



UNC ELN: Early Education in Rural NC

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

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



Research Question

- What is the quality of ECE classrooms in Pre-K vs Kindergarten?
- Do children show substantial gains in skills when they attend Pre-K?
- Do Pre-K attenders enter K with higher skill levels and do they show different larger gains during K than non-attenders?
- Are there differences in Pre-K effects by home language?



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)



NC Pre-K Program

- 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:
 - Year before kindergarten (four-year-olds)
 - “Risk” factors such as
 - Gross income \leq 75% of the state median income level
 - Limited English Proficiency
 - Disability
- Programs must meet performance standards
 - Observed high classroom quality
 - Lead teacher – has or is working on BA / B-K license
 - Class size=18 & Ratio=9:1
 - Uses approved curriculum

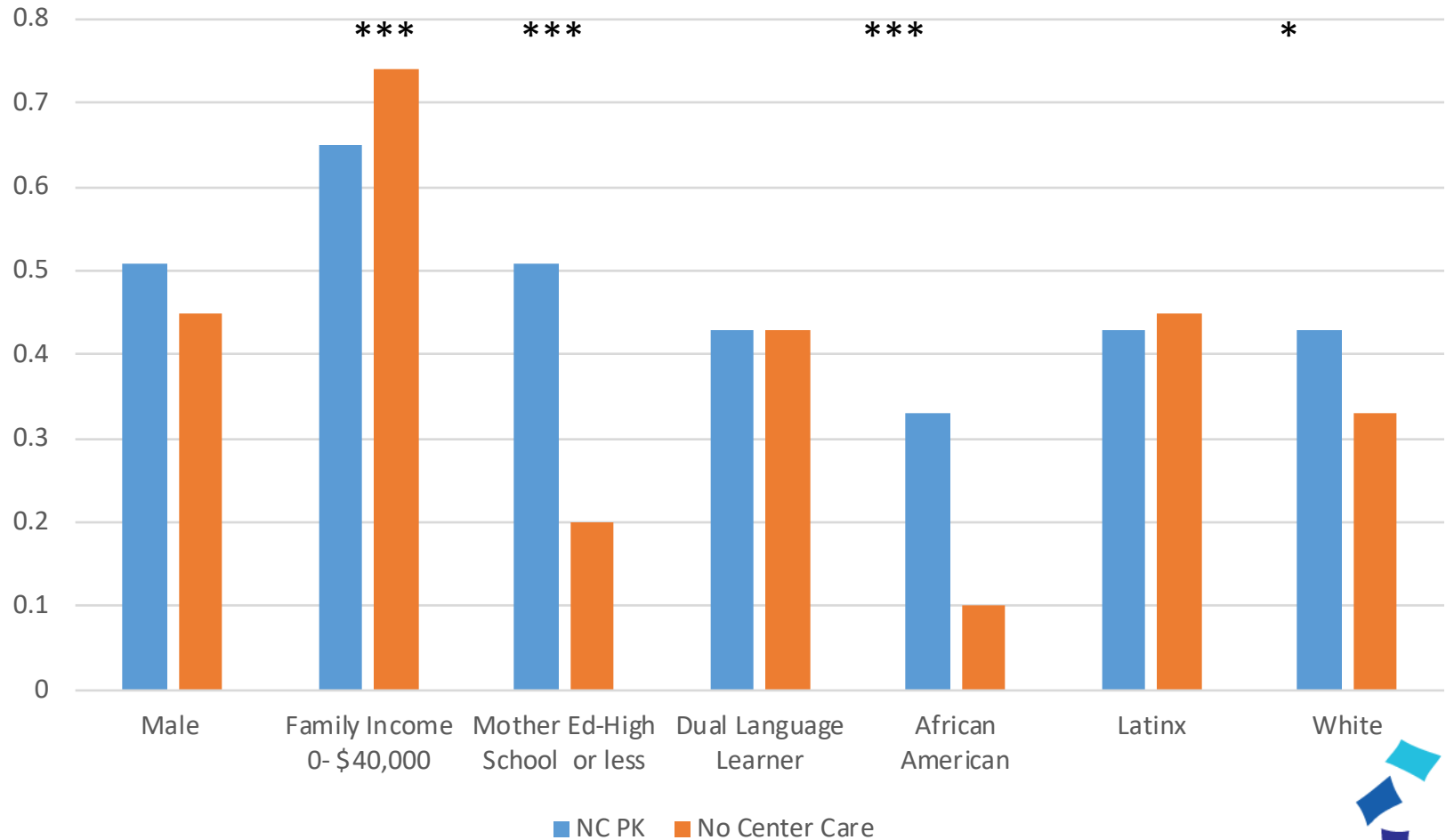


Study Sample: Pre-K Attenders and Non-Attenders

- Followed children into 182 K classrooms
- Recruited 249 children without preschool experience (non-attenders)
- Demographics – a few differences between attenders and non-attenders
 - Maternal education
 - Family income
 - Race



Child and Family Characteristics by Pre-K Status



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

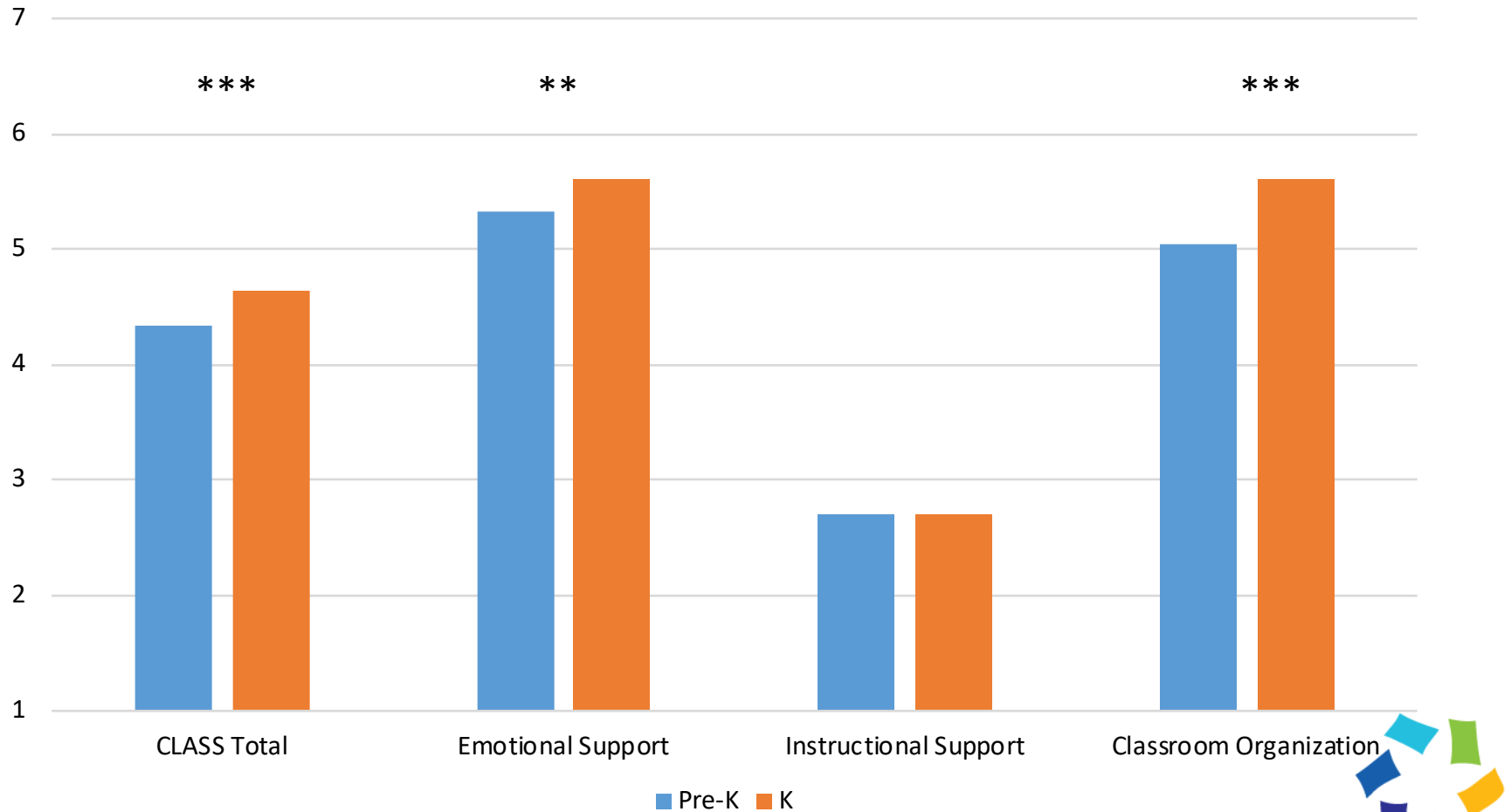


ECE Quality Measures

- 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



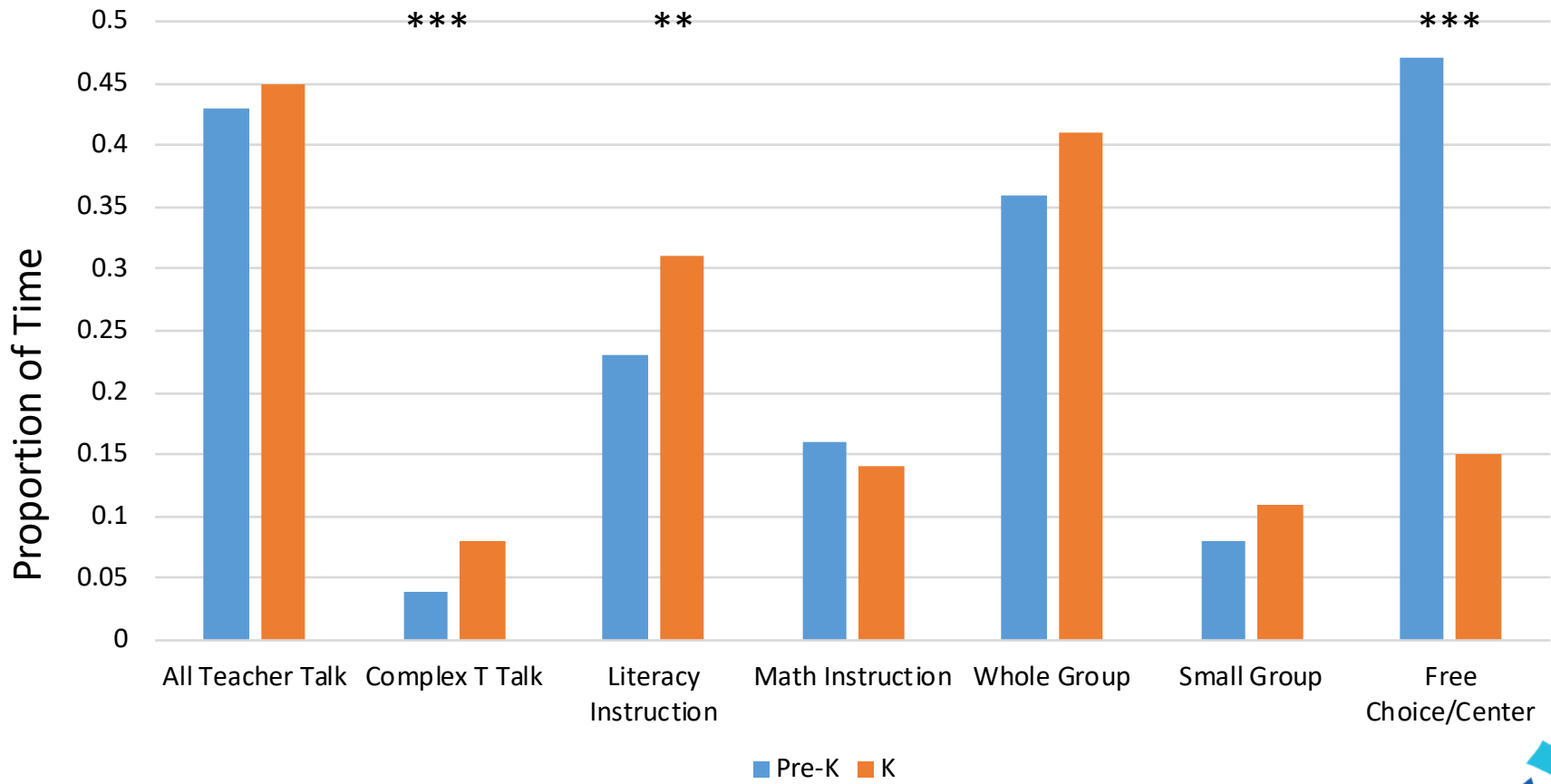
ECE Quality in Pre-K vs K: T-C Interactions



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



ECE Quality in Pre-K vs K: T-C Language and Instructional Practices



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

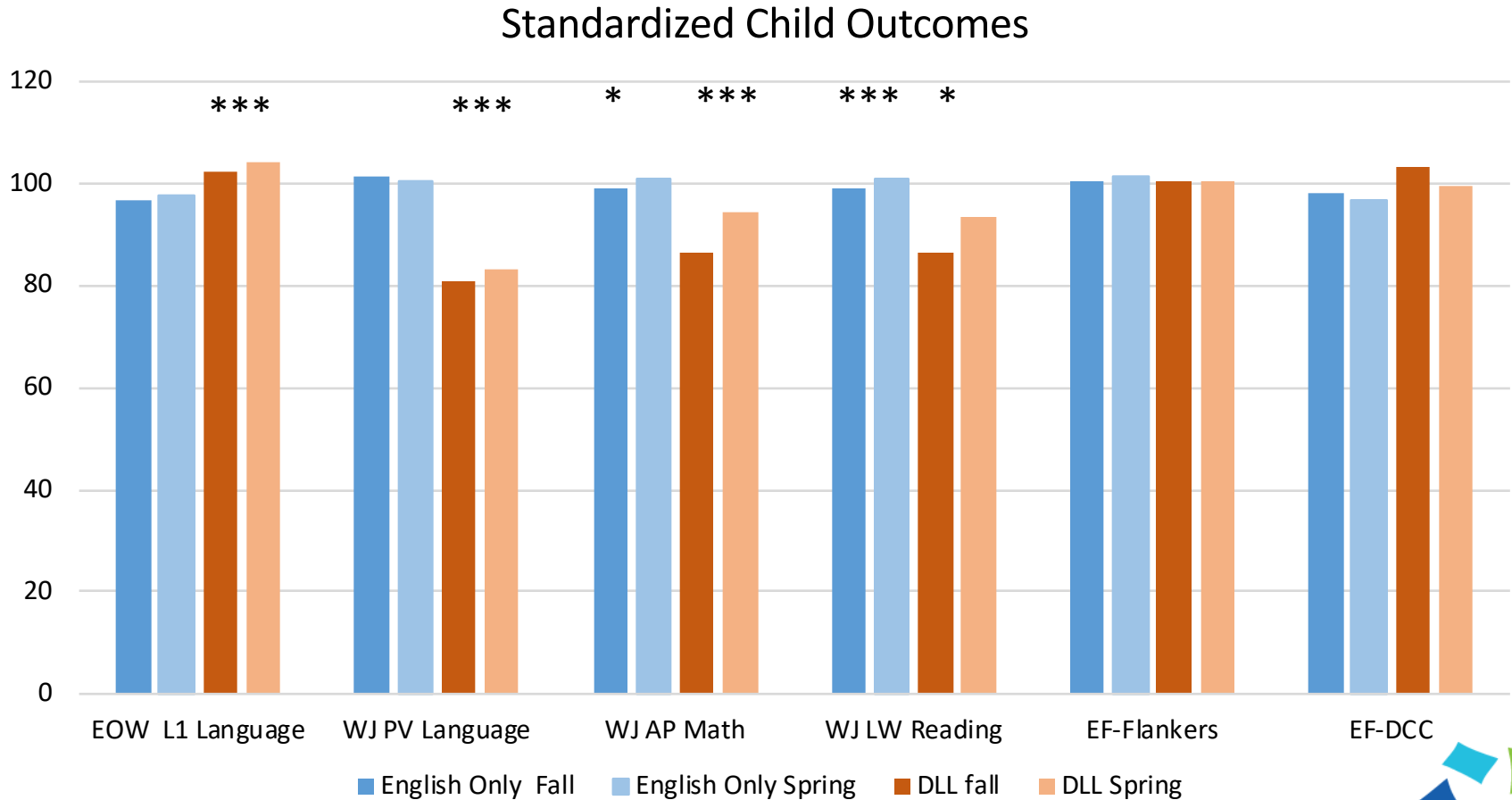


Outcome Measures (Fall/Spring)

- Mathematics
 - Applied Problems (WJ AP)
- Language and Literacy
 - Picture Vocabulary (WJ PV)
 - Expressive Language (EOW PVT – PK only)
 - 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)



Gains in Child Outcomes During Pre-K

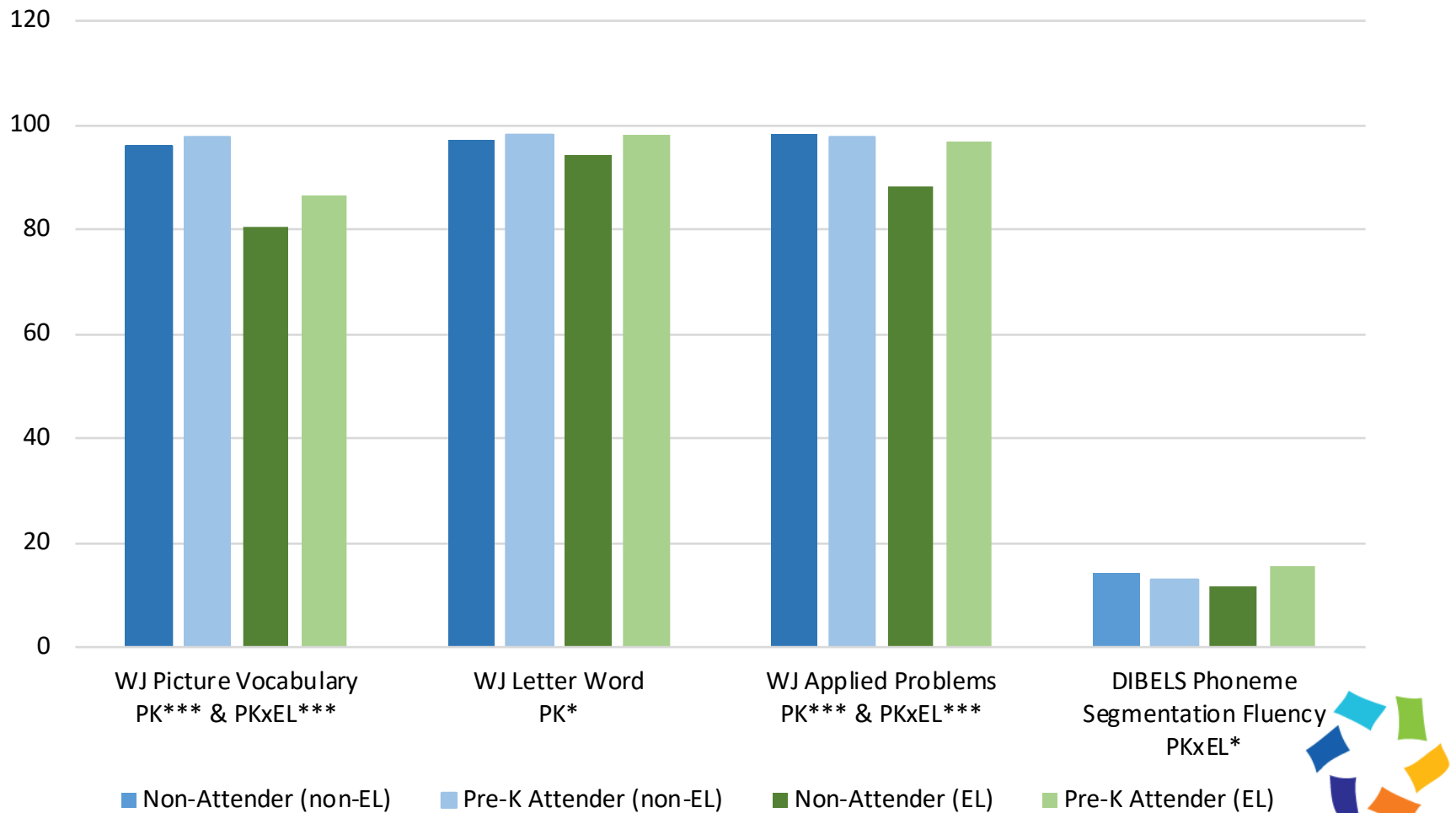


Note: * $p < .05$; ** $p < .01$; *** $p < .001$

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

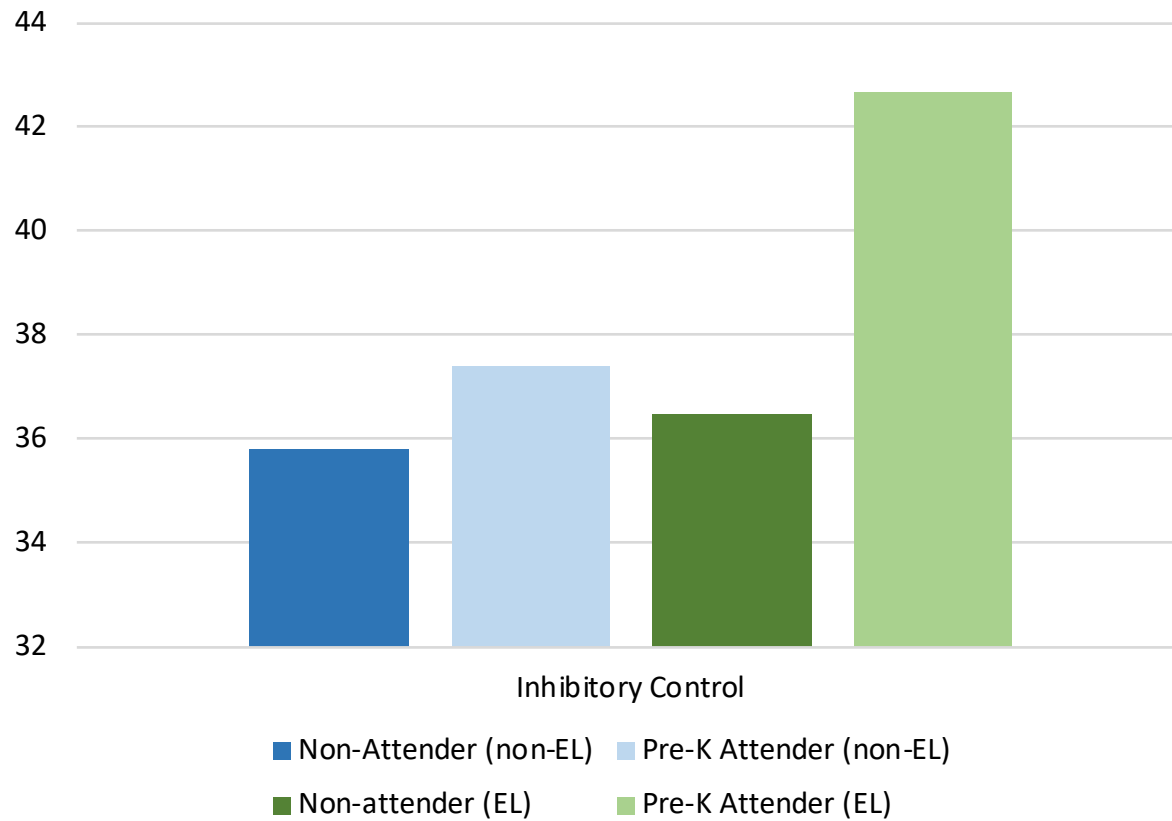
Fall Scores by Attender and EL Status



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

Spring Scores by Attender and EL Status



Summary

- NC Pre-K & K classrooms differ slightly in quality and practices
 - Quality of T-C Interactions: K > Pre-K
 - Teacher complex talk: K > Pre-K
 - Time in literacy instruction: K > Pre-K
 - Time in free play or centers: Pre-K > K
- Children showed gains in academic and EF skills in PK
- Children entered K with higher skills levels, especially ELs
- PK advantage disappeared in K
 - Exploring possible explanations such as lack of alignment across PK and K





Thank You

*The Early Learning Network is funded by the
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