Curriculum: The secret ingredient in early childhood program quality?

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Three questions

- What are indicators of quality in Early Childhood Programs?
- What mechanisms do those indicators of quality suggest—in other words, what actually makes a difference?
- How can the quality of EC programs be improved?

And a few themes

- Defining quality is not straightforward
- Developmentally appropriate practice (DAP) is cognitively challenging practice (CCP)
- Time on task really matters
- We learn from ‘failures’ as well as from successes

The facts

- Quantity and accessibility of EC programs are increasing rapidly
- BUT many EC classrooms devote little time to instruction
- The quality of instruction delivered is often low
- Interventions typically have greater effect on aspects of classroom quality **other than instruction**

Thus the big question

Why is instructional quality so difficult to improve?

Indicators of instructional quality

- Teachers' language
- Intensity of instructional activities
- Integration of language with content
- Presence of a curriculum

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But what do we mean by 'curriculum'?

What do we mean by curriculum?

Curriculum at its best is a support for teachers, a set of resources to draw from, rather than a constraint on either teachers or children

Speculation about the difficulty of improving instructional quality

- Teacher skills and capacities
  - As users of language
  - As applied developmentalists
- Teacher beliefs
- Supports for integration and content
- Supposed conflict between DAP and CCP
- Child-centered effects on classrooms
- Guidance for selecting curricula and activities

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DAP: Developmentally appropriate practice

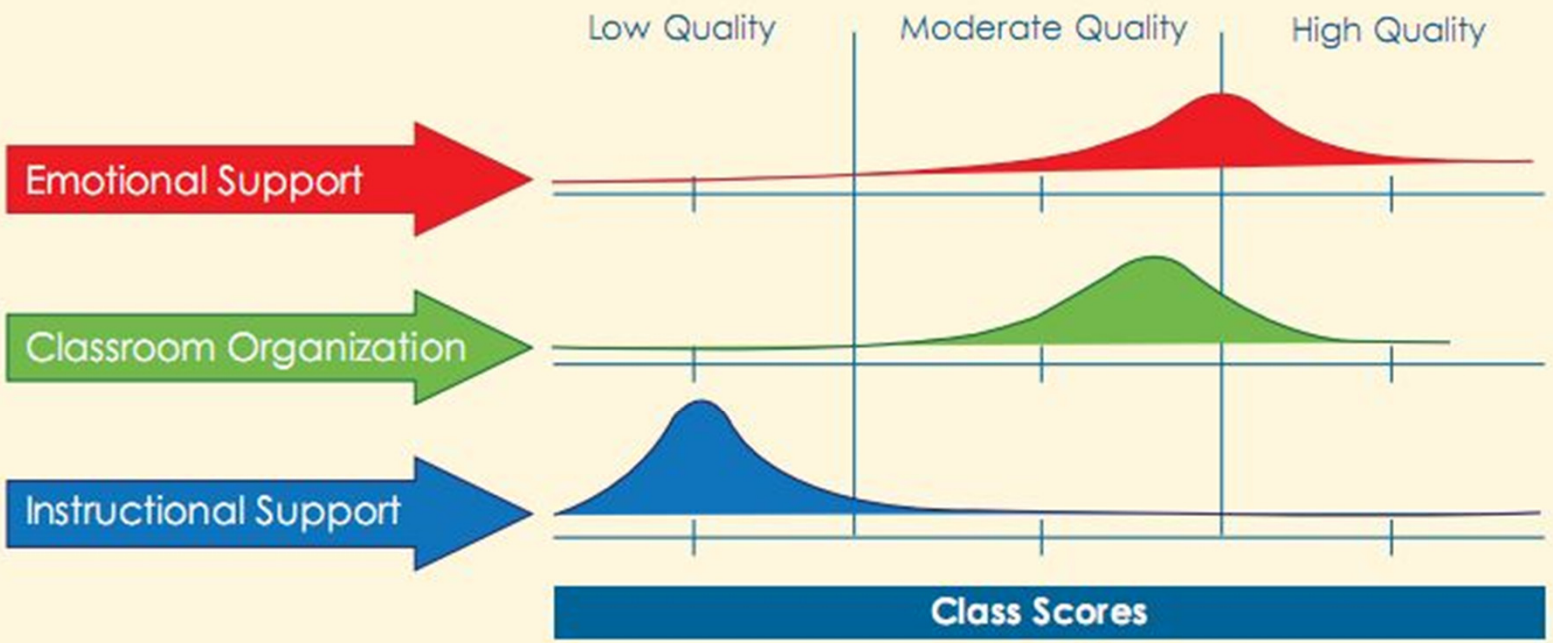
- Supposed conflict between DAP and CCP
- Child-centered effects on classrooms
- Guidance for selecting curricula and activities

CCP: Cognitively challenging practice

The facts

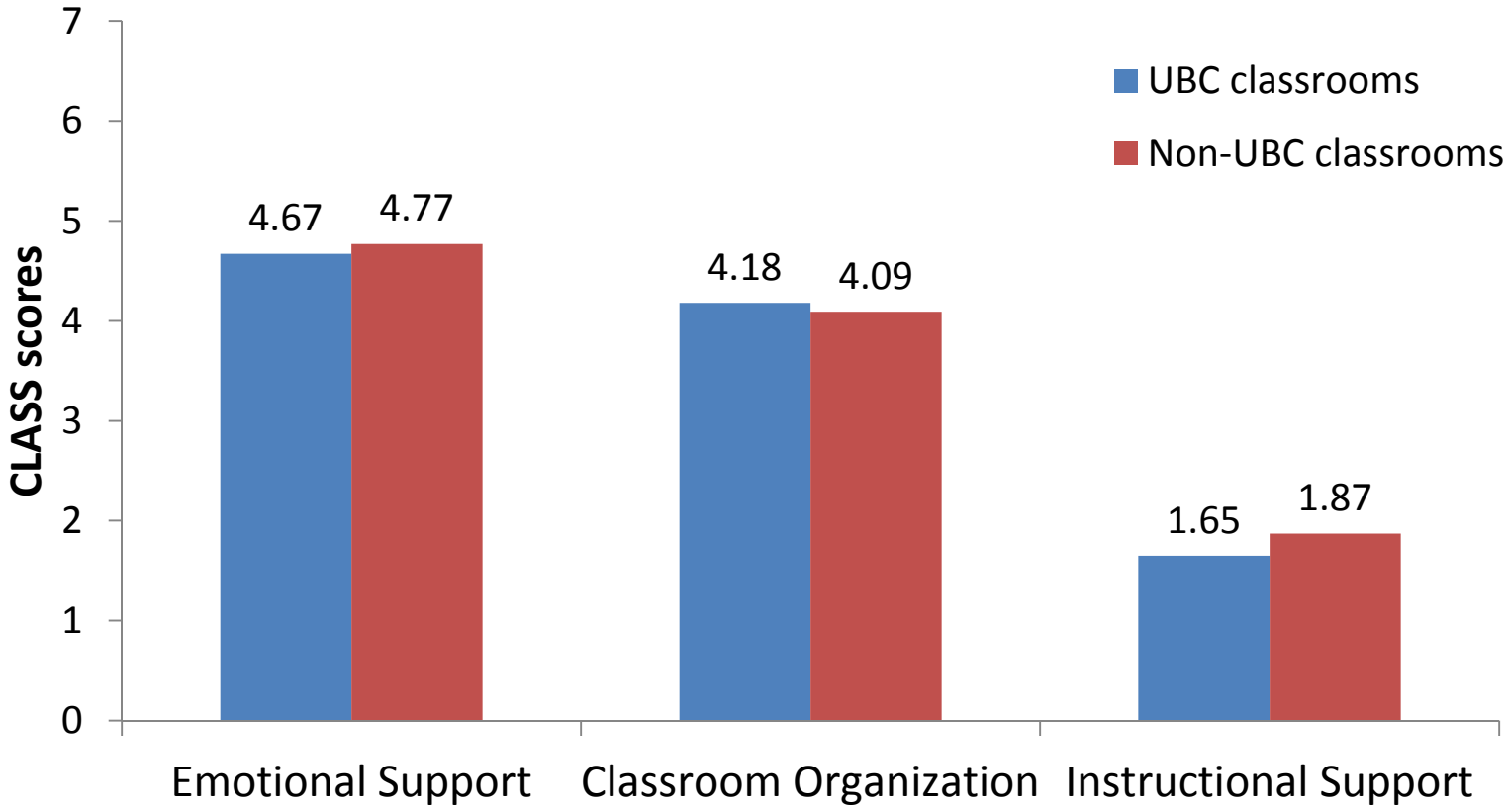
- Instructional quality in EC is typically much lower than other quality indicators

Average Ratings of Interactions in Pre-K - 3rd Classrooms



CLASS in CHILE: Mean CLASS scores at the beginning of pre-K in UBC and comparison classrooms

WU2



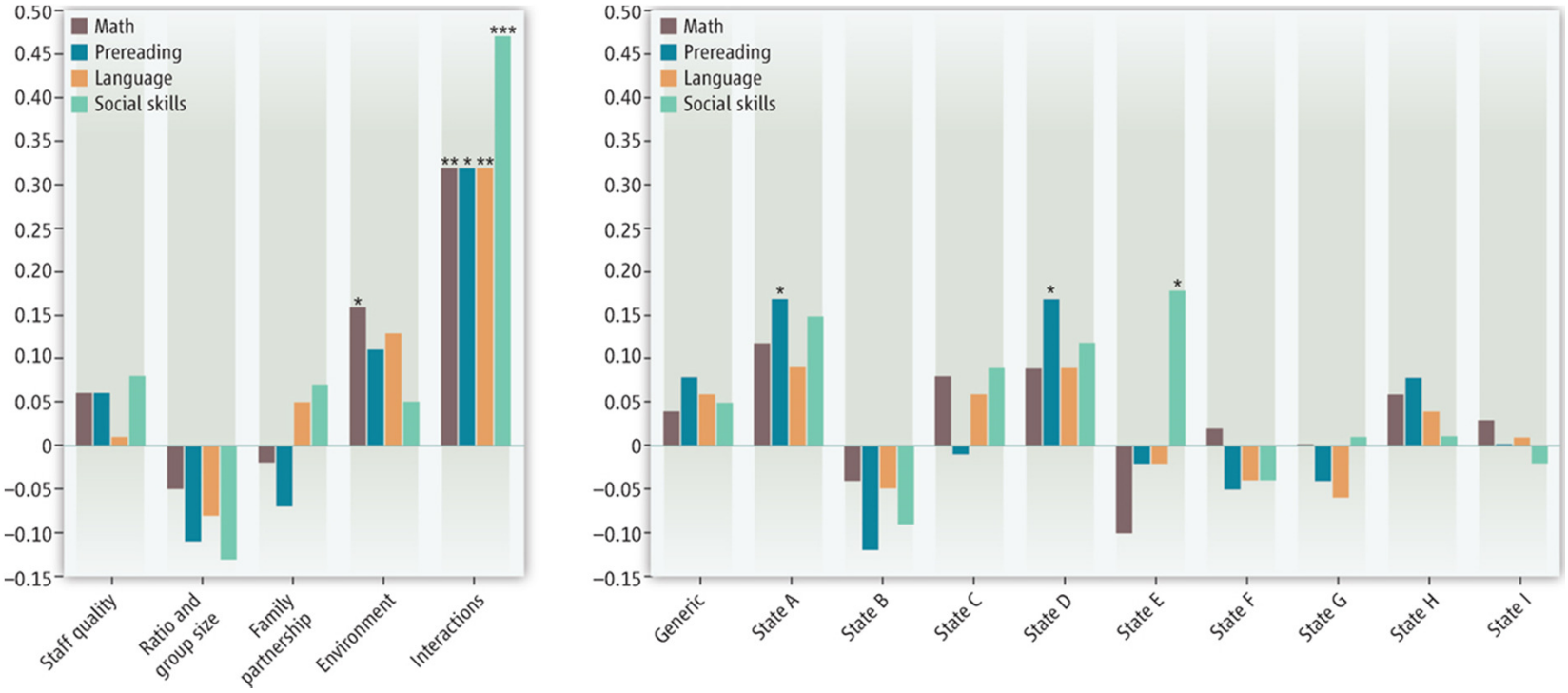
~p<.10, *p<.05, ***p<.001

WU2 or 'Mean scores on the CLASS' if you prefer
Windows User, 25/04/2013

The facts

- Interactional quality predicts child outcomes, other aspects of quality ratings do not (Sabol et al., 2013)

On most measures of children's learning, programs rated high by QRIs produce outcomes that are not significantly better than those of low-rated programs.Stars indicate a statistically significant difference in math, prereading, expressive language, and social skills (*P < 0.05, **P < 0.01, ***P < 0.001), see SM. (Left) QRIS individual measures.



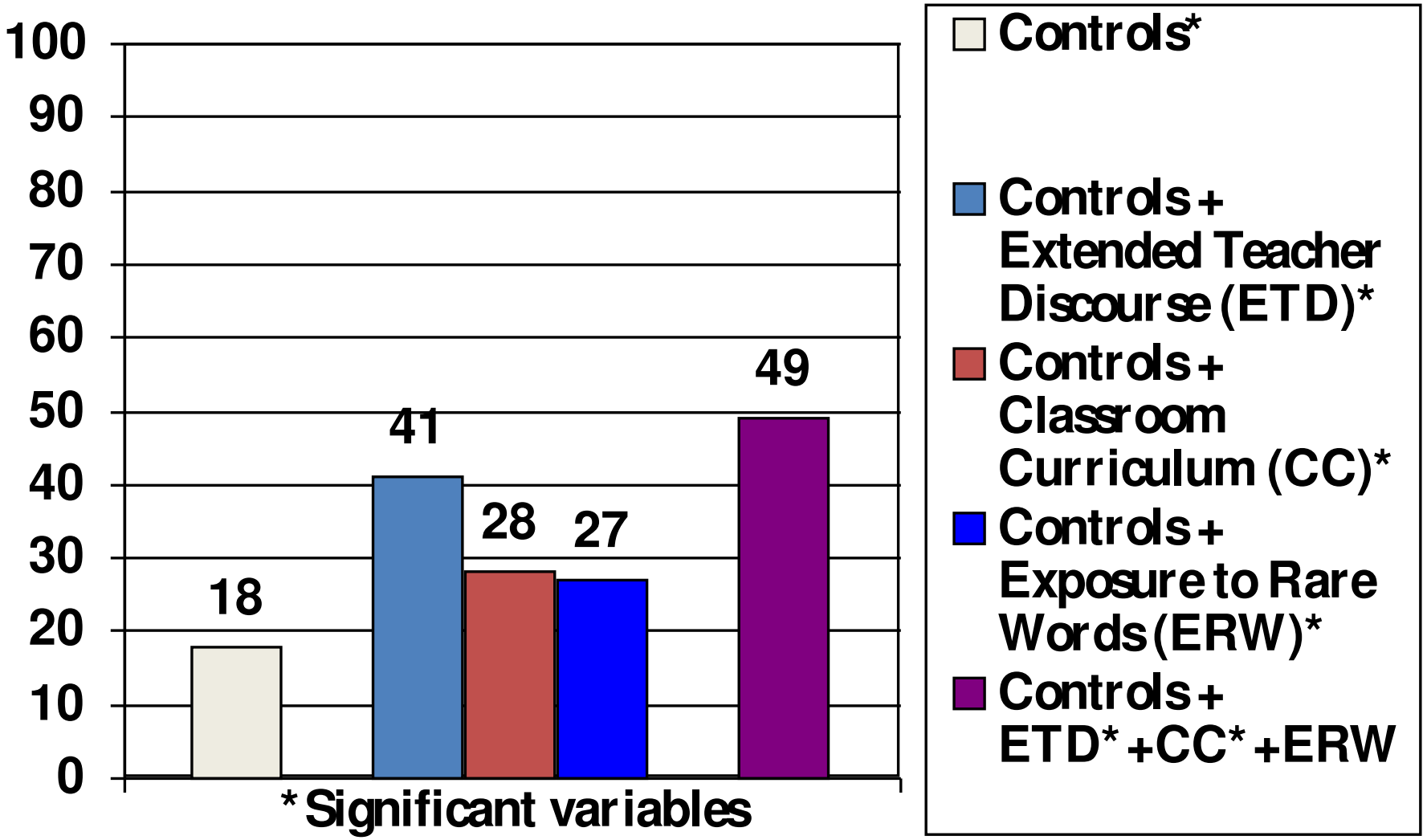
T J Sabol et al. Science 2013;341:845-846

The facts

- Aspects of teacher talk are key predictors of long-term good outcomes for children
  - Extended discourse
  - Vocabulary diversity
  - Syntactic complexity

Predicting Receptive Vocabulary: Preschool Environment Variables

From Snow, Tabors & Dickinson, 2002



Direct effects of preschool classroom measures on Grade 4 outcomes

Predicting Grade 4 comprehension from preK teacher talk

Teacher use of sophisticated vocabulary in free play (r_p = .29)

Teachers' attention-related utterances in large group (r_p = .25)

Dickinson, D.K. & Porche, M.V. (2011). Relation Between Language Experiences in Preschool Classrooms and Children's Kindergarten and Fourth-Grade Language and Reading Abilities. Child Development, 82, 870-886.

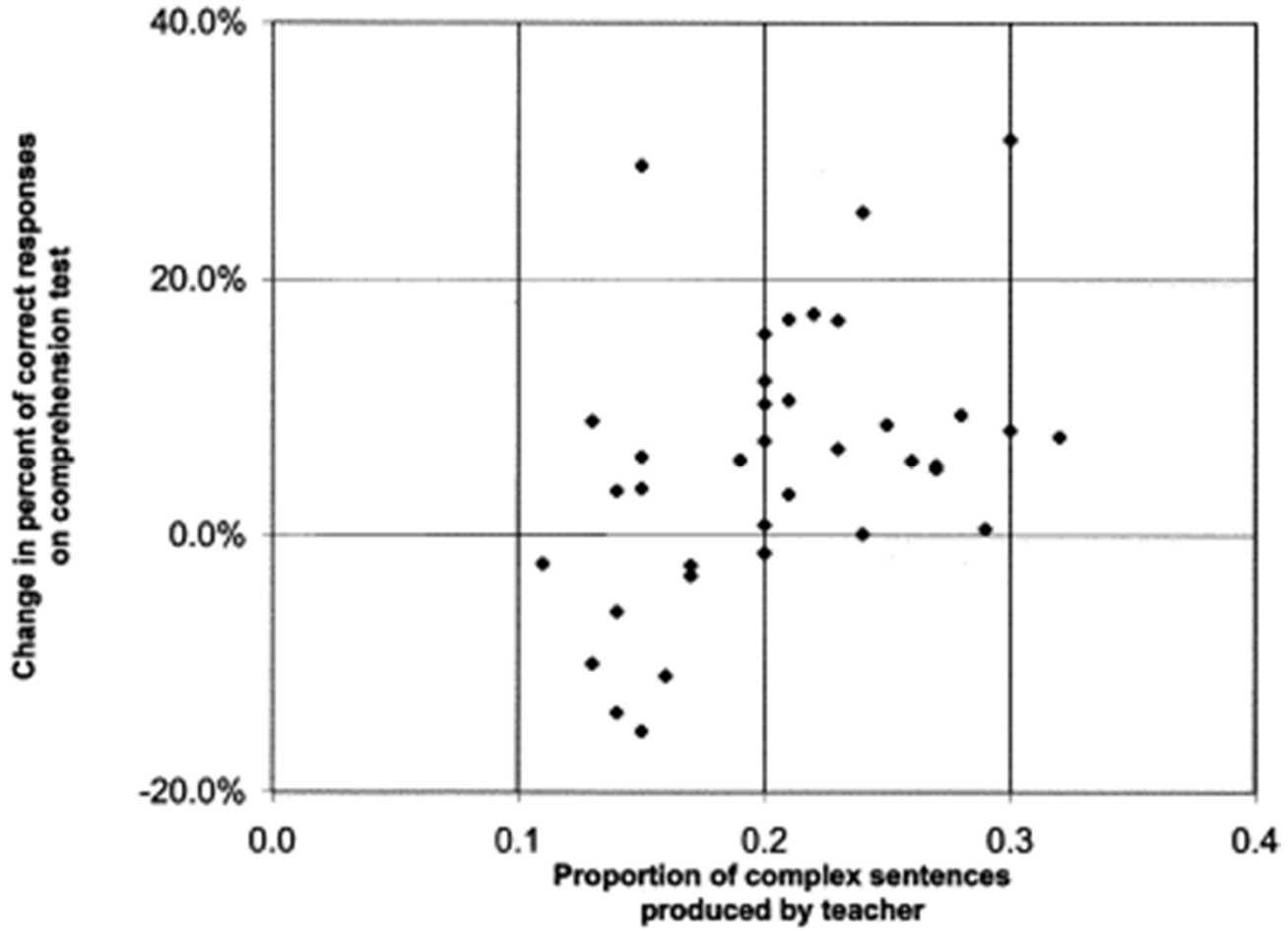
Two sample items from the comprehension test, Study 2 (Huttenlocher et al., 2002).

The boy is looking for the girl behind a chair, but she is sitting under the table.

The baby is holding the big ball and the small block.

Huttenlocher, J., Vasilyeva, M., Cymerman, E., & Levine, S. (2002). Language input and child syntax. Cognitive Psychology, 45, 337–374

Fig. 8. The relation of the proportion of complex sentences in teacher speech to change in comprehension scores (Huttenlocher et al., 2002).



Huttenlocher et al. study

- 40 classrooms from 17 preschools, Chicago
- Child SES predicted comprehension pretest (r = .48)
- Mean class growth in comprehension not related to SES
- Classroom factors predicted growth in comprehension:
  - Proportion of complex (multiclause) utterances in teacher talk (r = .42)
  - Overall rating of teaching quality (r = .32)
- BUT in a regression teacher syntax explained much more variance (18% vs 4%)!

The facts

- Three different teacher talk predictors
  - Extended discourse
  - Vocabulary diversity
  - Syntactic complexity
- Actually all aspects of the same strategy – talk about interesting things in interesting ways

Three questions

- What are indicators of quality in Early Childhood Programs?

  CLASS, frequency of interactions

- What mechanisms do those indicators of quality suggest—in other words, what actually makes a difference?
- How can the quality of EC programs be improved?

One effort to answer question 2 by building those features in!

- UBC program was designed to promote richer teacher talk (among other things)
- A cluster randomized trial
- A major investment in professional development and coaching as a mechanism

Diana Leyva, Hirokazu Yoshikawa, Ernesto Trevino, Andrea Rolla, M. Clara Barata, Christina Weiland, Susana Mendive, Mary Catherine Arbour, Paula Fernandez, many coaches, Fundacion Oportunidad Educacional

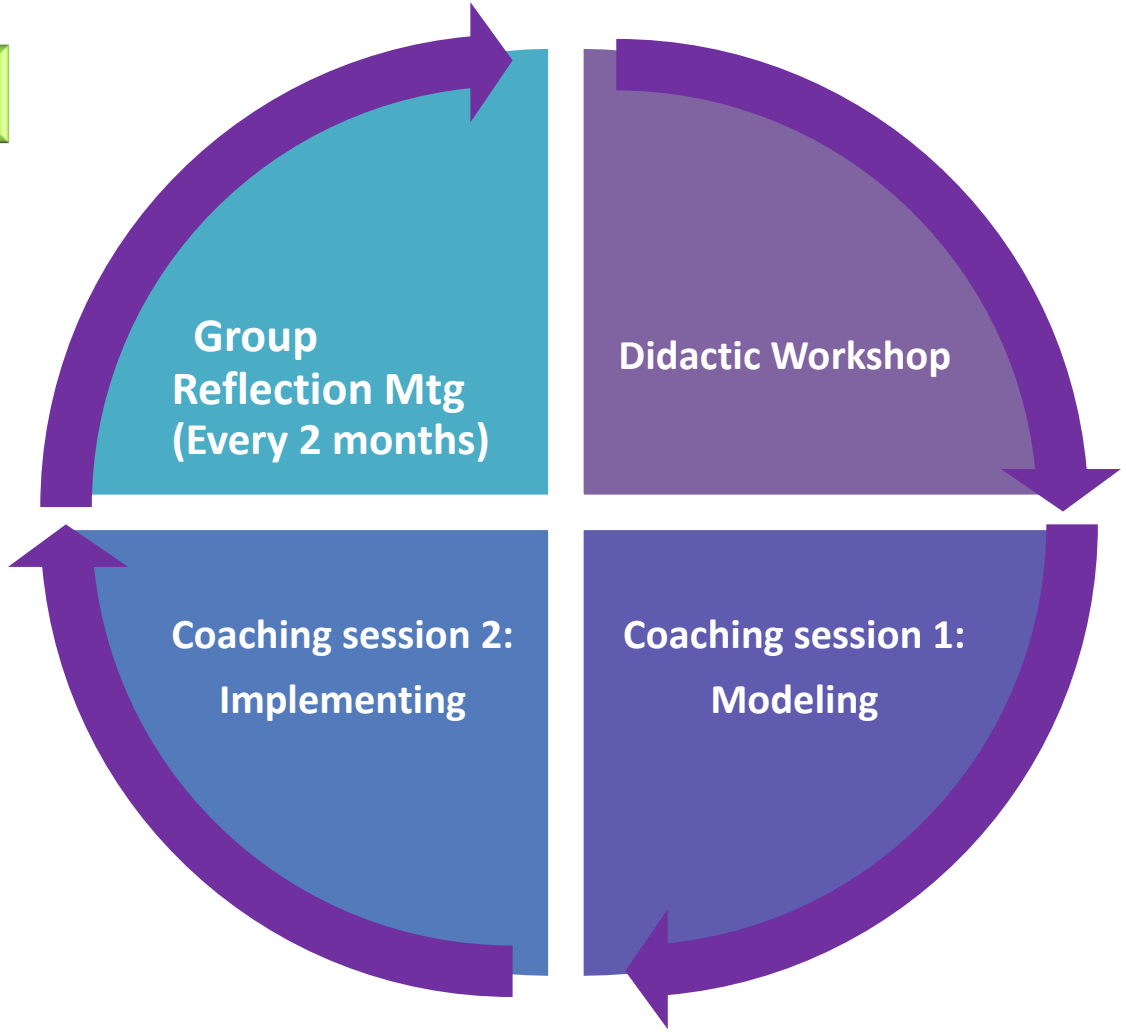
http://www.fundacionoportunidad.cl

UBC (Un Buen Comienzo) is an initiative to improve quality of preschool in Chile through a coaching-based teacher professional development program.

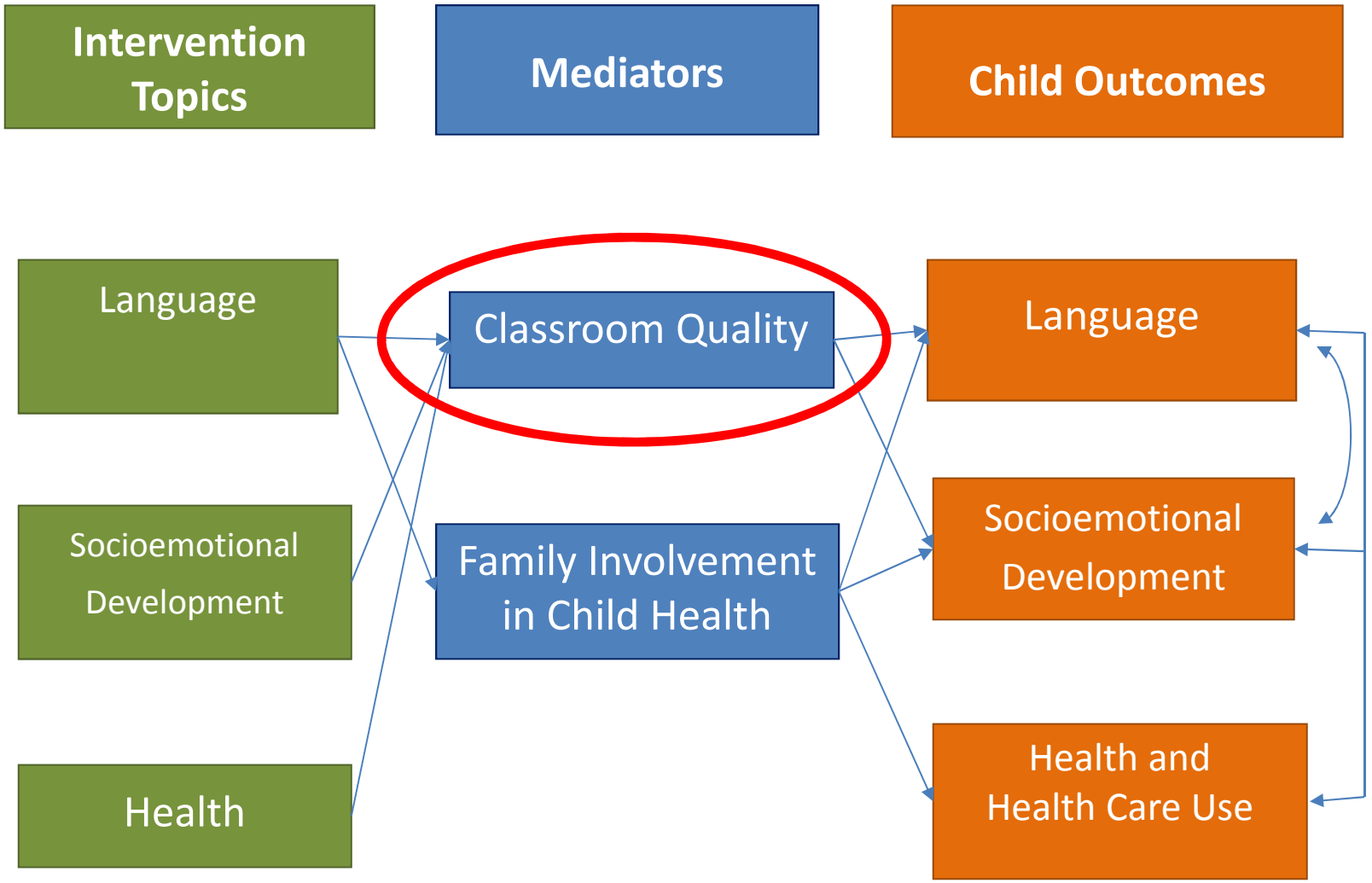
12 cycles in 2 years of program

Coaching session:

- PRE
- Modeling/ Implementing
- POST

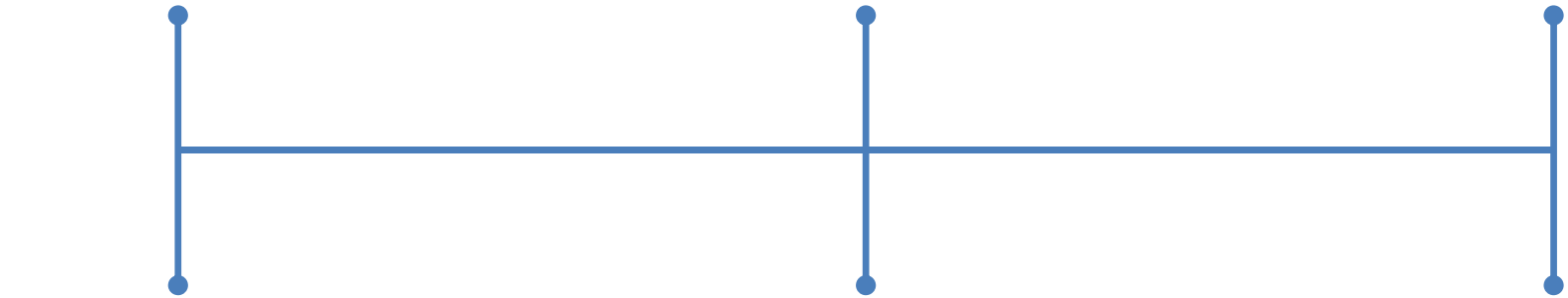


UBC Theory of Change

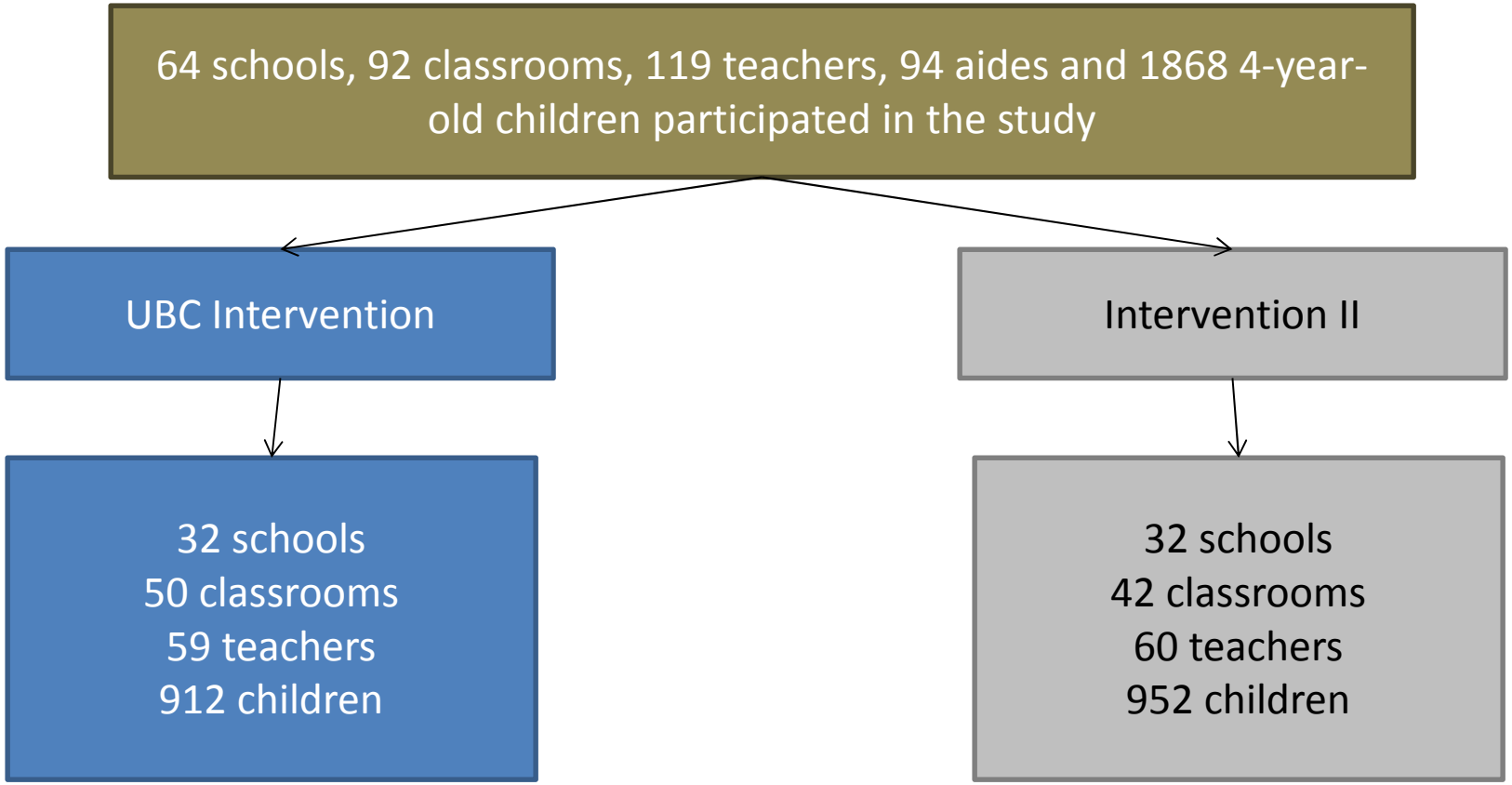


CLASS
Classroom Assessment Scoring System©

classroom quality assessment
teacher and parent questionnaires

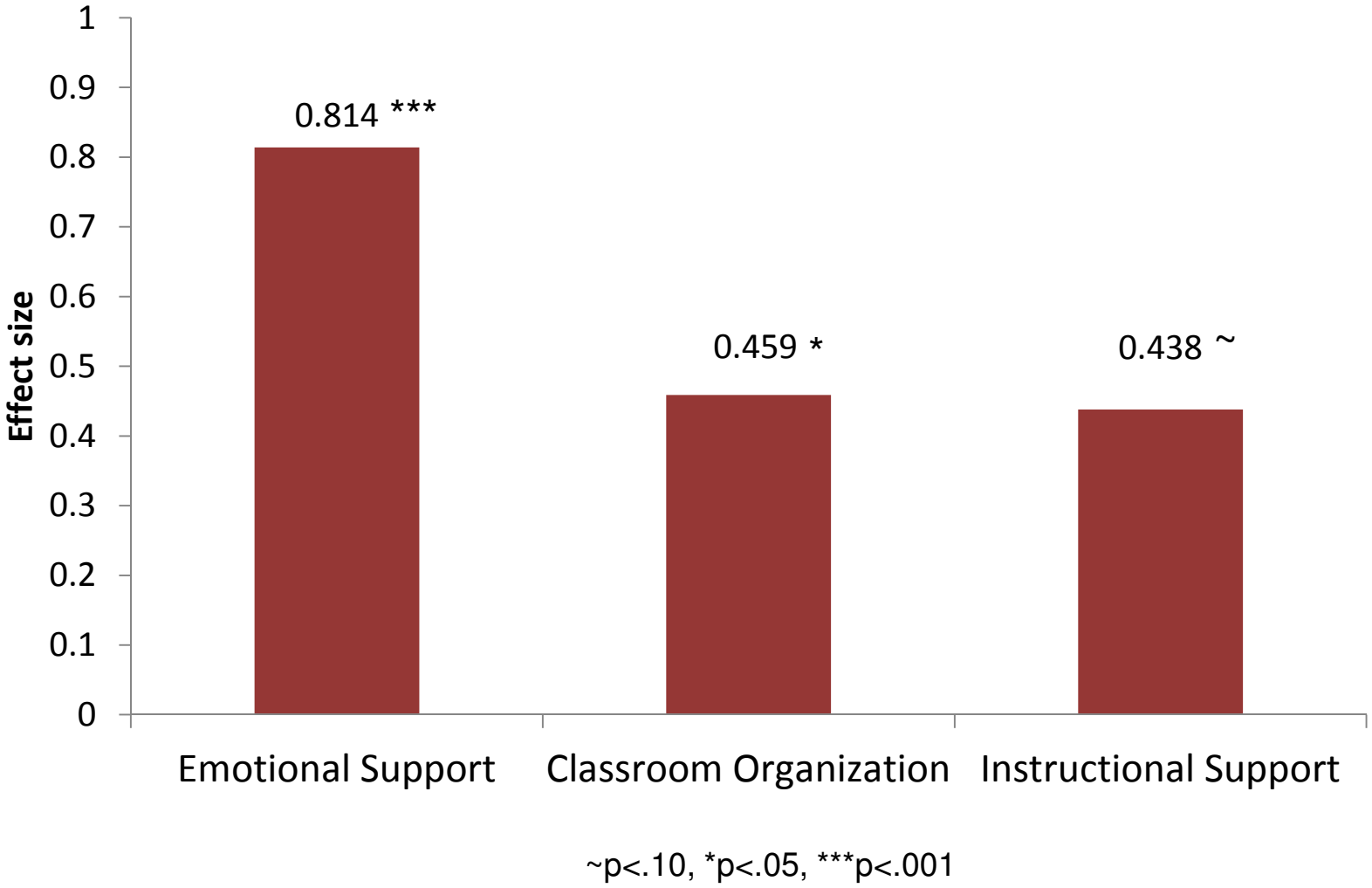


Beginning of pre-K **End of pre-K** **End of K**

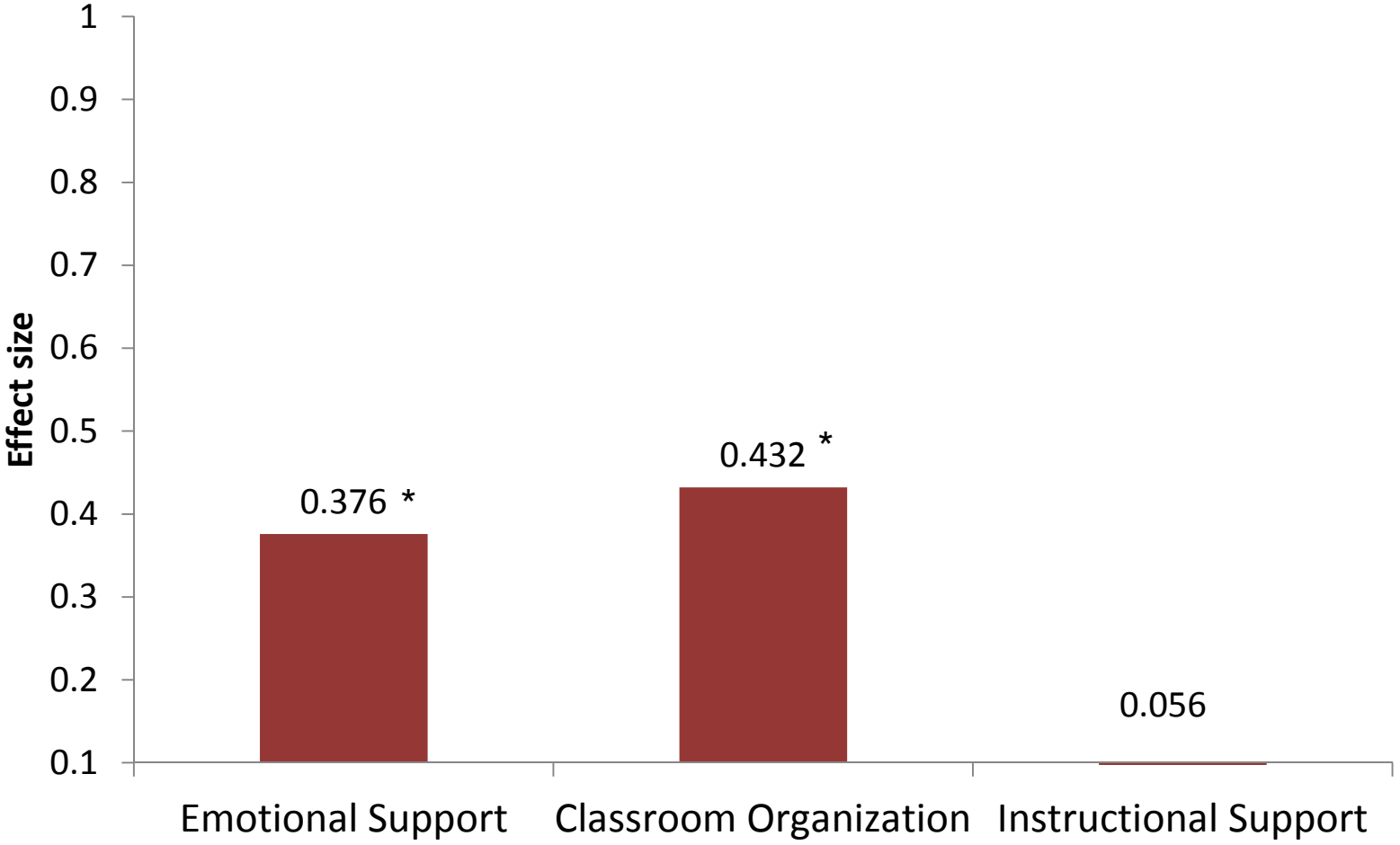


Six low-income municipalities in Santiago, Chile

After one year of intervention: UBC pre-K classrooms had better emotional support, classroom organization and instructional support than non-UBC classrooms

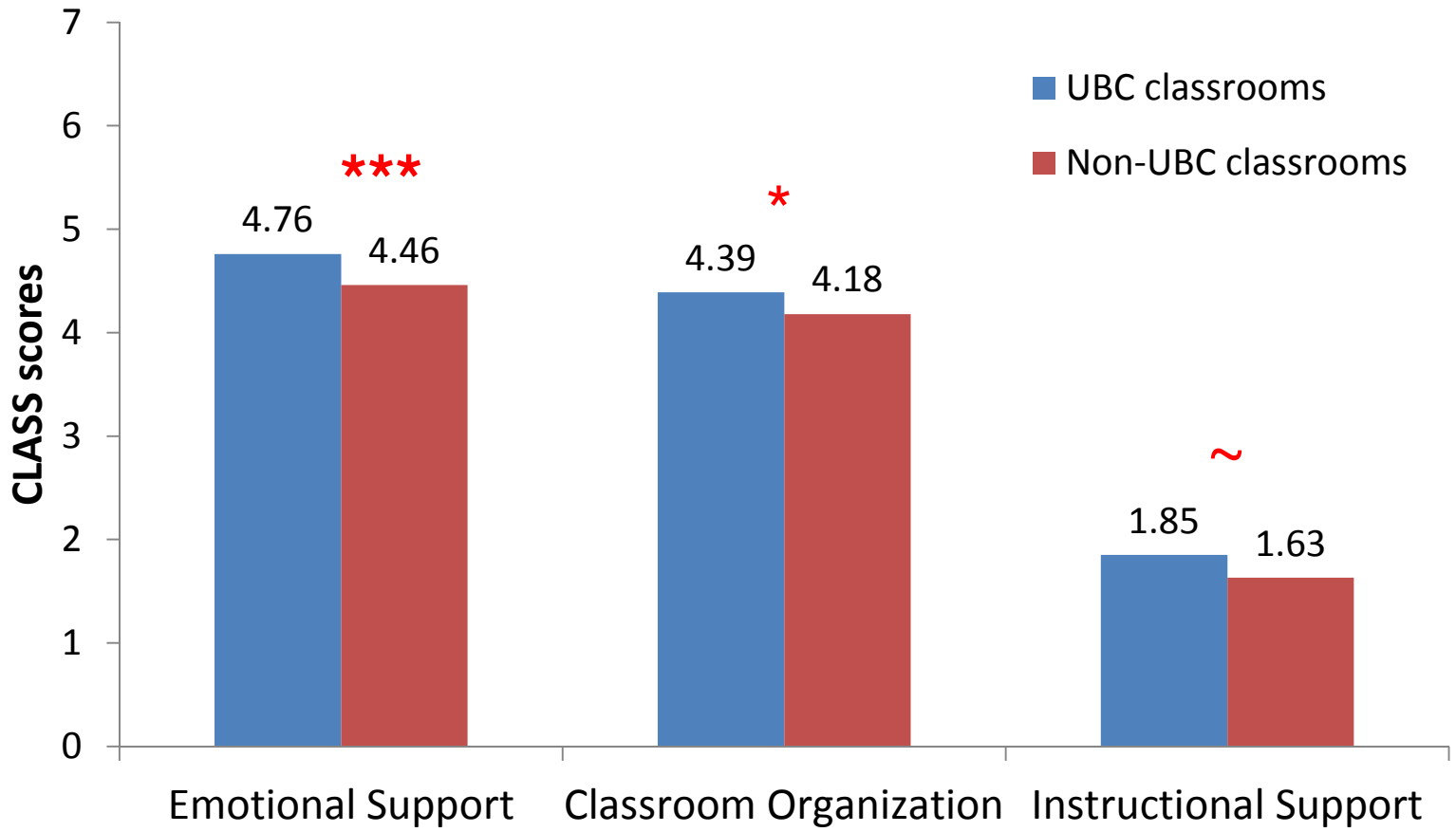


Second year of intervention: UBC K-classrooms were better in emotional support and classroom organization than non-UBC classrooms



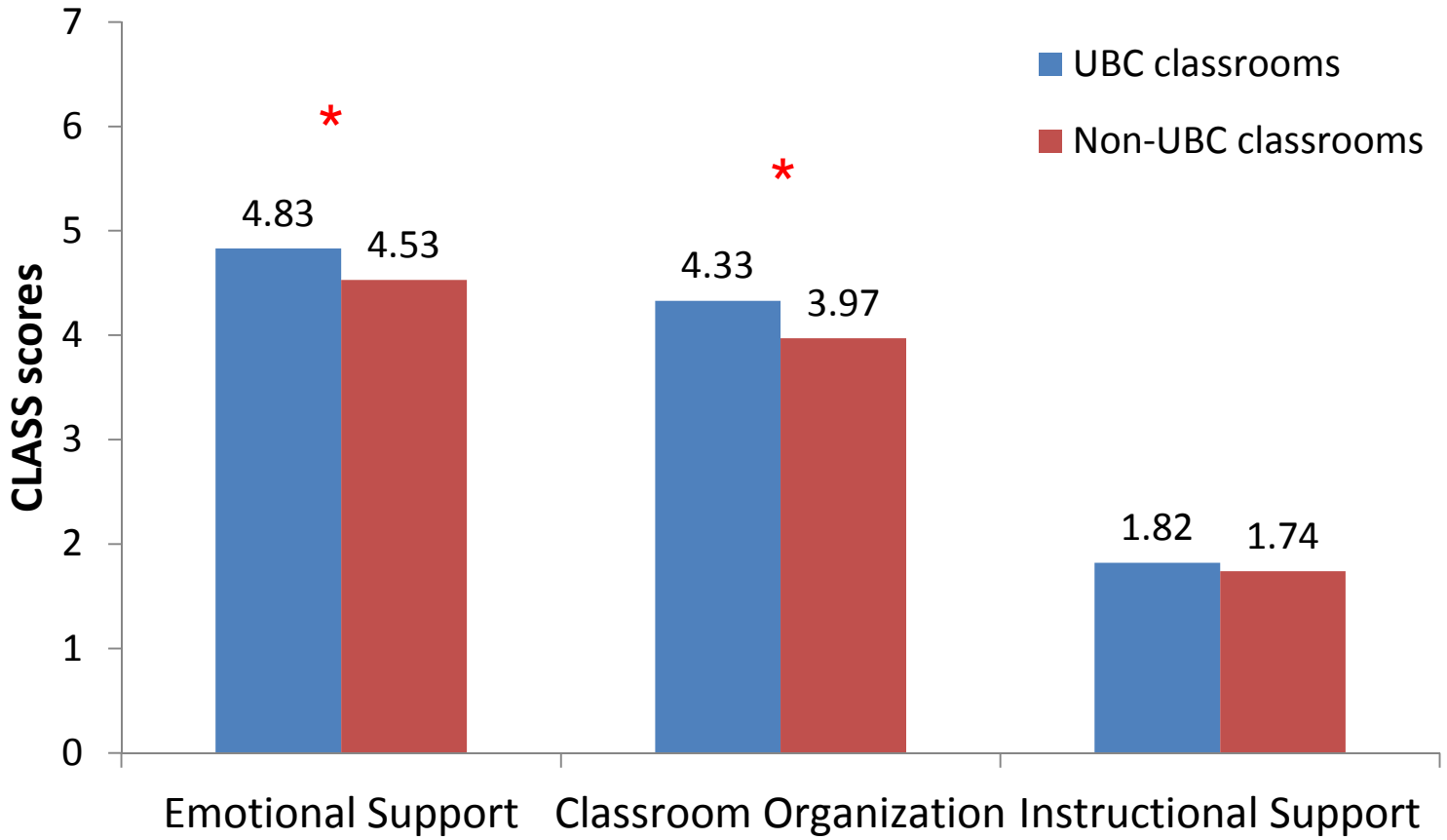
~p<.10, *p<.05, ***p<.001

Mean CLASS scores at the end of pre-K (after one year of intervention)



~p<.10, *p<.05, ***p<.001

Mean CLASS scores at the end of K (end of intervention)



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Trying to build those features in

- UBC program was designed to promote richer teacher talk (among other things)
- A major investment in professional development and coaching as the mechanism
- With small positive results for classrooms
- But none for kids! Why not?

Trying to build those features in

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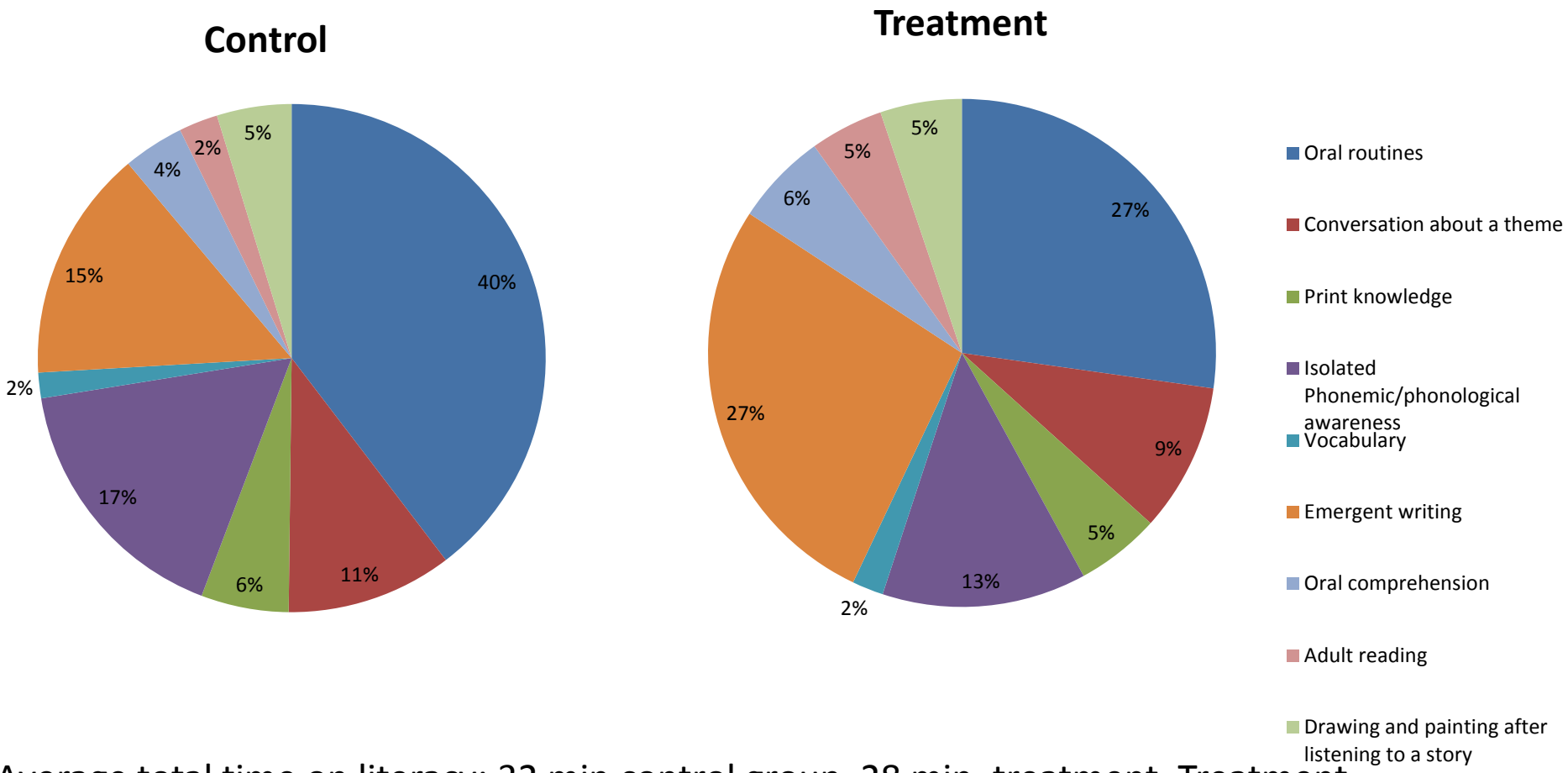
✓ Lack of support from school leaders?

✓ Limited time committed to program-based practices (Mendive & Weiland)?

✓ High levels of absenteeism among children (Arbour)?

Literacy Dosage, End of Kindergarten



-Average total time on literacy: 32 min control group, 28 min. treatment. Treatment classrooms spent less time than control classrooms on oral routines ($p<.05$)

- Oral routines was the predominant literacy topic and is considered lower quality.

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Implications: Build those features in!

- A major investment[illegible]essional development and coac[illegible]
- With sma[illegible]ooms
- But none[illegible]
- Lack [illegible]
- Limited time[illegible]n-based practices (Me[illegible]
- High levels of a[illegible]senteeism am[illegible]ng children (Arbour)

A failure? Perhaps, but a noble and illuminating 'failure'

Trying to build those features in

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Learning about quality from ‘failures’

Rich descriptions of normal classroom interactions

Targeted analyses of those interactions

Longitudinal analyses relating interactional features to child outcomes

Jocelyn Bonnes Bowne

Mayra Mascareña-Lara

Ligia Gomez

Mascareño (2014), Learning Opportunities in Kindergarten Classrooms: Teacher-child interactions and child developmental outcomes

- Proportion of complex language during read-alouds predicted child comprehension outcomes
- Profile-based analysis of children revealed positive effect of UBC – lower incidence of high risk profiles in K
- Frequency of shifts in level of talk during read-alouds predicted vocabulary outcomes

Mascareño, 2014: Strong sequential association between the level of complexity of teacher initiations' and that of children's answers

Summary of transition matrix with 1 lag

Teacher \ Child(ren)	Literal	Inferential	
Literal	83	4	87
Inferential	21	51	72
	104	55	159

- Strong sequential association
  - Yules' Q = 0.96
  - $p < .0001$ Monte Carlo simulations

Gomez 2014 dissertation (BC)

- Analyzed book-reading at end of Pre-K
- Treatment teachers more likely to be reading during videos
- Treatment teachers used more words, more different words, and longer utterances while reading aloud
- Treatment teachers used more different strategies
- Only treatment teachers talked about or requested comprehension strategies

Gomez 2014 dissertation (BC)

- No prediction to child outcomes from quantity measures
- High-level strategy use predicted growth in child vocabulary for treatment classrooms only
  - Analysis or Prediction
  - Request for Analysis or Prediction
  - Summary
  - Request for Summary
  - Vocabulary

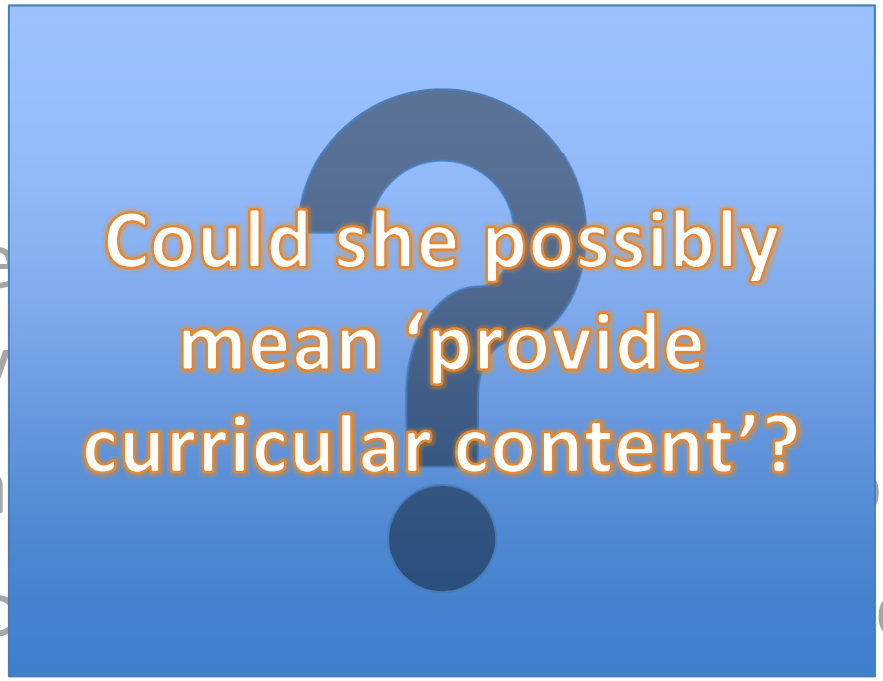
Three questions

- What are indicators of quality in Early Childhood Programs? CLASS, frequency of interactions
- What mechanisms do those indicators of quality suggest—in other words, what actually makes a difference? Teacher talk, child talk
- How can the quality of EC programs be improved?

Better teacher talk!

- UBC suggests that PD and coaching is only marginally effective.
- Maybe start with better teacher stock?
- Maybe focus on better preservice education?
- Maybe provide teachers with more support for good talk?

Better teacher talk!

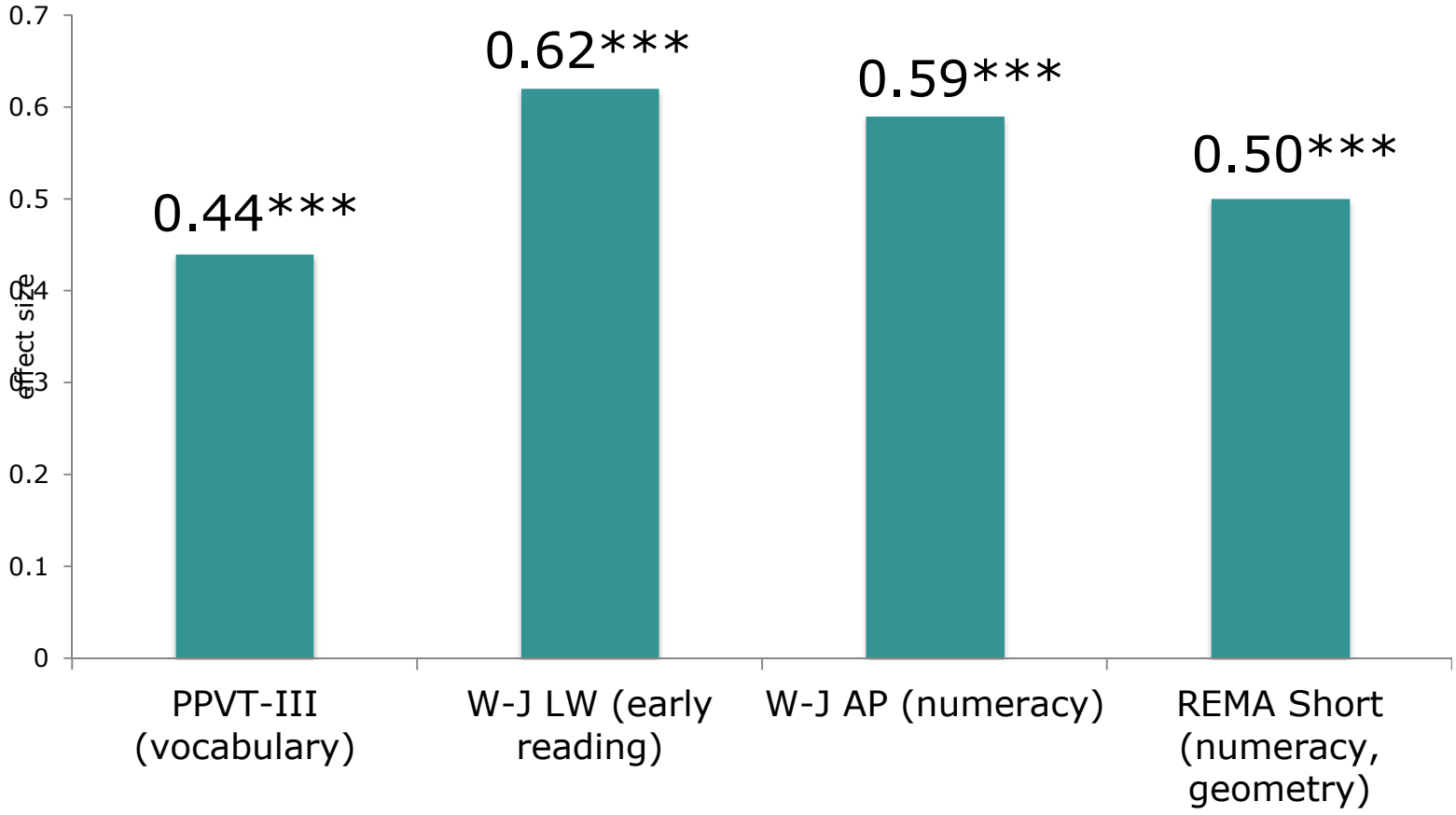


- UBC sugge… is only marginally…
- Maybe sta… ck?
- Maybe foc… ducation?
- Maybe provide teachers with more support for good talk?

YES! Some promising examples

- Weiland, Yoshikawa & Sachs using OWL and Building Blocks in BPS preK classrooms
- Lucia French's ScienceStart! http://journal.naeyc.org/btj/200209/ScienceInThePreschoolClassroom.pdf
- Duke's information-based and project-based literacy http://teacher.scholastic.com/products/classroombooks/buzzabout.htm
- Zhou & Chen's bilingual curriculum in Xinjiang

Results: Language, Literacy, and Mathematics



Weiland and Yoshikawa, 2013

Chen (2014):A Randomized Controlled Trail of a Chinese Literary Intervention in Xinjiang Bilingual Kindergartens: A Longitudinal Study

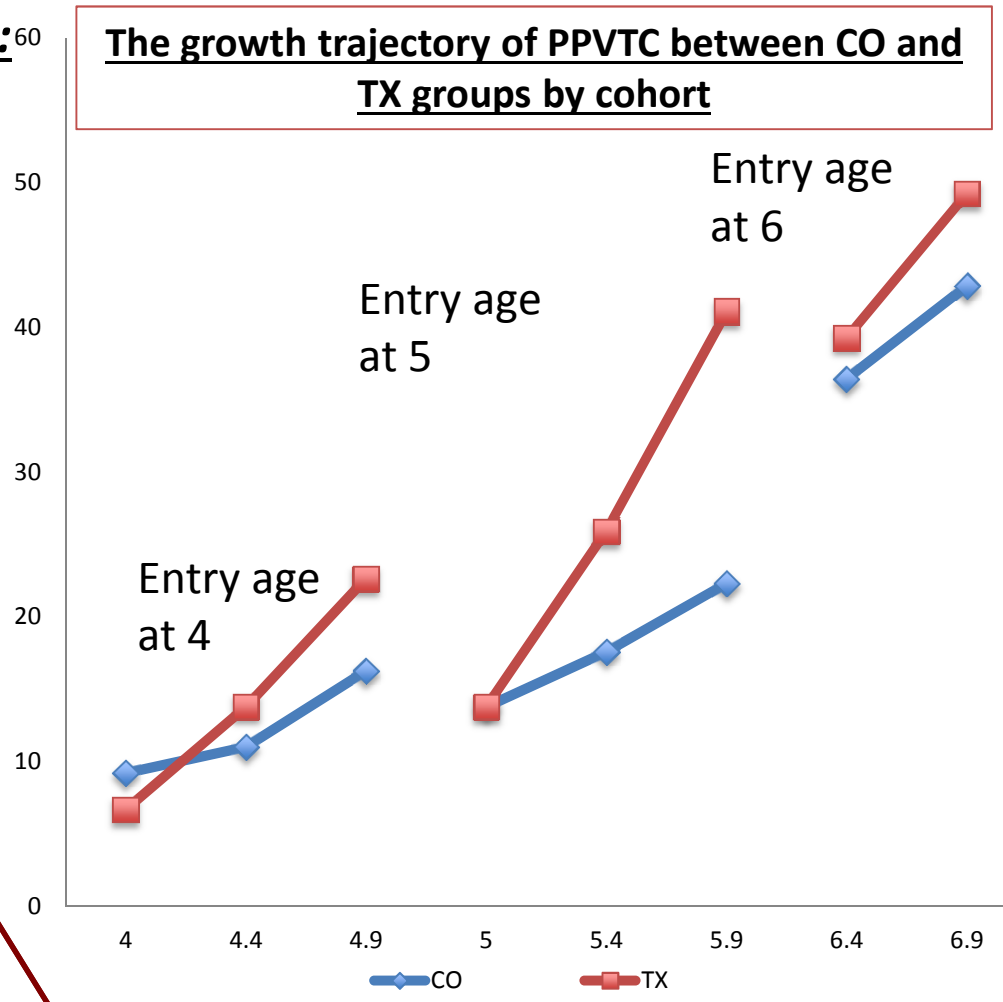

拼包
念儿歌 读童谣
鸟窝里的树
摇滚青蛙
长大是怎么一回事
年
我的家
我们去探险
火车火车呜呜叫
南瓜小房子
应该怎么做
我们来设计

RQ1: *Xinjiang Project* improves Chinese receptive vocabulary

Chinese Receptive Vocabulary:

Parameters	M1: random slope multilevel model	M2: random slope multilevel tobit model
Fixed effects ***Initial status:***		
Enter Age 4, γ_{00}	6.67*	3.08
Enter Age 5,γ_{01}	13.76*	11.09**
Enter Age 6,γ_{02}	31.29***	28.57***
Evt_Uyg,γ_{14}	-0.06	-0.59
GSKL, γ_{15}	5.11*	8.11**
Rate of Change:		
Enter Age 4,γ_{10}	10.63**	12.18***
Enter Age 5,γ_{11}	9.49***	9.65***
Enter Age 6,γ_{12}	12.85**	12.17***
XJP × T,γ_{13}	7.09*	8.41**
Variance Components		
Lev.1 Residual,σ_ε^2	185.72	199.65
Lev.2 Initial,σ_0^2	40.80	45.74
Lev.2 Rate of Change,σ_1^2	47.02	34.15
-2LL	5474.04	5282.52

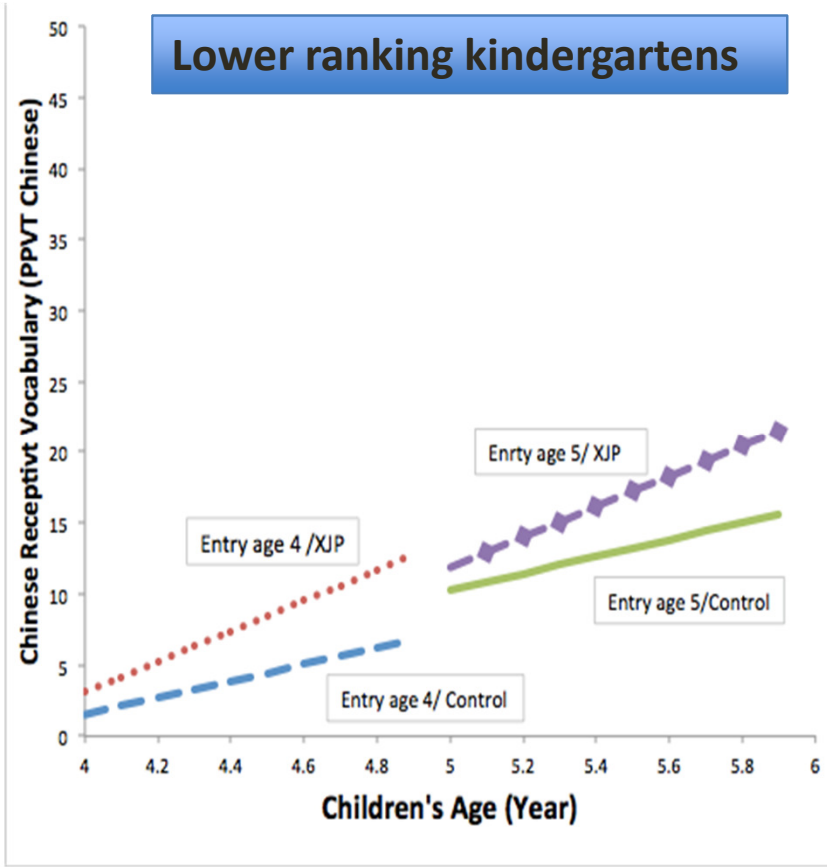
~p<0.10; *p<0.05; **p<0.01; ***p<0.001

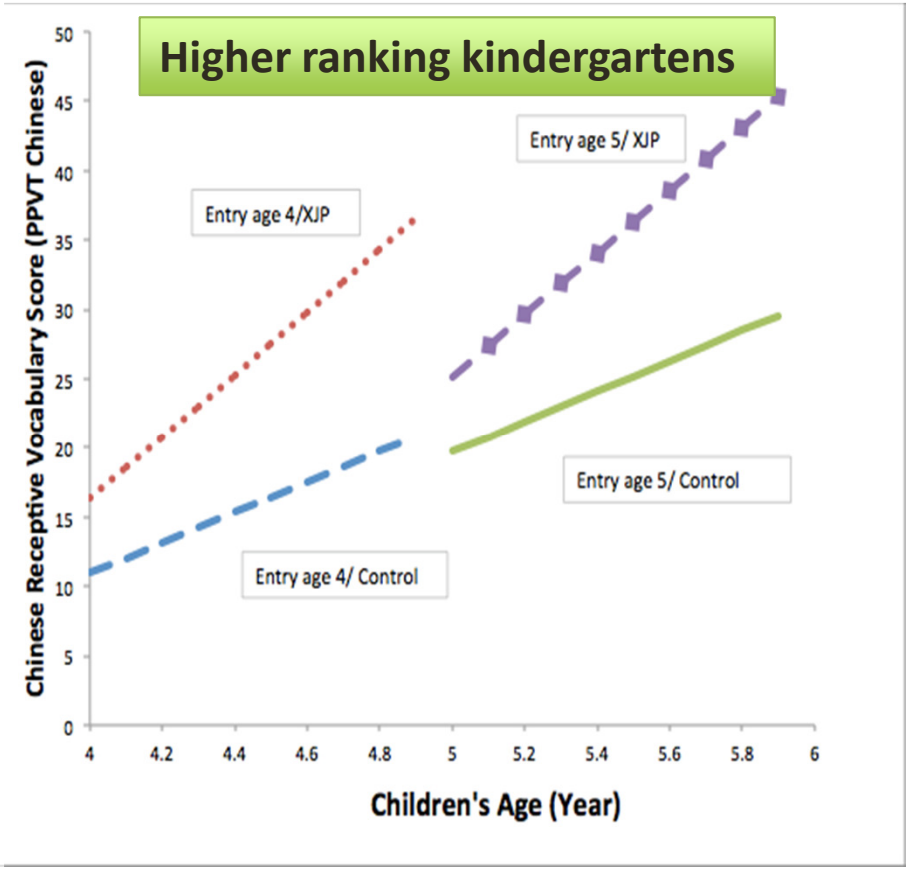


I estimate that participating in Xinjiang Project intervention increases Uyghur children's Chinese receptive vocabulary score by about 8 points per year more than control children's.

RQ1:Cohorts and kindergarten ranking on Chinese receptive vocabulary?

- *Do children with entry age of 5 have faster growth trajectories? Yes!*
- *Do children in higher government-ranked kindergartens have faster growth? Yes!*

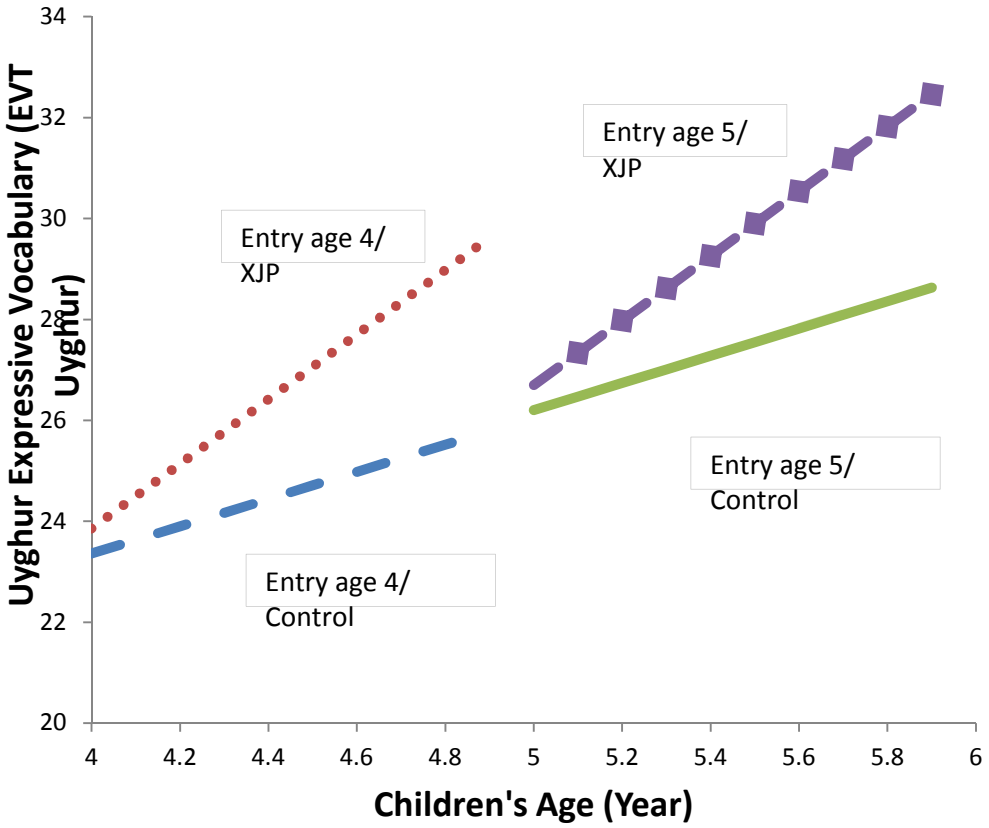




RQ2: *Xinjiang Project* improves Uyghur expressive vocabulary

Uyghur Expressive Vocabulary:

Parameters	M1: random slope multilevel model	M2: random slope multilevel tobit model
Fixed effects Initial status:		
Enter Age 4, γ_{00}	9.18	10.39
Enter Age 5,γ_{01}	10.07	10.95
Enter Age 6,γ_{02}	8.19	9.38
Evt_Uyg,γ_{14}	0.68***	0.66***
GSKL, γ_{15}	0.98	-0.60
Rate of Change:		
Enter Age 4,γ_{10}	1.59	0.68
Enter Age 5,γ_{11}	2.71	2.53
Enter Age 6,γ_{12}	1.11	2.82
XJP,γ_{13}	2.26*	2.04~
Variance Components		
Lev.1 Residual,σ_ε^2	57.72	58.83
Lev.2 Initial,σ_0^2	1.76	1.97
Lev.2 Rate of Change,σ_1^2	1.24	0.36
-2LL	4405.58	4223.86

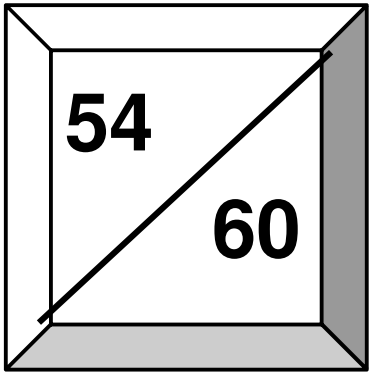


I estimate that participating in Xinjiang Project intervention increases Uyghur children's Uyghur expressive vocabulary score by about 2 points per year more than control children's

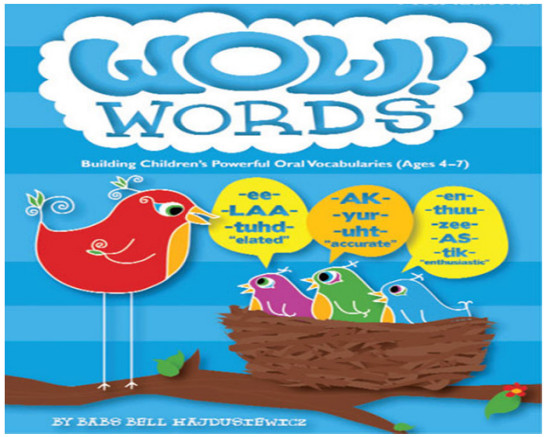
Curricula in a box!

Building Language For Literacy

41
+
13
=
54



WOW Words



26
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4
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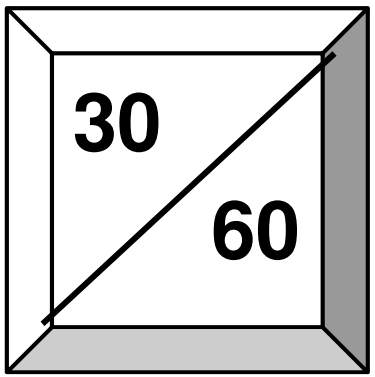
30



Reading Street

34
+
14
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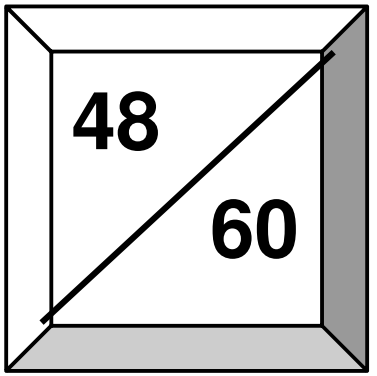
40



Early Childhood Education Settings

- What are indicators of quality in Early Childhood Programs?
- What mechanisms do those indicators of quality suggest—in other words, what actually makes a difference?
- How can the quality of EC programs be improved?

Professional development linked to introduction of curricular resources, creating more opportunities for children to talk, empowering teachers

Why curriculum?

- Well designed curricula provide topics that stimulate language and thinking
- Well designed curricula are supports, not constraints, to teachers
- Well designed curricula are optimal contexts for learning new practices
- Well designed curricula create opportunities for extension of time on task
- Well designed curricula empower teachers

Back to the themes

- Quality in EC education is not determined by easily regulable features of the classroom
- Improving the quality of classroom talk is complicated
- DAP requires CCP, and CCP is much more likely in the presence of well-designed curricula
- Time on task matters and well-designed curricula extend it
- But not all curricula are really curricula, and not all real curricula are created equal
- We learn a lot about what works from studying what doesn't