child Language Proficiency Levels at Pre-K Entry

| *pre*LAS Proficiency Level | English Language Proficiency | | | | Spanish Language Proficiency | |
| | Full Sample | | DLL Subsample | | DLL Subsample | |
	%	n	%	n	%	n
Level 1 (Non-Speakers)	7.9	91	47.1	65	34.1	46
Level 2 (Limited Speakers)	4.1	48	13.8	19	7.4	10
Level 3 (Limited Speakers)	14.3	166	18.1	25	17.0	23
Level 4 (Fluent Speakers)	26.2	303	11.6	16	21.5	29
Level 5 (Fluent Speakers)	47.5	551	9.4	13	20.0	27
Total	100.0	1159	100.0	138	100.0	135

Table 6. Child Outcomes for Full Sample (2013-2015)

Measure	Pre-Kindergarten				Kindergarten			
	Fall		Spring		Fall		Spring	
	n	Mean (SD) Range	n	Mean (SD) Range	n	Mean (SD) Range	n	Mean (SD) Range
Language and Literacy								
Letter knowledge (Naming Letters Task[a])	1,160	13.3 (10.0) 0–26	1,055	19.9 (8.0) 0–26	1,025	23.8 (4.9) 0–26	1,009	25.5 (2.1) 0–26
Letter-word identification (WJ-III Letter-Word Identification[b,c])	1,156	100.7 (13.8) 60–183	1,051	103.2 (12.7) 61–184	1,024	107.3 (12.7) 69–178	1,007	113.9 (13.2) 62–182
Vocabulary (WJ-III Picture Vocabulary[b,c])	1,160	99.9 (13.6) 31–134	1,052	99.8 (11.8) 39–141	1,024	99.3 (10.6) 48–131	1,007	98.8 (10.2) 44-133
Phonological awareness (WJ-III Sound Awareness[b,c])	1,137	95.9 (17.4) 58-166	1,044	102.3 (18.8) 56–163	1.022	106.9 (19.0) 48-163	1,001	114.4 (19.7) 47–200
Phonemic awareness (WJ-III Word Attack[c,d])	1,159	386.2 (23.5) 364–510	1.052	403.5 (26.7) 364–510	1,025	430.0 (28.4) 364–520	1,008	459.2 (26.4) 364-545
Math								
Math problem-solving (WJ-III Applied Problems[b,c])	1,150	102.8 (13.2) 56-143	1,052	103.7 (11.7) 53–127	1,025	104.7 (11.2) 71–143	1,006	106.5 (12.0) 62-149
Counting (Counting Task[e])	1,142	18.0 (11.3) 1–40	1,050	26.7 (11.7) 1–40	1,024	32.8 (10.0) 3–40	1,007	37.2 (6.7) 5–40
General Knowledge								
Basic self-knowledge (Social Awareness Task[f])	1,165	4.3 (1.5) 0–6	1,055	4.9 (1.3) 0–6	1,025	5.2 (1.1) 1–6	1,009	5.5 (2.1) 2–6
Classroom Behavior								
Social Skills (SSiS[b])	1,088	96.4 (16.0) 40-130	949	100.0 (14.9) 50-129	865	100.7 (14.5) 52-131	851	102.4 (15.1) 649-131
Problem Behaviors (SSiS[b])	1.093	100.8 (15.5) 82-160	953	100.8 (15.3) 82-160	873	99.0 (13.7) 83-151	853	99.5 (14.4) 83-158

[a] Possible range=0–26.

[b] Indicates standard scores on norm-referenced measure with mean=100, SD=15.

[c] Scores reflect use of updated normative tables (2007).

[d] W scores were used for this measure. Possible range≈360–545.

[e] Possible range=0–40.

[f] Possible range=0–6.

Table 7. Full Sample Kindergarten Regression Results—Language and Literacy

Effect	Naming Letters Task		WJ-III Letter-Word ID		WJ-III Picture Vocabulary		WJ-III Sound Awareness		WJ-III Word Attack	
	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)
Intercept	9.16	(0.62)	90.26	(1.17)	81.26	(0.81)	65.18	(1.46)	359.37	(2.26)
Time	4.16***	(0.10)	4.50***	(0.17)	-0.21	(0.13)	6.43***	(0.25)	23.91***	(0.40)
Age	2.22***	(0.47)	--	--	--	--	--	--	--	--
Gender[b]	-0.54	(0.28)	-1.15*	(0.53)	1.70***	(0.37)	-0.68	(0.65)	-0.97	(1.01)
Race[c]	-1.31***	(0.30)	-3.85***	(0.59)	1.03*	(0.40)	1.66*	(0.73)	-2.69**	(1.13)
Ethnicity[d]	-0.05	(0.46)	0.40	(0.90)	-7.62***	(0.62)	-1.52	(1.11)	2.70	(1.72)
IEP[e]	-0.75	(0.84)	-3.79*	(1.60)	-1.65	(1.12)	-8.37**	(2.01)	-3.01	(3.07)
English Proficiency	1.48***	(0.14)	2.83***	(0.26)	4.47***	(0.18)	7.25***	(0.32)	6.48***	(0.49)
Income[f]	-1.42***	(0.30)	-3.98***	(0.58)	-2.36***	(0.40)	-4.61***	(0.71)	-5.46***	(1.10)
Provider Type[g]	0.17	(0.33)	0.99	(0.66)	-0.09	(0.42)	1.79*	(0.83)	1.25	(1.24)
Teacher Certified[h]	-0.28	(0.43)	-0.70	(0.86)	0.07	(0.56)	2.02	(1.08)	-0.31	(1.63)
Class Size	0.20	(0.11)	0.46*	(0.22)	-0.01	(0.14)	0.44	(0.28)	0.88*	(0.41)

[a] Significance levels are *$p < .05$, **$p < .01$, ***$p < .001$.

[b] Female=0, Male=1.

[c] Non-White=0, White = 1.

[d] Non-Latino=0, Latino=1.

[e] No IEP=0, IEP=1.

[f] Category Two=0, Category One=1.

[g] Public school site=0, Private site=1.

[h] Teacher not certified=0, Teacher certified=1.

Table 8. Full Sample Kindergarten Regression Results—Math, General Knowledge, and Classroom Behavior

| | Math | | | | General Knowledge | | Classroom Behavior | | | |
| | WJ-III Applied Problems | | Counting Task | | Social Awareness Task | | SSiS Social Skills | | SSiS Problem Behaviors | |
Effect	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)
Intercept	82.08	(0.95)	11.06	(0.85)	3.12	(0.09)	83.49	(1.47)	105.93	(1.41)
Time	1.20***	(0.16)	6.48***	(0.16)	0.41***	(0.02)	2.08***	(0.26)	0.25	(0.24)
Age	--	--	4.55***	(0.62)	0.24***	(0.07)	--	--	--	--
Gender[b]	-0.02	(0.43)	-1.05**	(0.37)	-0.09*	(0.04)	1.02	(0.64)	-0.57	(0.61)
Race[c]	3.45***	(0.48)	-1.29**	(0.41)	-0.25***	(0.05)	1.82*	(0.74)	0.01	(0.72)
Ethnicity[d]	0.27	(0.73)	0.56	(0.62)	-0.41***	(0.07)	5.55***	(1.10)	-6.82***	(1.06)
IEP[e]	-5.22***	(1.31)	-2.54*	(1.14)	-0.36**	(0.13)	-6.81***	(2.01)	5.69**	(1.93)
English Proficiency	4.67***	(0.21)	2.14***	(0.18)	0.34***	(0.02)	2.99***	(0.32)	-1.62***	(0.31)
Income[f]	-2.89***	(0.47)	-1.36***	(0.40)	-0.22***	(0.05)	-1.53*	(0.71)	1.68*	(0.68)
Provider Type[g]	1.31*	(0.53)	0.58	(0.44)	-0.02	(0.05)	-1.22	(0.92)	1.65	(0.89)
Teacher Certified[h]	0.83	(0.69)	-0.14	(0.58)	-0.17**	(0.06)	-1.83	(1.18)	1.88	(1.15)
Class Size	0.22	(0.18)	0.21	(0.15)	0.03	(0.02)	0.30	(0.29)	-0.13	(0.29)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.
[b] Female=0, Male=1.
[c] Non-White=0, White =1.
[d] Non-Latino=0, Latino=1.
[e] No IEP=0, IEP=1.
[f] Category Two=0, Category One=1.
[g] Public school site=0, Private site=1.
[h] Teacher not certified=0, Teacher certified=1.

Table 9. Comparisons of Children's Growth in Pre-K and Kindergarten

Measure	Estimate	Standard Error	Degrees of Freedom	t-Value	p-Value
Naming Letters Task	4.80	0.27	971	17.79	<.001
WJ-III Letter Word ID	-3.97	0.39	971	-10.17	<.001
WJ-III Picture Vocabulary	0.63	0.34	969	1.86	.064
WJ-III Sound Awareness	-0.79	0.65	963	-1.21	.225
WJ-III Word Attack	-11.68	1.13	971	-10.31	<.001
WJ-III Applied Problems	-0.89	0.44	970	-2.04	.042
Counting Task	4.42	0.50	969	8.90	<.001
Social Awareness Task	0.28	0.05	971	5.27	<.001
SSiS Social Skills	1.49	0.70	774	2.14	.033
SSiS Problem Behaviors	-0.65	0.61	776	-1.07	.287

Table 10. English Outcome Scores for DLL Subsample

Measure	Pre-Kindergarten				Kindergarten			
	Fall		Spring		Fall		Spring	
	n	Mean (SD) Range	n	Mean (SD) Range	n	Mean (SD) Range	n	Mean (SD) Range
Language and Literacy								
Letter knowledge (Naming Letters Task[a])	132	7.3 (9.3) 2–26	126	15.5 (9.3) 0–26	118	22.3 (6.1) 0–26	116	25.2 (2.9) 0–26
Letter-word identification (WJ-III Letter-Word Identification[b,c])	133	91.2 (14.2) 60–133	126	97.8 (12.8) 63–148	118	102.8 (13.2) 71–154	116	109.9 (12.6) 77–148
Vocabulary (WJ-III Picture Vocabulary[b,c])	135	77.3 (19.3) 31–120	126	82.4 (13.8) 39–112	118	84.5 (11.4) 48–117	114	86.0 (9.3) 59–110
Phonological awareness (WJ-III Sound Awareness[b,c])	129	82.1 (10.9) 61–123	126	85.0 (15.8) 56–142	117	90.1 (17.3) 55–136	116	99.5 (19.4) 47–148
Phonemic awareness (WJ-III Word Attack[c,d])	132	374.6 (16.7) 364–468	125	391.3 (24.3) 364–493	118	422.3 (28.0) 364–508	116	452.7 (25.36) 377–508
Math								
Math problem-solving (WJ-III Applied Problems[b,c])	131	90.3 (13.7) 59–122	125	96.4 (11.3) 53–127	118	99.6 (10.5) 71–129	116	103.0 (11.7) 63–130
Counting (Counting Task[e])	130	12.4 (8.6) 1–40	125	22.1 (12.0) 1–40	117	29.4 (11.0) 7–40	116	35.8 (7.8) 12–40
General Knowledge								
Basic self-knowledge (Social Awareness Task[f])	136	2.4 (1.4) 0–6	126	3.7 (1.6) 0–6	118	4.4 (1.4) 0–6	116	4.9 (1.1) 2–6

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[a] Possible range=0–26.

[b] Indicates standard scores on norm-referenced measure with mean=100, SD=15.

[c] Scores reflect use of updated normative tables (2007).

[d] W scores were used for this measure. Possible range≈360–545.

[e] Possible range=0–40.

[f] Possible range=0–6.

Table 11. DLL Subsample English Kindergarten Regression Results—Language and Literacy

Effect	Naming Letters Task Est[a]	(SE)	WJ-III Letter-Word ID Est[a]	(SE)	WJ-III Picture Vocabulary Est[a]	(SE)	WJ-III Sound Awareness Est[a]	(SE)	WJ-III Word Attack Est[a]	(SE)
Intercept	5.30	(1.70)	84.73	(3.01)	63.47	(2.54)	63.83	(2.90)	360.61	(5.19)
Time	5.72***	(0.34)	6.71***	(0.49)	3.47***	(0.47)	6.39***	(0.65)	25.19***	(1.15)
Age	0.67	(1.56)	--	--	--	--	--	--	--	--
Gender[b]	0.19	(0.88)	-0.13	(1.58)	0.54	(1.35)	-1.87	(1.57)	3.51	(2.74)
Race[c]	0.70	(1.23)	-0.63	(2.24)	0.21	(1.90)	3.94	(2.18)	1.48	(3.85)
IEP[d]	4.07	(2.71)	-3.84	(4.73)	-0.87	(4.22)	-7.72	(4.79)	-4.21	(8.31)
English Proficiency	1.24***	(0.35)	2.68***	(0.63)	6.34***	(0.53)	5.85***	(0.61)	4.77***	(1.08)
Income[e]	1.15	(1.14)	1.31	(2.06)	-0.13	(1.73)	0.42	(2.01)	3.33	(3.53)
Provider Type[f]	-0.84	(1.17)	1.05	(2.17)	1.41	(1.61)	2.90	(1.93)	-4.60	(3.55)
Teacher Certified[g]	-1.78	(1.29)	-2.44	(2.39)	1.69	(1.82)	1.35	(2.17)	-5.83	(3.94)
Class Size	0.93**	(0.35)	0.78	(0.64)	-0.77	(0.50)	-0.27	(0.61)	1.73	(1.07)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.
[b] Female=0, Male=1.
[c] Non-White=0, White =1.
[d] No IEP =0, IEP=1.
[e] Category Two=0, Category One=1.
[f] Public school site=0, Private site=1.
[g] Teacher not certified=0, Teacher certified=1.

Table 12. DLL Subsample English Kindergarten Regression Results—Math and General Knowledge

Effect	Math				General Knowledge	
	WJ-III Applied Problems		Counting Task		Social Awareness Task	
	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)
Intercept	77.37	(2.54)	8.50	(2.19)	1.33	(0.26)
Time	4.91***	(0.48)	7.77***	(0.47)	0.87***	(0.05)
Age	--	--	7.25***	(1.99)	0.21	(0.24)
Gender[b]	-1.12	(1.36)	-0.18	(1.12)	-0.26	(0.14)
Race[c]	1.79	(1.91)	-0.09	(1.56)	0.02	(0.19)
IEP[d]	-4.25	(4.20)	-2.71	(3.50)	-0.64	(0.44)
English Proficiency	4.67***	(0.53)	2.82***	(0.45)	0.50***	(0.05)
Income[e]	3.36	(1.77)	2.40	(1.47)	0.19	(0.18)
Provider Type[f]	0.54	(1.67)	1.62	(1.41)	0.12	(0.16)
Teacher Certified[g]	-3.32	(1.85)	-2.56	(1.57)	-0.24	(0.18)
Class Size	0.19	(0.52)	0.55	(0.44)	0.03	(0.05)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.
[b] Female=0, Male=1.
[c] Non-White=0, White =1.
[d] No IEP =0, IEP=1.
[e] Category Two=0, Category One=1.
[f] Public school site=0, Private site=1.
[g] Teacher not certified=0, Teacher certified=1.

Table 13. Spanish Outcome Scores for DLL Subsample

Measure	Pre-Kindergarten				Kindergarten			
	Fall		Spring		Fall		Spring	
	n	Mean (SD) Range	n	Mean (SD) Range	n	Mean (SD) Range	n	Mean (SD) Range
Language and Literacy								
Letter knowledge (Naming Letters Task[a])	137	0.9 (3.2) 0–23	125	1.8 (4.4) 0–23	118	4.3 (6.1) 0–24	110	5.9 (7.2) 0–25
Letter-word identification (Bat-III Letter-Word Identification[b,c])	136	90.3 (10.7) 69–134	123	86.5 (11.7) 65–137	118	85.6 (12.9) 55–123	107	81.7 (14.1) 58–109
Vocabulary (Bat-III Picture Vocabulary[b,c])	137	71.0 (20.2) 22–121	122	66.4 (21.6) 10–111	117	60.6 (24.9) 1–112	106	57.1 (24.9) 1–112
Phonological awareness (Bat-III Sound Awareness[b,c])	135	74.1 (9.8) 59–106	122	77.6 (13.9) 50–119	115	76.1 (16.9) 47–114	106	82.9 (20.8) 39–130
Phonemic awareness (Bat-III Word Attack[c,d])	132	373.1 (13.0) 360–426	123	381.0 (15.9) 360–447	118	396.8 (15.9) 360–427	107	406.6 (20.8) 360–462
Math								
Math problem-solving (Bat-III Applied Problems[b,c])	131	87.1 (12.8) 50–119	122	90.9 (15.0) 38–122	117	89.6 (17.8) 12–125	107	92.8 (18.6) 1–127
Counting (Counting Task[d])	134	7.6 (4.8) 1–40	121	9.8 (5.6) 1–40	114	12.6 (9.0) 1–40	105	15.0 (9.8) 3–40
General Knowledge								
Basic self-knowledge (Social Awareness Task[e])	137	2.5 (1.2) 0–6	123	3.2 (1.3) 0–6	118	3.2 (1.4) 0–6	107	3.7 (1.5) 0–6

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[a] Possible range=0–26.

[b] Indicates standard scores on norm-referenced measure with mean=100, SD=15.

[c] Scores reflect use of updated normative tables (2007).

[d] Possible range=0–40.

[e] Possible range=0–6.

Table 14. DLL Subsample Spanish Kindergarten Regression Results—Language and Literacy

Effect	Naming Letters Task Est[a]	(SE)	Bat-III Letter-Word ID Est[a]	(SE)	Bat-III Picture Vocabulary Est[a]	(SE)	Bat-III Sound Awareness Est[a]	(SE)	Bat-III Word Attack Est[a]	(SE)
Intercept	-1.45	(0.94)	80.72	(2.35)	33.46	(3.30)	66.89	(2.69)	367.27	(3.07)
Time	1.51***	(0.23)	-3.04***	(0.53)	-5.00***	(0.61)	3.08***	(0.75)	10.44***	(0.81)
Age	1.19	(1.03)	--	--	--	--	--	--	--	--
Gender[b]	-0.09	(0.59)	-1.27	(1.42)	-1.34	(2.05)	-3.30*	(1.67)	2.47	(1.82)
Race[c]	-0.17	(0.82)	0.54	(1.99)	9.31**	(2.86)	3.90	(2.31)	-4.04	(2.57)
IEP[d]	0.21	(2.01)	-4.88	(4.96)	-18.87**	(7.10)	-0.61	(5.48)	-2.73	(6.16)
Spanish Proficiency	1.06***	(0.19)	3.29***	(0.46)	9.06***	(0.66)	1.25*	(0.54)	3.51***	(0.60)
Income[e]	-2.13**	(0.89)	-2.89	(1.66)	6.06*	(2.38)	-2.69	(1.95)	-2.74	(2.18)
Provider Type[f]	0.68	(0.68)	0.89	(1.68)	-5.44*	(2.34)	-0.40	(1.92)	1.76	(2.28)
Teacher Certified[g]	0.89	(0.76)	-0.72	(1.88)	-9.68***	(2.63)	0.71	(2.15)	-1.06	(2.51)
Class Size	0.06	(0.21)	0.58	(0.50)	2.41***	(0.71)	-0.02	(0.59)	1.68*	(0.68)

[a] Significance levels are *$p < .05$, **$p < .01$, ***$p < .001$.
[b] Female=0, Male=1.
[c] Non-White=0, White=1.
[d] No IEP =0, IEP=1.
[e] Category Two=0, Category One=1.
[f] Public school site=0, Private site=1.
[g] Teacher not certified=0, Teacher certified=1.

Table 15. DLL Subsample Spanish Kindergarten Regression Results—Math and General Knowledge

Effect	Math				General Knowledge	
	Bat-III Applied Problems		Counting Task		Social Awareness Task	
	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)
Intercept	68.04	(2.67)	2.67	(1.36)	1.46	(0.24)
Time	2.02***	(0.58)	2.40***	(0.35)	0.37***	(0.06)
Age	--	--	2.55	(1.41)	0.39	(0.26)
Gender[b]	-3.45*	(1.67)	-1.40	(0.78)	-0.38**	(0.15)
Race[c]	4.64*	(2.31)	1.28	(1.14)	0.32	(0.20)
IEP[d]	-7.60	(5.62)	-0.09	(2.66)	0.08	(0.51)
Spanish Proficiency	4.60***	(0.54)	1.43***	(0.26)	0.28***	(0.05)
Income[e]	2.04	(1.94)	-1.28	(0.94)	0.05	(0.17)
Provider Type[f]	-2.42	(1.90)	1.22	(0.99)	-0.18	(0.18)
Teacher Certified[g]	-5.85**	(2.14)	-1.34	(1.10)	-0.36	(0.20)
Class Size	0.71	(0.58)	0.36	(0.30)	0.06	(0.05)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.
[b] Female=0, Male=1.
[c] Non-White=0, White =1.
[d] No IEP =0, IEP=1.
[e] Category Two=0, Category One=1.
[f] Public school site=0, Private site=1.
[g] Teacher not certified=0, Teacher certified=1.

Table 16. Moderators of Kindergarten Outcomes–Language and Literacy

Effect	Naming Letters Task Est[a]	(SE)	WJ-III Letter-Word ID Est[a]	(SE)	WJ-III Picture Vocabulary Est[a]	(SE)	WJ-III Sound Awareness Est[a]	(SE)	WJ-III Word Attack Est[a]	(SE)
Intercept	5.64	(0.81)	88.33	(1.41)	75.54	(1.04)	66.56	(1.83)	364.56	(3.00)
Time	6.52***	(0.38)	5.96***	(0.62)	3.67***	(0.48)	5.33***	(0.92)	20.06***	(1.49)
Age	2.18***	(0.46)	--	--	--	--	--	--	--	--
Gender[b]	-0.57*	(0.27)	-1.18*	(0.53)	1.69***	(0.36)	-0.68	(0.66)	-0.98	(1.02)
Race[c]	-2.68***	(0.42)	-5.27***	(0.74)	0.62	(0.54)	0.70	(0.95)	-7.83***	(1.57)
Ethnicity[d]	-0.05	(0.45)	0.42	(0.89)	-7.70***	(0.61)	-1.54	(1.11)	2.75	(1.72)
IEP[e]	-0.73	(0.82)	-3.82*	(1.60)	-1.68	(1.10)	-8.44***	(2.02)	-3.10	(3.08)
English Proficiency	2.55***	(0.18)	3.52***	(0.31)	5.94***	(0.23)	7.04***	(0.40)	5.90***	(0.66)
Income[f]	-2.98***	(0.42)	-4.41***	(0.72)	-2.80***	(0.54)	-3.44***	(0.94)	-6.34***	(1.55)
Provider Type[g]	1.35**	(0.45)	2.11**	(0.81)	0.28	(0.57)	3.58***	(1.08)	3.77*	(1.74)
Teacher Certified[h]	-0.30	(0.59)	-1.41	(1.07)	0.33	(0.75)	2.34	(1.41)	0.36	(2.28)
Class Size	0.45**	(0.15)	0.59*	(0.27)	-0.11	(0.19)	0.36	(0.36)	0.91	(0.58)
Time x Race	0.91***	(0.20)	1.07**	(0.33)	0.27	(0.26)	0.77	(0.49)	3.77***	(0.80)
Time x Eng Prof	-0.71***	(0.08)	-0.51***	(0.13)	-1.00***	(0.10)	0.17	(0.20)	0.44	(0.32)
Time x Income	1.04***	(0.21)	0.31	(0.33)	0.27	(0.26)	-0.94	(0.49)	0.64	(0.80)
Time x Provider	-0.74***	(0.22)	-0.81*	(0.37)	-0.21	(0.27)	-1.43**	(0.54)	-1.79*	(0.87)
Time x Teacher Cert	0.05	(0.29)	0.54	(0.48)	-0.13	(0.36)	-0.34	(0.71)	-0.56	(1.14)
Time x Class Size	-0.17	(0.07)	-0.10	(0.12)	0.06	(0.09)	0.06	(0.18)	-0.02	(0.29)

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[a] Significance levels are *$p< .05$, **$p< .01$, ***$p< .001$.

[b] Female=0, Male=1.

[c] Non-White=0, White=1.

[d] Non-Latino=0, Latino=1.

[e] No IEP=0, IEP=1.

[f] Category Two=0, Category One=1.

[g] Public school site=0, Private site=1.

[h] Teacher not certified=0, Teacher certified=1.

Table 17. Moderators of Kindergarten Outcomes–Math, General Knowledge, and Classroom Behavior

| | Math | | | | General Knowledge | | Classroom Behavior | | | |
| | WJ-III Applied Problems | | Counting Task | | Social Awareness Task | | SSiS Social Skills | | SSiS Problem Behaviors | |
Effect	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)
Intercept	75.63	(1.21)	7.26	(1.20)	2.42	(0.13)	79.34	(1.81)	108.53	(1.71)
Time	6.15***	(0.61)	8.96***	(0.60)	0.89***	(0.06)	5.43***	(0.89)	-1.88	(0.82)
Age	--	--	4.52***	(0.62)	0.23***	(0.07)	--	--	--	--
Gender[b]	-0.06	(0.43)	-1.08**	(0.37)	-0.09*	(0.04)	0.99	(0.64)	-0.55	(0.61)
Race[c]	3.81***	(0.63)	-1.52*	(0.62)	-0.40***	(0.07)	1.90	(0.96)	-0.59	(0.91)
Ethnicity[d]	0.28	(0.72)	0.55	(0.62)	-0.41***	(0.07)	5.52***	(1.10)	-6.81***	(1.06)
IEP[e]	-5.22***	(1.30)	-2.59*	(1.13)	-0.36**	(0.13)	-6.91***	(2.01)	5.73**	(1.93)
English Proficiency	6.21***	(0.27)	3.11***	(0.26)	0.53***	(0.03)	4.01***	(0.40)	-2.18***	(0.37)
Income[f]	-3.40***	(0.62)	-2.74***	(0.61)	-0.27***	(0.07)	-0.45	(0.93)	0.31	(0.88)
Provider Type[g]	1.26	(0.69)	1.52*	(0.69)	-0.07	(0.07)	-1.01	(1.21)	2.34*	(1.15)
Teacher Certified[h]	1.20	(0.90)	1.24	(0.90)	-0.22*	(0.09)	-0.46	(1.57)	2.93*	(1.49)
Class Size	0.13	(0.23)	0.34	(0.23)	0.03	(0.02)	0.60	(0.39)	-0.25	(0.37)
Time x Race	-0.30	(0.33)	0.16	(0.32)	0.10**	(0.03)	-0.09	(0.49)	0.50	(0.45)
Time x Eng Prof	-1.19***	(0.14)	-0.63***	(0.13)	-0.13***	(0.01)	-0.82***	(0.19)	0.46**	(0.18)
Time x Income	0.38	(0.33)	0.92**	(0.32)	0.03	(0.03)	-0.89	(0.48)	1.10*	(0.44)
Time x Provider	0.08	(0.35)	-0.57	(0.34)	0.03	(0.04)	-0.16	(0.55)	-0.47	(0.52)
Time x Teacher Cert	-0.23	(0.46)	-0.85	(0.46)	0.04	(0.05)	-0.94	(0.72)	-0.74	(0.68)
Time x Class Size	0.05	(0.12)	-0.09	(0.12)	-0.00	(0.01)	-0.23	(0.18)	0.09	(0.17)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.

[b] Female=0, Male=1.

[c] Non-White=0, White=1.

[d] Non-Latino=0, Latino=1.

[e] No IEP=0, IEP=1.

[f] Category Two=0, Category One=1.

[g] Public school site=0, Private site=1.
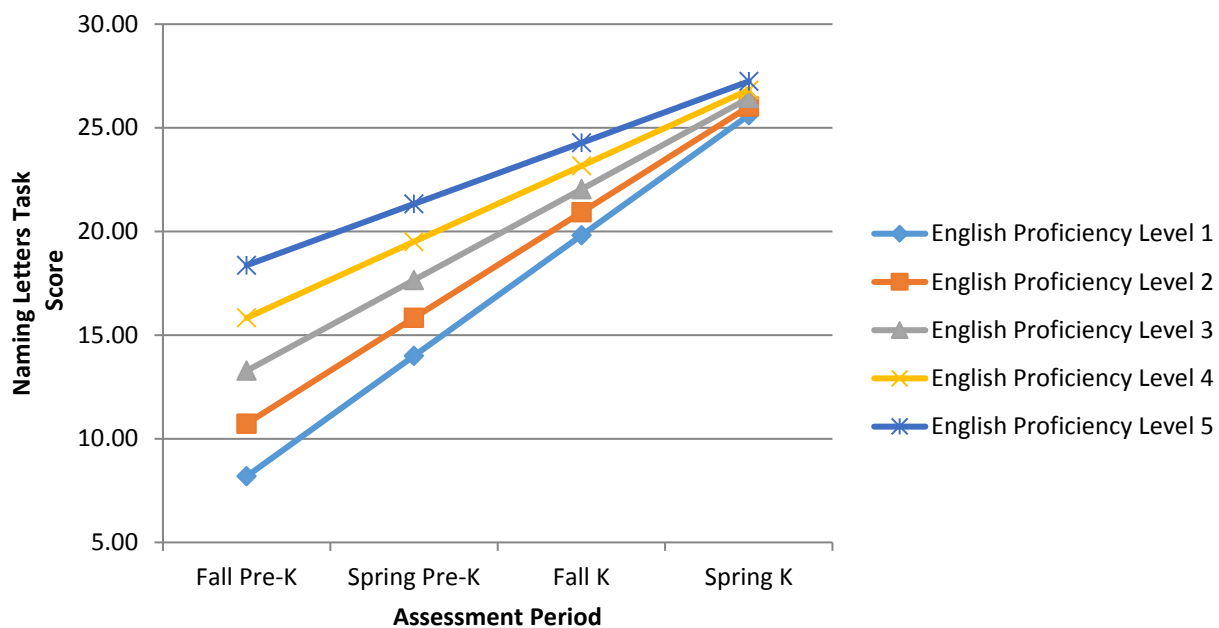
[h] Teacher not certified=0, Teacher certified=1.

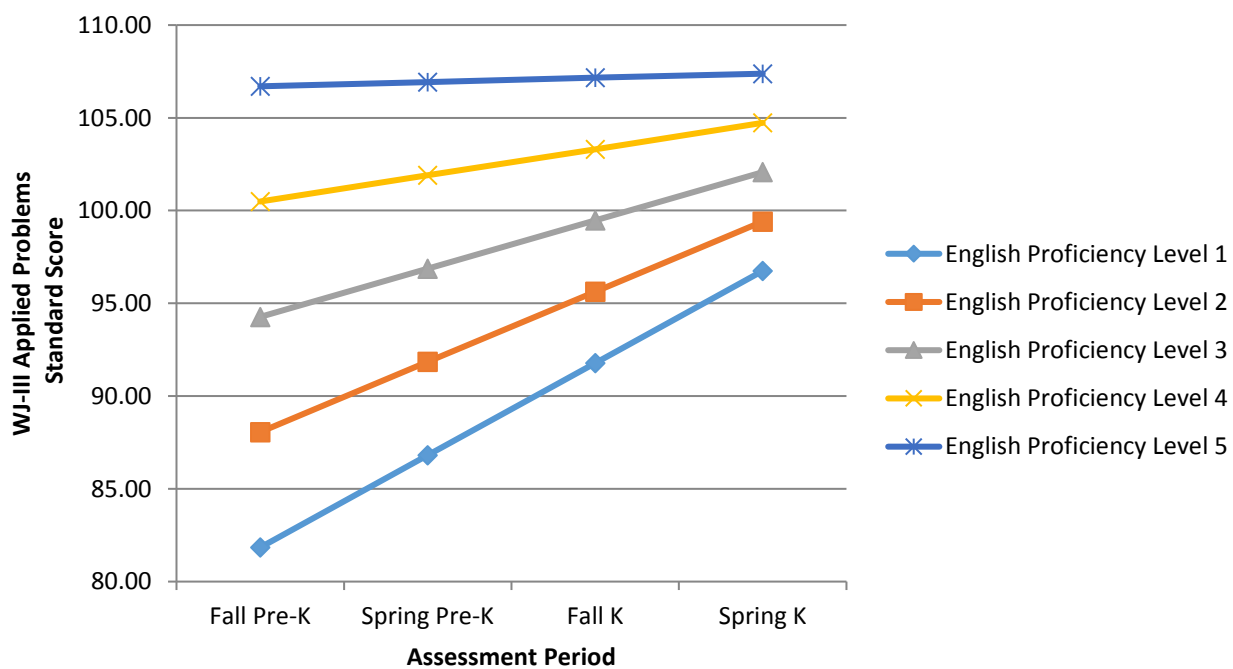**Figure 1. Growth in WJ-III Letter-Word Identification by English Proficiency**
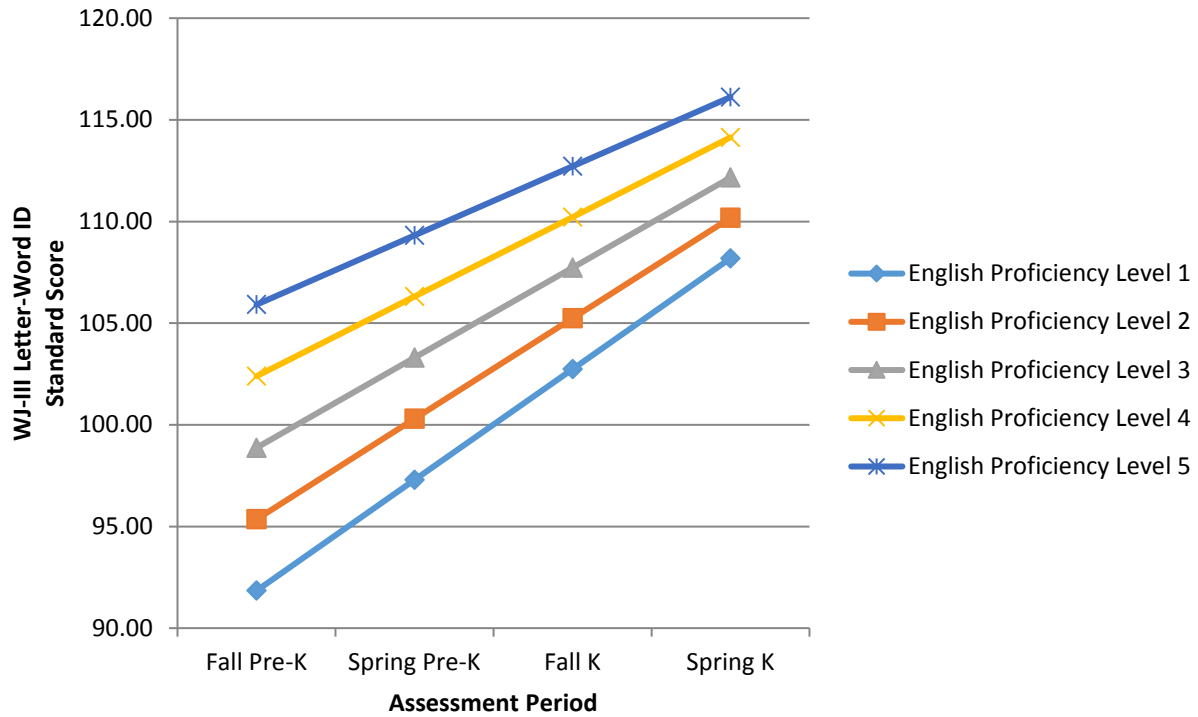
Figure 2. Growth in WJ-III Picture Vocabulary by English Proficiency
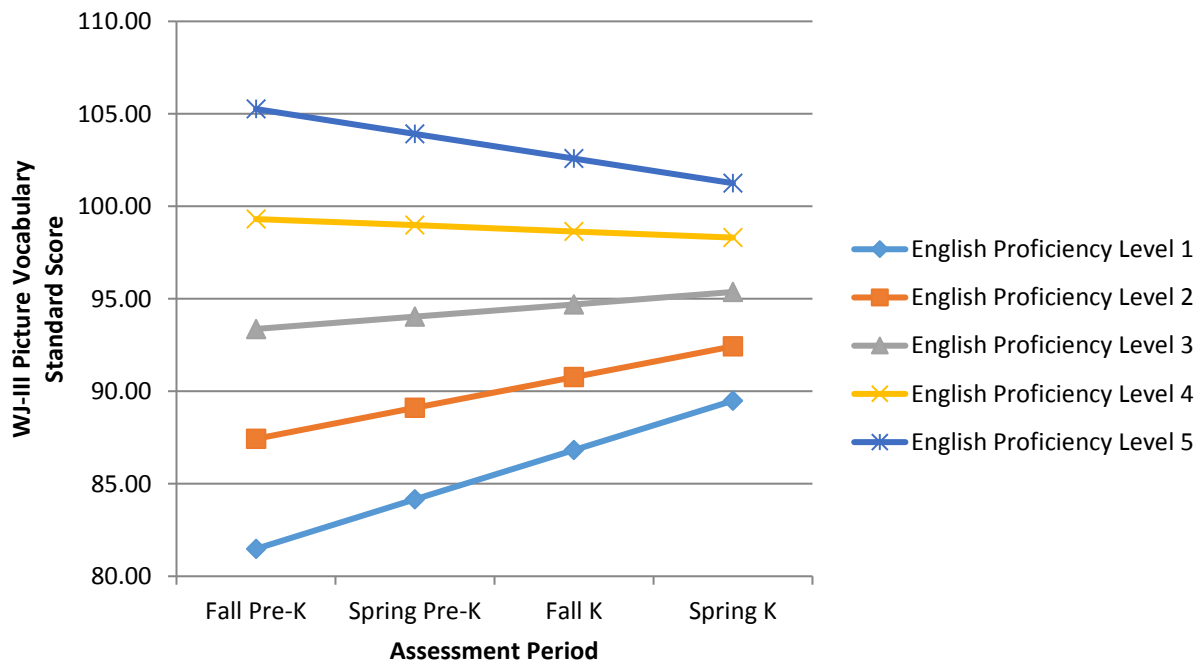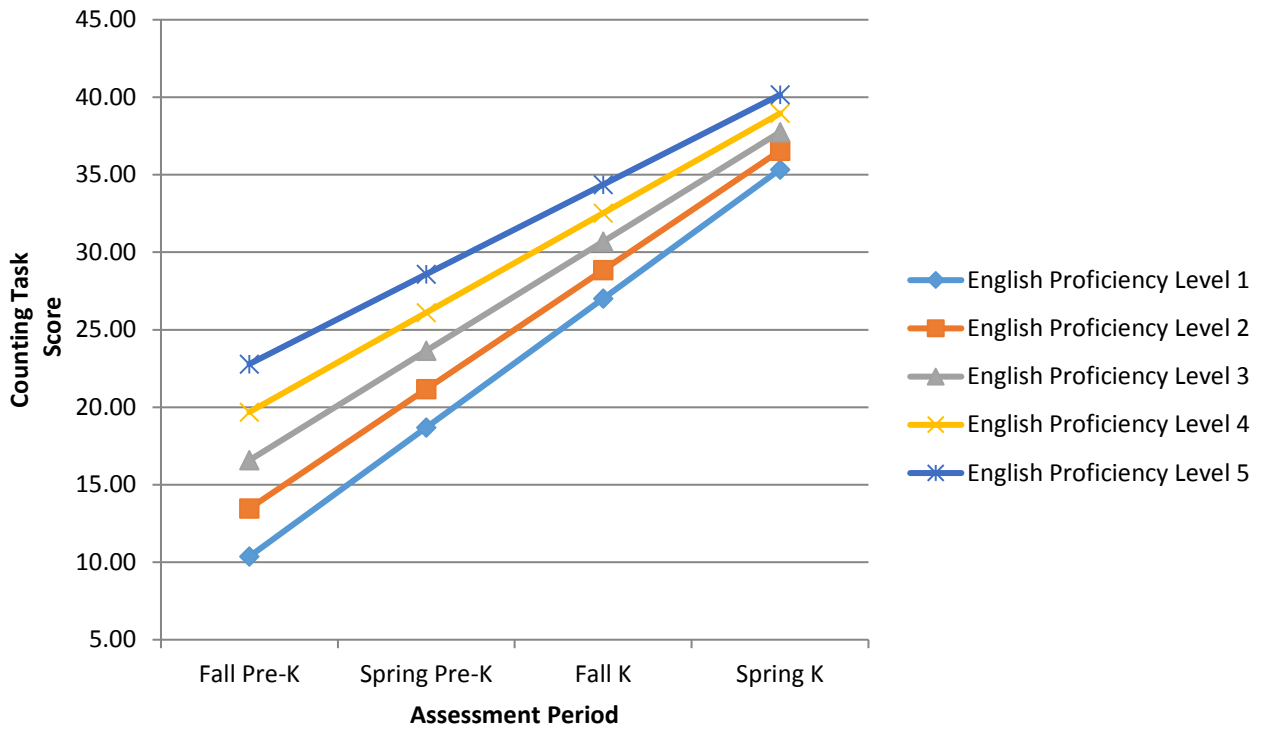
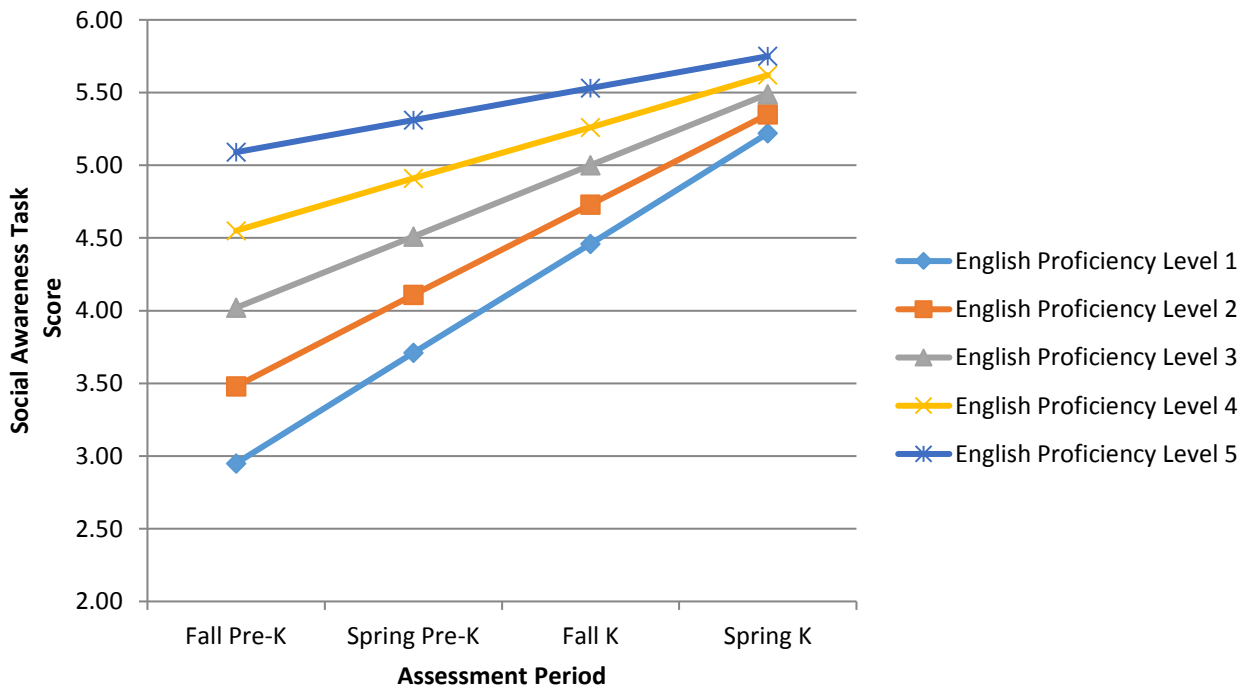**Figure 3. Growth in Naming Letters Task by English Proficiency**

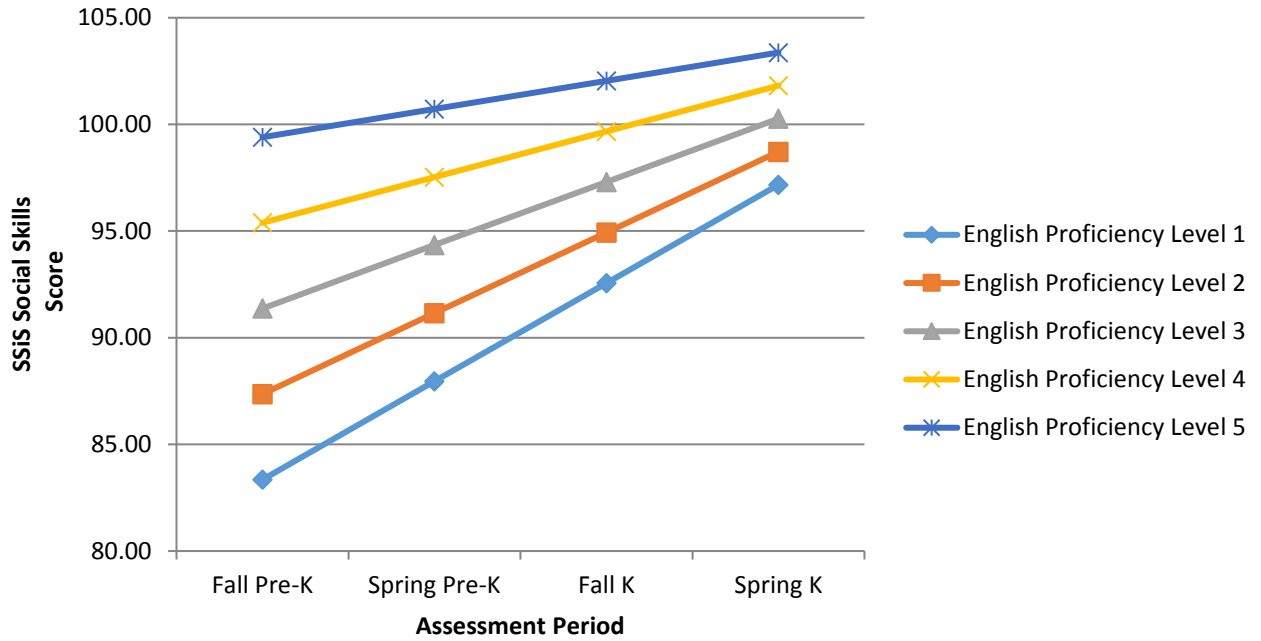**Figure 4. Growth in WJ-III Applied Problems by English Proficiency**

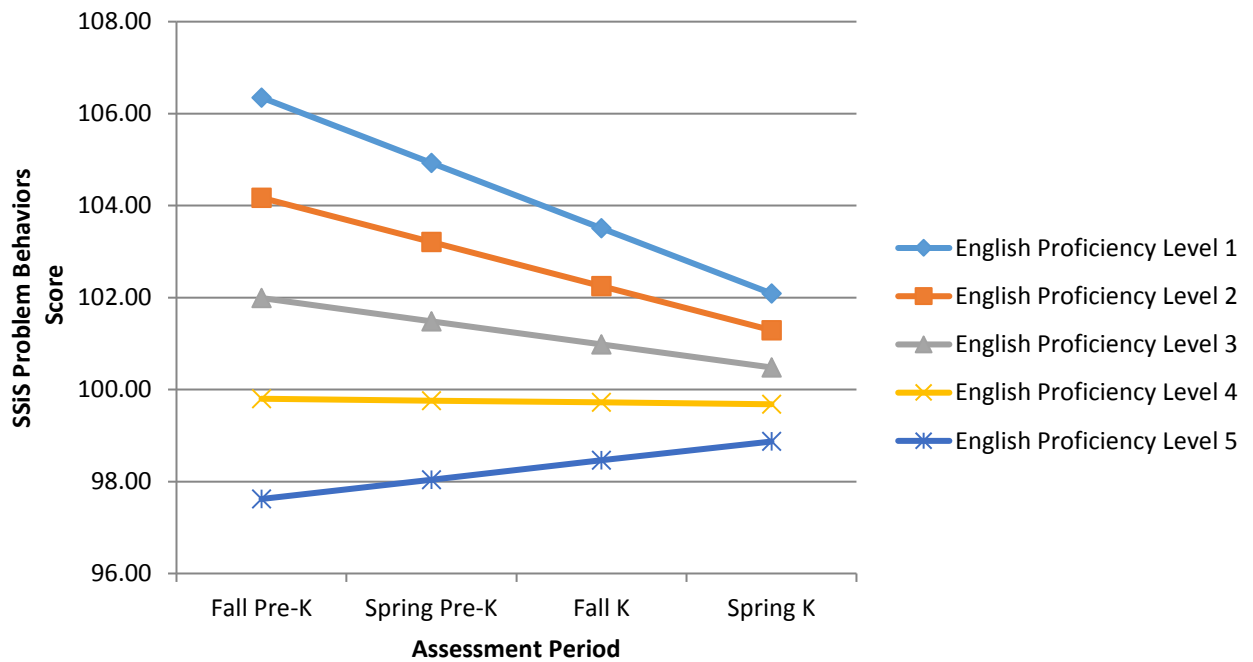**Figure 5. Growth in Counting Task by English Proficiency**

Figure 6. Growth in Social Awareness Task by English Proficiency
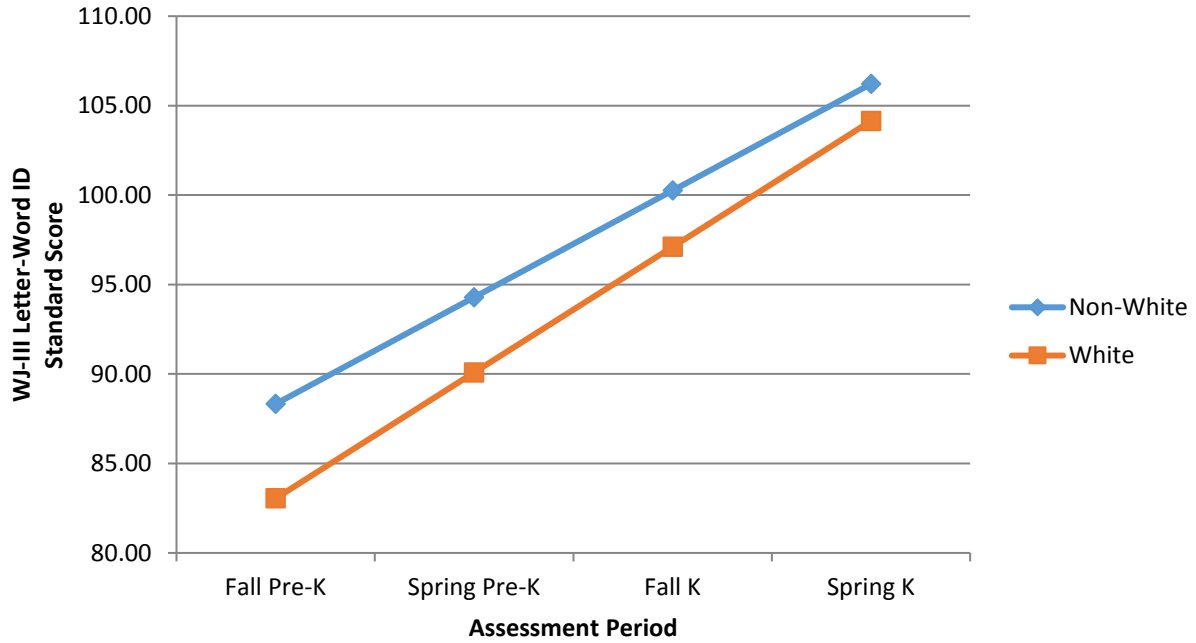
Figure 7. Growth in SSiS Social Skills by English Proficiency

Figure 8. Change in SSiS Problem Behaviors by English Proficiency

Figure 9. Growth in WJ-III Letter-Word Identification by Race

Figure 10. Growth in WJ-III Word Attack by Race
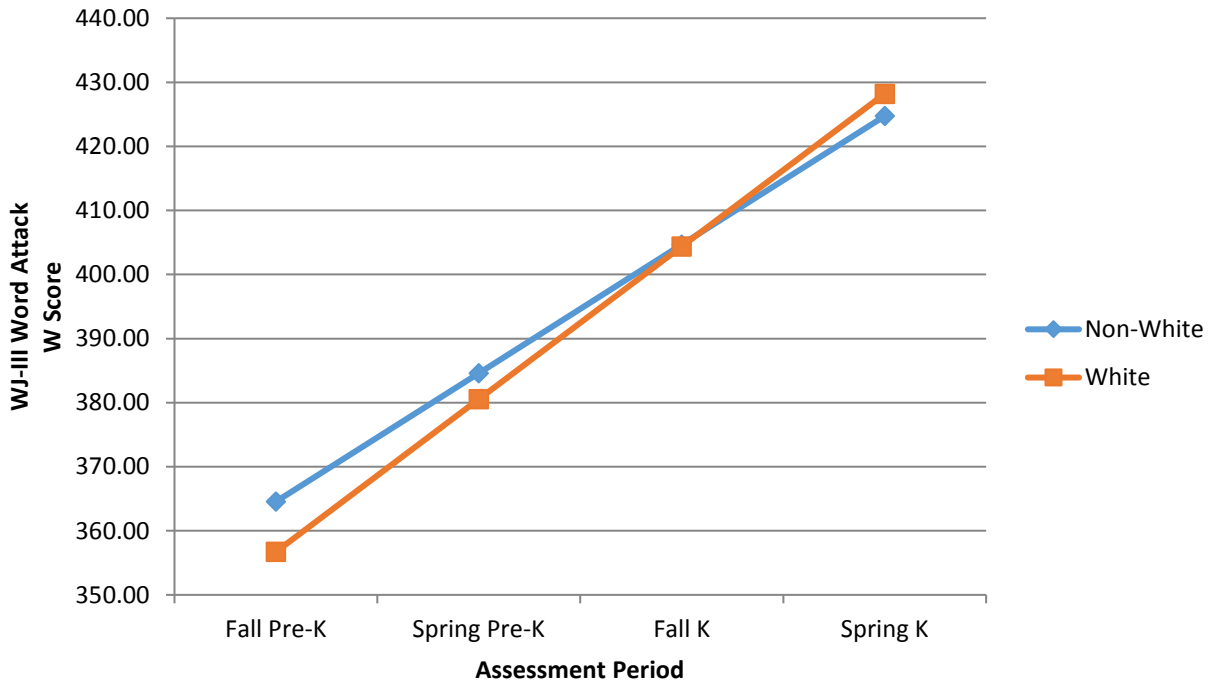
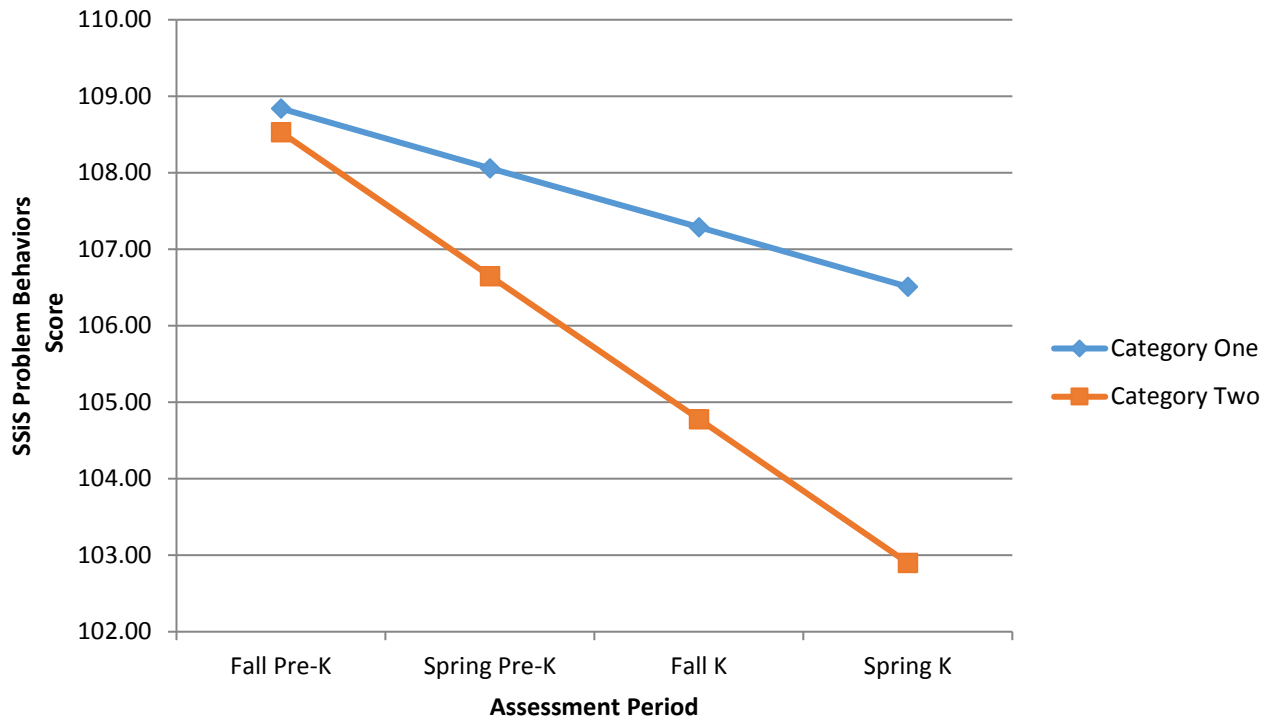**Figure 11. Growth in Naming Letters Task by Race**
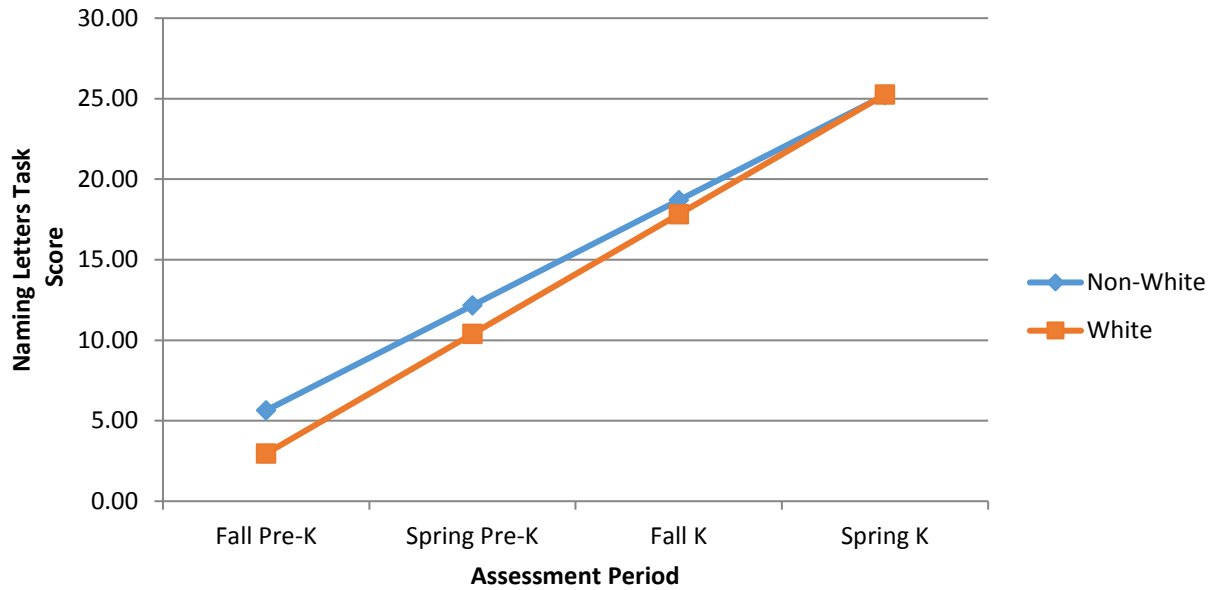
Figure 12. Growth in Social Awareness Task by Race
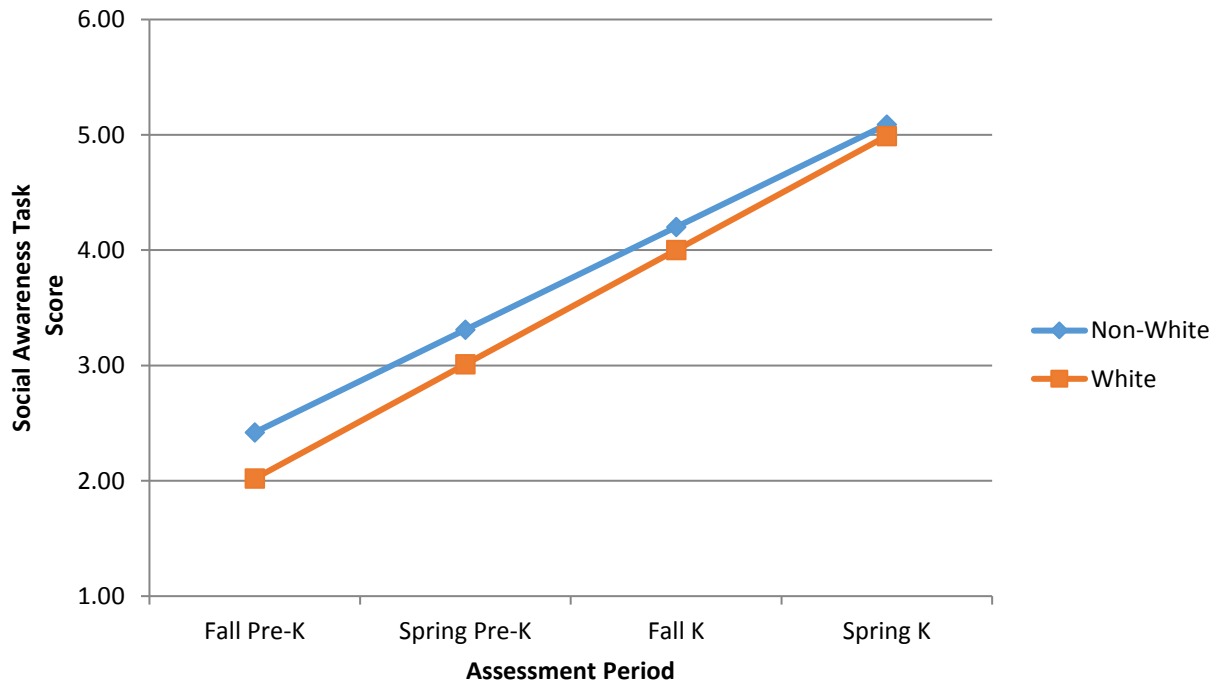
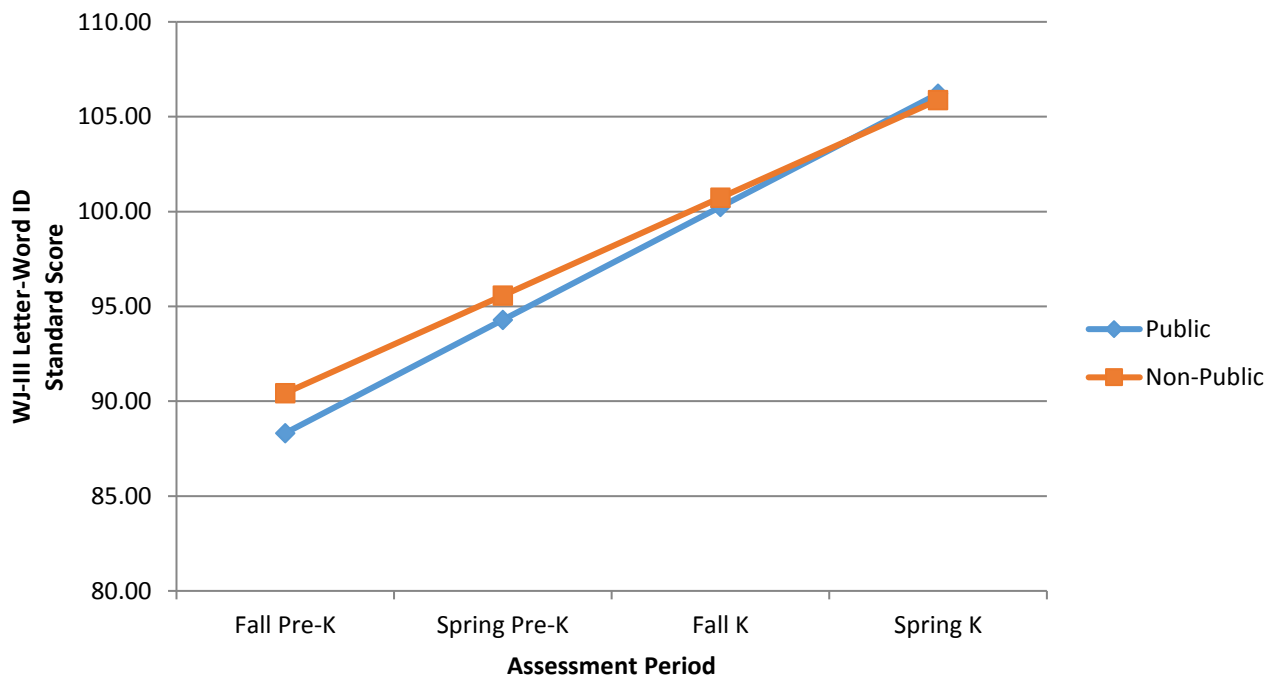**Figure 13. Growth in Naming Letters Task by Income**
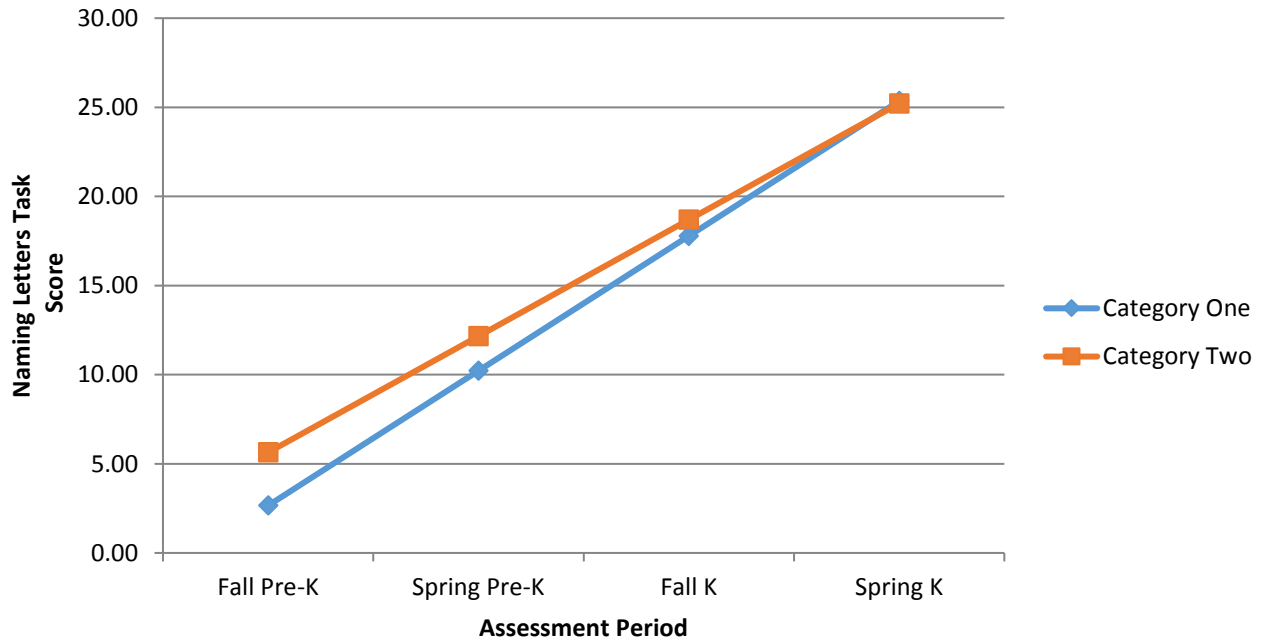
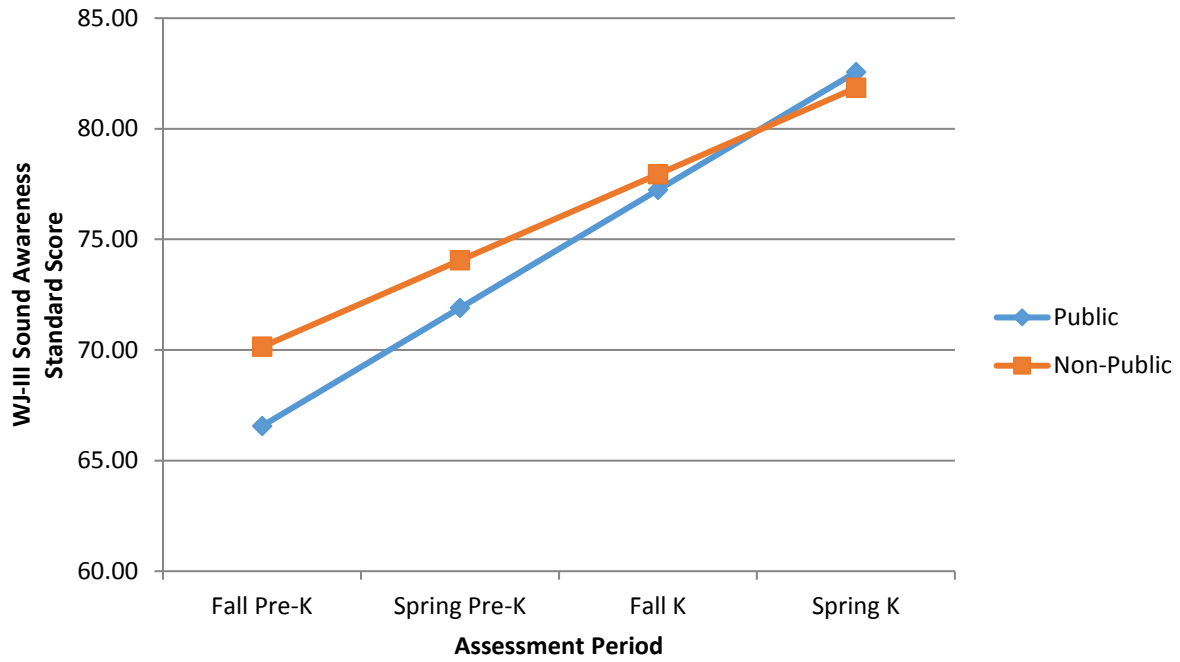
Figure 14. Growth in Counting Task by Income
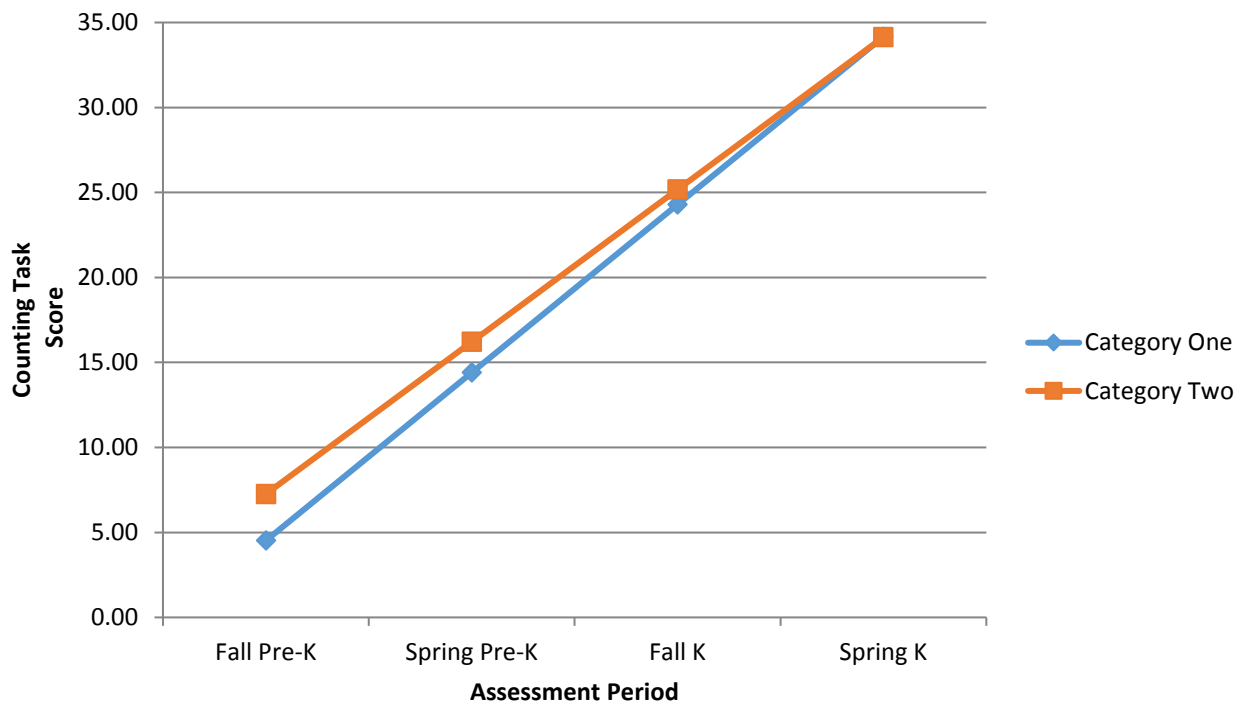
Figure 15. Change in SSiS Problem Behaviors by Income
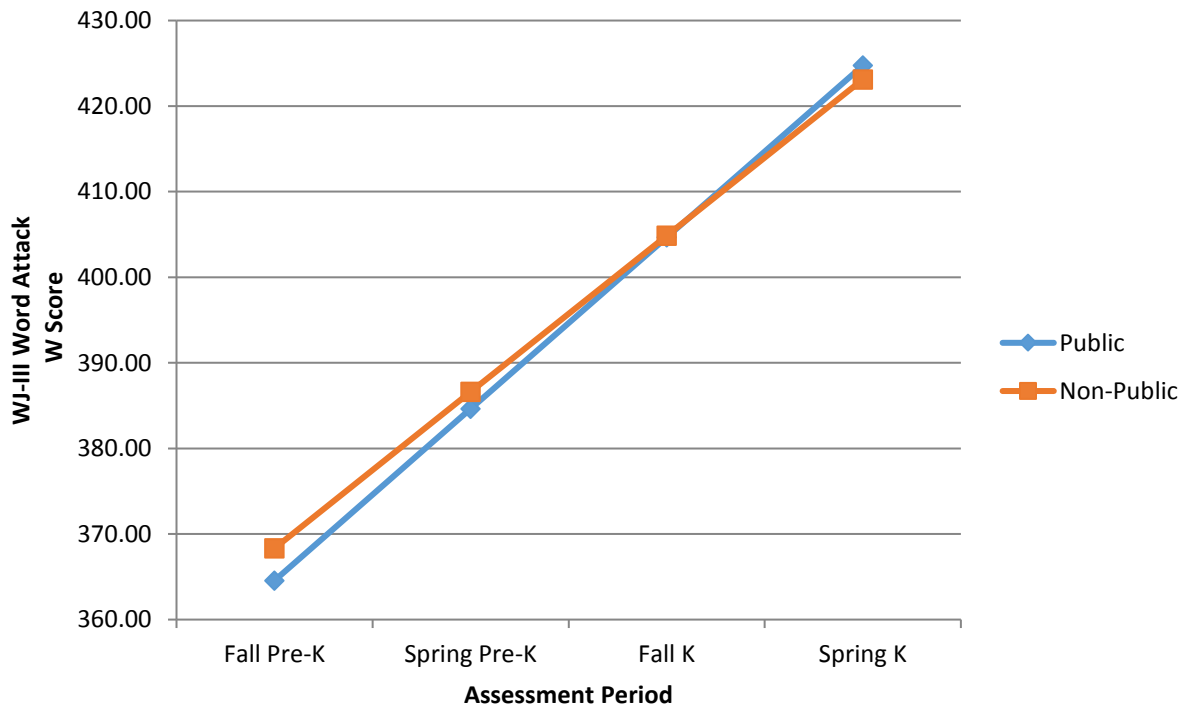

Figure 16. Growth in WJ-III Letter-Word Identification by Program Type
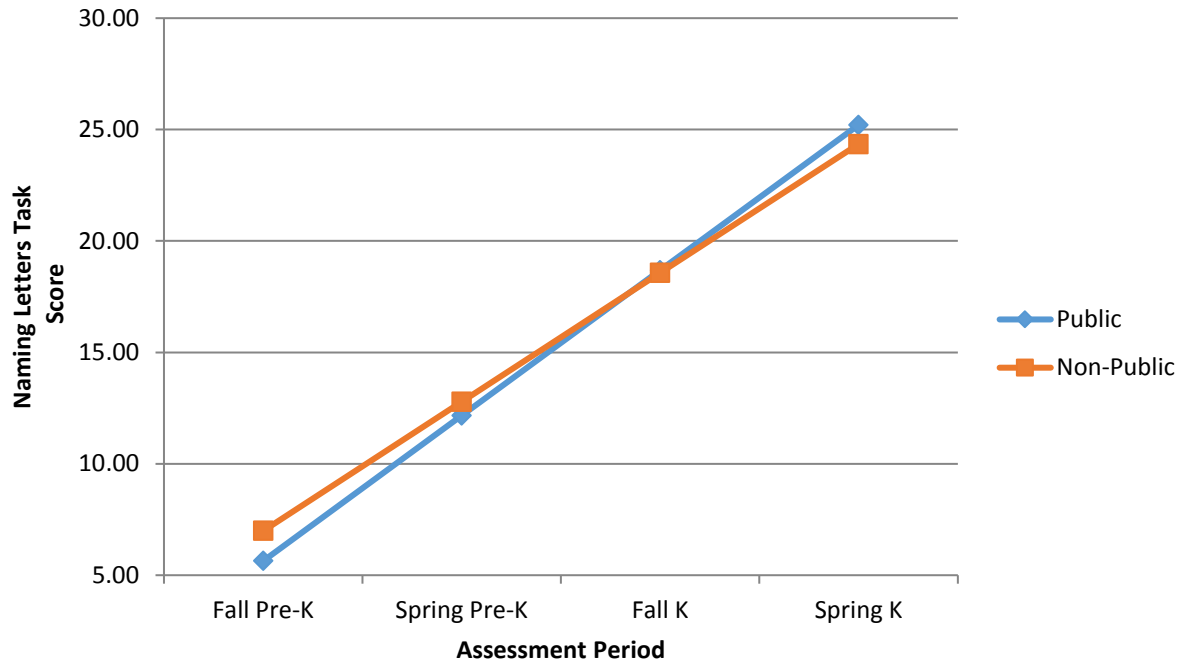
Figure 17. Growth in WJ-III Sound Awareness by Program Type

Figure 18. Growth in WJ-III Word Attack by Program Type

Figure 19. Growth in Naming Letters Task by Program Type

Table 18. Moderators of Kindergarten Outcomes–CLASS Subsample–Language and Literacy

Effect	Naming Letters Task Est[a]	(SE)	WJ-III Letter-Word ID Est[a]	(SE)	WJ-III Picture Vocabulary Est[a]	(SE)	WJ-III Sound Awareness Est[a]	(SE)	WJ-III Word Attack Est[a]	(SE)
Intercept	5.34	(0.07)	88.79	(1.54)	75.15	(1.14)	67.25	(1.98)	366.27	(3.09)
Time	7.10***	(0.53)	5.59***	(0.78)	4.53***	(0.62)	4.57***	(1.17)	17.02***	(1.90)
Age	2.72***	(0.62)	--	--	--	--	--	--	--	--
Gender[b]	-0.78*	(0.36)	-1.14	(0.62)	1.67***	(0.44)	-0.58	(0.76)	-1.83	(1.17)
Race[c]	-2.64***	(0.50)	-4.74***	(0.80)	0.80	(0.59)	1.18	(1.03)	-6.40***	(1.60)
Ethnicity[d]	-0.39	(0.62)	0.20	(1.06)	-8.88***	(0.75)	-1.67	(1.31)	1.36	(2.02)
IEP[e]	-0.94	(1.10)	-3.57	(1.86)	-1.15	(1.33)	-9.41***	(2.33)	-5.22	(3.53)
English Proficiency	2.48***	(0.22)	3.48***	(0.34)	5.99***	(0.26)	6.85***	(0.44)	5.49***	(0.69)
Income[f]	-3.12***	(0.49)	-4.43***	(0.78)	-2.65***	(0.58)	-3.00**	(0.99)	-6.68***	(1.57)
Provider Type[g]	1.94***	(0.56)	2.34*	(0.92)	0.44	(0.63)	3.19**	(1.21)	3.39	(1.82)
Teacher Certified[h]	-0.19	(0.72)	-1.74	(1.17)	-0.16	(0.21)	1.71	(1.53)	-0.32	(2.30)
Class Size	0.51**	(0.18)	0.55	(0.30)	-0.16	(0.21)	0.35	(0.40)	0.95	(0.59)
CLASS Emotional Sup	-1.47*	(0.61)	-0.03	(0.97)	0.44	(0.68)	-0.25	(1.31)	3.68	(1.98)
CLASS Class Org	1.28*	(0.59)	0.73	(0.95)	-0.30	(0.66)	0.62	(1.27)	-1.82	(1.90)
CLASS Instruction Sup	-0.18	(0.41)	0.01	(0.66)	-0.29	(0.45)	0.09	(0.88)	0.01	(1.32)
Time x Race	0.88**	(0.28)	0.71	(0.42)	0.14	(0.33)	0.57	(0.63)	3.46***	(1.01)
Time x Eng Prof	-0.69***	(0.11)	-0.53**	(0.17)	-1.17***	(0.13)	0.39	(0.25)	0.79	(0.40)
Time x Income	1.23***	(0.28)	0.54	(0.41)	0.24	(0.33)	-1.76**	(0.61)	0.74	(0.99)
Time x Provider	-1.17***	(0.30)	-1.24**	(0.46)	0.13	(0.35)	-1.55*	(0.70)	-2.16	(1.12)
Time x Teacher Cert	-0.01	(0.39)	0.31	(0.59)	0.16	(0.46)	-0.30	(0.91)	-0.24	(1.46)
Time x Class Size	-0.21	(0.10)	-0.02	(0.15)	-0.01	(0.12)	-0.02	(0.24)	0.13	(0.38)
Time x CLASS ES	1.04***	(0.29)	-0.95*	(0.43)	0.30	(0.33)	-0.10	(0.67)	-4.24***	(1.06)
Time x CLASS CO	-0.44	(0.30)	0.76	(0.46)	-0.12	(0.35)	0.68	(0.70)	2.95**	(1.11)
Time x CLASS IS	-0.09	(0.21)	0.56	(0.32)	-0.06	(0.24)	0.81	(0.49)	1.60*	(0.78)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.
[b] Female=0, Male=1.
[c] Non-White=0, White=1.
[d] Non-Latino=0, Latino=1.
[e] No IEP=0, IEP=1.
[f] Category Two=0, Category One=1.
[g] Public school site=0, Private site=1.
[h] Teacher not certified=0, Teacher certified=1.

Table 19. Moderators of Kindergarten Outcomes–CLASS Subsample–Math, General Knowledge, and Behavior

| | Math | | | | General Knowledge | | Classroom Behavior | | | |
| | WJ-III Applied Problems | | Counting Task | | Social Awareness Task | | SSiS Social Skills | | SSiS Problem Behaviors | |
Effect	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)	Est[a]	(SE)
Intercept	74.96	(1.29)	7.48	(1.34)	2.36	(0.14)	78.58	(1.96)	109.03	(1.85)
Time	7.73***	(0.78)	9.40***	(0.81)	0.99***	(0.09)	6.73***	(1.14)	-2.06*	(1.04)
Age	--	--	5.02***	(0.78)	0.25**	(0.09)	--	--	--	--
Gender[b]	-0.15	(0.49)	-1.46**	(0.46)	-0.12*	(0.05)	1.19	(0.74)	-0.14	(0.71)
Race[c]	3.91***	(0.67)	-1.46*	(0.68)	-0.37***	(0.07)	2.01	(1.04)	-0.75	(0.98)
Ethnicity[d]	-0.16	(0.85)	0.52	(0.79)	-0.55***	(0.09)	5.34***	(1.33)	-6.56***	(1.27)
IEP[e]	-4.92**	(1.50)	-2.72	(1.43)	-0.37*	(0.16)	-7.32**	(2.34)	6.19**	(2.23)
English Proficiency	6.38***	(0.29)	2.99***	(0.30)	0.54***	(0.03)	4.14***	(0.43)	-2.17***	(0.40)
Income[f]	-3.24***	(0.65)	-2.70***	(0.67)	-0.28***	(0.07)	-0.48	(0.98)	0.28	(0.93)
Provider Type[g]	0.97	(0.77)	2.16**	(0.78)	-0.03	(0.08)	0.08	(1.39)	1.62	(1.35)
Teacher Certified[h]	0.50	(0.97)	1.54	(0.99)	-0.24*	(0.10)	-0.58	(1.75)	3.95*	(1.68)
Class Size	0.15	(0.25)	0.39	(0.26)	0.02	(0.03)	0.81	(0.43)	-0.41	(0.42)
CLASS Emotional Sup	0.65	(0.83)	-2.07*	(0.87)	-0.00	(0.09)	-1.05	(1.48)	2.37	(1.42)
CLASS Class Org	0.16	(0.80)	1.29	(0.83)	0.14	(0.09)	3.57*	(1.47)	-1.50	(1.43)
CLASS Instruction Sup	0.03	(0.55)	0.97	(0.57)	-0.07	(0.06)	-2.94**	(0.99)	-0.82	(0.96)
Time x Race	-0.67	(0.42)	0.01	(0.43)	0.12*	(0.05)	-0.55	(0.62)	0.36	(0.57)
Time x Eng Prof	-1.54***	(0.17)	-0.61***	(0.17)	-0.15***	(0.02)	-0.95***	(0.24)	0.49*	(0.22)
Time x Income	0.20	(0.41)	0.76	(0.42)	0.04	(0.05)	-0.85	(0.60)	0.99	(0.55)
Time x Provider	0.10	(0.46)	-0.86	(0.46)	0.04	(0.05)	-0.60	(0.74)	-0.39	(0.68)
Time x Teacher Cert	-0.15	(0.60)	-0.78	(0.60)	0.03	(0.07)	-1.64	(0.95)	-0.96	(0.87)
Time x Class Size	-0.02	(0.16)	-0.10	(0.15)	0.01	(0.02)	-0.39	(0.24)	0.02	(0.22)
Time x CLASS ES	-0.53	(0.44)	1.23**	(0.44)	0.03	(0.05)	1.12	(0.72)	-0.34	(0.67)
Time x CLASS CO	0.12	(0.46)	-0.80	(0.46)	-0.09	(0.05)	-1.27	(0.75)	-0.80	(0.70)
Time x CLASS IS	0.58	(0.32)	-0.57	(0.32)	0.03	(0.03)	1.30*	(0.51)	0.81	(0.47)

[a] Significance levels are *p< .05, **p< .01, ***p< .001.

[b] Female=0, Male=1.

[c] Non-White=0, White=1.

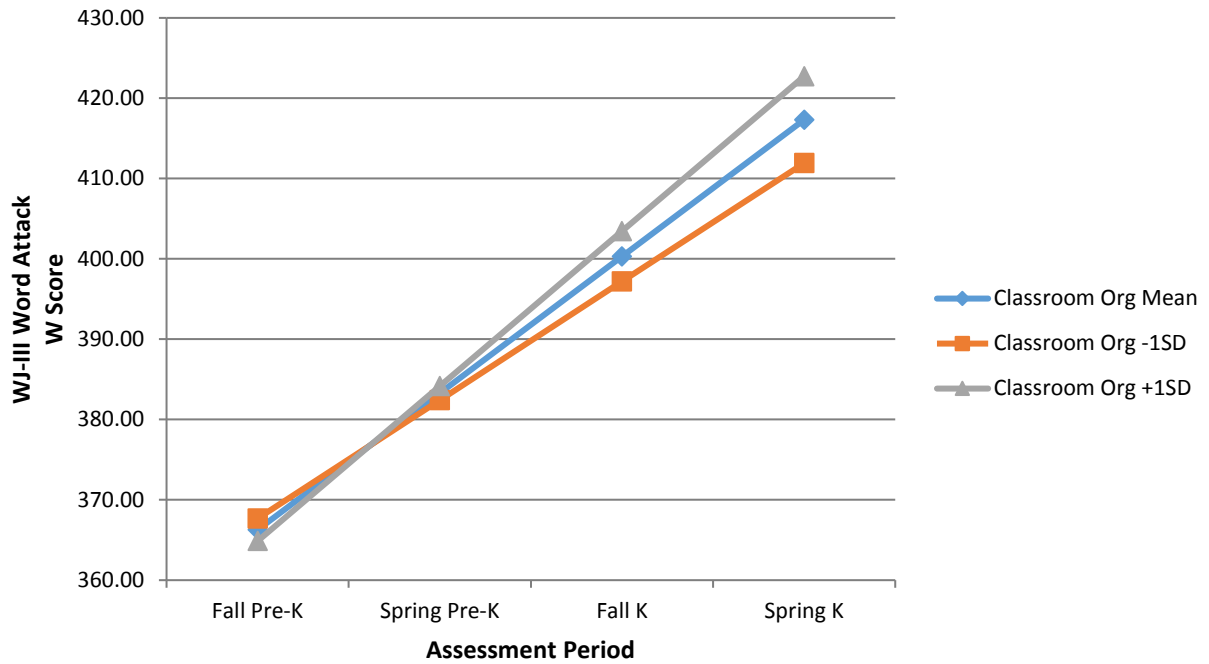[d] Non-Latino=0, Latino=1.

[e] No IEP=0, IEP=1.

[f] Category Two=0, Category One=1.
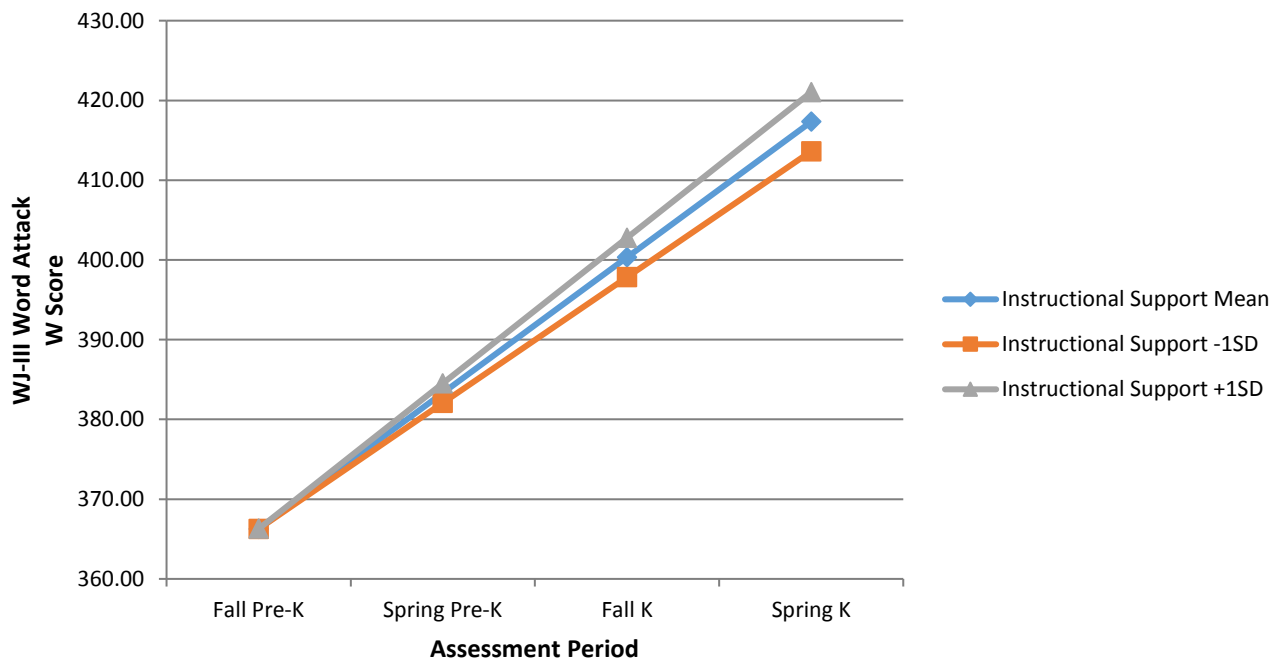
[g] Public school site=0, Private site=1.

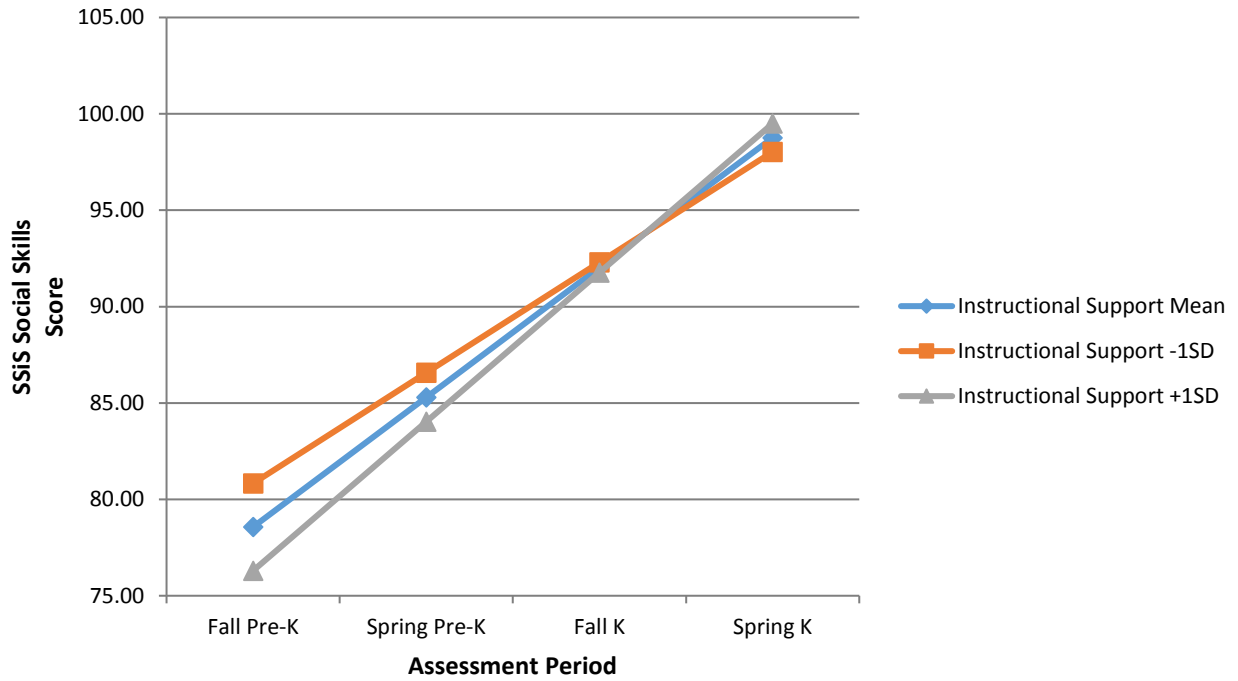[h] Teacher not certified=0, Teacher certified=1.

Figure 20. Growth in WJ-III Word Attack by CLASS Classroom Organization
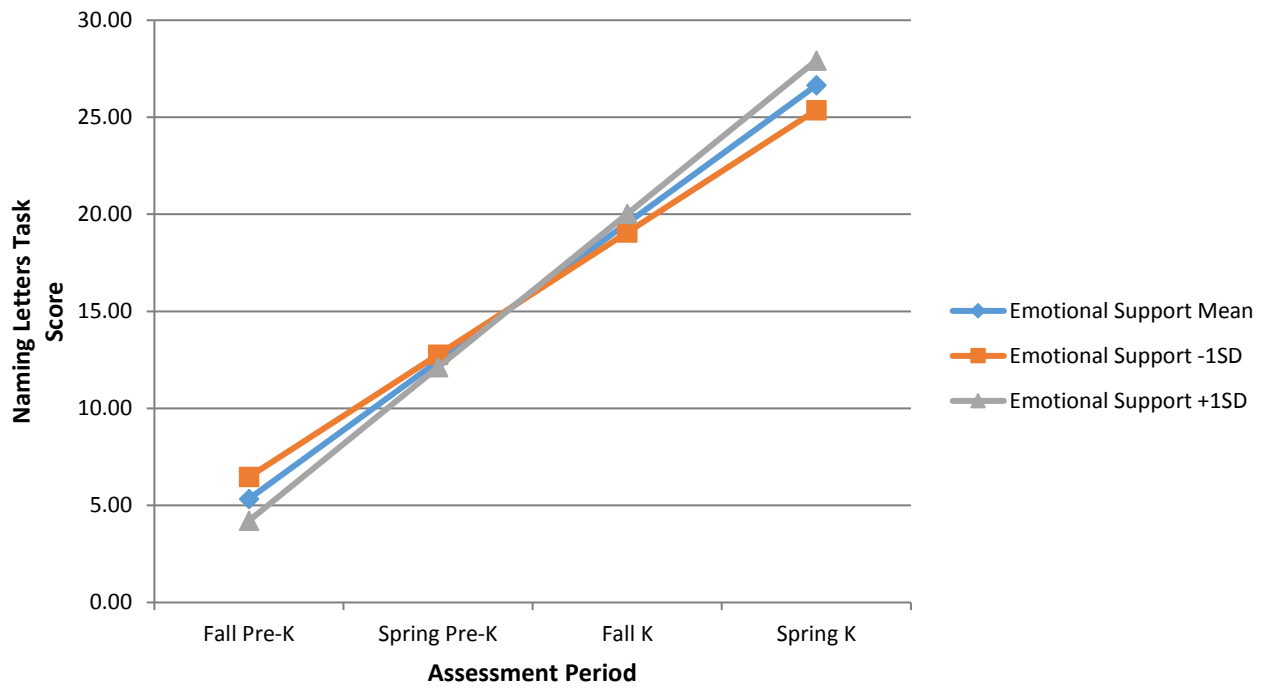

Figure 21. Growth in WJ-III Word Attack by CLASS Instructional Support
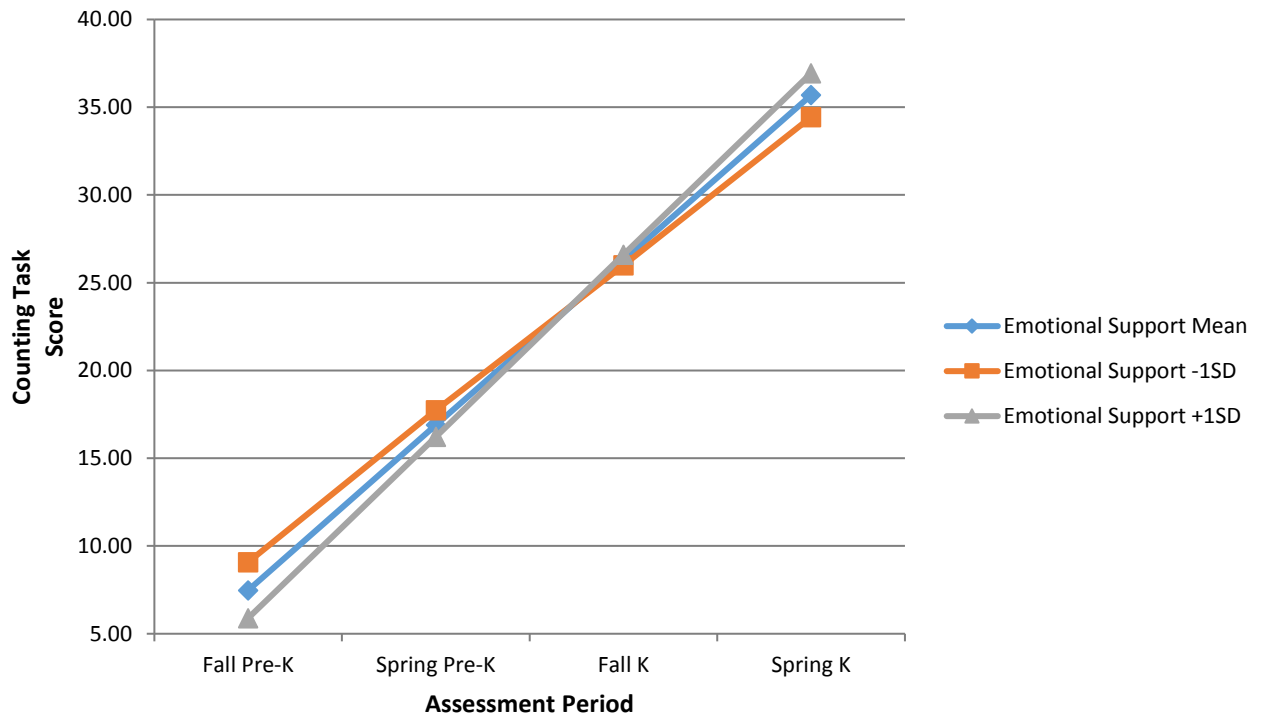
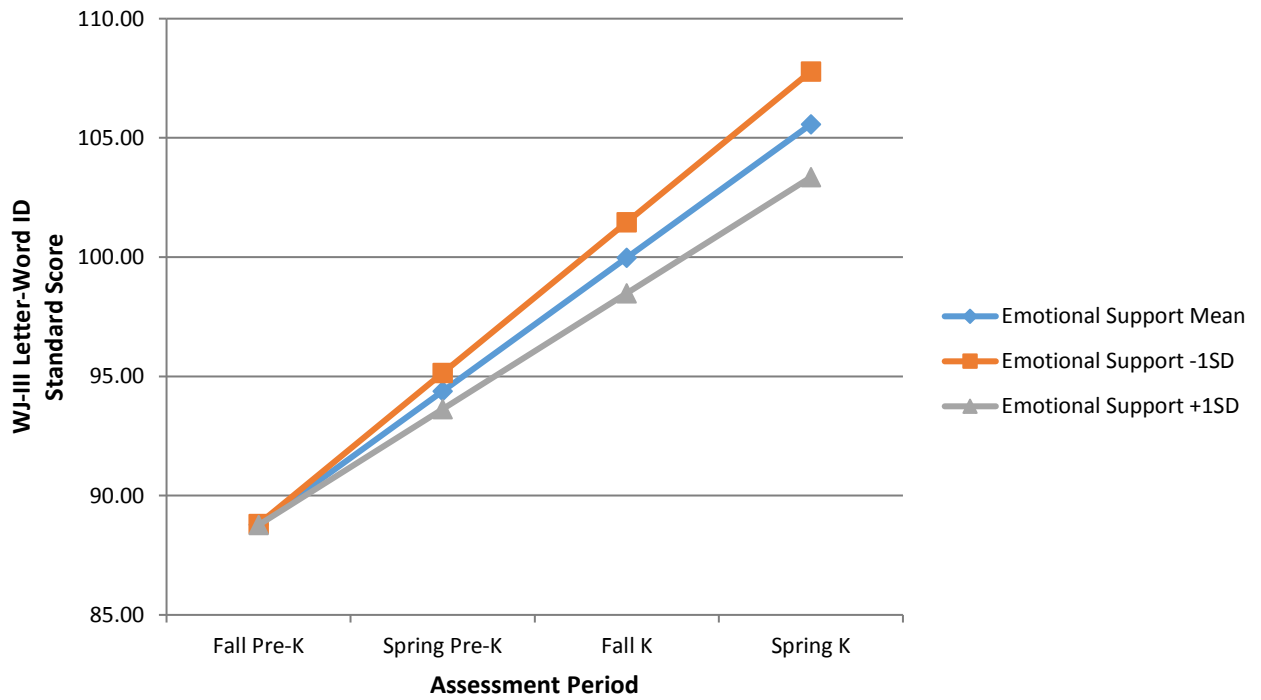**Figure 22. Growth in SSiS Social Skills by CLASS Instructional Support**

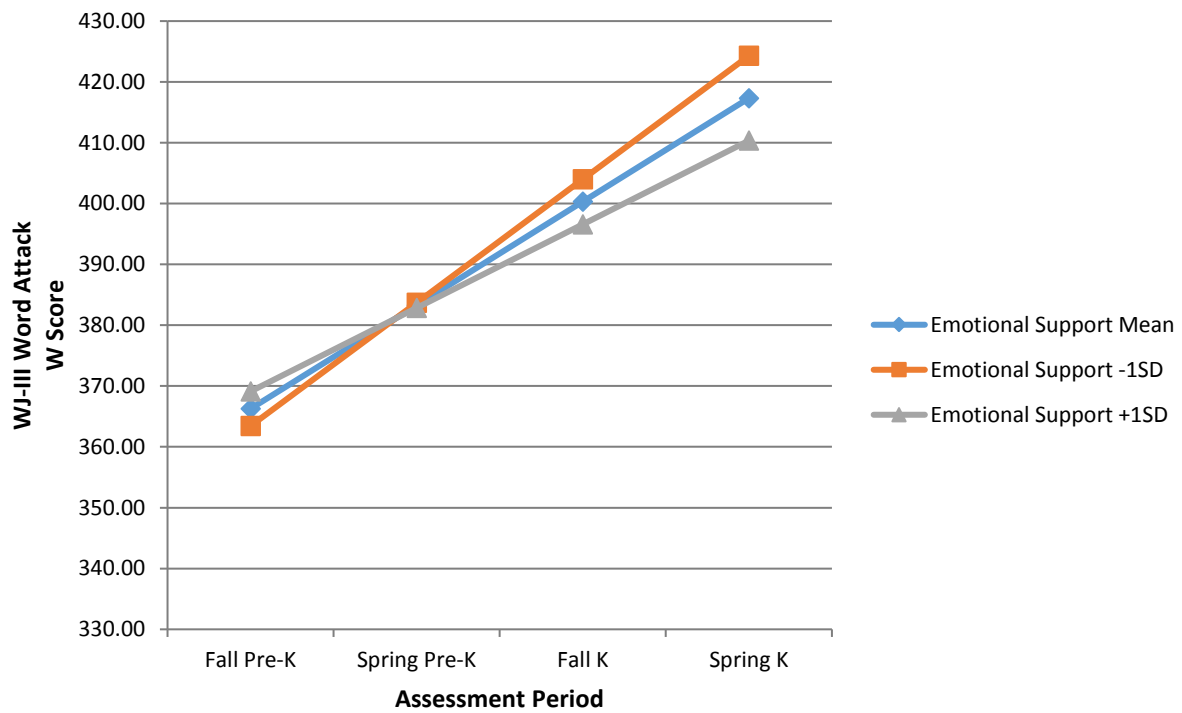**Figure 23. Growth in Naming Letters Task by CLASS Emotional Support**

Figure 24. Growth in Counting Task by CLASS Emotional Support

Figure 25. Growth in WJ-III Letter-Word Identification by CLASS Emotional Support

**Figure 26. Growth in WJ-III Word Attack by CLASS Emotional Support**

Table 20. Classroom Assessment Scoring System (CLASS) Scores

| CLASS Domain / Dimension	Pre-K n=199			Kindergarten n=296		
	Mean	(SD)	Range[a]	Mean	(SD)	Range[a]
Emotional Support	5.7	(0.7)	3.6–6.9	5.2***	(0.8)	1.7–6.9
Positive climate	5.9	(0.9)	3.0–7.0	5.3	(1.1)	1.8–7.0
Negative climate[b]	1.2	(0.4)	1.0–3.4	1.4	(0.7)	1.0–5.8
Teacher sensitivity	5.5	(1.0)	2.2–7.0	5.1	(1.1)	1.3–7.0
Regard for student perspectives	4.7	(1.0)	1.6–6.8	3.7	(1.0)	1.5–6.4
Classroom Organization	5.5	(0.8)	3.1–6.9	5.3*	(0.8)	2.7–6.9
Behavior management	5.8	(1.0)	2.8–7.0	5.6	(1.0)	1.6–7.0
Productivity	5.9	(0.7)	3.4–7.0	5.6	(0.9)	2.6–7.0
Instructional learning formats	4.7	(0.9)	2.0–6.8	4.8	(1.0)	2.0–7.0
Instructional Support	2.6	(0.7)	1.1–5.9	2.5	(0.8)	1.0–4.9
Concept development	2.5	(0.8)	1.0–5.6	2.4	(0.8)	1.0–4.6
Quality of feedback	2.6	(0.9)	1.0–6.0	2.6	(1.0)	1.0–5.8
Language modeling	2.6	(0.8)	1.0–6.2	2.5	(0.9)	1.0–5.4

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[a] Domain scores could range from 1.0–7.0; Dimension scores could range from 1–7.

[b] Scoring is reversed for the Negative climate dimension before it is included in the calculation of the Emotional Support domain score.
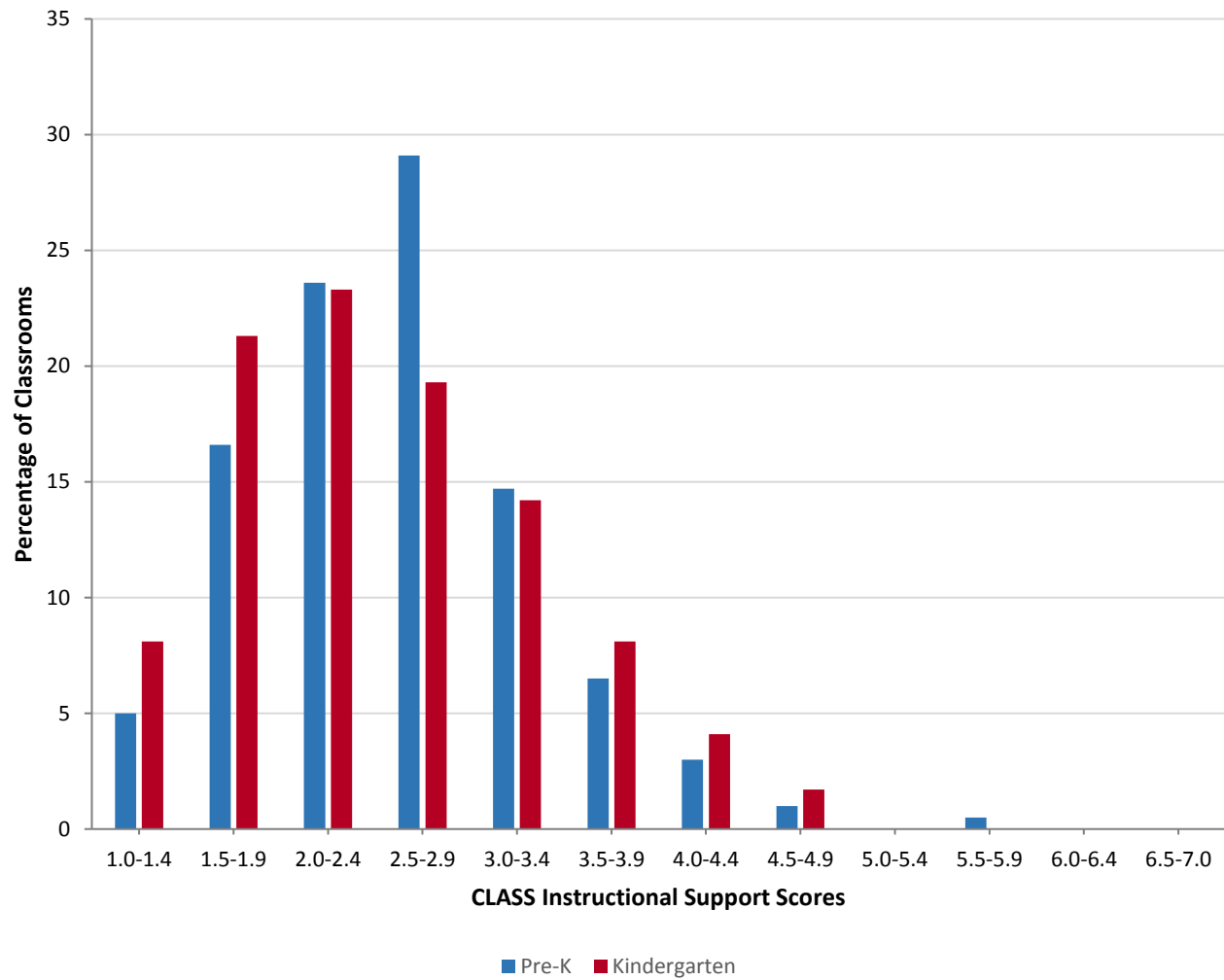
Figure 27. CLASS Emotional Support Scores in Pre-K (n=199) and Kindergarten (n=296)
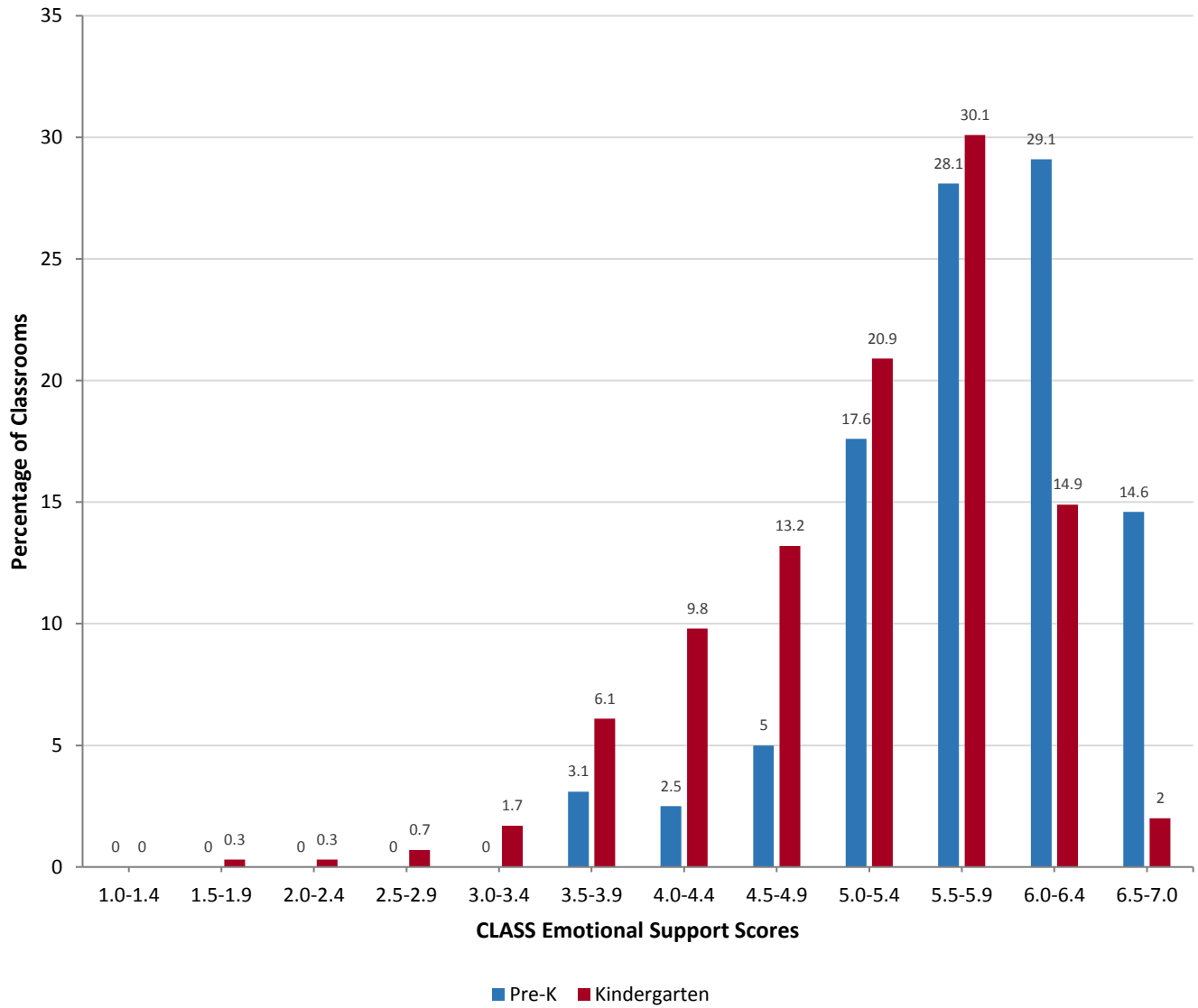
Figure 28. CLASS Classroom Organization Scores in Pre-K (n=199) and Kindergarten (n=296)
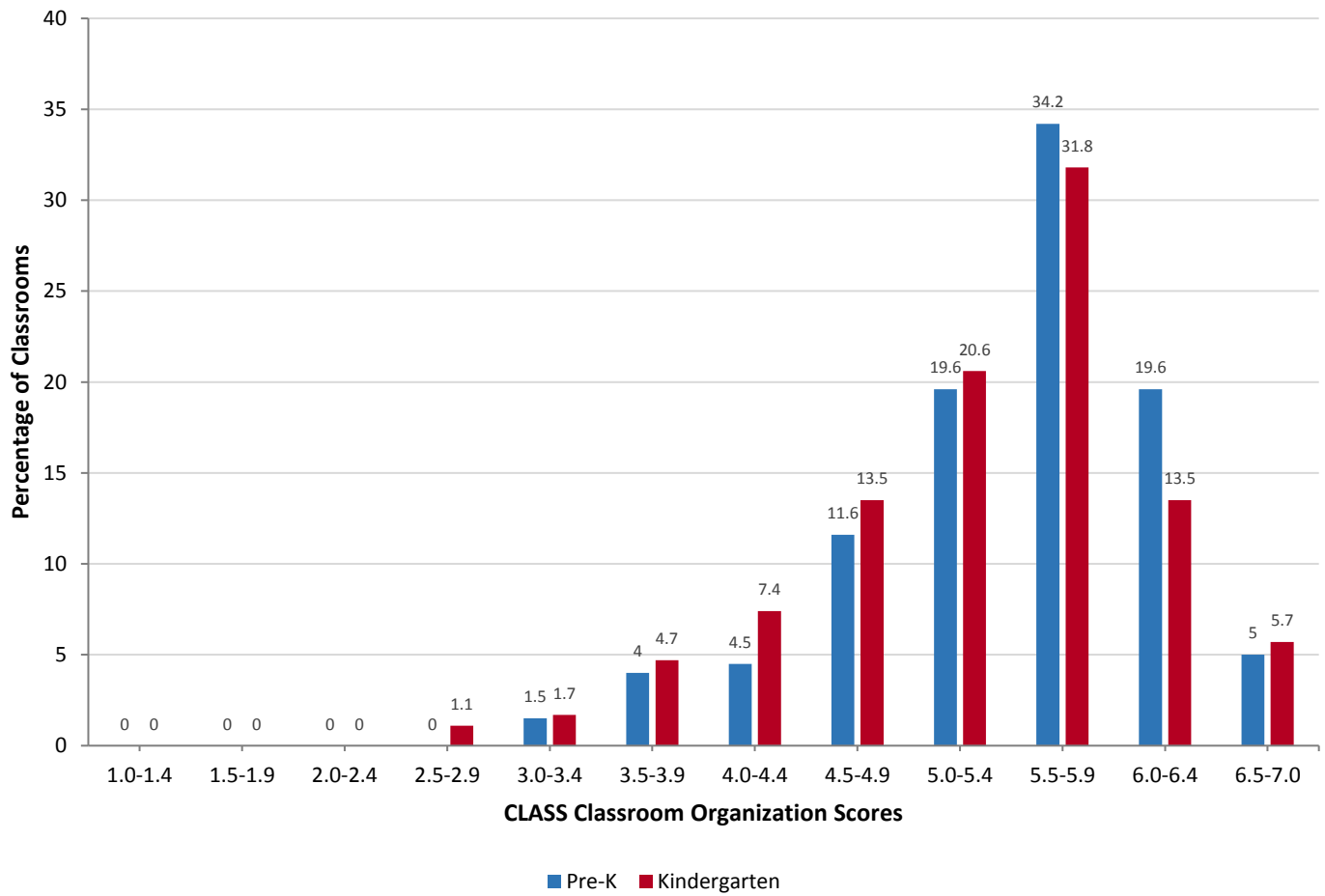
Figure 29. CLASS Instructional Support Scores in Pre-K (n=199) and Kindergarten (n=296)

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