Early Childhood Education: Research and Policy

Peg Burchinal
University of North Carolina at Chapel Hill

UNC
FRANK PORTER GRAHAM
CHILD DEVELOPMENT INSTITUTE

Overview

- Brief history of research on child care and it role in child care policy
- Discuss growing concerns: modest quality effects and fade-out
- Present our research addressing these concerns:
  - Extend definitions of child care quality
  - Reexamine school readiness skills

Importance of Early Experiences

- Early experiences play a crucial role in development
  - Behavioral trajectories

    (Brooks-Gunn & Duncan, 2000; Belsky et al., 2009)
  - Brain development

    (Shonkoff, Boyce, & McEwen, 2009)
  - Genes to shape cognitive and social development

    (Caspi et al., 1996)

UNC FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

Increased Focus on Early Childhood Education in US

- Child care became a high priority for policy, practice, and research
  - Importance of early experiences
  - Major societal changes ->nonparental care for most children
  - Mechanism to address achievement gaps
    - Experimental evidence high quality child care can change lives for less advantaged children

UNC FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

Early Child Care Research

- Early intervention studies – low income children. 10+ small experimental or quasi experimental studies funded by NICHD
  - Abecedarian Project
  - High Scope/ Perry Preschool
  - Others – center and home-based programs

UNC FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

Early Studies: Perry Preschool

- Experimental Study
  - Part-time care beginning at 3 or 4 years of age with parenting component
  - Focus on self-regulation and hands-on learning
- Immediate impacts
  - Higher IQ
- School age impacts
  - Higher achievement scores, fewer behavior problems
- Adult outcomes
  - Fewer adults in judicial system
  - Higher incomes
  - Fewer women using welfare
- Cost-benefit analysis $12.50 / $1

Early Studies: Abecedarian

- Experimental Study
  - Full time care: infancy to kindergarten entry
  - Focus on language/cognitive developemnt
- Immediate impacts
  - Higher IQ
- Young Adult Impacts 21 years
  - Higher IQ and academic skills
  - More likely to attend college
  - Less likely to have a menial job
- Adult Impacts 30-35 years
  - More likely to graduate from college
  - Higher Incomes
  - Fewer risk factors for heart or metabolic disease
- Cost benefit analysis: $7.50 / $1

Impact on Child Care Programs and Policies

- Great Society: Head Start
  - Transitioned from summer program to today's infant and preschool program
  - Serves low-income children and their families
  - Focus on whole child and family supports
- State Pre-kindergarten Programs
  - 54 programs in 43 states and DC
  - Typically serves low-income children (but some universal programs)
  - Typically more focus on academic skills

Findings from subsequent observational studies

- Quality
  - Infant/toddler center care- poor quality
  - Preschool center care - mediocre quality
- Low-income children received higher quality care when in publicly funded programs

- Quality of care predicted child outcomes: Language, academic, social skills
  - Short term
  - Long-term (through high school)

Impact on Policy

- Created wide-scale concerns about quality of child care in US – among parents and policy makers
- Increased regulations
  - state regulations of child care providers
  - performance standards in Pre-kindergarten programs
- Eventually led to Quality Rating and Improvement Systems

Publicly funded child care programs: short-term impacts

- Head Start Impact Study: modest to moderate impacts – especially language and literacy
- Pre-kindergarten programs: relatively consistent short term impacts on academic outcomes
- QRIS: improved quality, not child outcomes

Impacts of the Best Pre-K Programs

	Achievement Gain	Long-term impacts	Larger gains
New Jersey	40% SD points	5th Grade	Poverty
Boston	40% -60% SD points	3rd Grade	Poverty, home language
Maryland	32 percentile points	4th Grade	Poverty
North Carolina	20% - 30% SD points	3rd Grade	Poverty, home

Growing concerns: Fade-out of child care program impacts

- Head Start Impact Study – short term impacts disappeared by grade 1.
- Pre-K evaluations – moderate to large short term impacts but impacts diminish (NC, MD, OK) and became negative in TN

Growing concerns: Modest associations child care quality and child outcomes

- Modest associations: quality and child outcomes
  - Several meta-analyses looking at gains in child outcomes in preschool
    - Partial correlation ~ .05: Process quality (CLASS/ECERS)
    - Partial correlations: structural quality
      - Teacher education: partial correlaton ~ .10
      - Teacher training – ns
      - Ratio – ns
      - Group size– ns

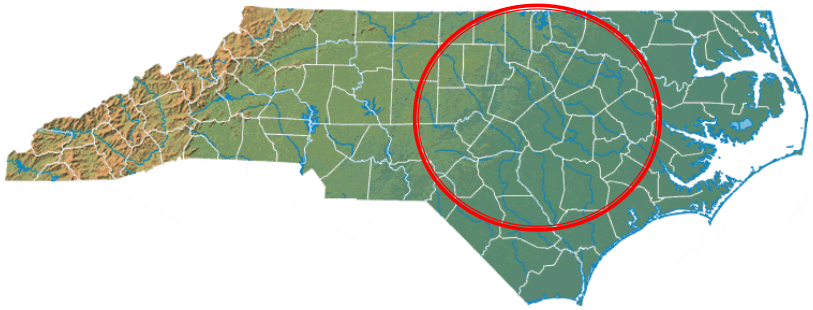
Possible explanations

- Modest associations –
  - Current model of child care quality may be insufficient
  - One-size-fits-all model – likely different outcomes impacted by different types of classroom experiences

Do different aspects of early childhood education predict different child outcomes?

- Quality of teacher-child interactions
  - All outcomes, especially social skills
- Curriculum
  - Outcomes that are the focus of curriculum
    - Whole child curricula- language and social skills
    - Content-specific curricula-specific skills
- Teacher-child language exchanges
  - Language skills
- Content-specific instructional time
  - Content specific skills
- Activity settings
  - All outcomes

Study Sample

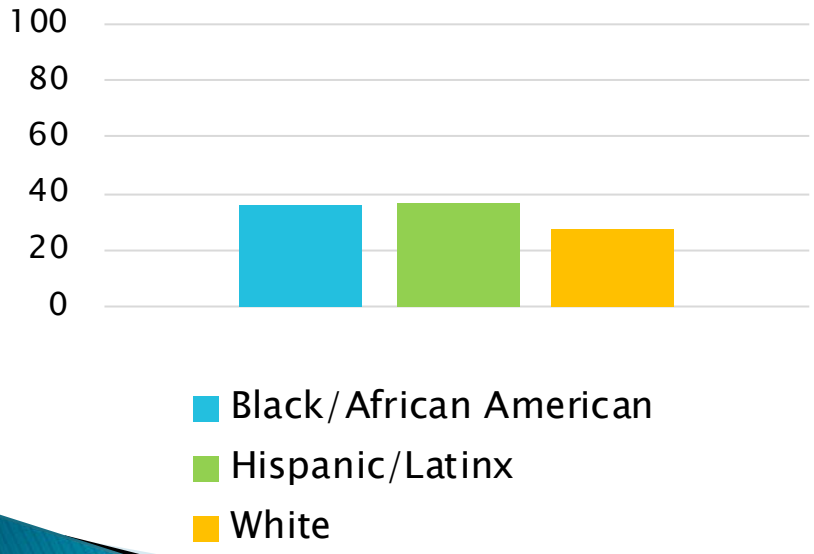


- 6 rural NC counties
- 63 randomly-selected NC Pre-K classrooms
  - 65% in schools
- 361 randomly-selected children recruited in fall

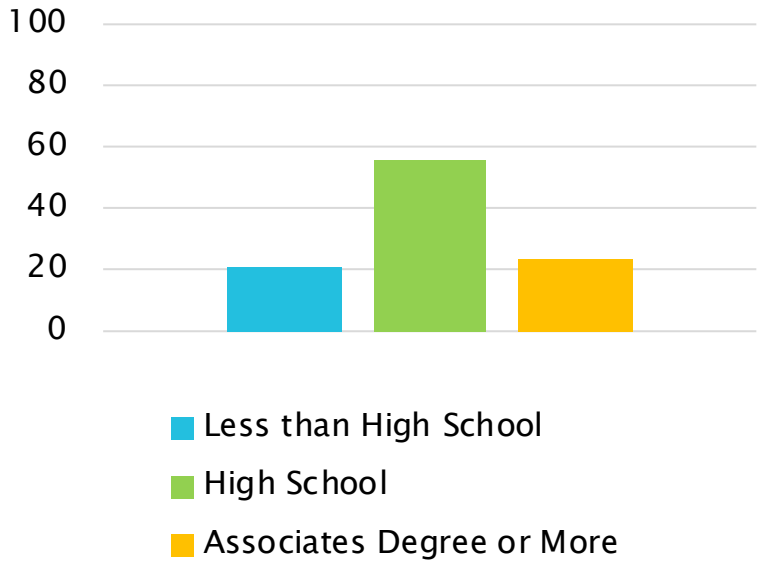
Study Sample

N = 361

Race/Ethnicity



Mother's Education



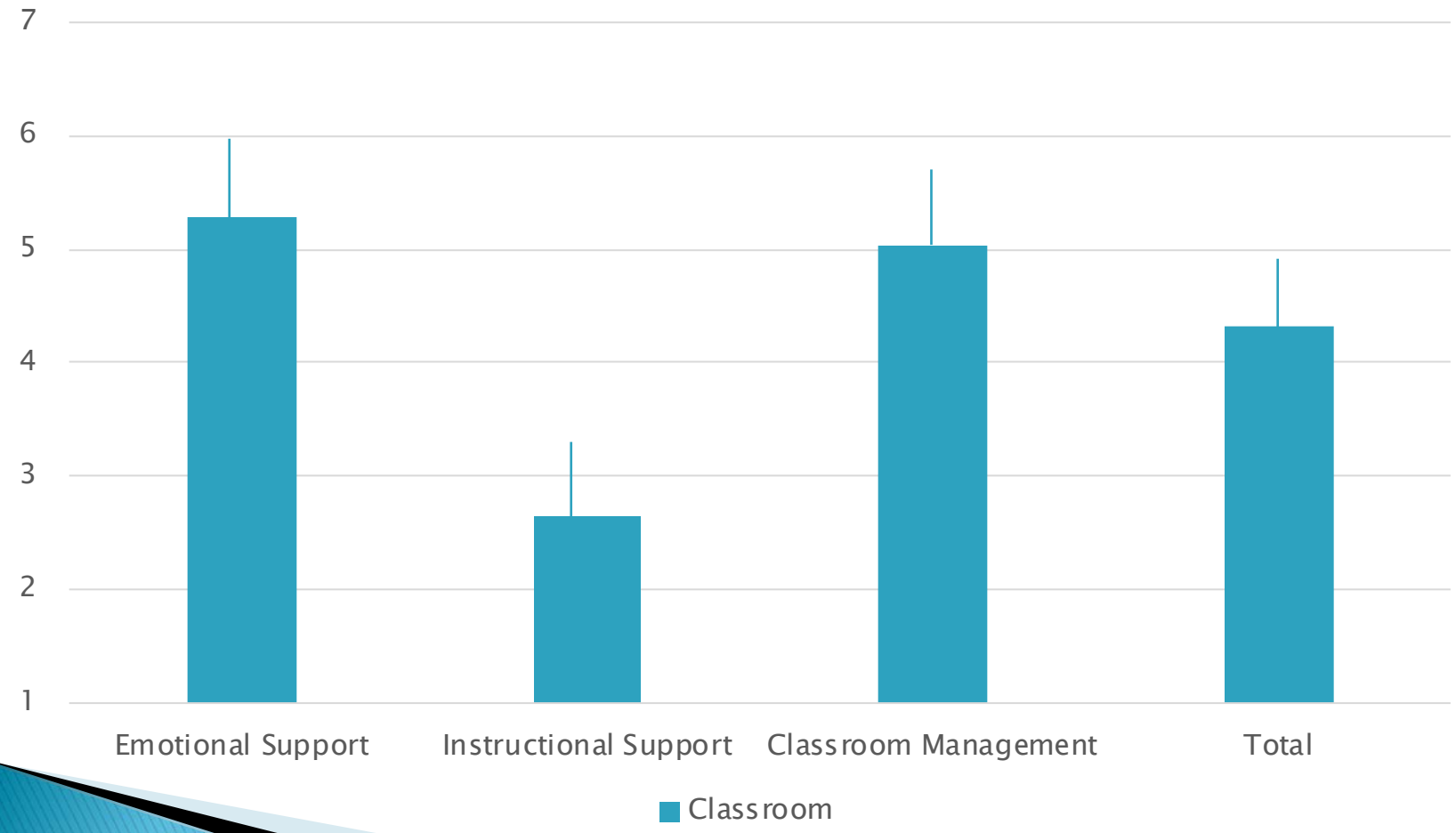
Method- Child Outcomes
collected in fall and spring

- Direct Assessments
  - Language
    - Woodcock Johnson III Picture Vocabulary (WJ PV)
    - Expressive One Word Picture Vocabulary Test (EOW)
  - Reading
    - WJ Letter-word (WJ LS)
    - DIBELS Initial Sounds & Phonic Segmentation
  - Math – WJ Applied Problems (WJ AP)
  - Executive Functioning
    - NIH Executive Function Tool Box – Flankers (inhibitory control) & Dimensional change card sort (cognitive flexibility)
- Teacher surveys Fall & Spring of Pre-K
  - Social Skills and Self-regulation
    - Teachers rated individual children on Teacher-Child Relationship Scale, Learning Behavior Scale, Teacher-Child Relationship Scale
    - Factor analysis of scale scores yielded 2 composites

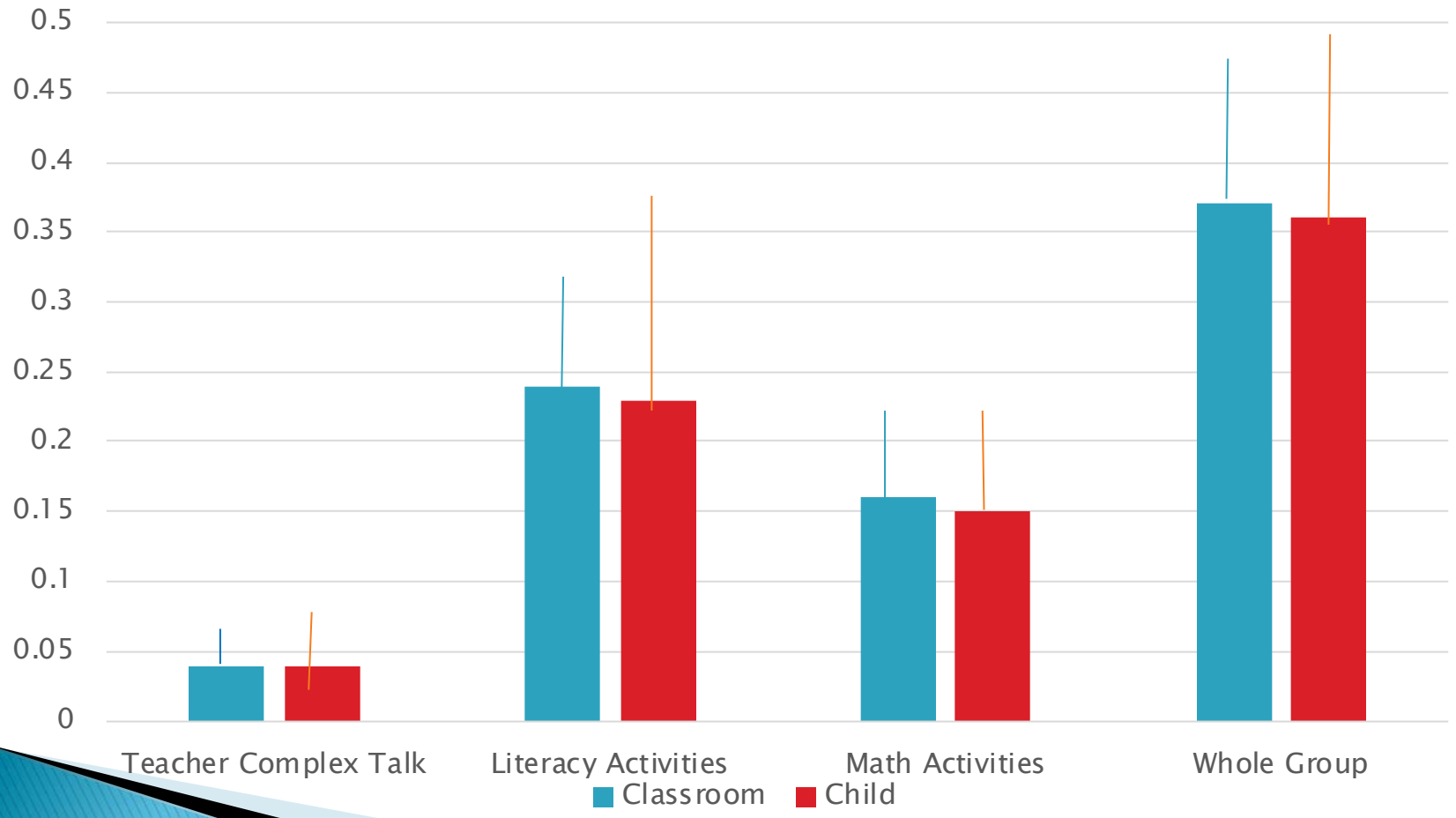
Methods – ECE Quality

- Teacher reported curriculum
  - 78% Creative Curriculum
- Classroom observations
  - Teacher-Child Interactions
    - Classroom Assessment Scoring System (CLASS)
    - 2+ hours: 4+ cycles – observe classroom
  - Teacher Language, Instruction, & Grouping
    - Language Interaction Snapshot (LISn)
    - 20+ minutes of time sampled observation of individual children
      - 30 second cycles– record language exchanges
      - End of 5 minutes – record setting and activities
    - Combined across children to create "classroom-level" measure
    - LISn variables: Proportion time
      - High quality T-C language exchanges: decontextualized language or multiple turns
      - Literacy and math activities
      - Whole group settings

CLASS


7
6
5
4
3
2
1
Emotional Support
Instructional Support
Classroom Management
Total
Classroom

LISn Classroom Quality



Hypotheses

- Child-level v classroom-level measurement of quality
  - Some aspects of child care experiences may vary greatly among children in same classroom
    - T-C language exchanges
  - Other aspects may be consistent across children
    - Time spent in instructional activitities

Hypotheses

- Some aspects of the child care environment will promote gains in all domains
  - Quality teacher-child interactions: positive
  - Time in whole group activities: negative

Hypotheses

- Some aspects of child care environment will promote gains in specific child outcomes
  - Language
    - *Child-specific*: teacher complex talk
    - Whole -child curricula
  - Reading and math
    - Time in content-specific activities
    - Not using whole-child curricula
  - Social Skills
    - Supportive teacher-child interactions

Findings: Outcome Specific ECE Quality Models?

- Two ECE quality measures – gains in all outcomes
  - Quality teacher-child interactions
  - Less time in whole group activities
- Different aspects of ECE quality- gains in specific child outcomes
  - Language
    - Child-specific T complex talk
    - Whole -child curricula
  - Reading and math
    - Reading: Not using whole-child curricula
    - Reading: Time in content-specific activities
  - Social Skills
    - Supportive teacher-child interactions

Conclusions

- Extend definitions of child care quality
  - Focus on different dimensions to promote different outcomes
- Child-level quality measurement
  - May be needed-for when children within a classroom have different experiences
    - Yes: T-C language exchanges
    - No: instructional time; activity grouping

UNC
FRANK PORTER GRAHAM
CHILD DEVELOPMENT INSTITUTE

Implications

- Research: Child-level observations
  - Replication
  - Examine whether more observations are needed
    - Only 20m on one morning for this study!
- Policy: may warrant
  - Developing different models for different outcomes
  - Considering degree of within-classroom variability
- Professional development: may suggest greater attention to
  - Other ECE quality dimensions
  - Individual child experiences

Longer-term Pre-K effects

- Pre-K: Short-term impacts
  - Strongest evidence: Academic skills
  - Some evidence: social skills, executive functioning
- Pre-K: Fade out
  - Growing concerns that strong impacts at entry to K disappear in the first years of school (Head Start, some Pre-K)
  - Possible explanations
    - Sustaining environments
    - Redundant instruction Pre-K and K
    - Teaching the wrong skills

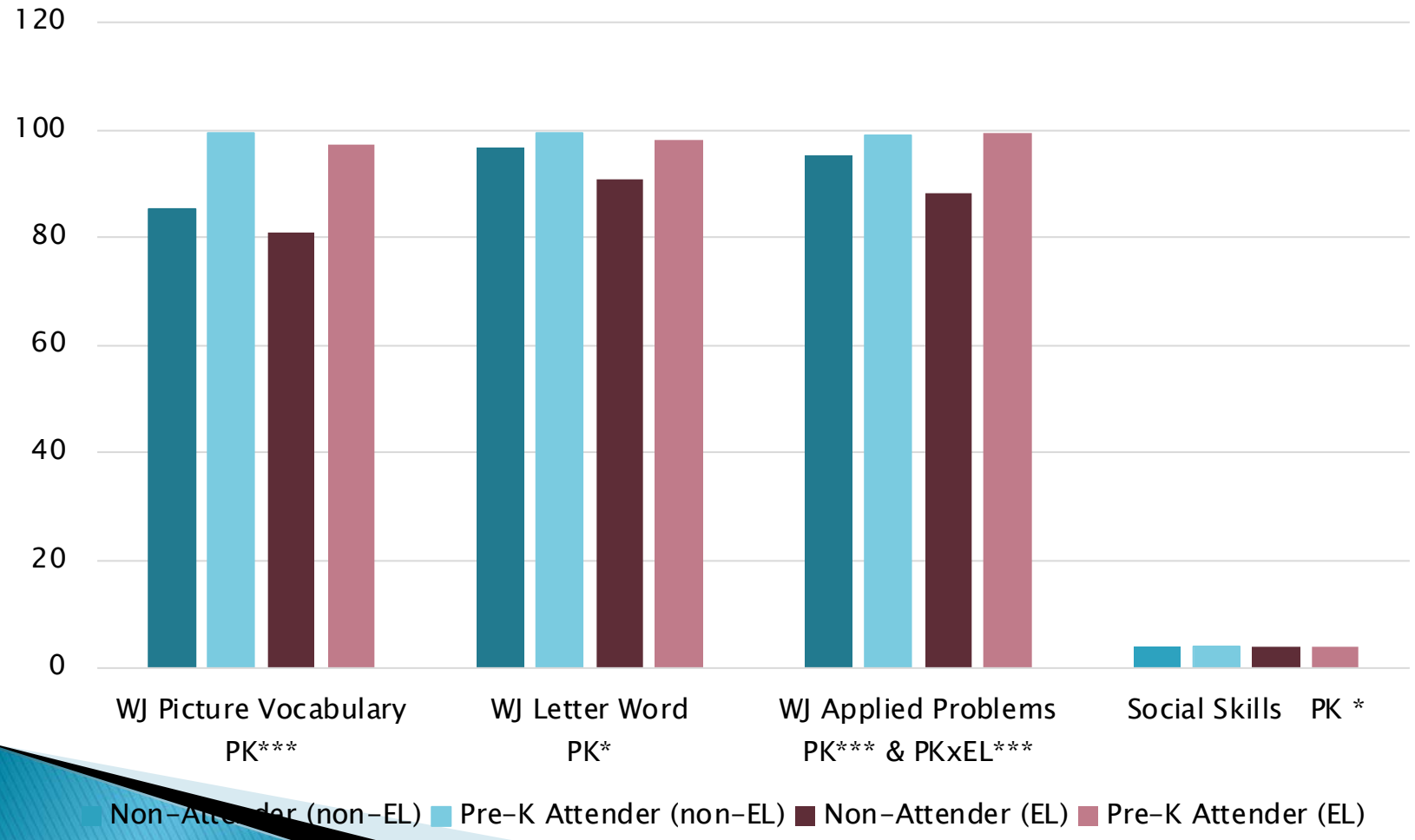
Study Sample: Pre-K Attenders and Non-Attenders

- Followed 466 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

Pre-k Attender/Non-Attender x DLL Differences at Kindergarten Entry

	K-F Vocab B(se)	K-F Reading B(se)	K-F Letter B(se)	K-F Phonic B(se)	K-F Math B(se)	K-F Inhib Control B(se)	K-F Cog Flexibt B(se)	K-F Social skills B(se)	K-F Self reg B(se)
Intercept	91.21	95.81	20.16	12.92	95.38	97.47	95.19	3.89	4.15
	(0.49)	(0.59)	(0.69)	(0.62)	(0.52)	(0.75)	(0.71)	(0.03)	(0.03)
Preschool	**3.63*** **	**3.60*** **	**1.12**	**1.44**	**4.17*** **	**1.57**	**2.30**	**0.15***	**0.06**
Group	**(0.89)**	**(1.05)**	**(1.24)**	**(1.11)**	**(0.94)**	**(1.3)**	**(1.28)**	**(0.06)**	**(0.06)**
DLL	-12.2***	-1.45	-2.10	-0.72	-5.94***	-0.47	-1.55	0.02	0.12
	(1.07)	(1.27)	(1.5)	(1.34)	(1.13)	(1.60)	(1.53)	(0.08)	(0.07)
DLL x	**1.09**	**2.66**	**4.46**	**3.84**	**5.84****	**1.96**	**0.10**	**0.11**	**0.12**
Preschool	**(1.76)**	**(2.07)**	**(2.45)**	**(2.2)**	**(1.85)**	**(2.63)**	**(2.48)**	**(0.12)**	**(0.12)**
Maternal	1.44***	1.29***	0.58*	0.97***	1.08***	0.14	0.06	0.03*	0.01
Education	(0.2)	(0.23)	(0.28)	(0.25)	(0.21)	(0.29)	(0.28)	(0.01)	(0.01)
Male	1.24	-0.01	-0.77	-1.53	0.42	-0.69	-1.53	-0.16**	-0.2***
	(0.83)	(0.98)	(1.16)	(1.04)	(0.87)	(1.22)	(1.2)	(0.06)	(0.06)
African	-0.53	1.42	-0.67	-0.42	-3.09**	-1.79	-4.41**	-0.16*	-0.13
American	(1.09)	(1.3)	(1.53)	(1.37)	(1.16)	(1.64)	(1.62)	(0.08)	(0.07)
Age	-3.67**	-9.90***	8.14***	4.49**	-6.53***	0.32	-0.68	0.21*	0.18*
	(1.23)	(1.4[illegible])	(1.72)	(1.55)	(1.32)	(1.81)	(1.75)	(0.09)	(0.08)

Fall Scores by Attender and EL Status



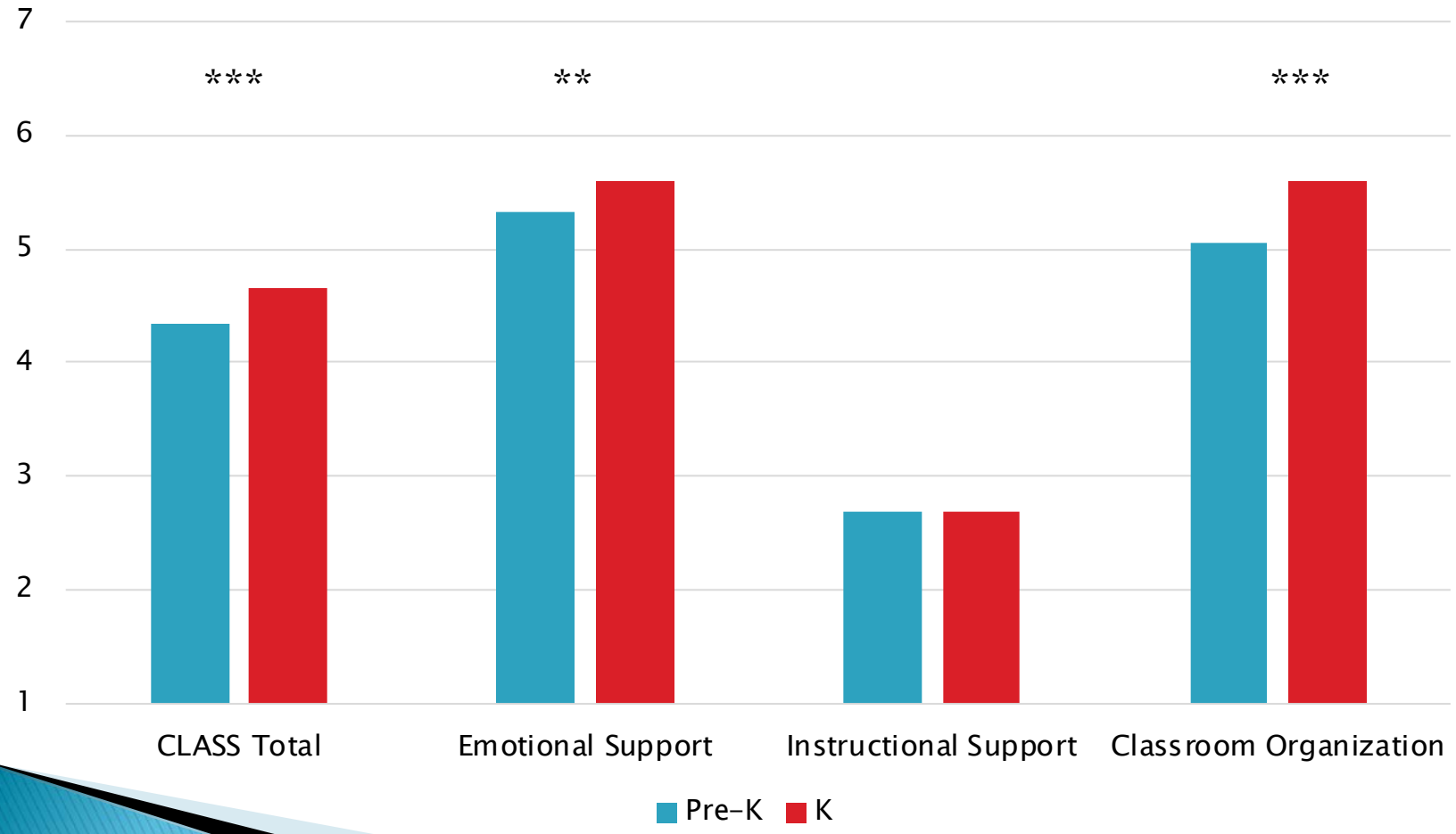
Pre-k Attender/Non-Attender x DLL Differences at Kindergarten End

	K-S Vocab B(se)	K-S Reading B(se)	K-S Letter B(se)	K-S Phonic B(se)	K-S Math B(se)	K-S Inhib Control B(se)	K-S Cog Flexibt B(se)	K-S Social skills B(se)	K-S Self reg B(se)
Intercept	93.12	110.7	34.08	39.31	101.8	99.54	97.73	4.06	4.25
	(0.28)	(0.51)	(0.52)	(0.83)	(0.49)	(0.6)	(0.71)	(0.02)	(0.02)
Fall score	0.59***	0.73***	0.36***	0.5***	0.67***	0.26***	0.3***	0.8***	0.81***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
Preschool	**0.03**	**-1.67***	**-0.22**	**0.23**	**-0.39**	**0.64**	**0.67**	**-0.03**	**-0.03**
Group	**(0.58)**	**(0.76)**	**(0.89)**	**(1.19)**	**(0.81)**	**(1.18)**	**(1.21)**	**(0.04)**	**(0.04)**
DLL	-4.3***	1.16	0.24	-3.21*	0.83	0.64	2.07	0.09*	0.10*
	(0.77)	(0.96)	(1.11)	(1.53)	(1.02)	(1.42)	(1.49)	(0.05)	(0.05)
DLL x	**1.67**	**1.08**	**3.50***	**1.72**	**-1.75**	**0.81**	**-2.13**	**0.11**	**0.11**
Preschool	**(1.13)**	**(1.48)**	**(1.77)**	**(2.42)**	**(1.61)**	**(2.27)**	**(2.33)**	**(0.07)**	**(0.07)**
Maternal	0.04	0.35*	0.33	0.13	-0.04	0.22	-0.2	0.01	0.01
Education	(0.13)	(0.18)	(0.20)	(0.27)	(0.19)	(0.25)	(0.27)	(0.01)	(0.01)
Male	0.87	0.19	-2.65**	-0.24	0.62	0.13	-3.31**	-0.12***	-0.11**
	(0.54)	(0.69)	(0.83)	(1.11)	(0.75)	(1.08)	(1.13)	(0.04)	(0.04)
African American	-0.47	-3.00**	-0.34	-2.2	-2.88**	-1.29	1.88	0.03	0.02
	(0.71)	(0.92)	(1.1)	(1.49)	(1.02)	(1.33)	(1.49)	(0.05)	(0.05)
Age	-0.40	-3.52	2.94*	2.97	-4.2***	-8.53***	-6.01***	0.10	0.09

Possible explanations

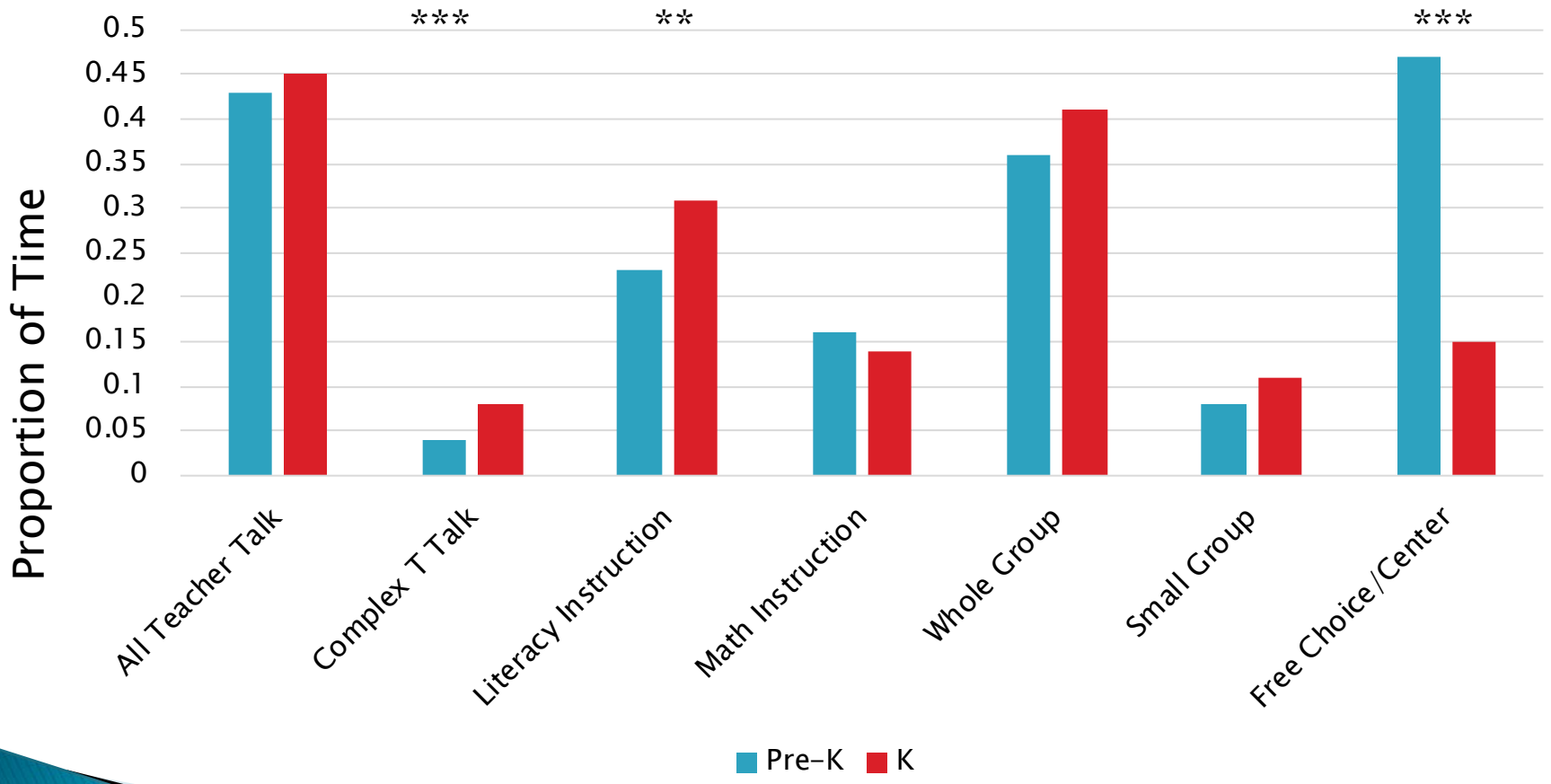
- Sustaining Environments
  - Quality was higher in K than PK
  - No evidence that K CLASS or difference in PK and K CLASS related to residualized gains in K among PK attender

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



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

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



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

Continuity and Change in Classroom Quality

	K Vocab	K Reading	K Letter sound	K Phonic	K Math	K Inhib Control	K Cog Flex	K Social Skills	K Self Reg
Emotional Support K-PK	0.02 (0.04)	0.10* (0.05)	0.06 (0.05)	0.02 (0.05)	0.03 (0.05)	0.03 (0.06)	0.10 (0.06)	0.10 (0.05)	0.10 (0.05)
Classroom Organization K-PK	0.04 (0.04)	0.07 (0.05)	0.02 (0.05)	0.00 (0.05)	-0.03 (0.04)	-0.02 (0.06)	-0.01 (0.06)	0.08 (0.05)	0.08 (0.05)
Instructional Support K-PK	0.03 (0.04)	0.03 (0.05)	0.03 (0.06)	-0.02 (0.05)	0.01 (0.04)	0.07 (0.06)	0.00 (0.06)	0.08 (0.06)	0.04 (0.05)

Redunancy in Instructional Content

	K Vocab	K Reading	K Letter sound	K Phonic	K Math	K Inhib Control	K Cog Flexibty
Literacy rigor mean	0.04 (0.04)	0.10* (0.05)	0.06 (0.06)	0.05 (0.06)			
Literacy rigor K-PK	0.03 (0.04)	0.04 (0.05)	0.09 (0.05)	0.07 (0.05)			
Math rigor mean					-0.01 (0.05)	0.00 (0.07)	-0.11 (0.07)
Math rigor K-PK					0.01 (0.04)	0.04 (0.06)	-0.08 (.06)

Identifying which school readiness skills predicted K gain in skills

School readiness skill	K Vocab	K Reading	K Letter sound	K Phonic	K Math	K Inhib Control	K Cog Flexibt	K Social skills	K Self reg
Language	0.64*** (0.04)				0.10* (0.04)				-0.10** (0.04)
Reading	0.08* (0.03)	0.61*** (0.03)	0.12* (0.05)	0.14** (0.04)	0.14*** (0.04)				
Math	0.08* (0.03)	0.08* (0.04)	0.11* (0.05)	0.12* (0.05)	0.46*** (0.04)		0.24*** (0.06)	0.14*** (0.04)	
Inhibitory Control			0.17*** (0.04)	0.14*** (0.04)	0.10** (0.03)	0.25*** (0.04)		0.06* (0.03)	0.07* (0.03)
Cognitive Flexibility					0.09** (0.03)		0.24*** (0.05)		
Self-regulation		0.14*** (0.03)	0.12** (0.04)	0.17*** (0.04)				0.65*** (0.03)	0.75*** (0.03)

School readiness skills

- This study:
  - Cognitive and social skills > language and literacy in predicting gains in K
  - Cognitive and social skills – target of the Perry Preschool and Abecedarian Project

Summary

- Child care programs (HS & Pre-K, including this study)- impressive short term impacts
- Growing evidence – focus on additional quality dimension.
  - Teacher talk – child vocabulary
  - Instructional time and curriculum: literacy skills
  - Whole group – (negative) language, EF
- Growing evidence – Fade out in K
  - This study: likely explanation is focus on literacy skills, not math and self regulation in Pre-K.

Possible implications

- Rethink our quality performance standards
  - Process quality: CLASS/ECERS may not be sufficient
- Rethink focus on literacy instruction – perhaps more on promoting
  - Cognitive skills such as math & EF
  - Social skills such as self-regulation