EarlyLearning NETWORK

Early Learning Research Network: Supporting Early Learning from Preschool through Early Elementary School Grades

IES Annual PI Meeting

Thursday, January 10, 2019

earlylearningnetwork.unl.edu

Learning Frontiers: Trajectories and Differences for Children in Nebraska

University of Nebraska-Lincoln Team

January 10, 2019

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Research Questions

Effects of Pre-Kindergarten Attendance

For children who *attended* and those who *did not attend* center-based preschool:

- What is the *trajectory* of growth in expressive vocabulary, social skills, and problem behaviors *across the pre-Kindergarten to Kindergarten transition*?
- What is the *difference*, if any, in expressive vocabulary, social skills, and problem behaviors *at the end of Kindergarten*?

Research Questions

Effects of Geographic Locale

For children in *rural* and *urban Nebraska*:

- What is the *trajectory* of growth in expressive vocabulary, social skills, and problem behaviors *across the pre-Kindergarten to Kindergarten transition*?
- What is the *difference*, if any, in expressive vocabulary, social skills, and problem behaviors *at the end of Kindergarten*?

Analytic Approach

- Cross-classified multilevel modeling accounted for repeated observations nested within children, and children changing classrooms/schools from Year 1 to Year 2 (Pre-K to Kindergarten)

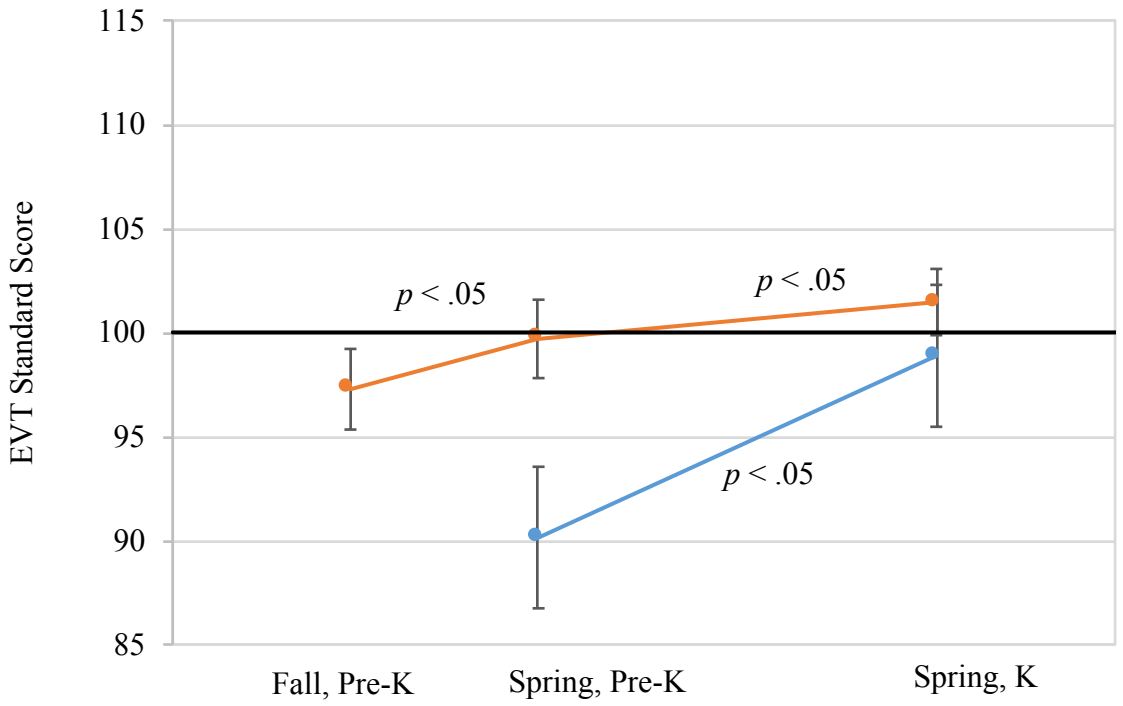
- Model controlled for child age, child race/ethnicity, poverty/low income status, parent education, home language

Sample Demographics ($N = 357$)

Child Race/Ethnicity	
Black/Non-Hispanic	12.1
Hispanic/Any Race	26.4
White/Non-Hispanic	49.7
Other	6.0
Primary Home Language	
Only English	77.7
Other	22.3
Parent Education (Highest Degree)	
< HS diploma	18.2
HS diploma/GED	21.8
Some college/Certificate/2-year degree	39.7
≥ 4 year degree	20.3
Income Status	
> 150% FPL & no support	35.4
≤ 150% FPL &/or govt support	64.6

Attender v. Non-attender: Expressive Vocabulary (EVT)

***N* = 319 (223 attenders & 96 non-attenders)**



The increase in EVT scores from the end of Pre-K to the end of K was significantly greater for non-attenders than attenders.

Attender v. Non-attender: Expressive Vocabulary (EVT)

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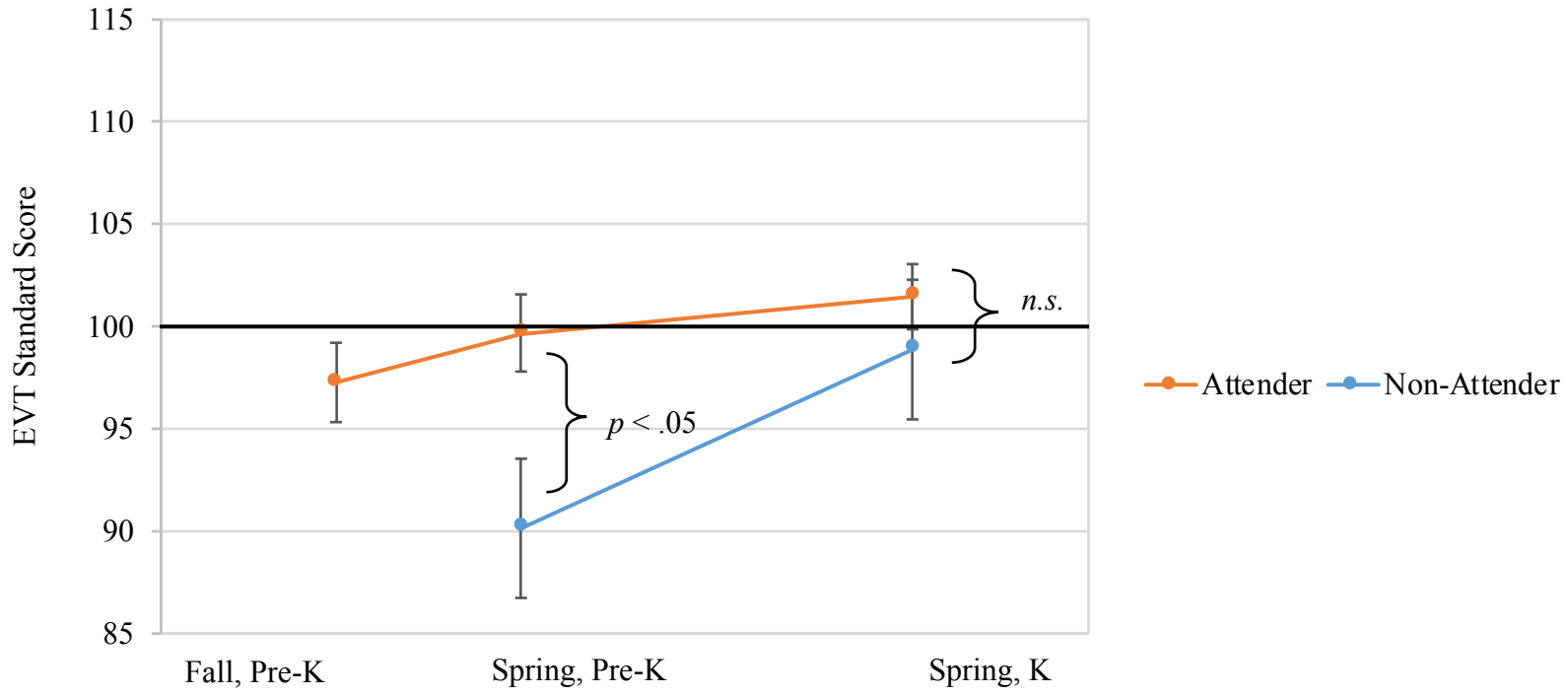

Attender v. Non-attender: Social Skills (SSIS-SS)

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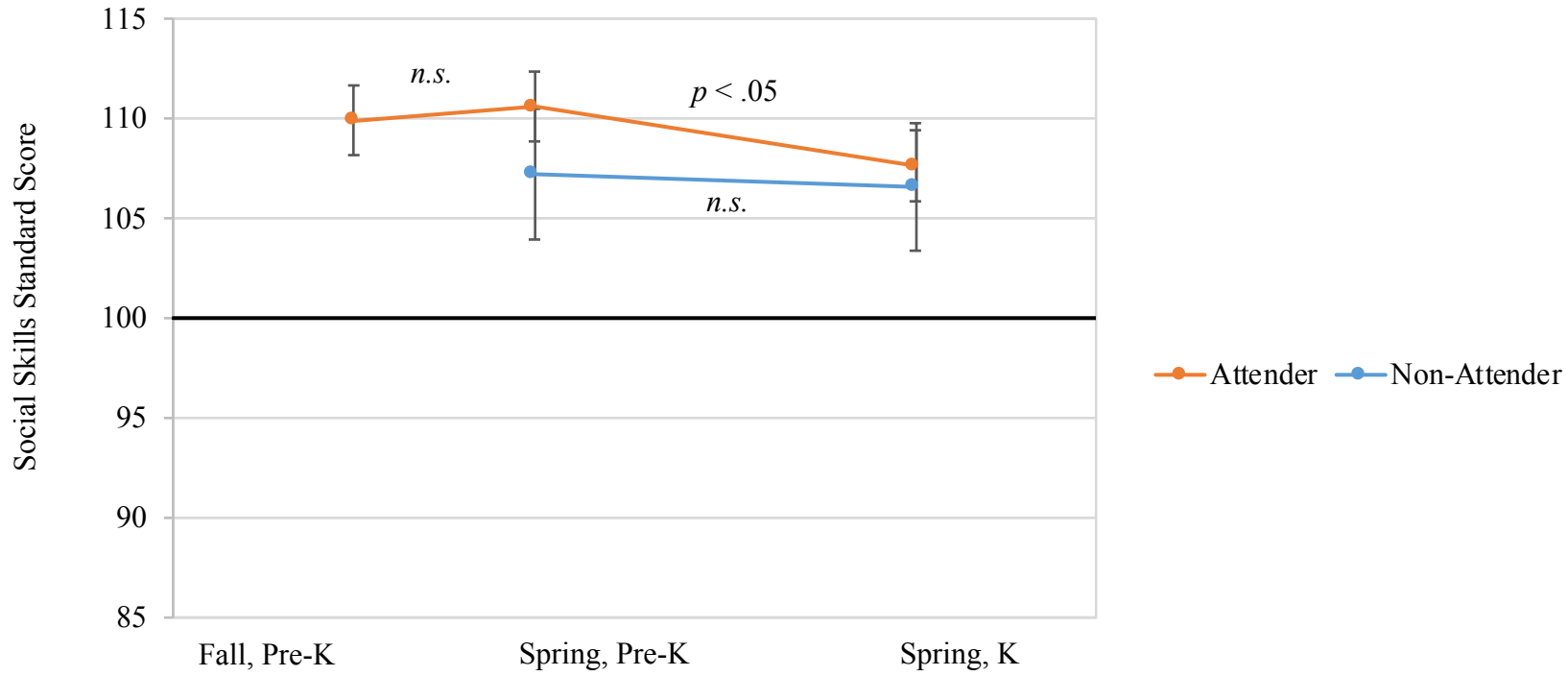

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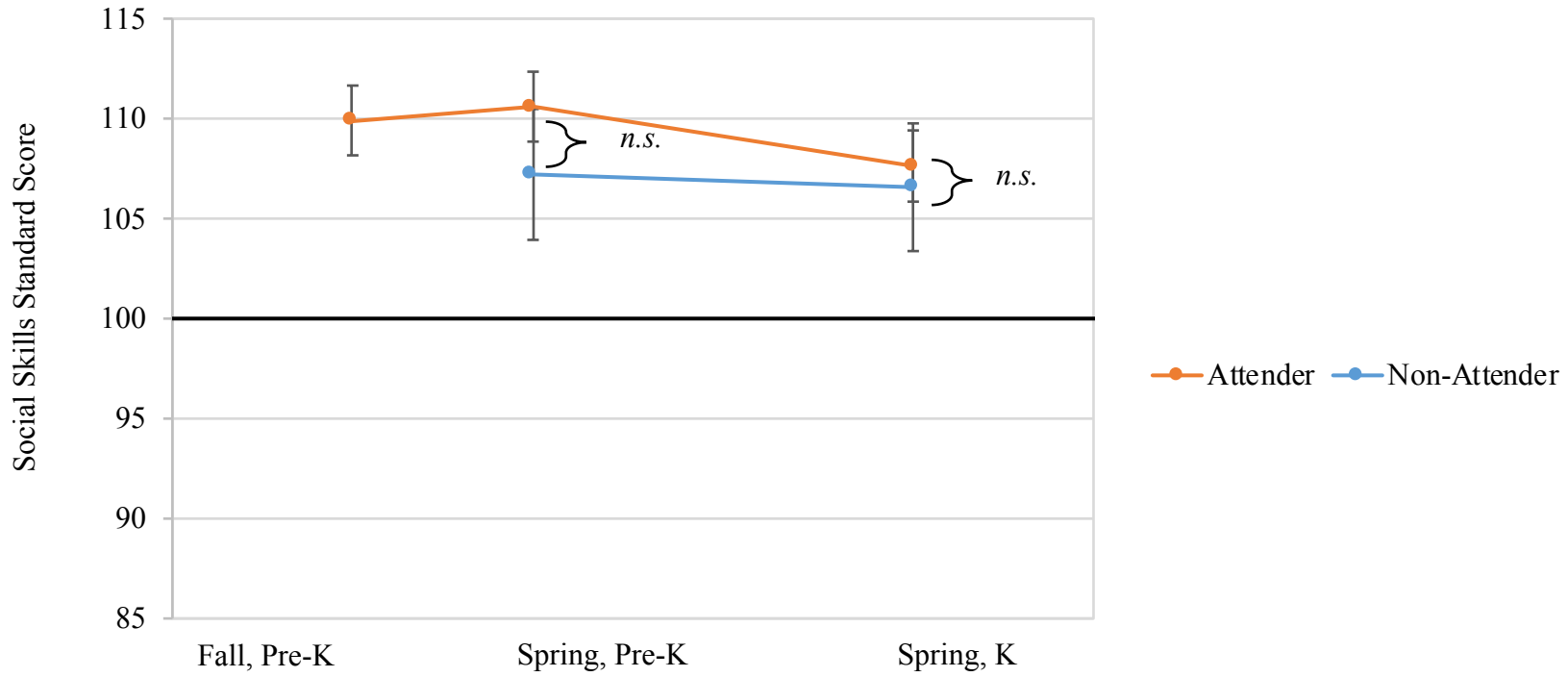

Attender v. Non-attender: Problem Behaviors (SSIS-PB)

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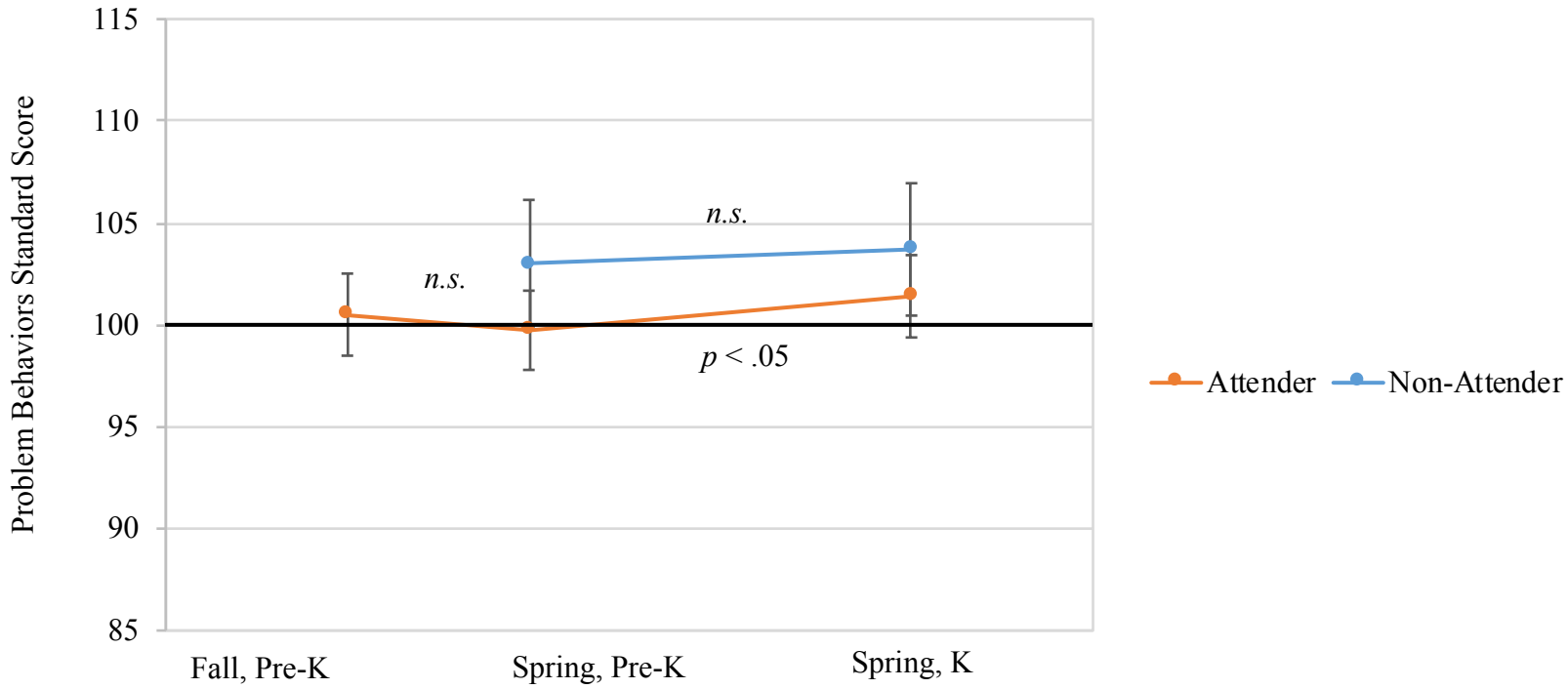

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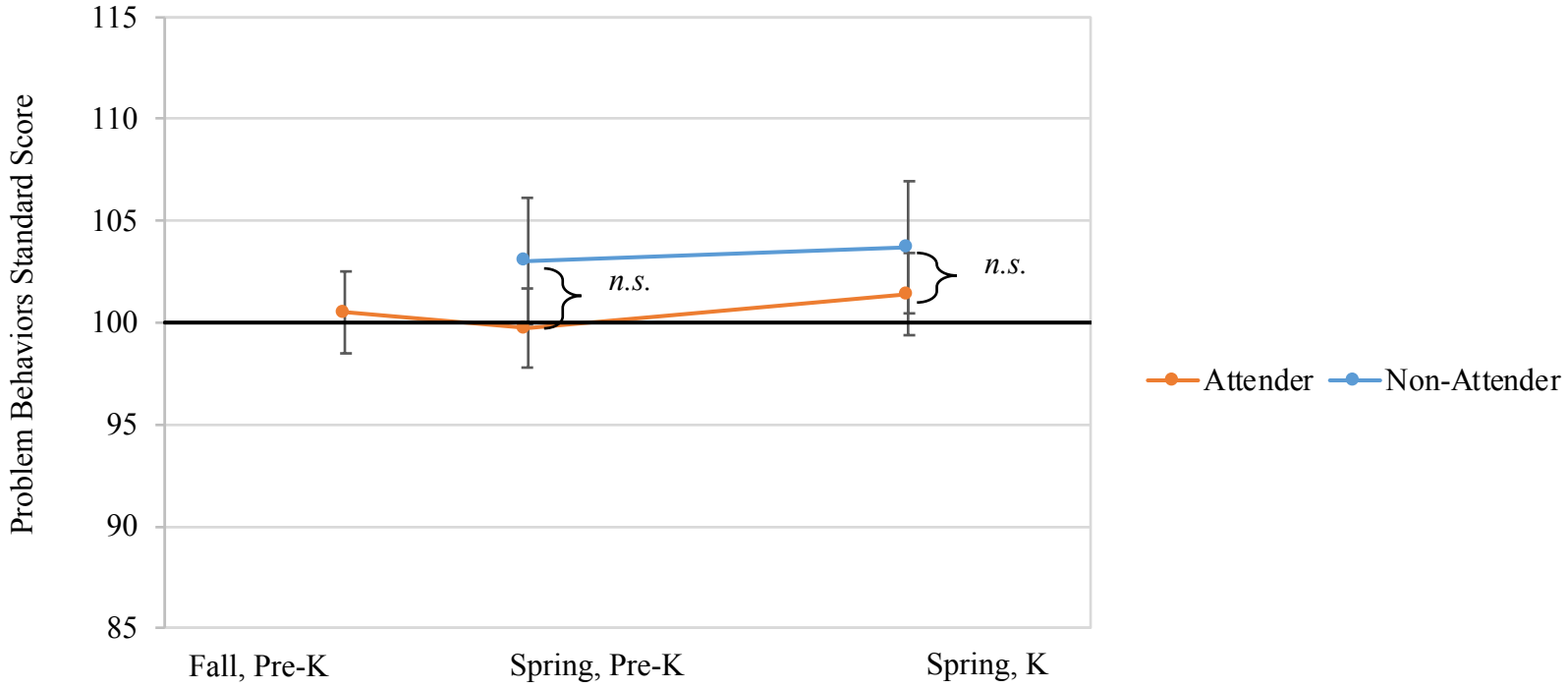
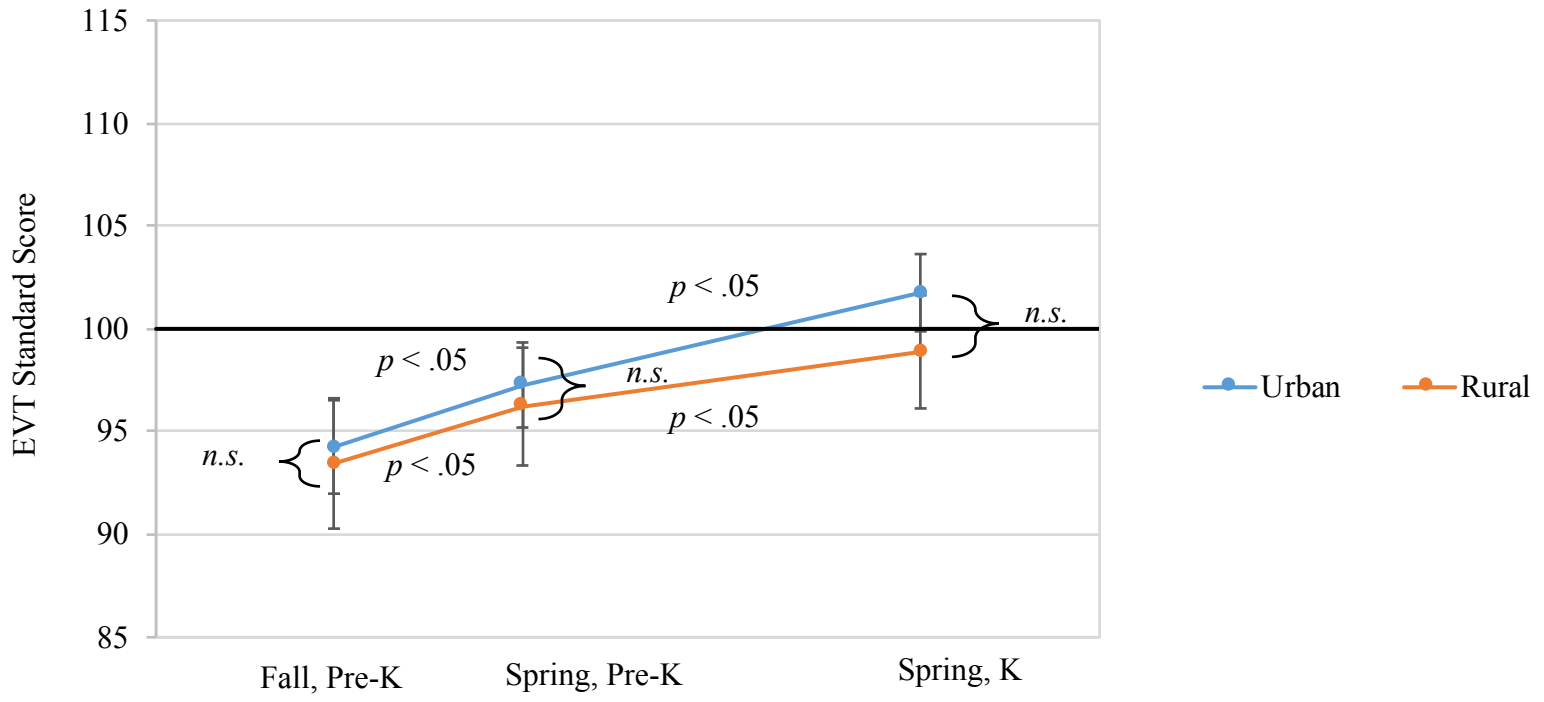


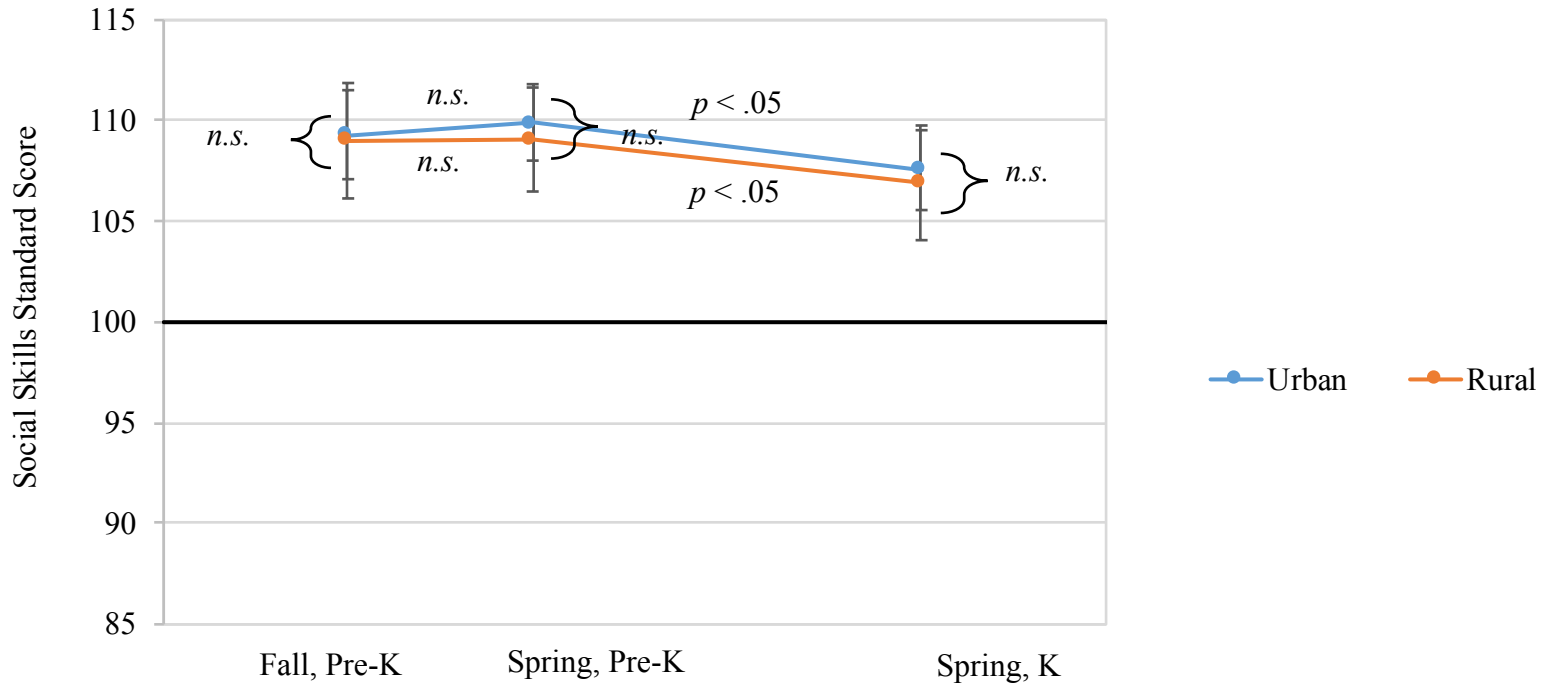
Rural v. Urban: Expressive Vocabulary (EVT)

***N* = 319 (119 rural & 200 urban)**



Rural v. Urban: Social Skills (SSIS-SS)

***N* = 315 (116 rural & 199 urban)**



Rural v. Urban: Problem Behaviors (SSIS-PB)

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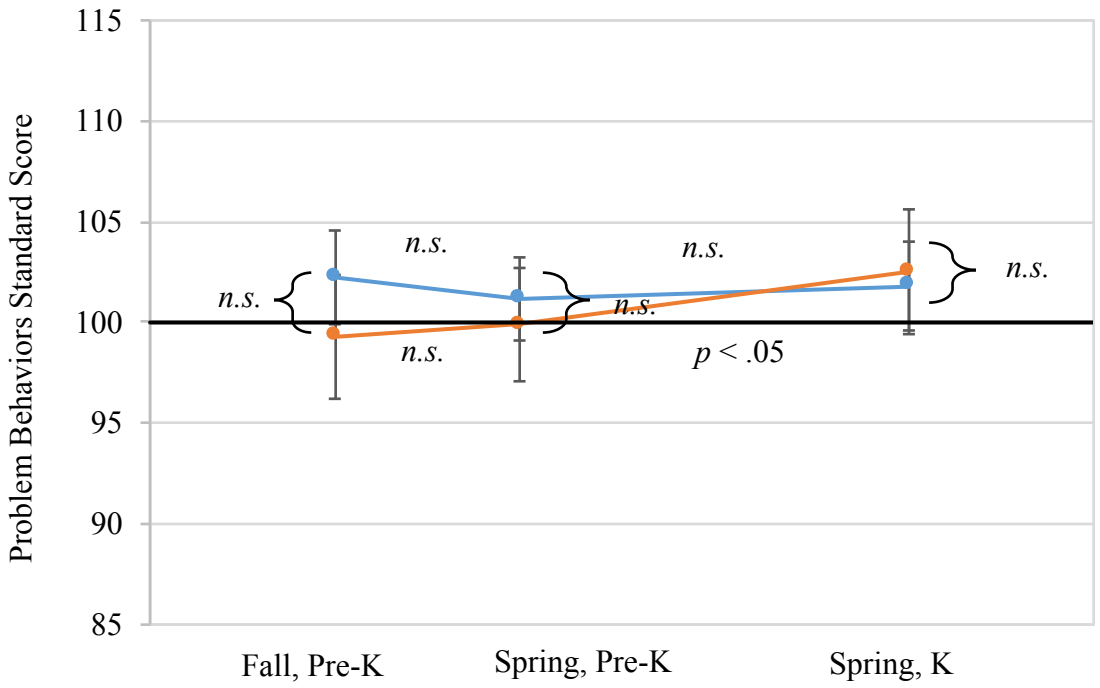

The increase in problem behaviors between the Fall of Pre-K and the Spring of K was significantly greater for rural than urban students.

Summary: Attenders v. Non-attenders

In Nebraska:

- Center-based Pre-Kindergarten appears effective at establishing an ***early trajectory*** of success in ***expressive vocabulary*** and prepares children to be "school ready" by entry into Kindergarten.
- Kindergarten programs appear to be effectively narrowing the gap (difference) between attenders and non-attenders.
- Social skills and problem behaviors appear in the average range for attenders and non-attenders at each timepoint, and across the Pre-K to Kindergarten trajectory.

Summary: Rural v. Urban

In Nebraska:

- Rural and urban children show highly similar levels and patterns of change in expressive vocabulary and social skills within and across Pre-K to Kindergarten.
- Differences between rural and urban children are evident for ***problem behaviors,*** such that the difference in problem behaviors from the start of Pre-K to the end of Kindergarten appears ***more pronounced in rural*** than urban children.

Thank You

UNL Research Team:

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Natalie Koziol, Mark Dekraai, Jim Bovaird

The Early Learning Network is funded by the Institute of Education Sciences.

PreK Attendance, Academic Skills, Behaviors, and Variation by Race/Ethnicity: Evidence from the Boston Public Schools

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The Early Learning Network is funded by the Institute of Education Sciences.

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Boston as an Early Childhood Education Research Site

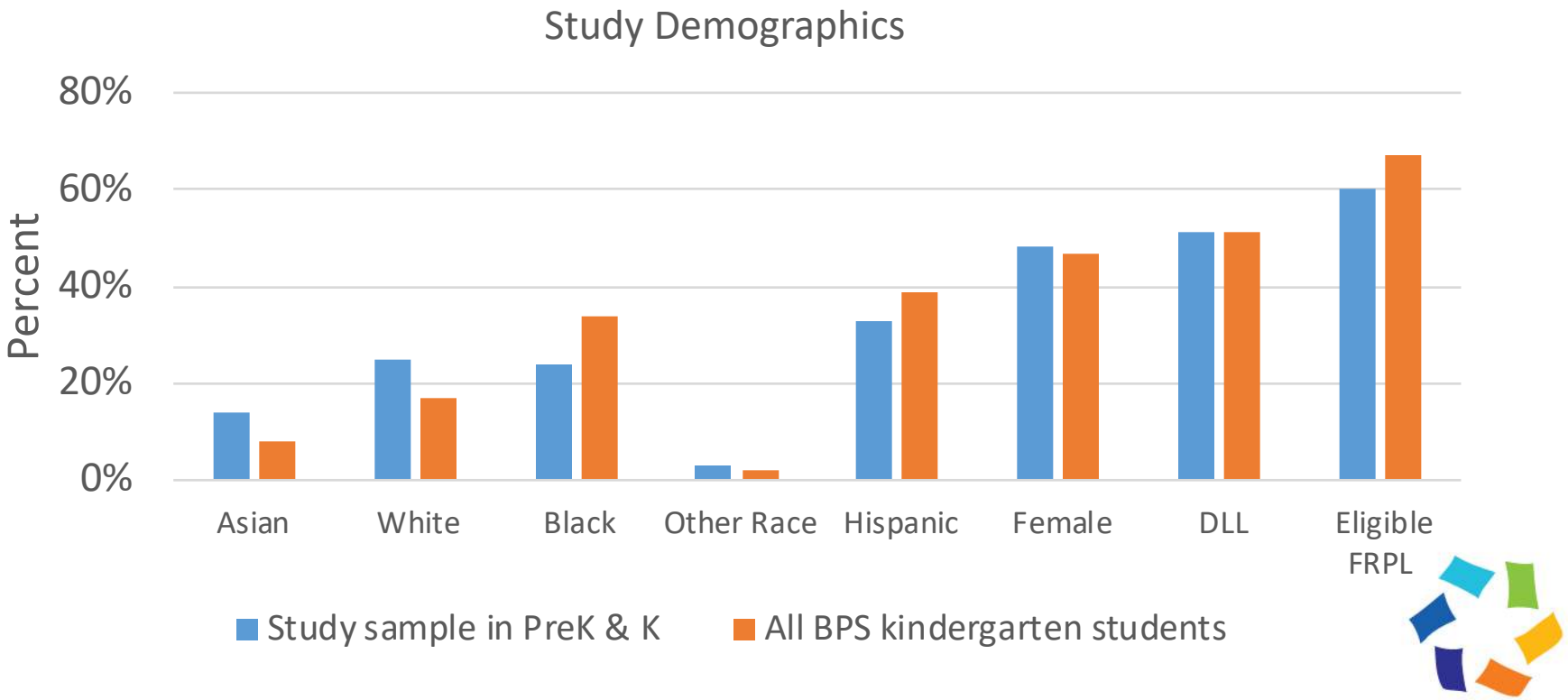
- High-quality public PreK program
  - Substantial short-term impacts on school readiness skills (Weiland & Yoshikawa, 2013)
  - Two evidence-based curricula paired with coaching & training
  - Slots in the PreK program allocated via lottery
- BPS PreK model implemented in CBO PreK programs funded with preschool expansion grant (PEG) funds
- Four-year olds can also access Head Start and other private center-based programs

Research Questions

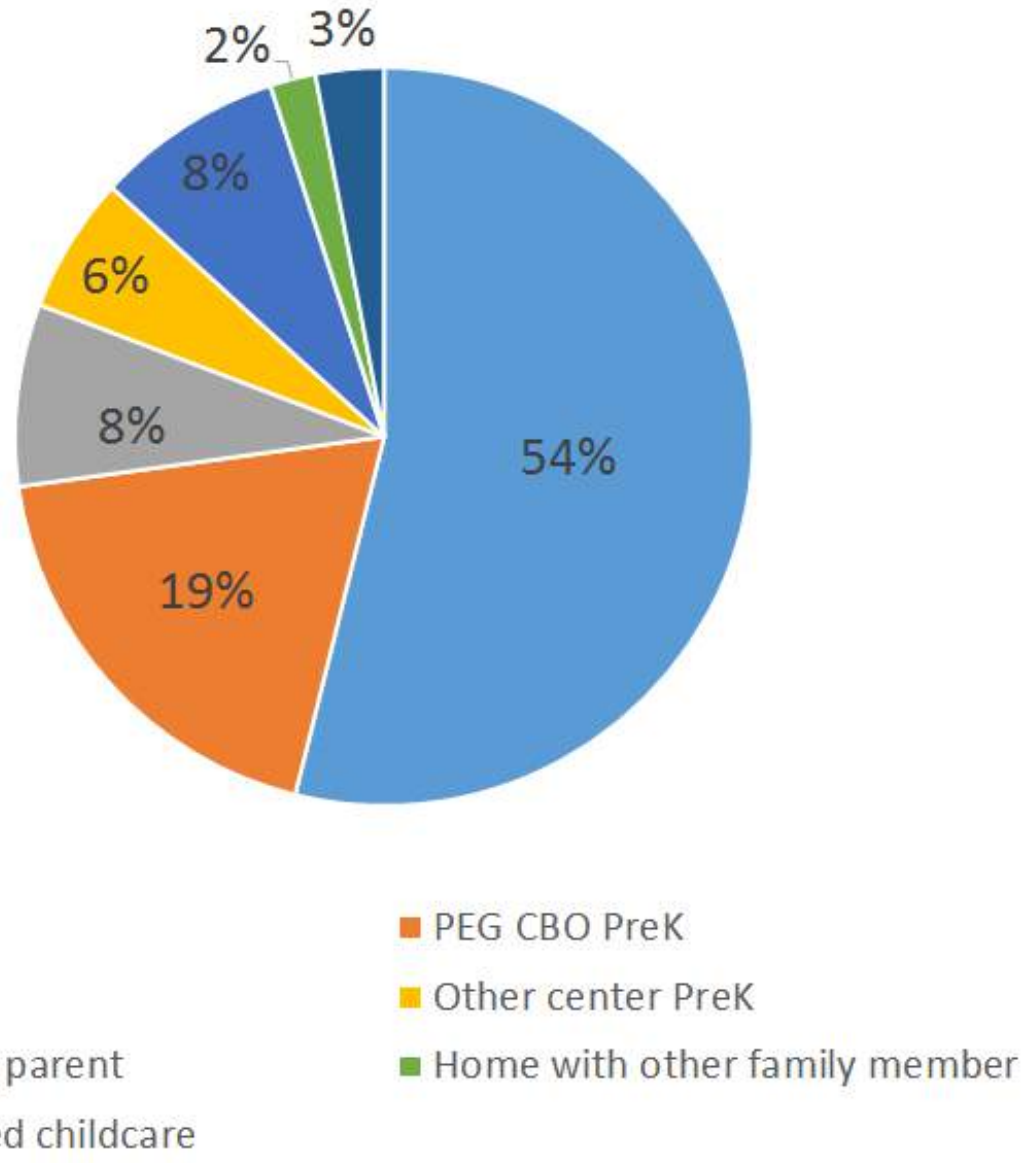
- Which demographic characteristics (e.g., race/ethnicity, DLL status, and free/reduced price lunch eligibility) predict enrollment in:
  - Public PreK; vs.
  - PEG CBO PreK; vs.
  - Head Start; vs.
  - Other center-based PreK; vs.
  - No enrollment in PreK in 4 year old year (i.e., non-PreK attenders)?
- How do academic skills and behaviors differ between these groups across PreK and Kindergarten?
- How do academic skills and behaviors across PreK and Kindergarten vary by students' race/ethnicity and family income?

Summary of design and sample

- Students enrolled in PreK and are followed through 3rd grade (non-PreK attenders enrolled in K). Beginning in K, students were only assessed if they showed up in BPS public schools
- Assessments/teacher reports collected in Fall & Spring of PreK & K
- Random sampling at school & student-level

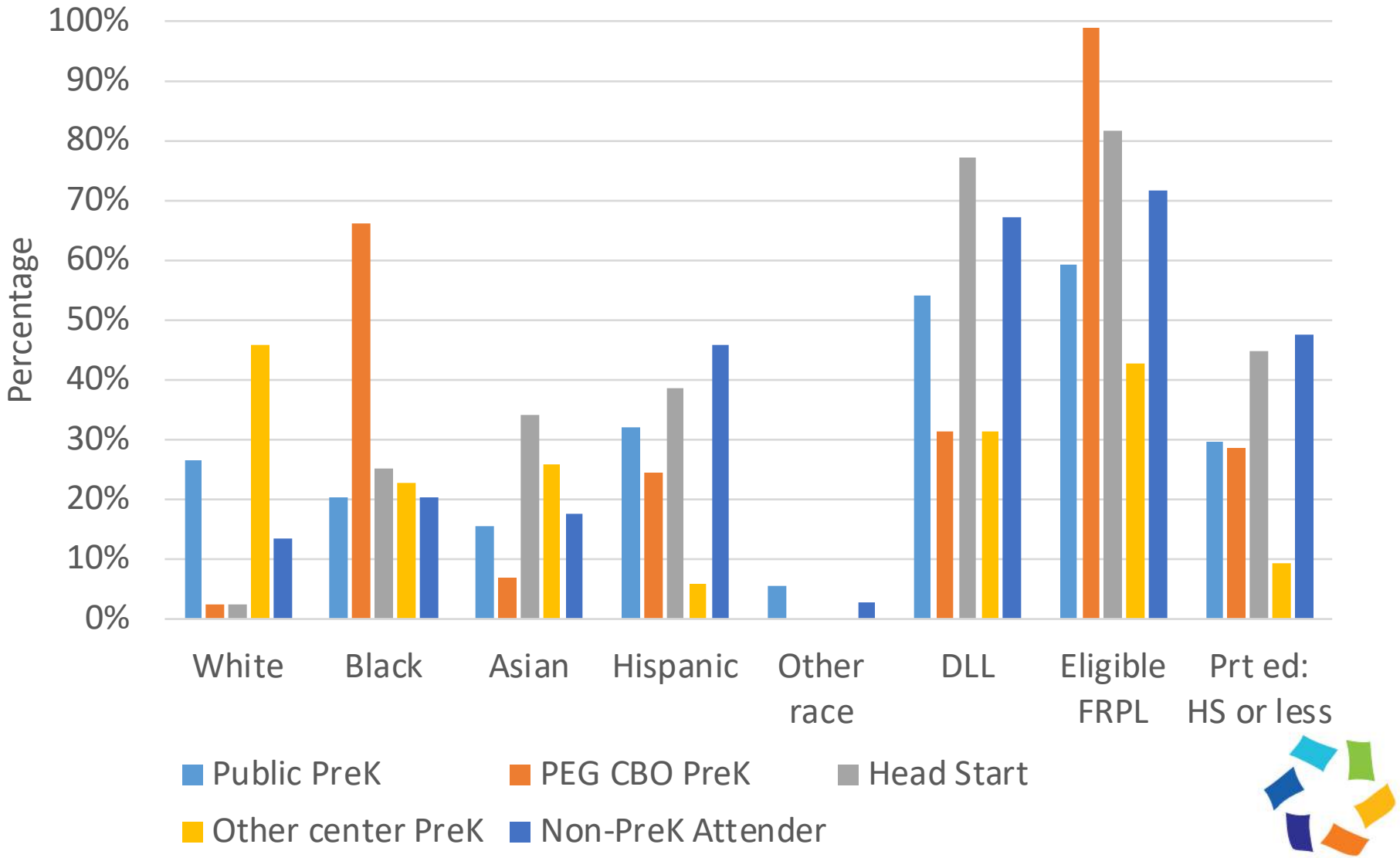


Kindergarten sample composition by PreK attendance
Full sample *N* = 571 students

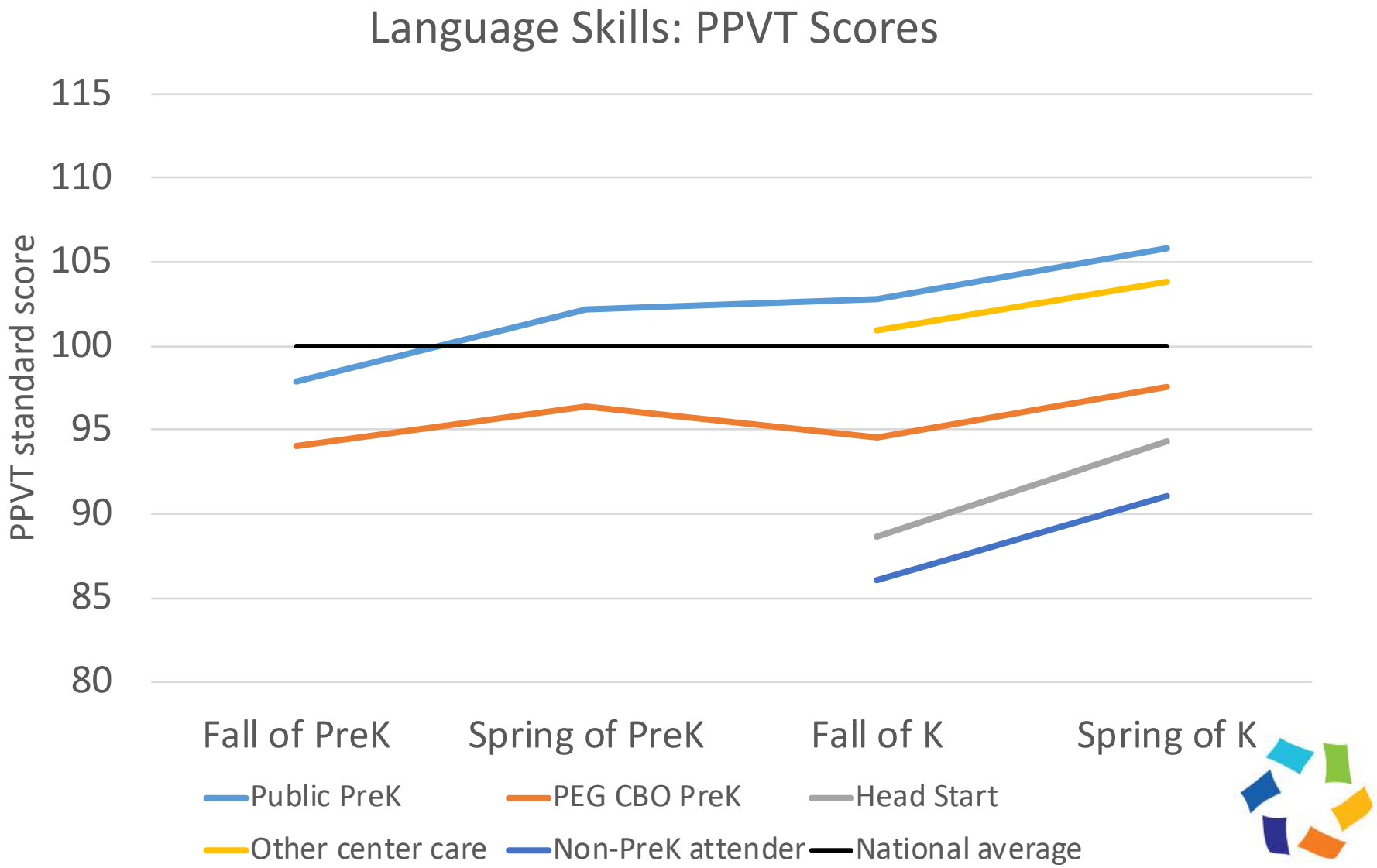


Demographic characteristics by PreK attendance

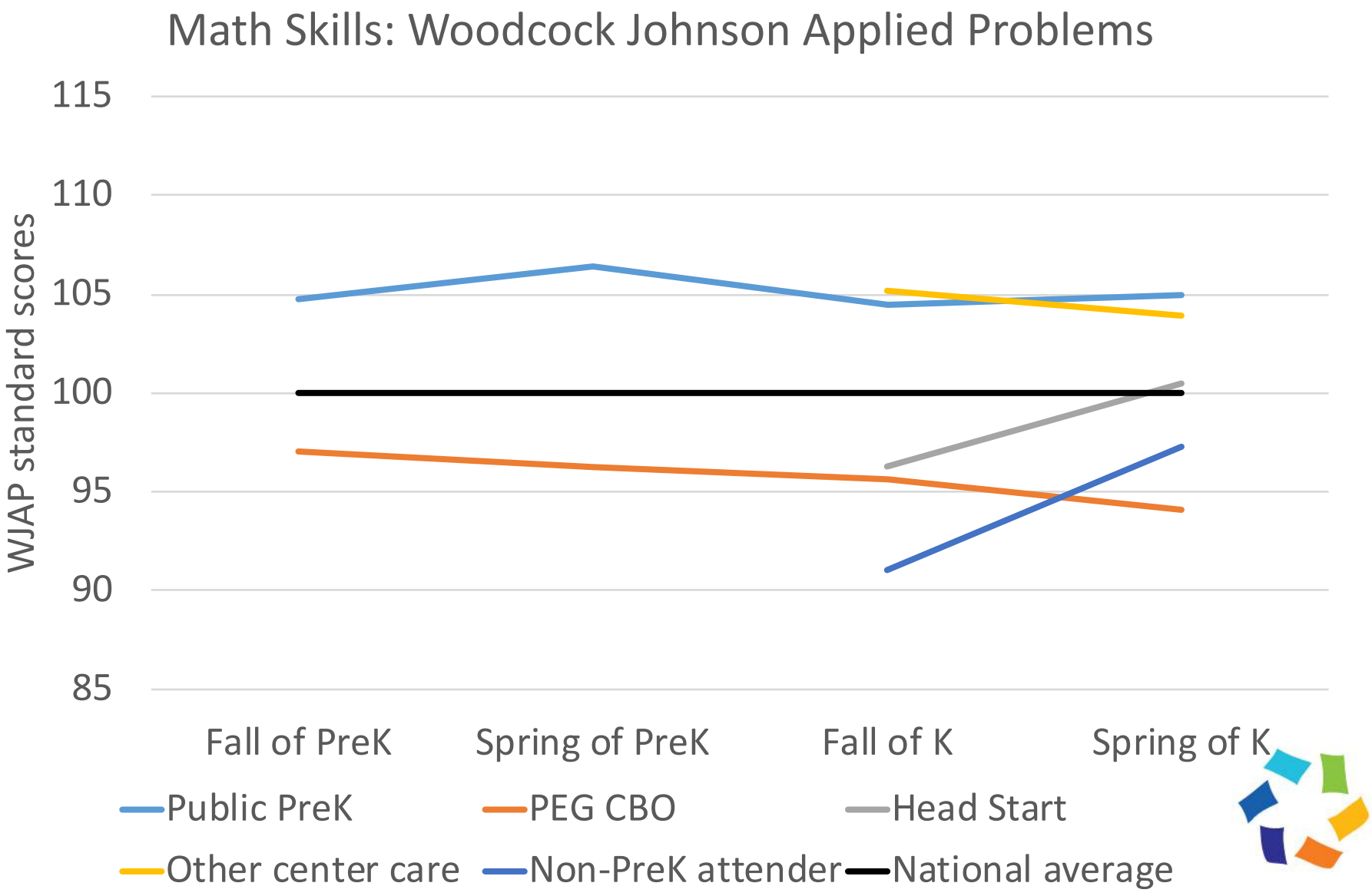
Source: BPS administrative data & parent report



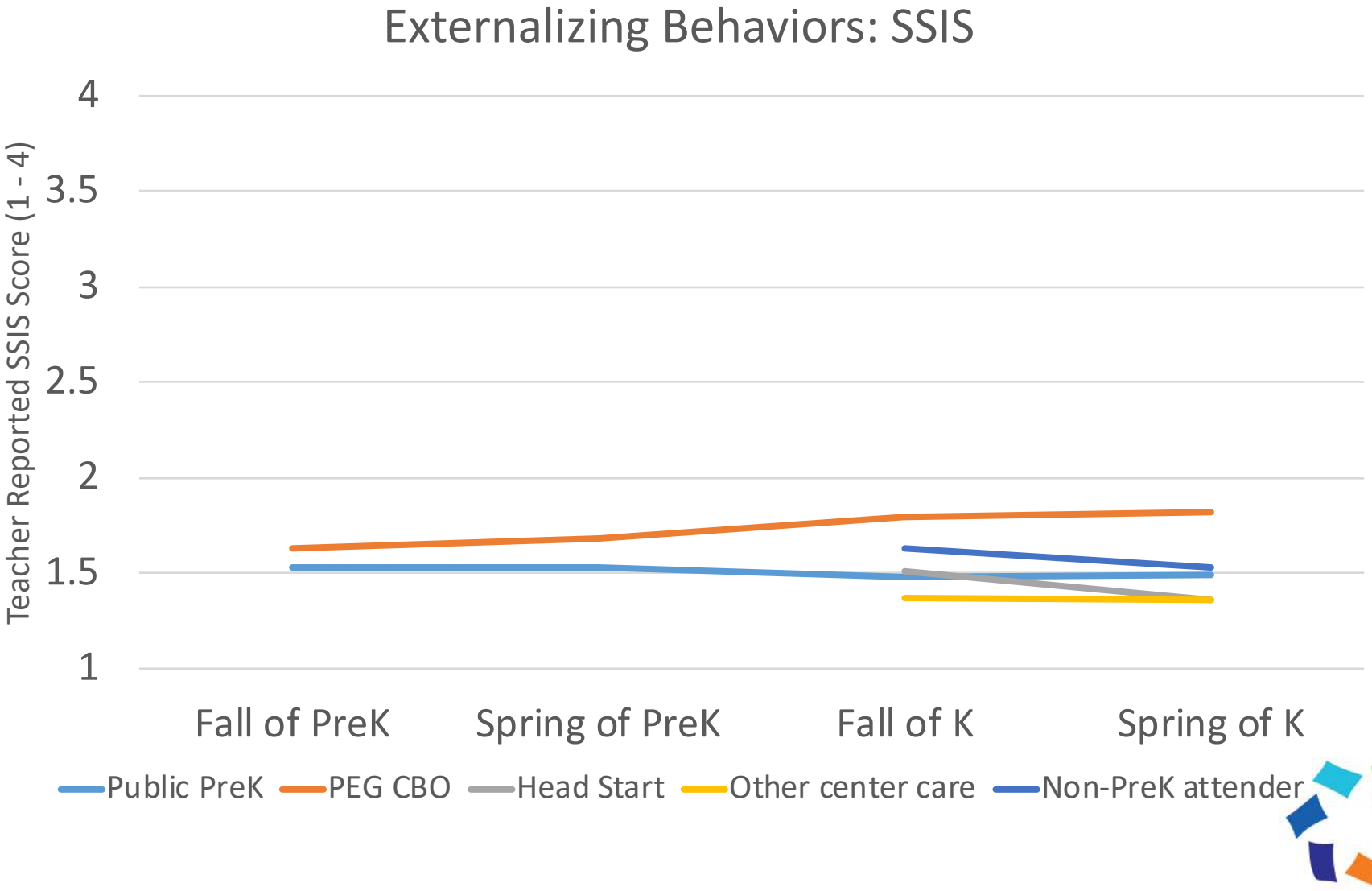
Language Skills by PreK Attendance Group



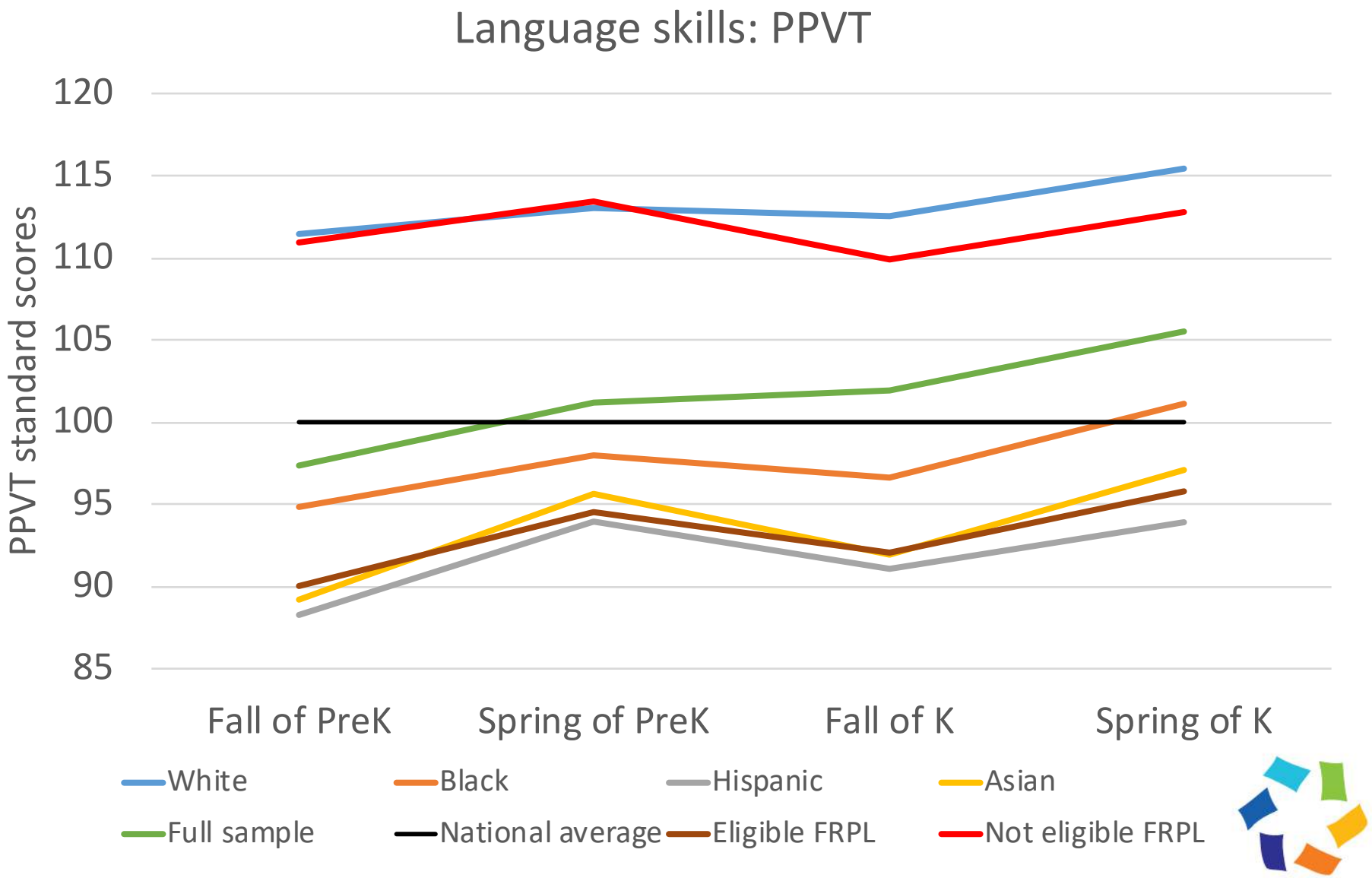
Math Skills by PreK Attendance Group



Externalizing Behaviors by PreK Attendance Group



Variation in Language Skills by Race & Income



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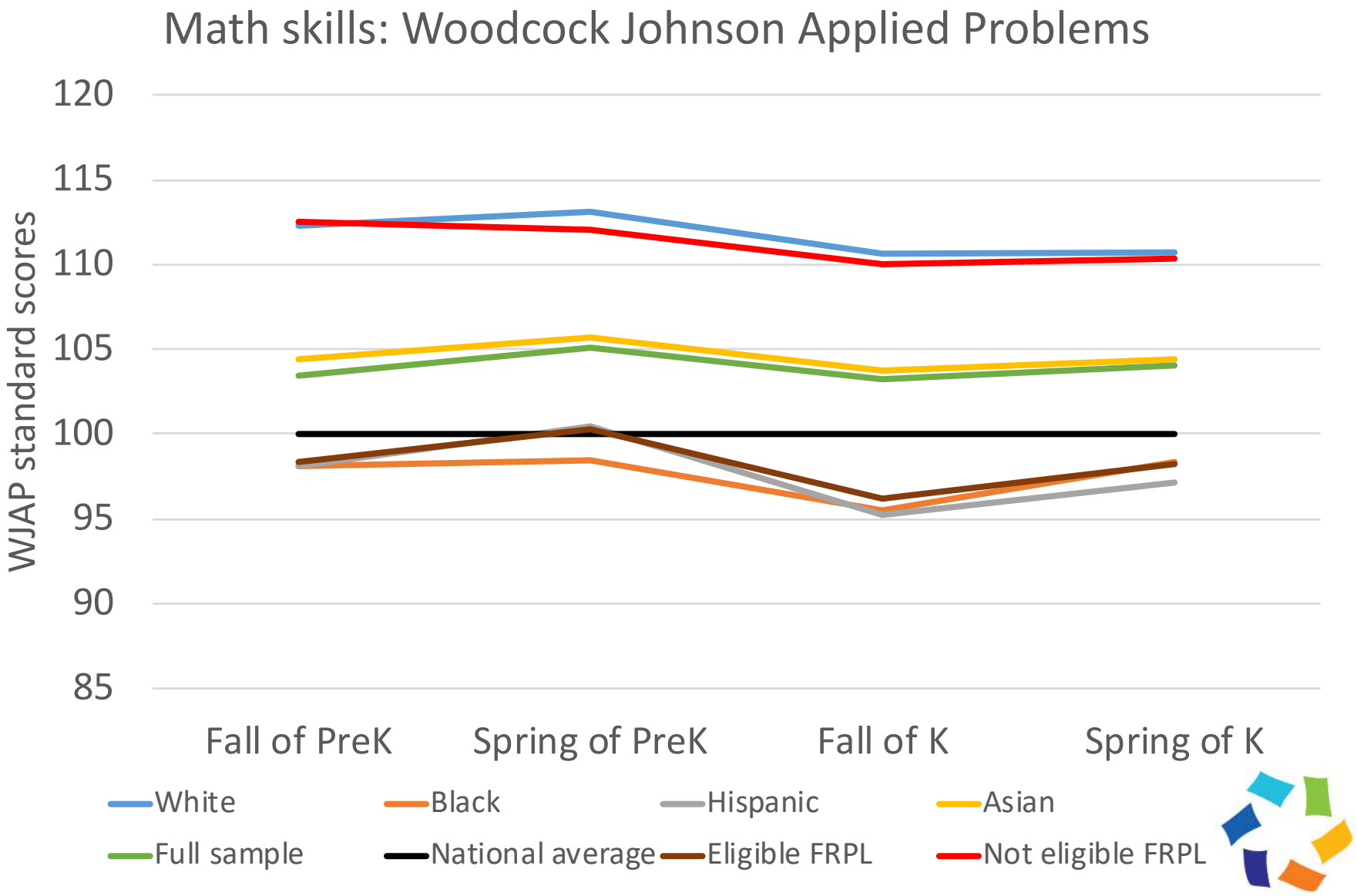

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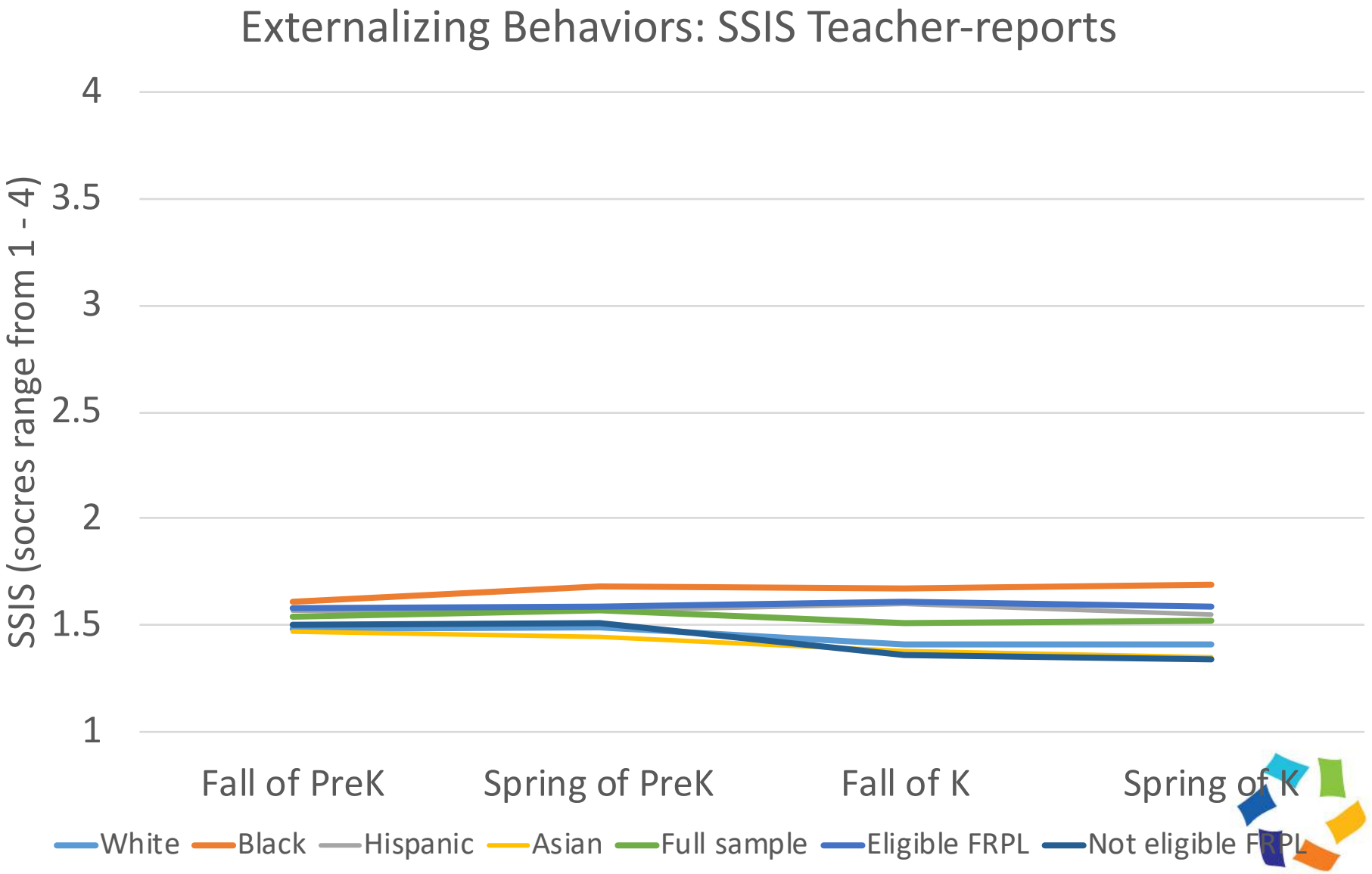

Summary & next steps

- Public PreK and center-based attenders more likely to be White, not eligible for free lunch, higher parent education, and less likely to be Hispanic or DLLs.
- Enrollees in community-based PreK programs and Head Start more likely to be Black and eligible for free/reduced price lunch.
- Significant mean differences across time in academic skills and behaviors by type of PreK attendance.
  - Growth patterns during the academic year look more similar with non-attenders showing faster growth in math skills in kindergarten.
  - White students maintain or gain in academic skills during summer between PreK and K. Other groups are less likely to maintain or gain.
- Substantial variation in academic skills by race/ethnicity and income.
- Additional analysis suggests that Public PreK attenders experience the highest quality kindergarten experiences.
  - Selection is a key issue to better understand why students do or do not enroll in public PreK.

Preliminary Findings from Early Learning Ohio

Jessica Logan
The Ohio State University

The Early Learning Network is funded by the Institute of Education Sciences.

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Early Learning Ohio

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Hui Jiang

Jing Chen

Early Learning Ohio

Outline:

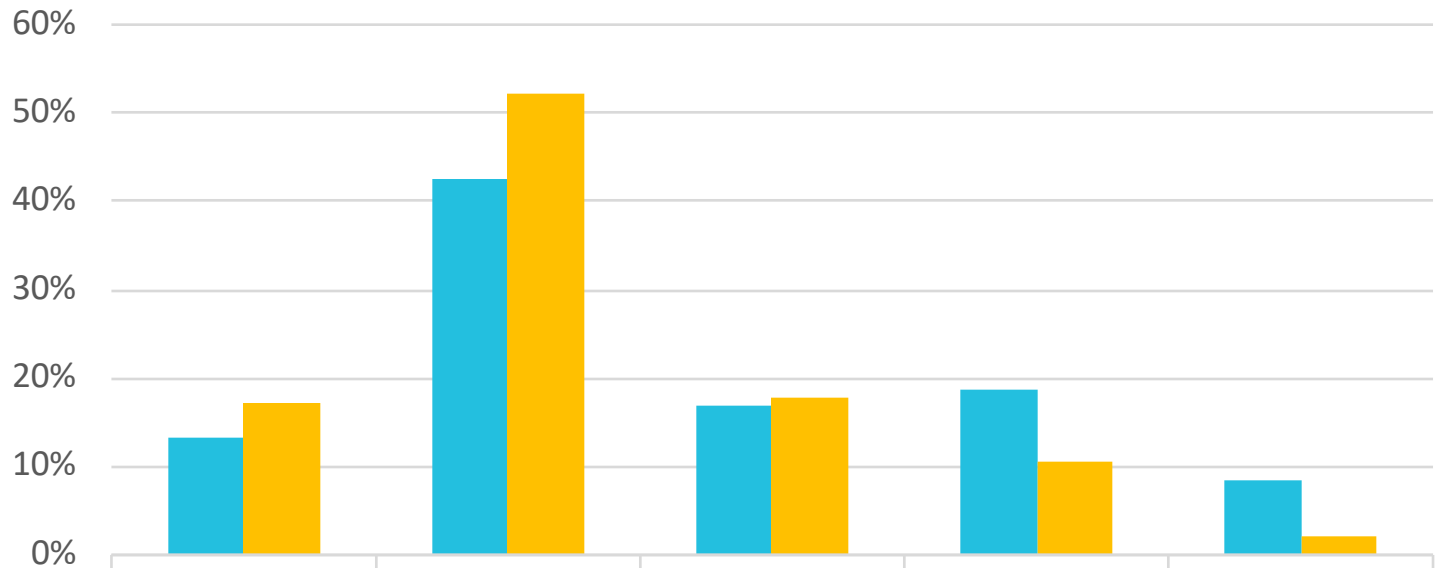
1) Descriptive information about the sample
2) Differences between PreK Attenders and Non-Attenders
   - Demographics
   - Academic and Social Outcomes
3) Moderators of those differences:
   - Do the impacts of PreK on outcomes vary by demographic characteristics?

Transition from PreK to K: Sample Descriptive Information

- Our longitudinal sample = 796 children in 64 classrooms
  - 539 PreK Attenders
  - 157 PreK Non-Attenders
- Most demographics did not vary by group:
  - 88% spoke English at home; 51% Male
  - 77% White, 15% Black, 15% Asian, AK, Other;
  - 15% Latinx
  - Median household income 30-40k

Transition from PreK to K: Sample Descriptive Information

- Non-Attenders had significantly lower levels of mother's education:



	Less than high school diploma	High school diploma or GED	AA/AS 2 year degree	Bachelor's degree	Master's degree
Attender	13%	43%	17%	19%	9%
Non-Attender	17%	52%	18%	11%	2%

Pre-K attenders and non-attenders:

- Examined a comprehensive set of ways children who did and did not attend PreK might differ:
  - Academic outcomes: *Woodcock Johnson* Applied Problems, Letter Word ID, Picture Vocab, Head-to-Toes
  - Social outcomes: *Teacher-Child Rating Scale:* Behavior control and Social skills. *Ladd* School Liking, Disliking, and loneliness.
  - Kindergarten Transition: Developed a new measure

- Analyzed using Hierarchical Linear Models in SAS Proc Mixed controlling for Income, Mom Ed, Gender, & Race.

Pre-K attenders and non-attenders: Academic outcomes

- Scores from fall of K:

		Applied Problems SS	Letter-Word ID SS	Picture Vocabulary SS	Head-to-Toes Raw Score
Non-Attender	Mean	97.55	94.77	94.77	28.05
	SD	12.47	11.75	11.73	16.76
Attender	Mean	100.60	98.21	97.40	30.60
	SD	12.73	12.43	9.52	16.65
Effect Size: Attender vs. Non Attender	*d*	0.24	0.28*	0.26*	0.15

*significantly different from zero, $p<.05$, in hierarchical linear models

Pre-K attenders and non-attenders: Child outcomes

- Scores from fall of K:

		Behavior Control Raw Score	Social Skills Raw Score	School Liking	School Dislike	Loneliness
Non-Attender	Mean	22.03	22.76	5.29	1.84	1.95
	SD	6.35	6.92	1.31	1.72	1.91
Attender	Mean	20.65	22.73	5.04	2.06	1.72
	SD	7.31	6.97	1.45	1.73	1.91
Effect Size: Attender vs. Non Attender	*d*	-0.18*	0.00	-0.18	0.13	-0.12

*significantly different from zero, $p<.05$, in hierarchical linear models

Measuring the Kindergarten Transition: Teacher Report

- Developed a New Measure of the Kindergarten Transition.

- Teachers answered five questions about children's transition to Kindergarten:

    1. Difficulty making friends and interacting with classmates
    2. Difficulty following schedule and routine
    3. Difficulty adjusting to academic demands
    4. Difficulty working in groups in the classroom
    5. Difficulty being organized

- Overall:
    - 29% of students had no difficulty in *any* of the domains.
    - 30% of student have some difficulty in *all five* domains.

Pre-K to K transition: Attenders vs. Non-Attenders

- Mean number of difficulties across the five items did not differ by attender status:

	Making friends	Following routines	Academic demands	Working within groups	Being organized
NonAttender	0.95	0.65	1.05	0.94	1.01
Attender	0.93	0.71	1.12	1.06	1.15
Effect Size	-0.02	0.06	0.05	0.10	0.10

Other Meaningful Differences in Academic Outcomes

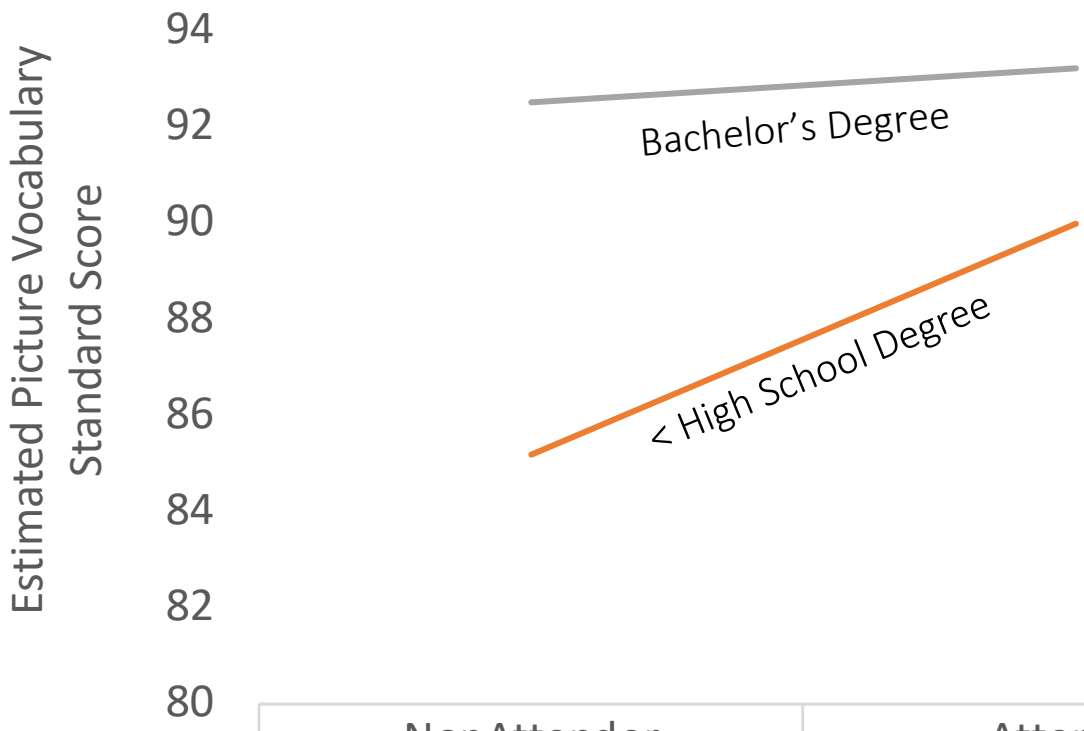
- Are the observed effects of attender status moderated by other demographic characteristics?

- In other words, is there difference in the importance of PreK attendance for different groups of children?

Moderators of PK Attendance on Outcomes:

- Gender: Only found effects for Letter Word ID
  - No difference between girls and boys who attended PreK
  - Girls outperform boys without PreK.
- Race: Only found differences for the HTKS
  - The gap between white and non-white students is smaller for PK Attenders than non-attenders
- Mother's Education
  - Gaps between PreK attenders and non-attenders narrowed for Picture Vocabulary, Social Skills, School liking, and Transition Problems

Gap narrowing example:



	NonAttender	Attender
<HS Education	85	90
Bachelors Degree	93	93

Conclusions:
Other potential moderators to consider

- The district has very limited public PreK

- Characteristics of the child's *preschool* classroom may be important.
  - 30% in Head Start
  - 27% in Public Pre-K
  - 36% in Private Center-based care

- Dose of the PreK experience; Days and Hours in PreK varied considerably
  - 43% in care 5 or more days per week
  - 19% in care 4 days per week
  - 13% in care 3 days per week
  - Hours per week distributed evenly from 1-> 41 hours per week

UNC ELN:
Early Education in Rural NC

Margaret Burchinal, Mary Bratsch-Hines, Lora Cohen-Vogel,
Ellen Peisner-Feinberg, Ximena Franco, & Rose Byrnes
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Educational Practices and Child Outcomes in Pre-K

- Early childhood education (ECE) can reduce achievement gap
  - Led to state and federal preschool programs
- Mixed evidence regarding how quality is measured and shorter- and longer-term impacts
  - Very modest associations between “process” quality measures and child outcomes
  - Raises questions about which child outcomes are promoted by which aspects of preschool and early elementary education

ECE Quality Dimensions

- Current models: focus on quality of teacher-child interactions and curriculum
  - Measured at classroom level
- Alternative measures of "process" quality: describing child's experiences in preschool
  - Measured at child level:

    Quality of language exchanges with teacher

    Instructional time in content areas

    Instructional format

Research Question

- Are gains in child outcomes related to different ECE quality dimensions for different outcomes in pre-K and kindergarten?

Study Sample: Pre-K Attenders

- 6 rural NC counties
- 45 early childhood education programs
  - 62% public school
  - 22% private for-profit
  - 9% Head Start
  - 7% private nonprofit
- 63 randomly-selected NC Pre-K classrooms
  - 455 randomly-selected children
  - 36% Spanish-English English Learners (ELs)

Study Sample: Pre-K Attenders and Non-Attenders

- Followed children into 182 K classrooms
- Recruited 249 children without preschool experience (non-attenders)
- Demographics – a few differences between attenders and non-attenders
  - Non-attenders > Attenders
    - Maternal education
    - Family incomes
    - Smaller household sizes
    - Proportionately fewer ELs

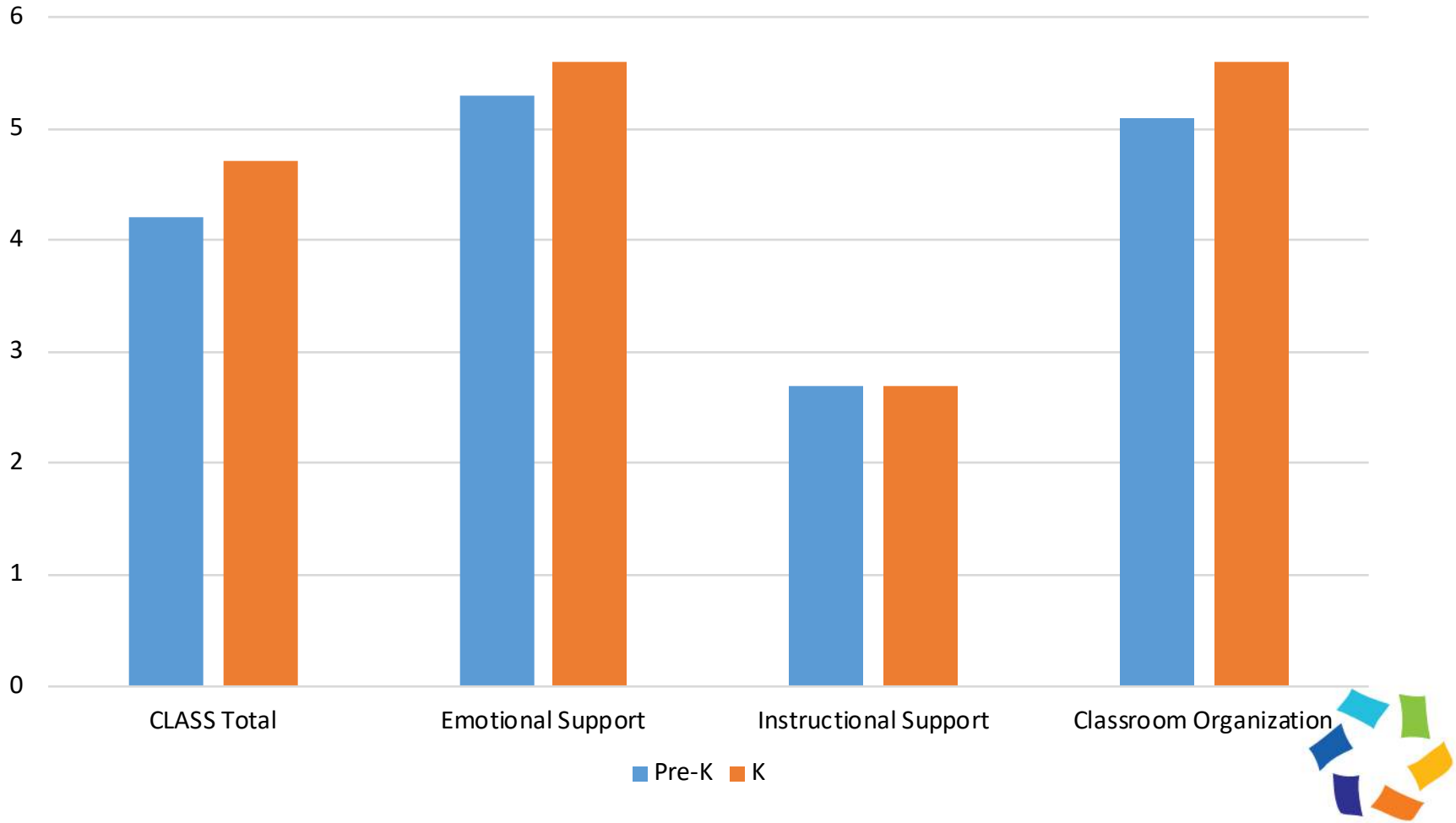
Outcome Measures (Fall/Spring)

- Mathematics
  - Applied Problems (WJ AP)
- Language and Literacy
  - Picture Vocabulary (WJ PV)
  - Letter-Word Identification (WJ LW)
  - First Sound Fluency (DIBELS FSF)
  - Phoneme Segmentation Fluency (DIBELS PSF)
- Executive Functions
  - Flanker Inhibitory Control and Attention Test (NIH Toolbox Inhibitory Control)
  - Dimensional Change Card Sort (NIH Toolbox Cognitive Flexibility)

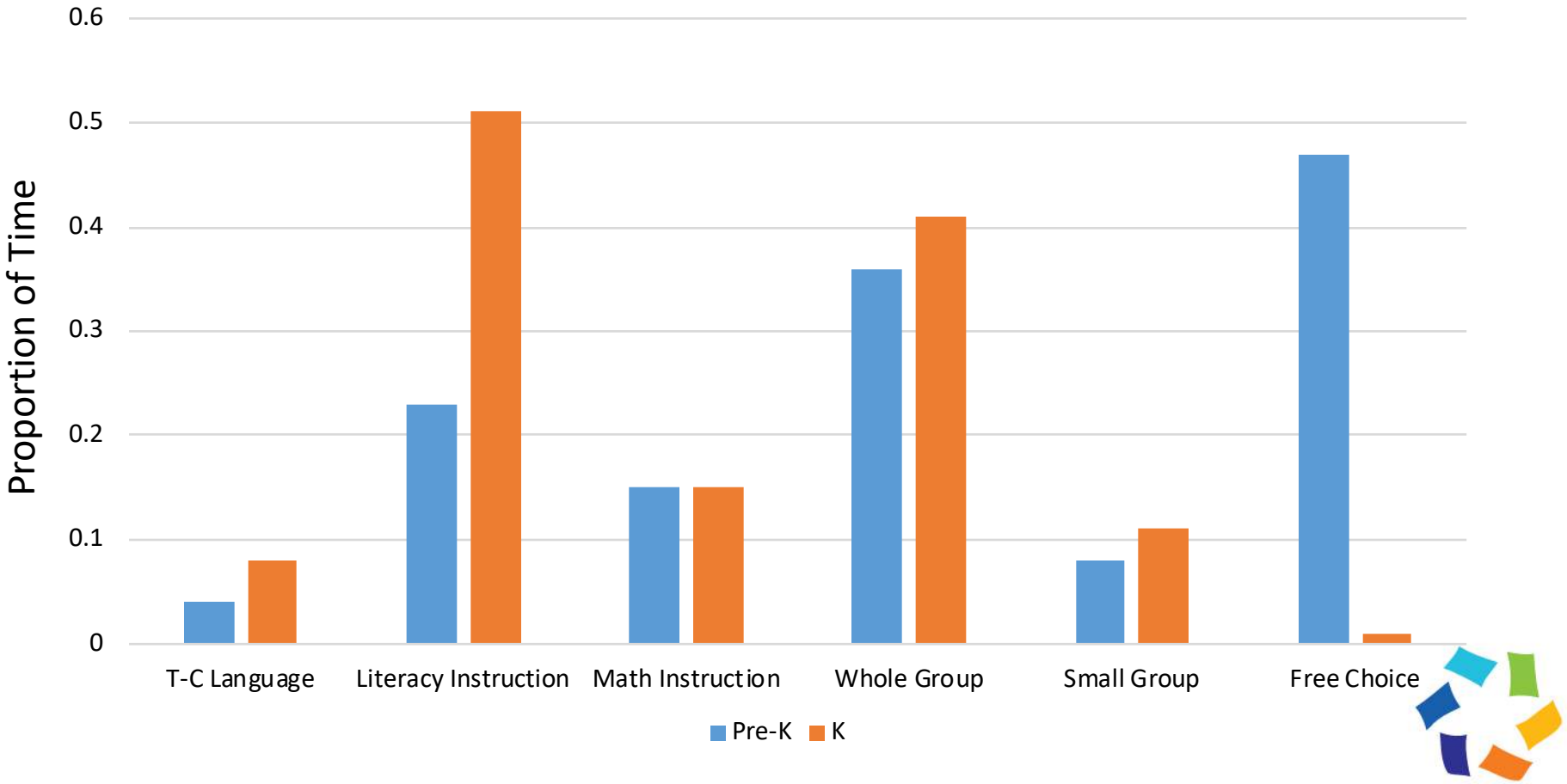
ECE Quality Measures

- Teacher-Child Interactions: CLASS
- Instructional Format:
  - Language Interaction Snapshot (LISn) – time child observed in whole and small group
- Content Instruction:
  - LISn – time child observed in reading and math activities/instruction
- Teacher Complex Language:
  - LISn – time teacher used decontextualized language or multi-turn conversation with target child
- Curriculum:
  - Teacher report (PK 80% Creative Curriculum, K – Not used)

ECE Quality: T-C Interactions



ECE Quality-Child Level Measures



ECE Quality and Child Outcomes (HLM Analysis)

- Gain scores analyzed
- PK Model
  - Level 1: $Y_{ijk} = d_{ojk} + d_{1jk} <\text{child covariates}> + e_{ijk}$
  - Level 2: $d_{ojk} = B_o + B_1\ CLASS_{jk} + B_2\ T\ Complex\ Language_{jk}$
    $+ B_3\ Content\ Activities_{jk} + B_4\ Small\ Group_{jk}$
    $+ B_5\ Whole\ Group_{jk} + B_6\ Creative\ Curriculum_{jk} + e_{jk}$
- K Model – adds Pre-K attender and crosses attender status with ECE quality dimensions

Pre-K HLM Results: ECE Quality and Gains in Child Outcomes

	Language: WJ PV / EOW	Literacy WJ LW	Sounds: DIBELS FSF	Phon. Aware DIBELS PSF	Math: WJ AP	EF: Flanker	EF: Card Sort
CLASS		.20**				-.14**	
T Complex Talk	.16* / .13*						
Instruction: Literacy Math			.13**	.12*			
Small Group				.13*			
Whole Group	/ -.20*				-.19*		
Creative Curriculum	.12*/	-.17**	-.17**	-.13**			

* p<.05; ** p<01

Kindergarten HLM Results: ECE Quality and Gains in Child Outcomes

	Language: WJ PV	Literacy: WJ LW	Sounds: DIBELS FSF	Phonemic Aware: DIBELS PSF	Math: WJ AP	EF: Flanker	EF: Card Sort
CLASS							
T Complex Talk			PK -.13* Non .10	.10^{+}		PK -.12 Non .10	.10^{+}
Instruction: Literacy Math		.15**		PK .12^{+} Non -.09			
Small Group							
Whole Group			PK .17^{+} Non -.03			-.12*	

Note: + .10 > p < .05; * p < .05; ** p < .01. Interactions listed if < .10.

Summary

- No “silver bullet”
  - No single dimension related to most outcomes
  - Different pattern of associations in pre-K and kindergarten
- Some evidence supports focusing on child-level assessments
- Some evidence supports different predictors for different outcomes
  - Time in literacy activities – gains in PK & K literacy skills
  - Teacher complex talk – gains in PK Language but mixed results in K
  - Whole group instruction – smaller gains in PK but mixed results in K

Children's School Readiness at Kindergarten Entry

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Motivation

- With pre-K now a regular part of the educational landscape, there has been increasing interest in whether scaled-up programs in different localities contribute to children's early learning

- There has also been growing interest in identifying the conditions contributing to variation in program benefits and which children benefit most from program enrollment

Study Context

- Large urban county: 186,000 students in public schools
- Economically, racially, and linguistically diverse
- Over 15 years experience operating pre-K
  - Classrooms in public schools (72%)
  - Classrooms in community centers (28%)
- Experienced teaching staff
    - Mean years of education: 16.8
    - Mean years teaching experience: 15.6
- Classroom quality (CLASS): 4.4

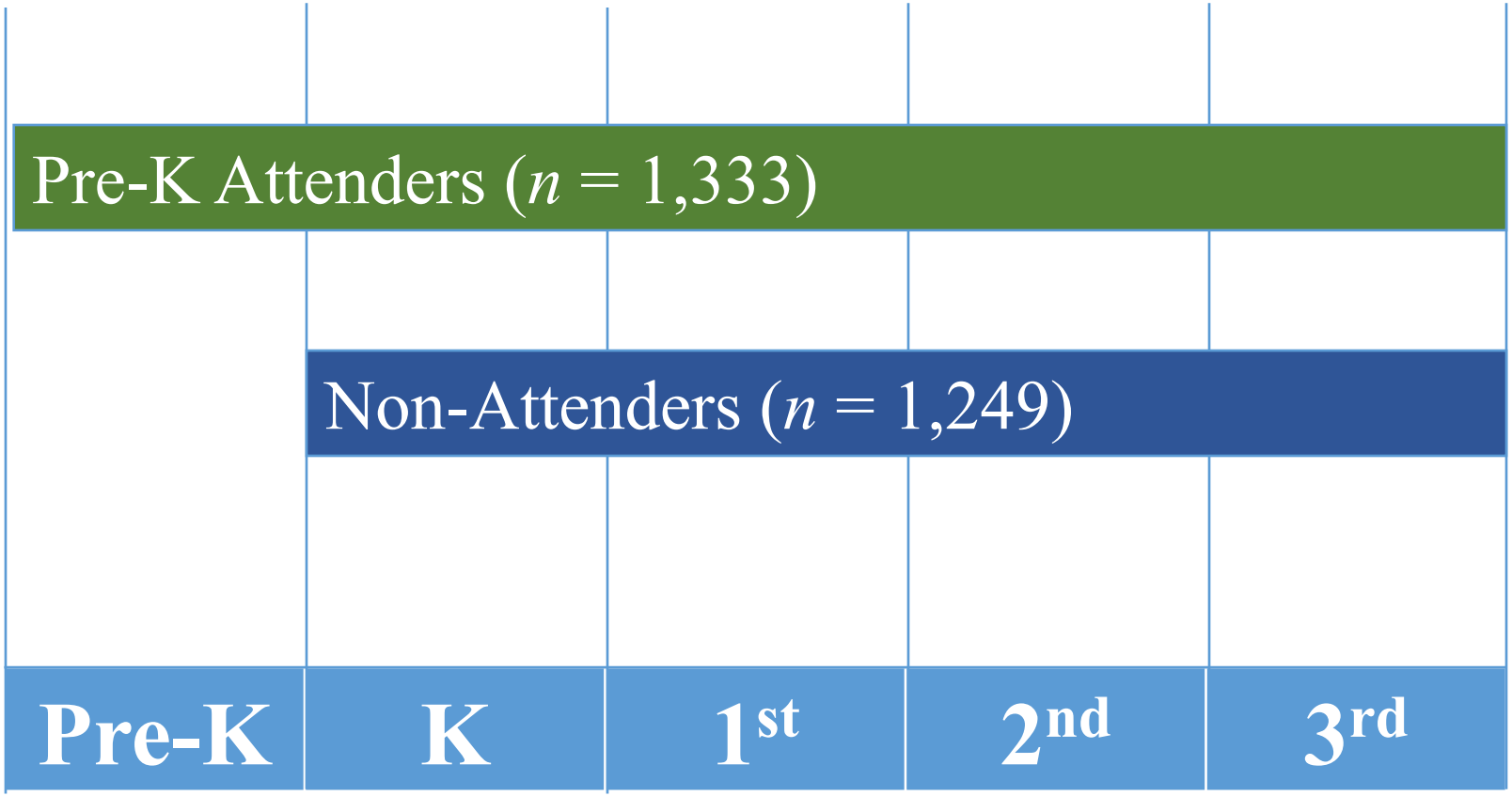
Research Questions

1. How well are children in this community doing in terms of school readiness in the fall of kindergarten?

2. Are there differences in school readiness skills between pre-K attenders and non-attenders?

3. To what extent do the benefits of pre-K vary by children's background characteristics (i.e., home language and income) and pre-K experiences (i.e., classroom type and quality)?

Procedures



Sample Demographics Stratified by Pre-K Enrollment

	Non-Attender	Pre-K Attender
Variable	**Mean/Percent**	**Mean/Percent**
Child male	48%	50%
Child Hispanic	63%	62%
Child Black	8%	16%
Child Asian/other	16%	12%
Child White	12%	10%
Child English language	15%	20%
Child Spanish language	61%	57%
Child Other language	25%	23%
Parent years of education	11.79	11.74
Household income to needs	1.14	1.07

Methods

- Children's school readiness was assessed at kindergarten entry
  - Academic achievement: Woodcock Johnson
  - Executive function: Pencil Tap Task, Backward Digit Span Task, Head-Toes-Knees-Shoulder Task
  - Social competence: Teacher-Child Rating Scale
- Descriptive statistics (research question 1)
- Regression models that control for a full set of child and family covariates (research questions 2 and 3)

How well are children in this community doing in terms of school readiness in the fall of kindergarten?

Academic Performance at Kindergarten Entry

Variable	Mean	Standard Deviation
Letter-Word Identification	93.09	14.38
Picture Vocabulary	93.41	14.78
Applied Problems	84.49	17.55
Quantitative Concepts	88.95	14.41
Academic Knowledge	82.90	16.44

Children in this study sample are ~75% of a standard deviation **below** national norms academically

Executive Function and Social Behavioral Performance at Kindergarten Entry

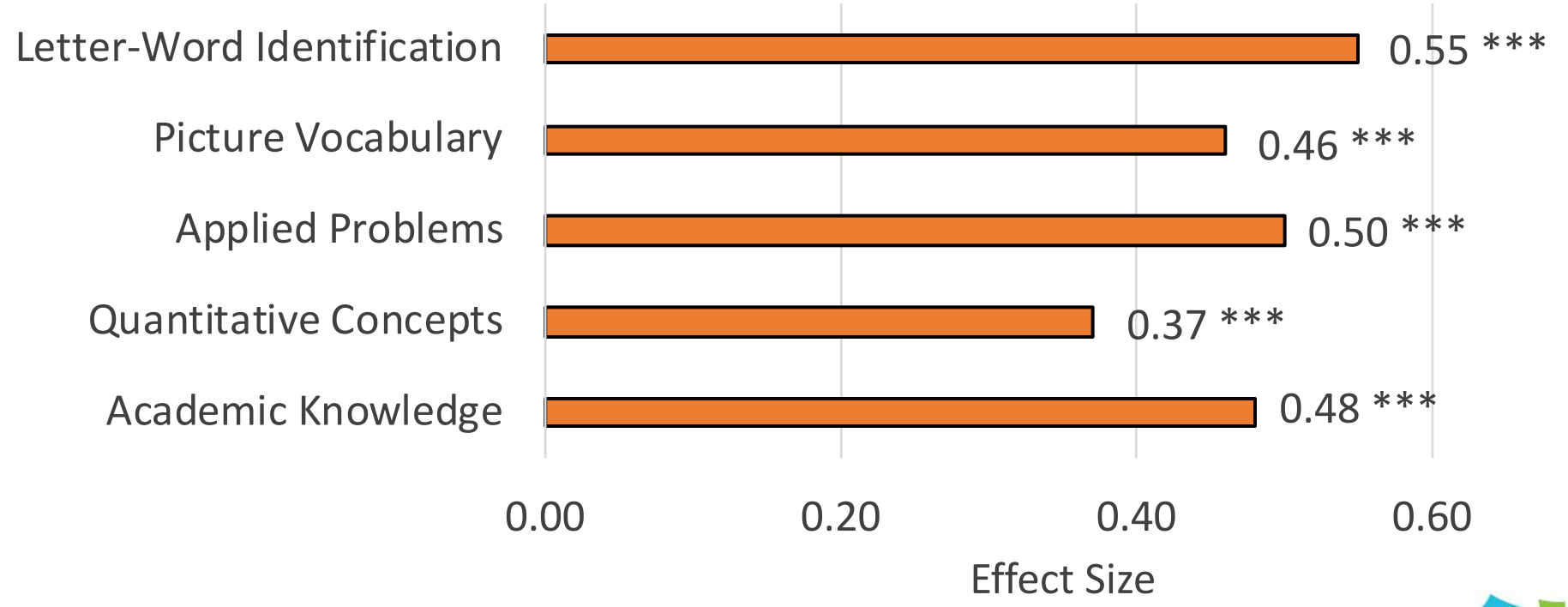
Variable	Mean	Standard Deviation	Range
Pencil Tap	0.82	0.27	0-1
Backward Digit Span	1.56	0.85	1-5
Head Toes Knees Shoulders	40.76	27.81	0-94
Frustration Tolerance	3.37	0.96	1-5
Task Orientation	3.25	1.05	1-5
Peer Social Skills	3.90	0.87	1-5
Conduct Problems	1.79	0.88	1-5

Children in this study sample are doing **moderately well** on these measures of social behavior and executive functioning

Are there differences in school readiness skills between pre-K attenders and non-attenders?

Academic Benefits of Pre-K

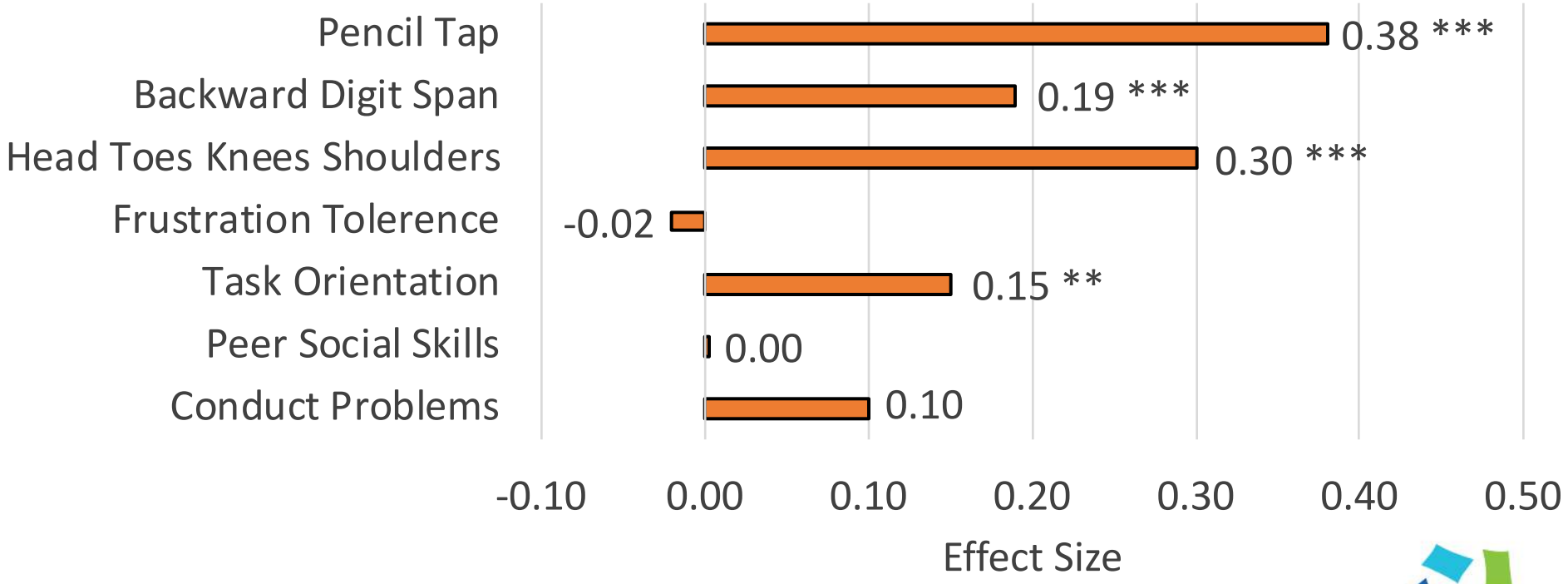
Children who attended pre-K at age 4 demonstrated **stronger** academic skills than children who did not attend these programs



Notes. *** $p < .001$.

Executive Function and Social Behavioral Benefits of Pre-K

Pre-K graduates demonstrated **stronger** executive function skills than non-attenders, but **few** differences emerged in their social-behavior



Notes. *** $p < .001$. * $p < .01$.

To what extent do the benefits of pre-K vary by children's background characteristics and pre-K experiences?

Differential Effects of Pre-K

Which children benefited most from pre-K?

- Few differential effects emerged in terms of children's social-behavior and executive functioning

- In terms of academics, the lowest income children (~30% of a standard deviation) and dual language learners (~45% of a standard deviation) benefited **most** from pre-K

Differential Effects of Pre-K

Which pre-K programs conferred the greatest benefit?

- Few differences emerged academically as a function of auspice or quality

- Community-based (~25% of a standard deviation) and low quality (~15% of a standard deviation) programs were linked with **less** optimal social skills, but not school-based and high quality programs

Conclusions

- Children in the study sample scored below national norms on achievement at kindergarten entry, but pre-K enrollment minimized the gap
- Consistent with a number of state-level evaluations, academic benefits of pre-K were larger for the most disadvantaged children and dual language learners
- As children make their way through subsequent grades, we will examine the extent to which the benefits of pre-K fade or persist, and the conditions under which these shifts may take place

EarlyLearning NETWORK

Optimizing Learning Opportunities for Students

Carol M. Connor
Ashley Adams
Deborah Vandell
University of California, Irvine

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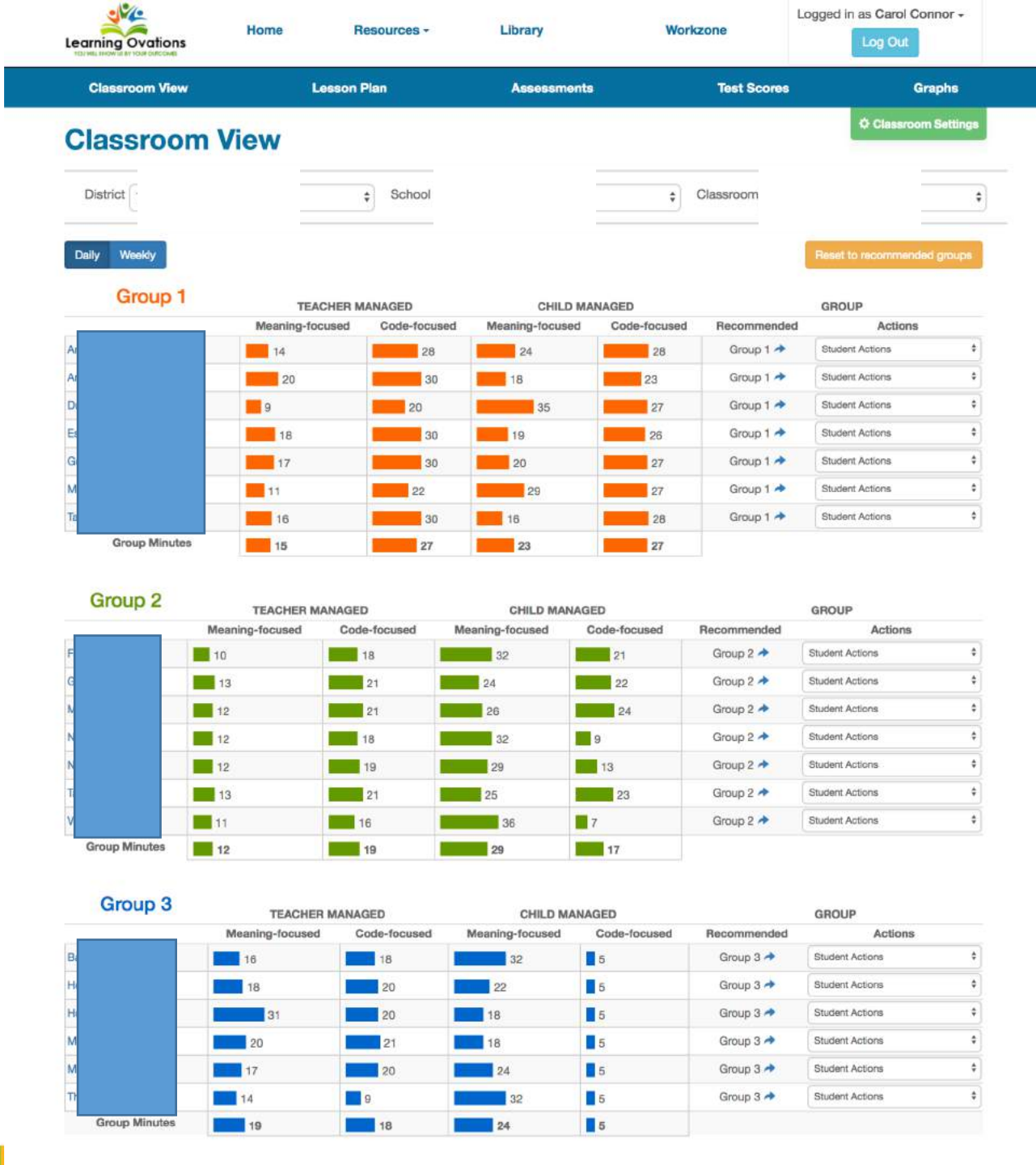
Overview

- Describe the OLOS observational system and component parts
- Brief presentation of Findings and Measurement

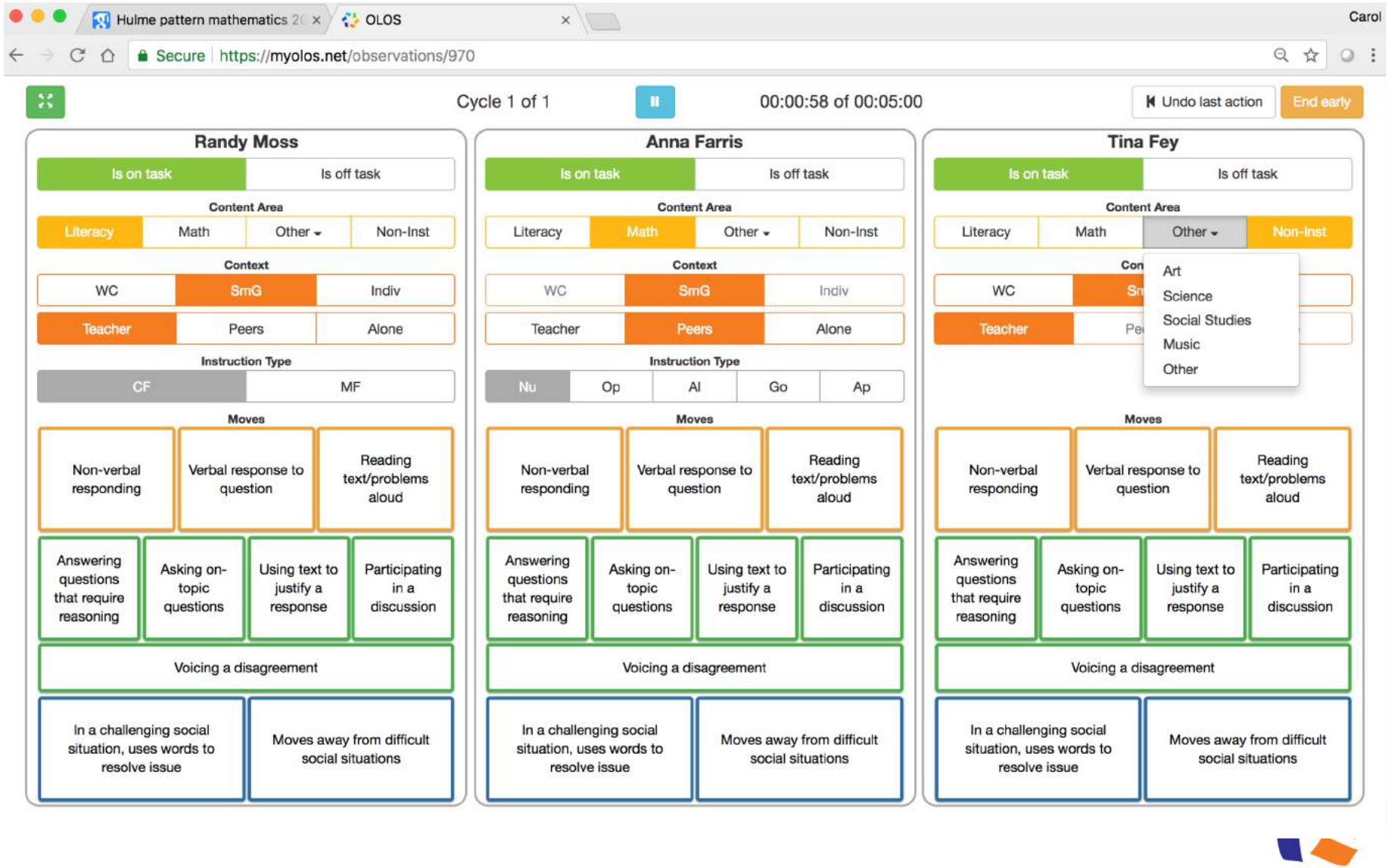
OLOS combines 3 different valid observations systems: Pre-kindergarten through 3rd Grade

- Children bring widely varying skills and other characteristics to the classroom and may experience different learning opportunities – even when they share the same classroom
- OLOS focuses on the observation of individual students within the classroom

A2i Classroom View



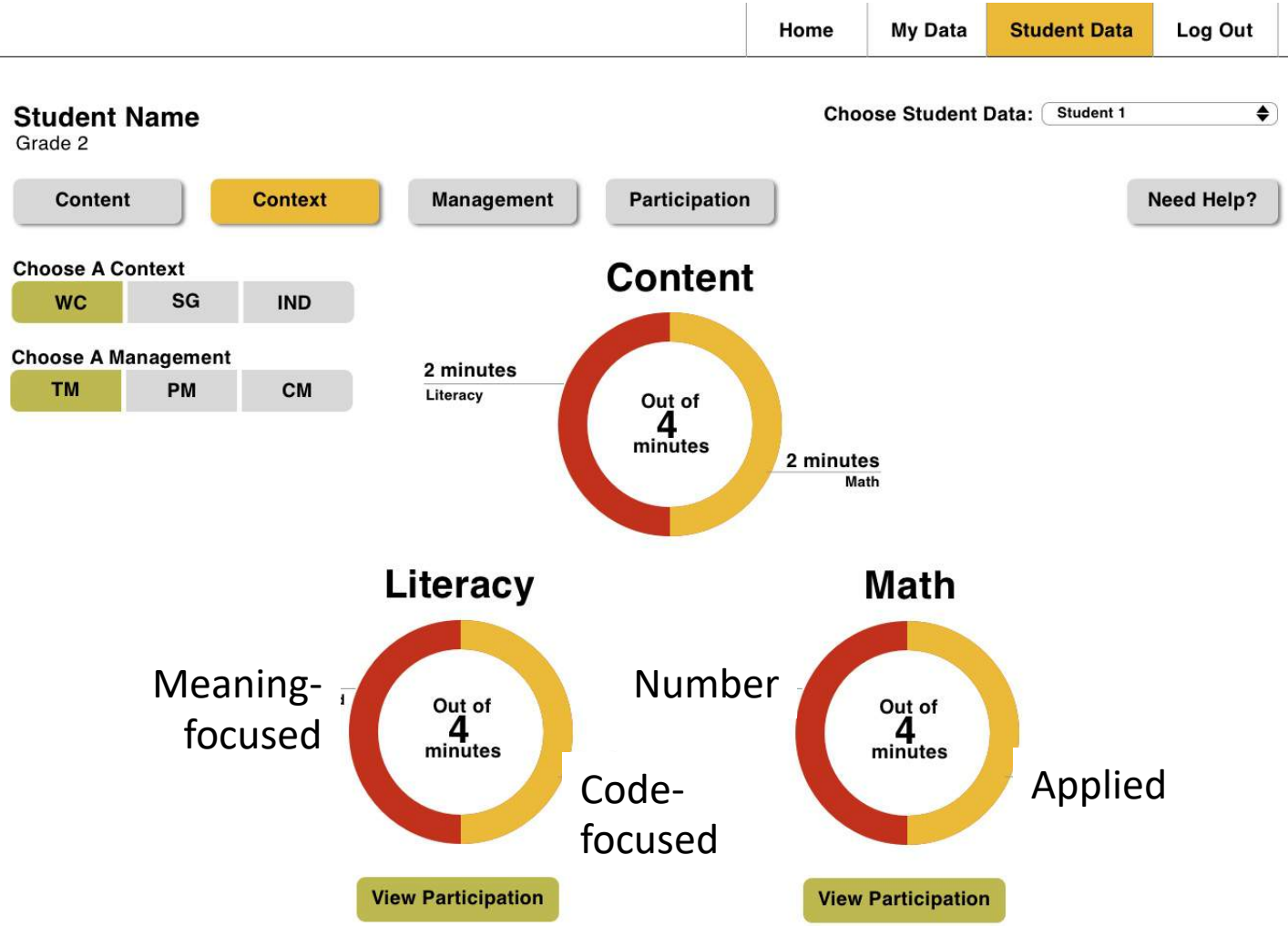
OLOS beta


Hulme pattern mathematics
OLOS
Carol
Secure https://myolos.net/observations/970
Cycle 1 of 1
00:00:58 of 00:05:00
Undo last action
End early
Randy Moss
Anna Farris
Tina Fey
Is on task
Is off task
Content Area
Literacy
Math
Other
Non-Inst
Context
WC
SmG
Indiv
Teacher
Peers
Alone
Instruction Type
CF
MF
Nu
Op
Al
Go
Ap
Moves
Non-verbal responding
Verbal response to question
Reading text/problems aloud
Answering questions that require reasoning
Asking on-topic questions
Using text to justify a response
Participating in a discussion
Voicing a disagreement
In a challenging social situation, uses words to resolve issue
Moves away from difficult social situations
Art
Science
Social Studies
Music
Other

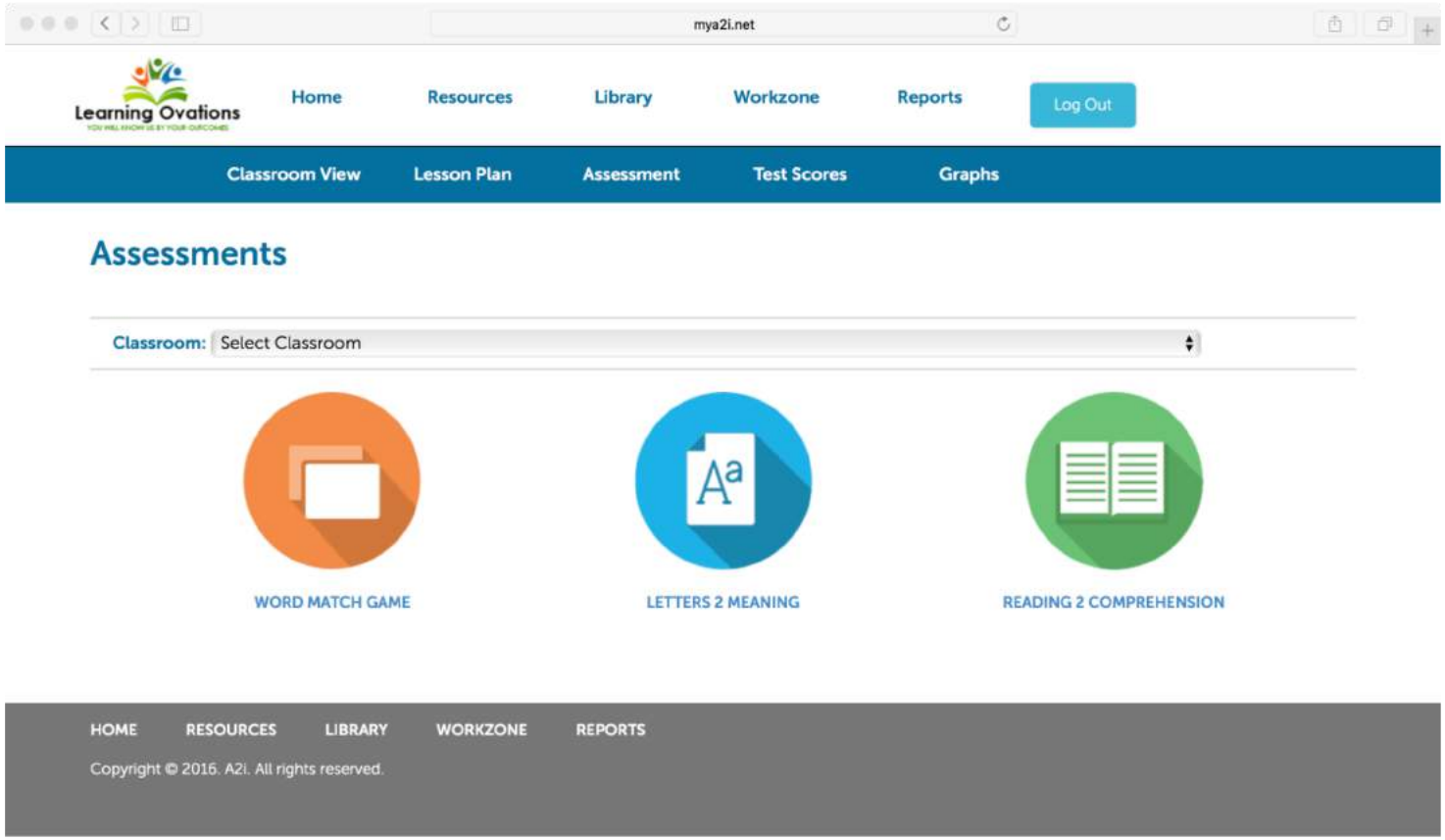
Observation Protocol

Cycle A1	Child A,B,C 15 min	Teacher 5 min	Child A,B,C 15 min	Teacher 5 min
Cycle A2	Child A,B,C 15 min	Teacher 5 min	Child A,B,C 15 min	Teacher 5 min
Cycle B1	Child D,E,F 15 min	Teacher 5 min	Child D,E,F 15 min	Teacher 5 min
Cycle B2	Child D,E,F 15 min	Teacher 5 min	Child D,E,F 15 min	Teacher 5 min
Cycle C1: etc.				

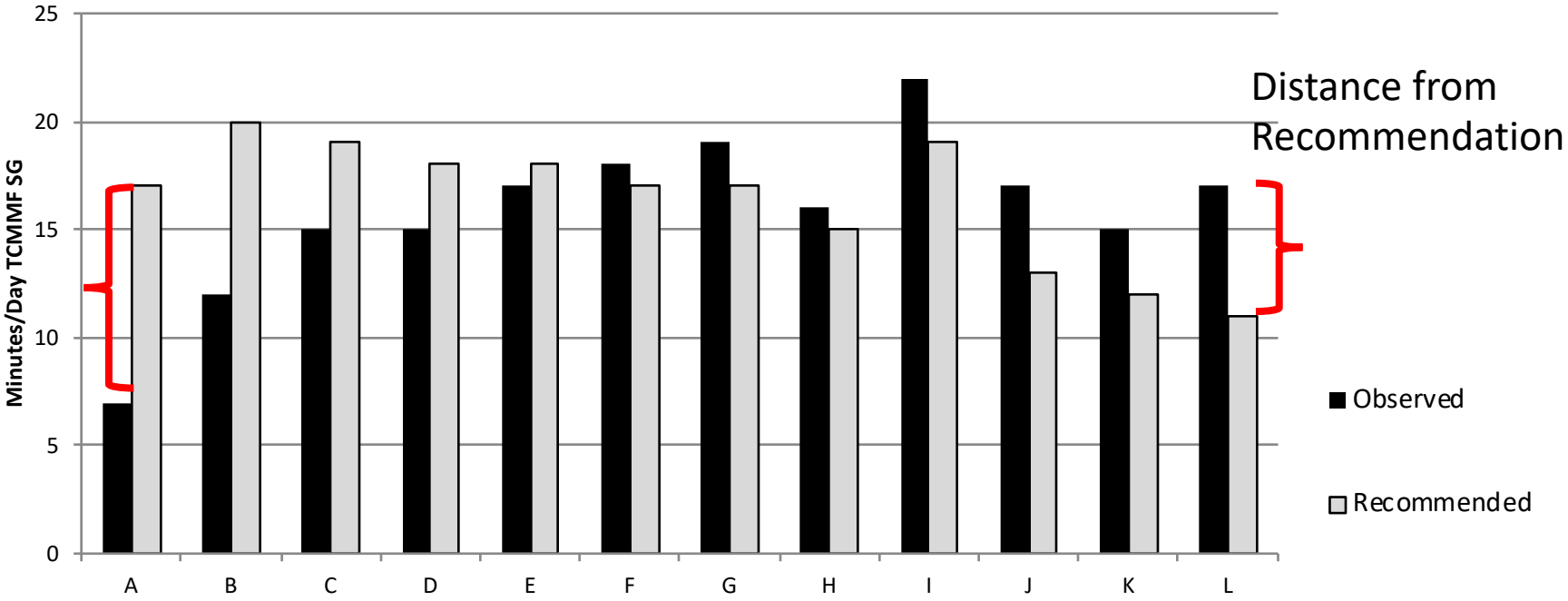
Reports (Proto-type)



Online Adaptive Assessments



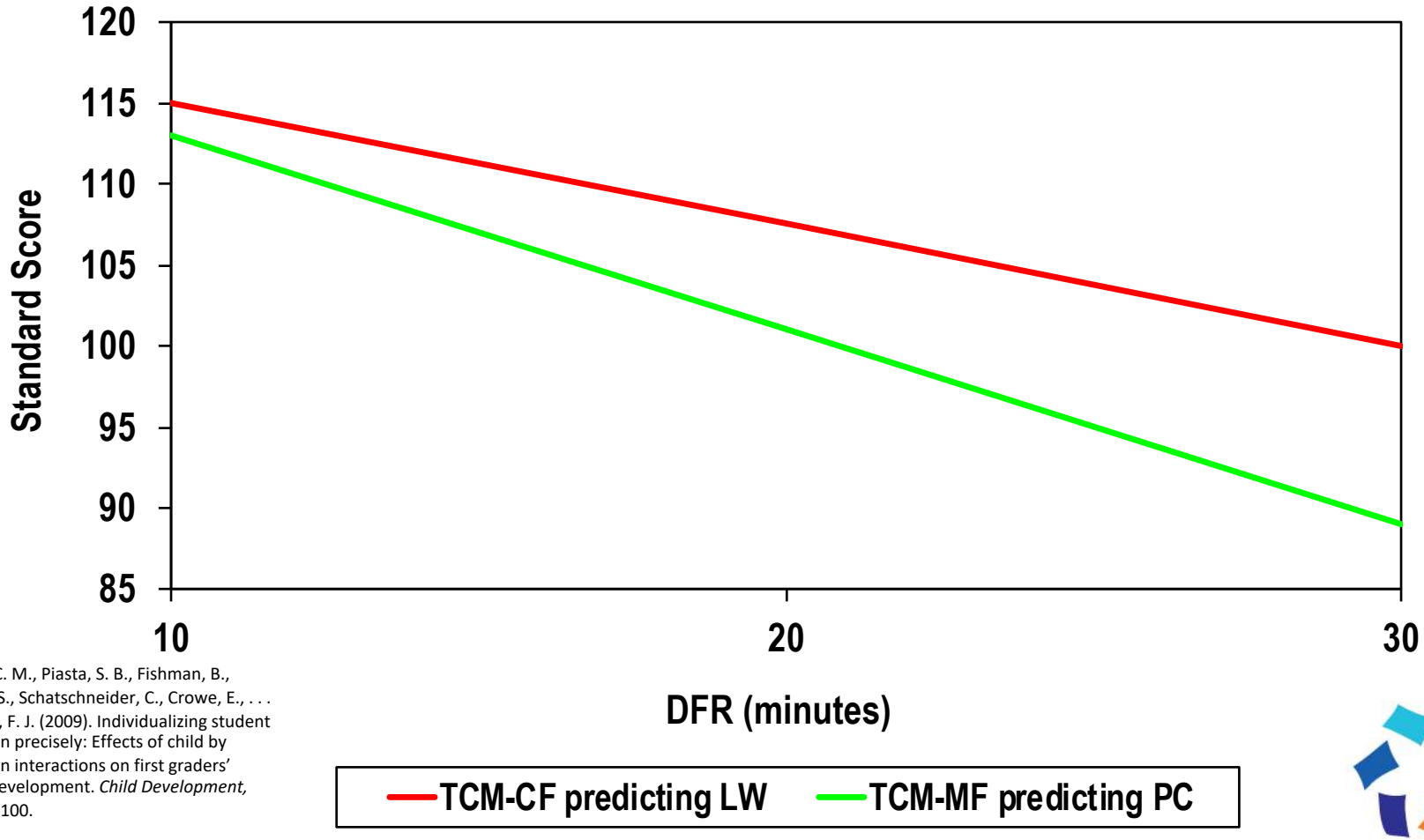
3rd Grade TCM Small-group Meaning-focused DFR -ISI



Connor, C. M., Morrison, F. J., Fishman, B., Giuliani, S., Luck, M., Underwood, P., . . . Schatschneider, C. (2011). Classroom instruction, child X instruction interactions and the impact of differentiating student instruction on third graders' reading comprehension. *Reading Research Quarterly, 46*(3), 189-221.

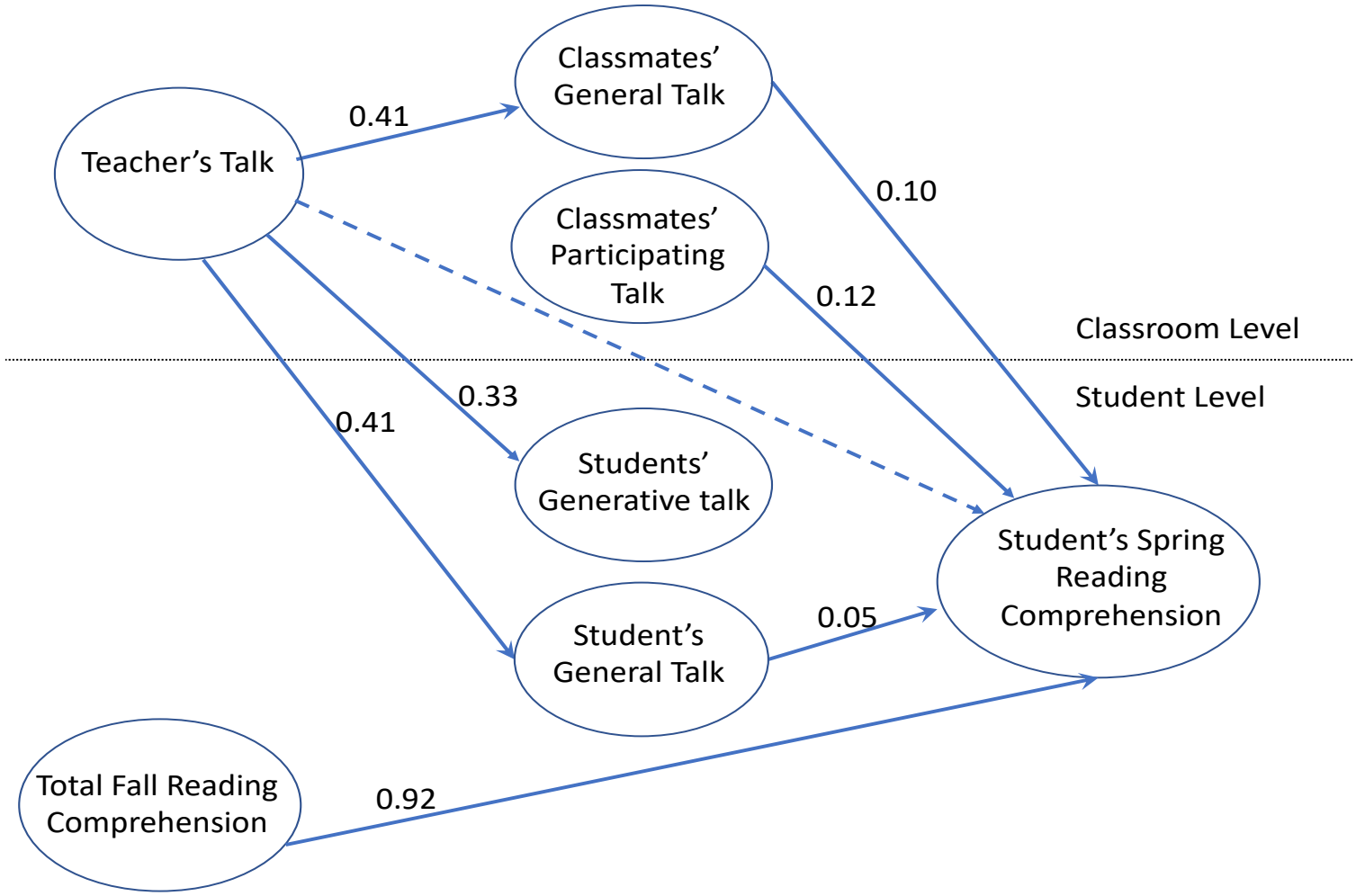
Connor, C. M., Piasta, S. B., Fishman, B., Glasney, S., Schatschneider, C., Crowe, E., . . . Morrison, F. J. (2009). Individualizing student instruction precisely: Effects of child by instruction interactions on first graders' literacy development. *Child Development, 80*(1), 77-100.

First Grade: Distance from Recommendation Predicting Reading standard scores

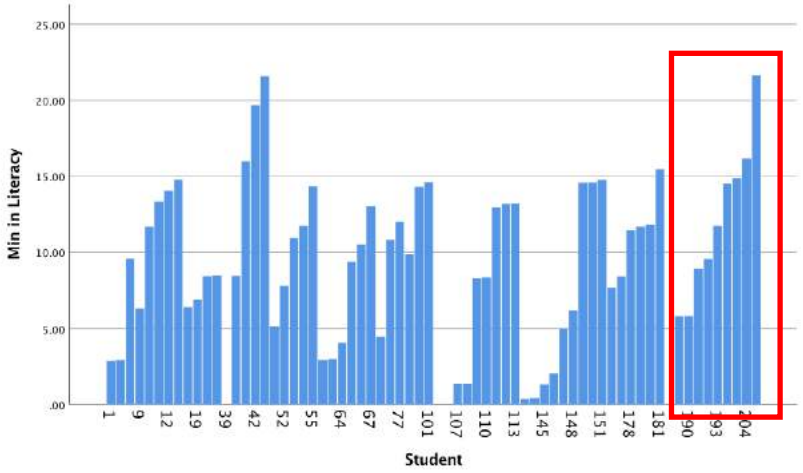


Connor, C. M., Piasta, S. B., Fishman, B., Glasney, S., Schatschneider, C., Crowe, E., . . . Morrison, F. J. (2009). Individualizing student instruction precisely: Effects of child by instruction interactions on first graders' literacy development. *Child Development, 80*(1), 77-100.

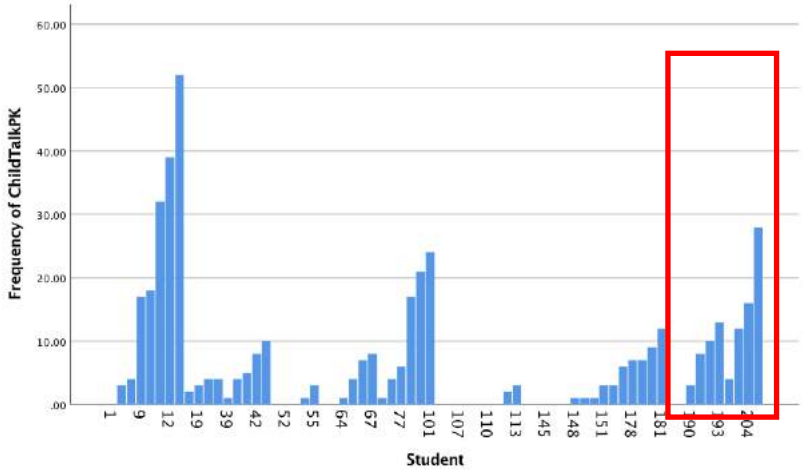
COLT/OLOS child talk in 2nd and 3rd Grade



OLOS feasibility in PreK



Each bar represents the total number of minutes/30 minutes each child spent in **literacy learning opportunities.** Students sorted by classroom, program, and time in literacy learning opportunity.



Each bar represents the frequency of **Child Talk** per 30 minutes for an individual child, sorted by classroom, program and frequency of Child Talk

Summary

- Observing classroom with OLOS is feasible based on our PK-3rd Grade studies
  - Live
  - Video
- Measurement studies of components – ISI, Q-CLE, and COLT – Observation data is complex
  - Multi-level bi-variate factor analysis
  - Multi-level SEM
- Predictive Validity Study is ongoing

Child Talk Codes – 2nd and 3rd Grade

Student Talk Type	Frequency of talk	Loadings		
		Main	Part	Part2
Participating				
Non-verbal responding (raising hand, thumbs up/down, shaking head yes/no)	4.99 (5.92)	1	1	--
Verbally answering simple “wh ”, yes/no, and choice questions (single child)	1.90 (4.29)	0.94	0.83	--
Reading text aloud	0.59 (1.72)	0.76	0.20	--
Generative				
Answering questions that require thinking or reasoning	0.35 (.90)	1.54	--	1
Asking simple, on-topic questions	0.09 (0.40)	1.33	--	-1.45
Using text to justify a response	0.03 (0.25)	1.81	--	1.60
Off-topic generative participation	0.07 (0.36)	1.95	--	-1.68
Participating in a discussion	0.08 (0.35)	1.55	--	0.13
Voicing a disagreement	0.00 (0.07)	2.60	--	0.03
TOTAL Mean Frequency Score (unscaled)	8.55 (0.22)			
Factor variance		0.26	0.29	0.10

Thank You

The Early Learning Network is funded by the Institute of Education Sciences.

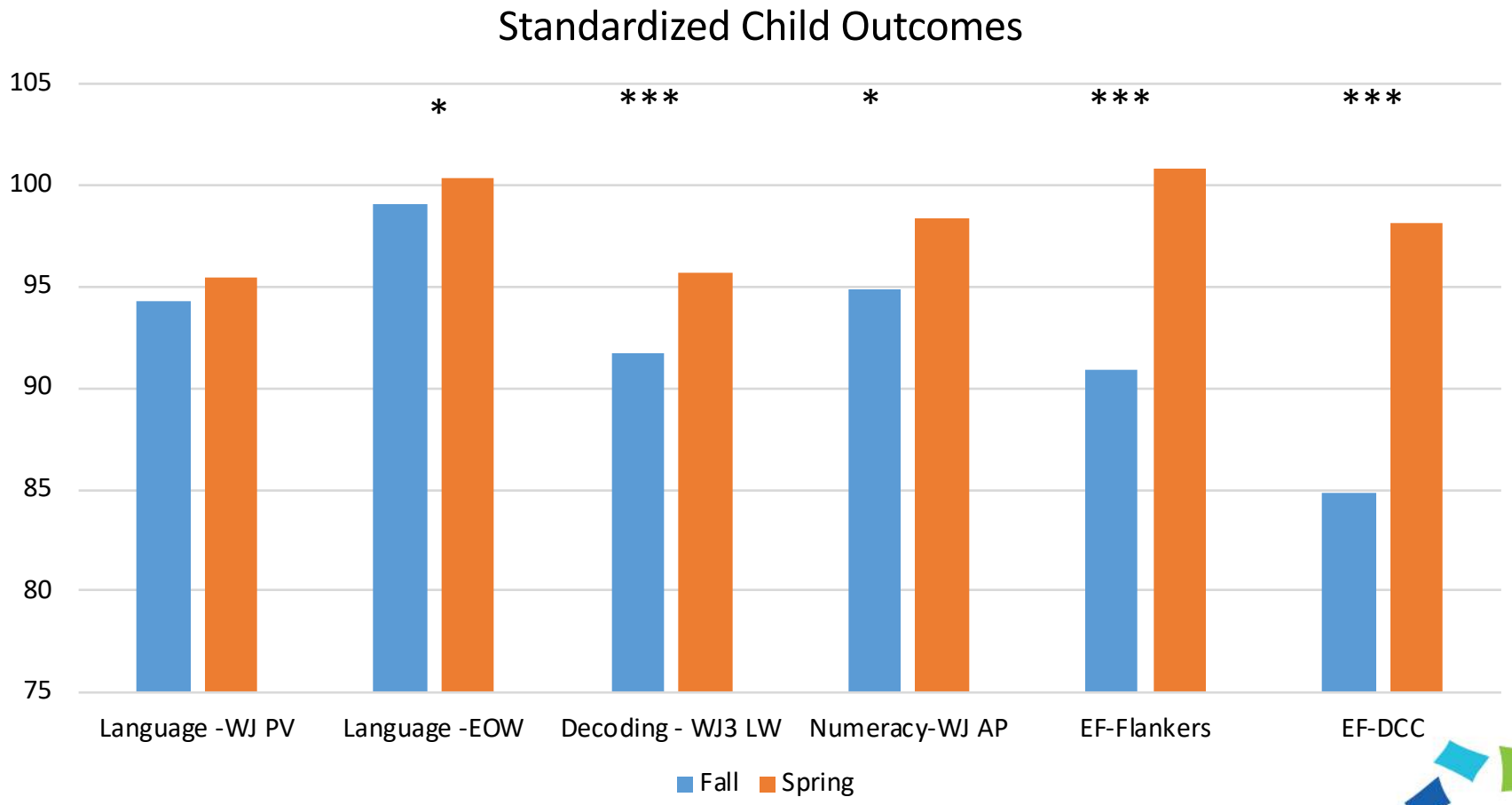
For questions only

- Next slides are included to answer potential questions -

NC Pre-K

- NC Pre-K is an established high quality state-funded pre-k program (Friedman et al., 2018)
- Serves approximately 30,000 children across NC
- Child eligibility criteria:
  - Primary criteria:
    - Year before kindergarten (four-year-olds)
    - Gross income <= 75% of the state median income level
  - Secondary criteria:
    - Includes Limited English Proficiency
- Programs must meet performance standards

Pre-K – Gains in Child Outcomes During PK

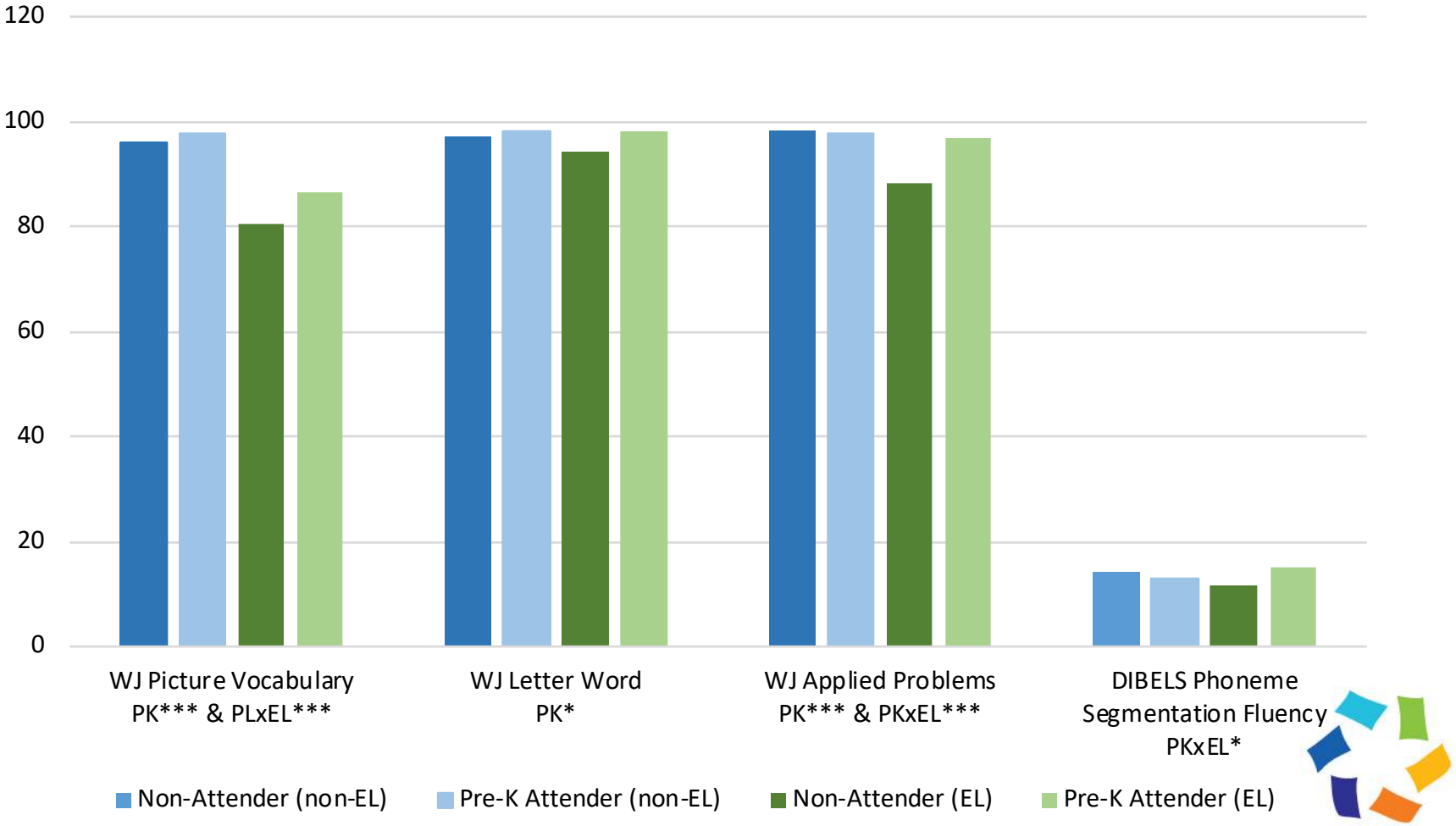


Note: * p<.05; ** p<.01; *** p<.001

RQ1: Pre-k Attender/Non-Attender x EL Differences at Kindergarten Entry

Parameter	Picture Vocabulary	Applied Problems	Letter-Word Identification	First Sound Fluency	Phoneme Segmentation Fluency	Inhibitory Control	Cognitive Flexibility
Intercept	91.36***	95.96***	97.27***	21.37***	13.68***	31.53***	23.53***
	(0.46)	(0.49)	(0.50)	(0.60)	(0.54)	(0.45)	(0.60)
NCPK	3.65***	3.57***	2.18*	0.98	1.13	0.62	2.34
	(0.96)	(1.01)	1.04)	(1.25)	(1.12)	(0.93)	(1.24)
EL	-12.67***	-4.20***	-0.96	-0.35	0.35	0.73	0.07
	(1.09)	(1.15)	(1.18)	(1.42)	(1.27)	(1.06)	(1.41)
NCPK*EL	4.54*	9.29***	3.11	4.47	4.81*	1.98	3.30
	(1.93)	(2.04)	(2.10)	(2.52)	(2.26)	(1.88)	(2.49)
Mat Ed	1.60***	1.28***	1.36***	0.70*	1.02***	0.11	0.16
	(0.22)	(0.23)	(0.24)	(0.28)	(0.25)	(0.21)	(0.28)
Male	1.20	0.05	-0.05	-0.67	-1.50	-0.77	-1.75
	(0.93)	(0.98)	(1.01)	(1.21)	(1.08)	(0.90)	(1.20)
Age	-3.37*	-8.17***	-11.3***	9.78***	5.21**	5.80***	6.48***
	(1.41)	(1.50)	(1.54)	(1.84)	(1.65)	(1.37)	(1.86)

Figure 1: Fall Scores by Attender and EL Status



RQ1: Pre-k Attender/Non-Attender x EL Differences at Kindergarten End

Parameter	Picture Vocabulary	Applied Problems	Letter-Word Identification	First Sound Fluency	Phoneme Segmentation Fluency	Inhibitory Control	Cognitive Flexibility
Intercept	93.46***	99.65***	115.78***	8.49	25.75**	35.83***	43.83***
	(4.66)	(6.34)	(5.60)	(7.10)	(9.44)	(7.96)	(11.6)
NCPK	-0.04	-1.38	-1.34	-0.19	0.33	1.55	2.78
	(0.70)	(0.94)	(0.82)	(1.02)	(1.35)	(0.94)	(1.43)
EL	-4.54***	0.69	0.55	0.93	-3.27	0.69	1.46
	(0.92)	(1.17)	(1.03)	(1.30)	(1.72)	(1.18)	(1.76)
NCPK*EL	0.94	-2.48	1.35	3.69	-0.02	5.66**	-3.69
	(1.39)	(1.91)	(1.67)	(2.09)	(2.78)	(1.93)	(2.88)
Fall Score	0.57***	0.62***	0.74***	0.35***	0.50***	0.25***	0.31***
	(0.03)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.05)
Mat Ed	0.00	-0.59*	0.17	0.11	0.01	-0.09	0.07
	(0.17)	(0.23)	(0.20)	(0.24)	(0.33)	(0.21)	(0.32)
Male	0.51	1.03	0.26	-2.65**	-0.75	-1.18	-5.04***
	(0.65)	(0.89)	(0.78)	(0.98)	(1.31)	(0.90)	(1.38)
Age	-1.58	-5.15***	-4.26***	3.53*	4.21*	0.94	1.53
	(1.01)	(1.41)	(1.27)	(1.55)	(2.03)	(1.36)	(2.02)

Figure 2: Spring Scores by Attender and EL Status