

# Improving Impacts of Classrooms: Observation of teacher-child interaction and professional development

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Discover. Create. Change.

# Pressing concerns

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- **What are the ingredients of a high-quality classroom?**
- **What is a high-quality teacher?**
- **Can public schools effectively address performance gaps among students and morale problems among staff?**
- **Can training make a difference for the quality of schooling?**
- **Can we approach these questions scientifically?**

# Large-scale observations of classrooms

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- **Methods, decisions, results**
- **What is the experience of children in preK–5<sup>th</sup> grade?**
- **Are these experiences related to structural features of classrooms?**
- **In what ways do these experiences matter for children?**
- **How can the richness and quality of experiences in classrooms be improved?**

# Child-adult relationships and schools

- **Early history of relationships with adults forms “infrastructure” for school success:**
  - **Social competence with peers**
  - **Self-regulation, emotional self-control**
  - **Task orientation, persistence, following directions**
- **Instruction is, in part, a social process:**
  - **Interactions and relationships with teachers are a “medium”**
  - **Good “instruction” for young children is embedded in relationships**

# Large-scale observational studies

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- **National-level studies**
  - **National Center for Early Development and Learning (NCEDL)**
  - **NICHD Study of Early Child Care**
- **Up to 1,000 settings observed at preschool, K, 1, 3 — more than 4,000 classrooms**
- **Large set of systematic standardized classroom observation in U.S. schools**
- **All teachers credentialed/certified**

# Observations at-scale

- **Trade-offs and decisions**
  - ❑ **Multiple versus single occasions**
  - ❑ **Length of the “window”**
  - ❑ **Time of day / content of instruction**
  - ❑ **Unit of analysis** □ **global or micro**
  - ❑ **Classroom-level or child-level**
  - ❑ **Training demands and reliability**
  - ❑ **Applicable across diverse settings**
- **No system can address every concern**
- **Ultimate criterion is link to child outcomes**

# Observation systems: Choices

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- **Typical day or morning**
- **Classroom-level and child-level focus**
- **Time-sampled codes**
  - **Setting and activities (e.g., literacy, math, etc.)**
  - **Teacher behaviors (e.g., interact w/class, teach academics, etc.)**
  - **Child behaviors (e.g., engagement, social behavior)**
- **Global ratings**

# What to observe?

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- **Observational codes selected because they predict children's social and academic skills**
- **“Value added” effects, controlling for:**
  - **Family, parent, child factors**
  - **Prior functioning**
  - **Prospective and experimental designs**
- **Confidence that indicators relate to what matters for children's development**

# Scientific procedures: Global and micro

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- Detailed manual describing codes/procedures
- Master-coded video segment
- Central training of observers
- Post-training practice and feedback
- Videotaped certification test
- Live reliability visits (drift)
- All visits scheduled on a typical day
- Multiple visits to some rooms

# Can measurements be useful?

- **For policy**
  - **Scalable, reliable, valid, coarse distinctions**
  
- **For program / professional development**
  - **Reliable, valid, articulated in experience of practitioners**
  
- **Scale**
  - **Operate consistent across exceptional variation**
  - **Reality of program / classroom is variation**
  - **High level of need for technical support and training infrastructure**
  - **Web solutions**

# Program/professional development

- Behaviorally anchored – very clear articulation of constructs in behavior
- Malleable, change and growth are possible
- Change is detectable using measurement scaling
- Change is valid in relation to professional development aims and measure of quality
  - P.d. inputs should create intended changes in quality
- Scalability of professional development
- Motivational aspects of professional development
  - Improvement or compliance?

# Describing opportunities to learn: Counting behaviors, activities, practices

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- Vast majority of interaction/activity is whole group or individual seatwork
- Few, if any, social or instructional interactions between teacher and individual child
- Mostly literacy (50%-90% of instruction)
- Exceptional variation within and across grades and classrooms
- Similar patterns from pre-k to 5<sup>th</sup> grade

# Rating interactions: What is the CLASS?

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- **Focus on teachers' interactions with students**
- **What the teacher is doing to promote the positive emotional, social, and academic development of students in the classroom**
- **Three broad domains, consistent pk-12:**
  - Emotional Support**
  - Organization / Management**
  - Instructional support**

# Classroom ratings: CLASS PK-5

- Positive climate
- Negative climate
- Teacher sensitivity
- Regard for student perspectives

**Emotional  
Support**

- Effective behavior management
- Learning formats/engagement
- Productivity

**Organization/  
Management**

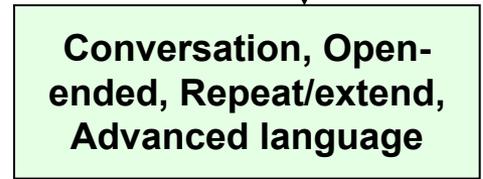
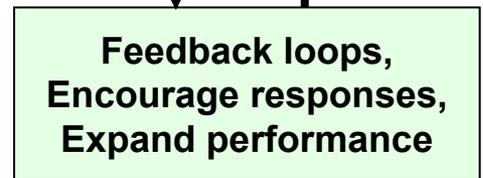
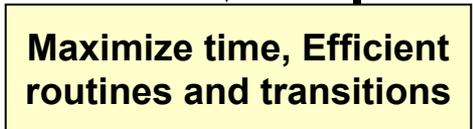
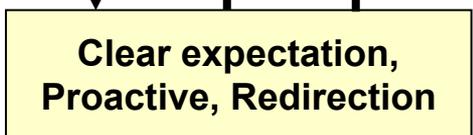
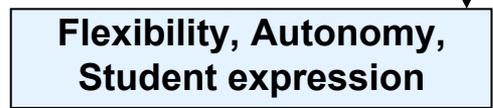
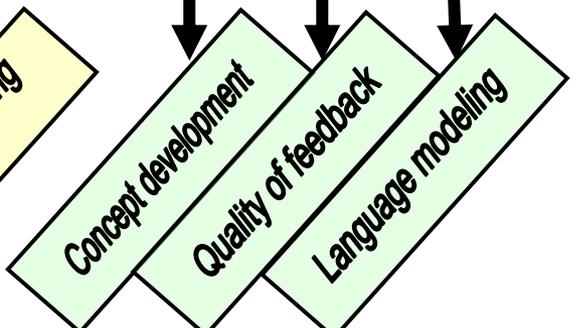
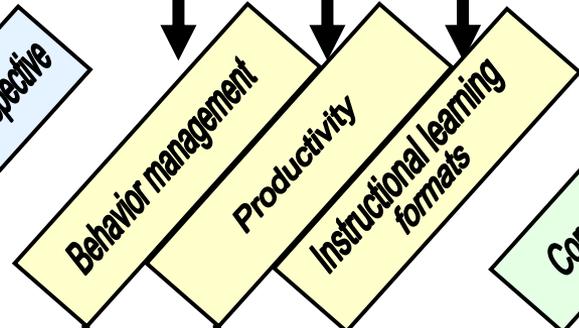
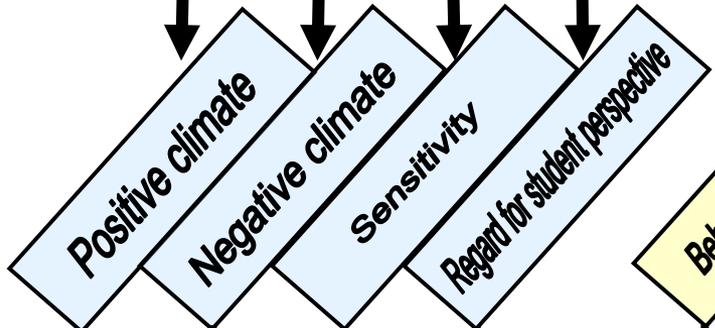
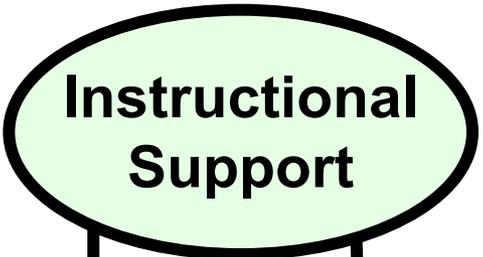
- Concept development
- Evaluative feedback
- Language modeling

**Instructional  
Support**

**DIMENSIONS**

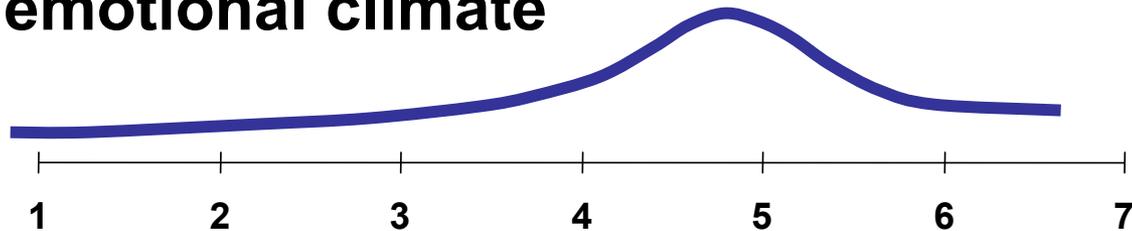
**DOMAINS**

**INDICATORS**

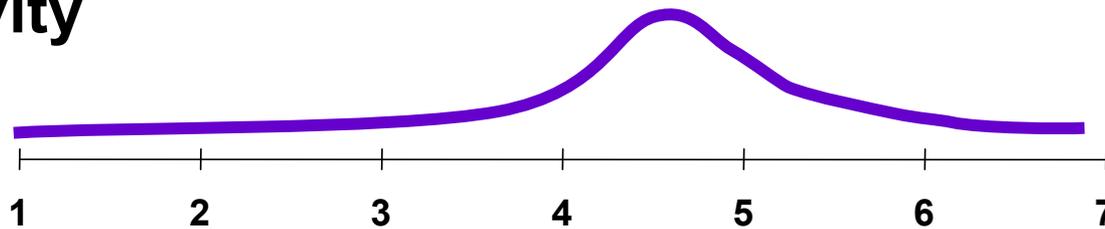


# Features of teacher-student interaction

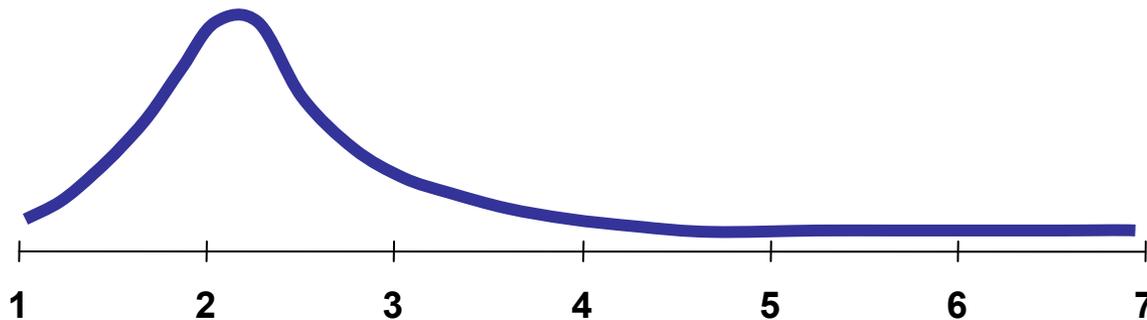
## ■ Positive emotional climate



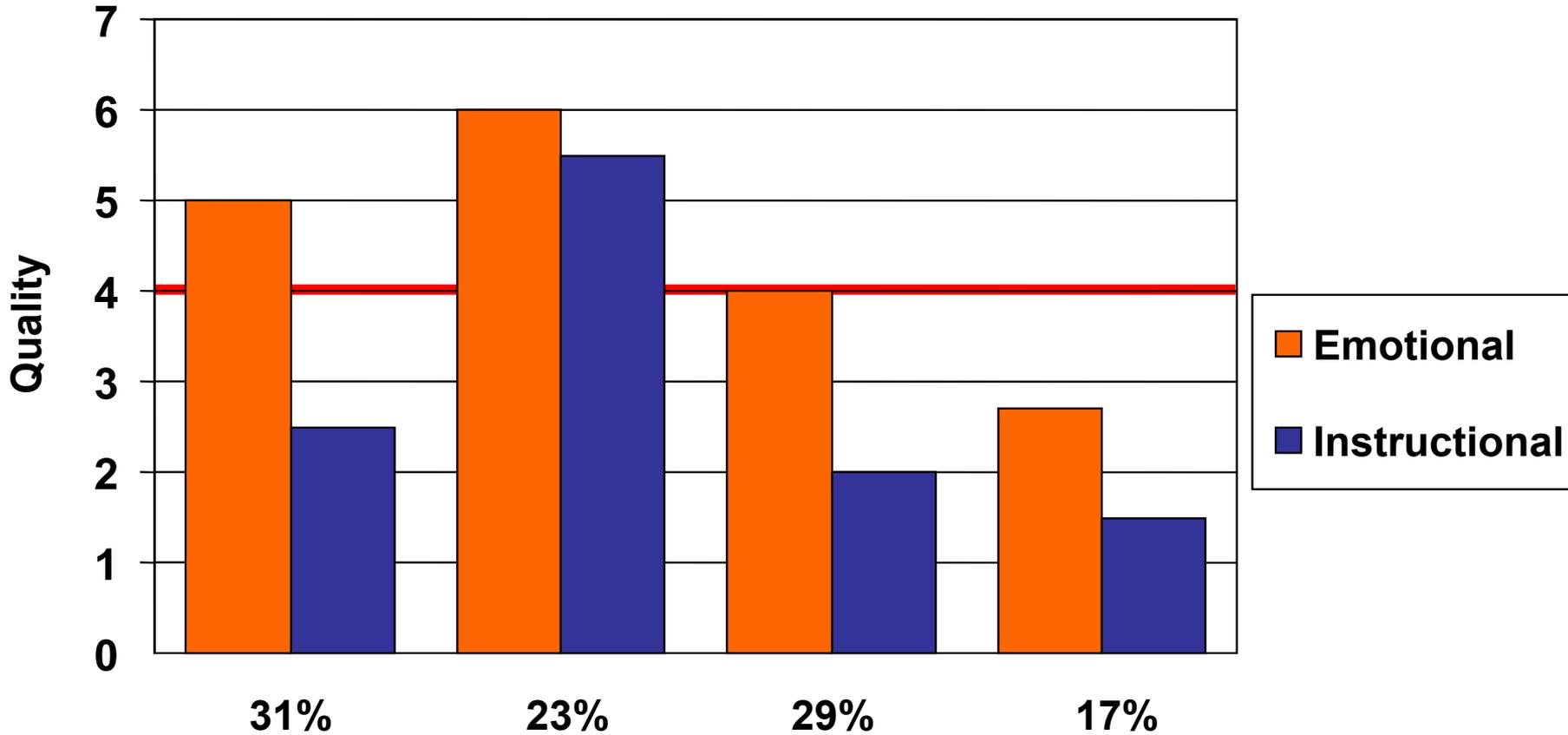
## ■ Productivity



## ■ Quality of feedback



# Profiles of classroom quality: First grade



# What observational studies reveal

- **Exceptional variability, instructionally passive, quality declines over the day**
- **Little to no association of observed behavior with:**
  - **Teacher experience, degree, salary, curriculum, public/private**
- **Small associations (.10 ):**
  - **Class size: larger classes more structured; smaller classes more social and more demanding cognitively**
  - **Family income/education and more positive ratings**
- **Low-achieving students have 10% rate of stable quality**
- **A highly dynamic context that can be indexed observationally at more molar levels of analysis – G-studies**

# Teacher-child interactions and children's social and academic performance

- **Designs that isolate effects for teacher inputs on pre-post after controls**
  - ❑ Family and demographic factors
  - ❑ Children's prior performance
  - ❑ Structural features of schooling
- **Primarily small effects (.10-.20)**
  - ❑ Instructional and emotional support domains predict more positive achievement and social outcomes.
  - ❑ Larger effects on more proximal outcomes (e.g., child engagement)
  - ❑ Exposures to more instruction in math predicts math gains; literacy intensity predicts phonemic skills
- **Stronger effects for different groups of children (approx. .5 s.d./year)**
  - ❑ Low maternal education
  - ❑ Adjustment problems in K
  - ❑ Poor

# **Comparing Process vs Structural Indicators of Quality** — Mashburn et al., (in press)

**Examined associations between children's development of academic, language, and social skills during pre-K and:**

- **Whether pre-K programs met nine standards of quality proposed by the NIEER (Barnett et al., 2004, 2005)**
- **Observations of the overall quality of the pre-K environment measured by the ECERS –R, and**
- **Observations of the quality of emotional and instructional interactions measured by the CLASS.**

# Infrastructure and design quality

## ■ NIEER Index

- Teacher has BA (70%)
- Teacher's field ECE/CD (60%)
- Teacher Aide has CDA (20%)
- Class size 20 or less (82%)
- Comprehensive curriculum (57%)
- Ratio 10:1 or less (87%)
- Program serves meals (78%)
- Program has health services (81%)
- Program provides family services (47%)

## ■ NIEER Index Average 5.89 (out of 9)

# Pre-k quality and growth in child outcomes

- **Where should we focus attention in policy, program development, and teacher preparation?**
- **Predicting achievement growth during pre-k from:**
  - ❑ **Structural features (teacher ed., curriculum, etc.)**
  - ❑ **Observed interactions (ECERS, CLASS)**
- **No association of structure with outcome, singly or in combination (e.g., NIEER index)**
- **Instructional and Emotional Supports (CLASS predict positive changes in literacy, language, and math skills)**
  - ❑ **Small effect sizes (.15-.20) persist into kindergarten**

# Predicting student development in pre-k

	Emotional Support	Instructional Support	ECERS-R Total
Receptive Language		✓	
Expressive Language		✓	✓
Rhyming		✓	
Letter Naming		✓	
Math Skills		✓	
Social Competence	✓		
Behavior Problems	✓		

**Changes in children's development from beginning to end of preschool**

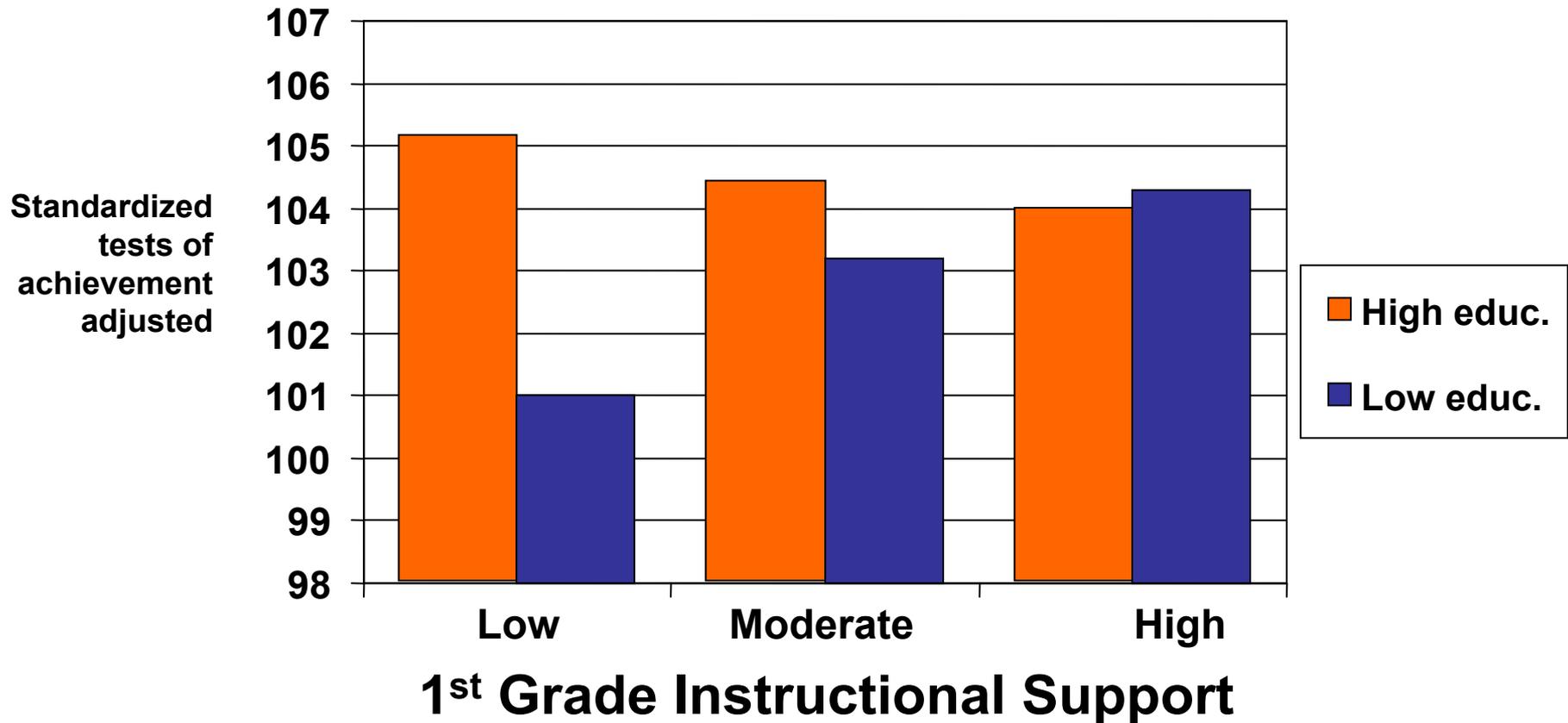
Mashburn, et al. (in press)

# Do associations persist into kindergarten?

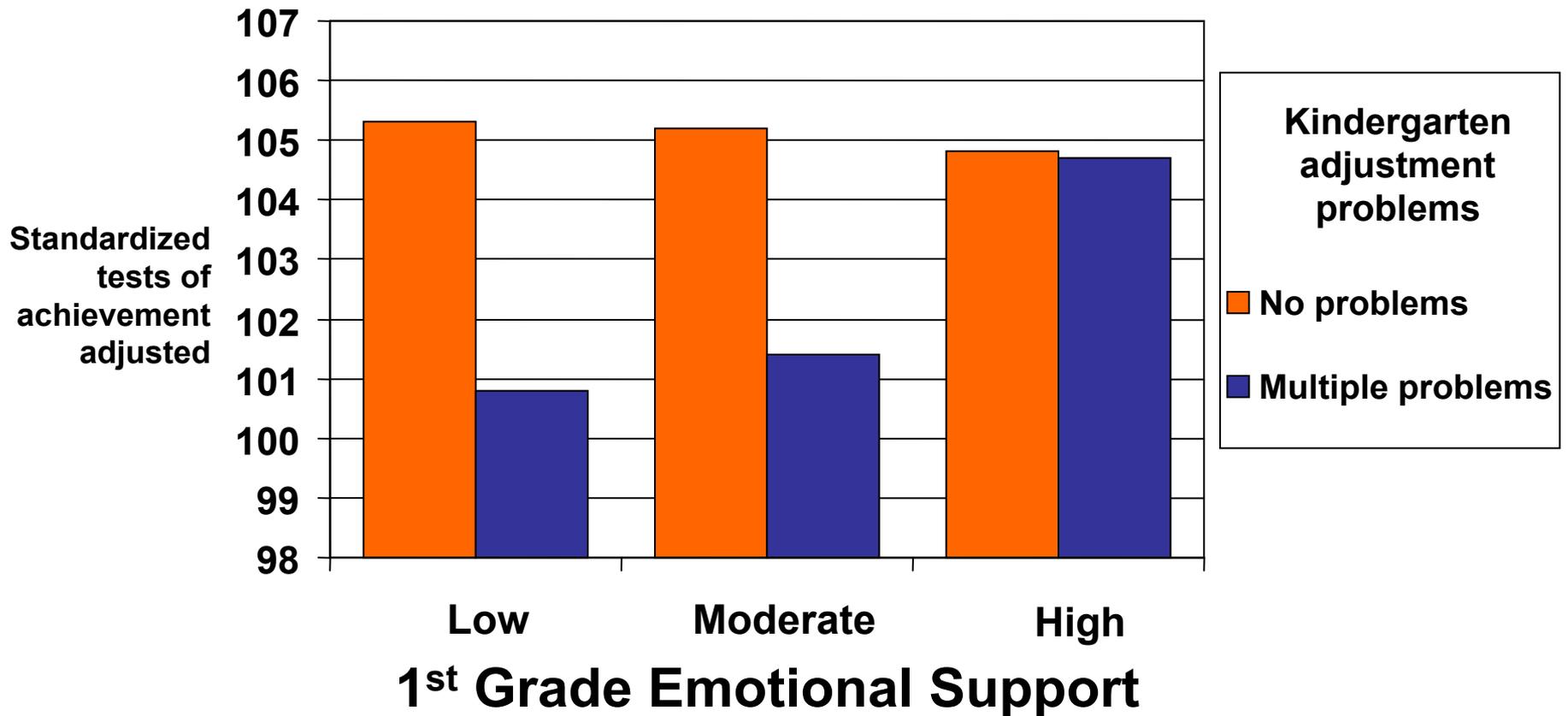
- Burchinal et al., (in press)

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- Yes, children in pre-k classrooms offering higher levels of Instructional Support displayed better language skills at the end of the kindergarten year
  - Kindergarten Instructional Support scores made an independent contribution to gains in children's language and math abilities

# Gains in grade 1 achievement in instructionally supportive classrooms



# Gains in grade 1 achievement in emotionally supportive classrooms



# A focus on literacy and language instruction

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- **Examine the extent to which variations in the quality of literacy and language interactions, during implementation of activities, was associated with gains in language and literacy skills across pre-k year**
- **New scale – Literacy Focus – measures extent to which literacy instruction is explicit and embedded within meaningful activities**

# Findings

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- **Children in classrooms with higher Literacy Focus scores (in which teachers offered more explicit literacy instruction, embedded in meaningful activities) made greater gains in print awareness and emergent literacy**
- **Language modeling was associated with greater gains in vocabulary and emergent literacy for children coming from homes where English was not spoken**

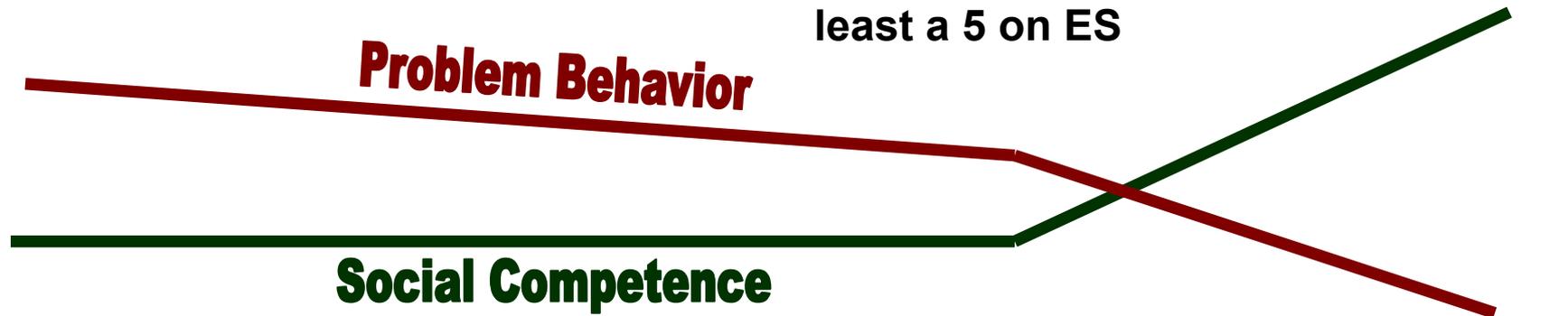
# Are there thresholds of quality for poor children?

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- Used NCEDL SWEEP and MS data
- Examined only children categorized as poor
- Used spline regression to examine associations between CLASS and outcomes in low-mid- versus high-quality classrooms

Greater gains in social competence only in classrooms scoring over a 5 on ES

Small declines in problem behavior in low and mid range, larger declines when classroom has at least a 5 on ES



1 2 3 4 5 6 7

Pre-K CLASS Emotional Support Scores

10%

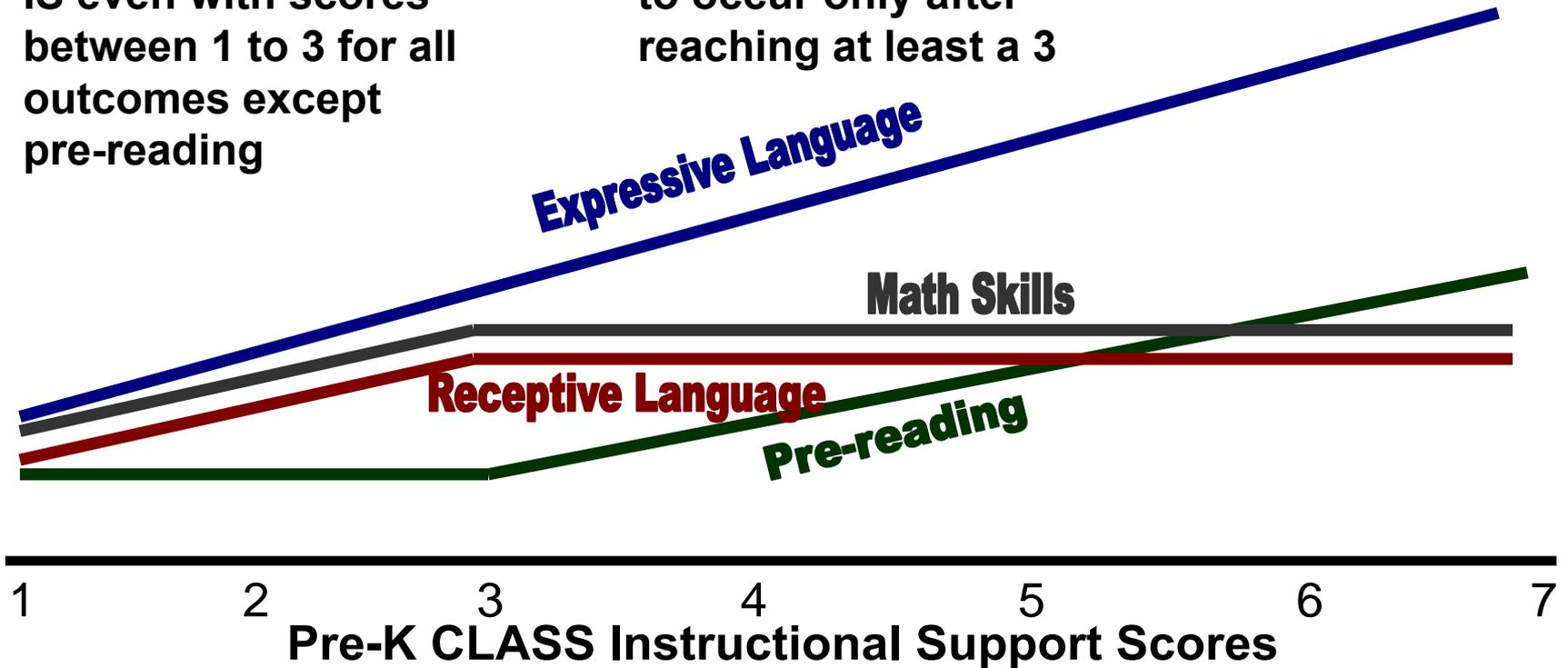
43%

47%

Percent of Classrooms in each Range

**Greater gains**  
 observed with higher  
 IS even with scores  
 between 1 to 3 for all  
 outcomes except  
 pre-reading

**Significant gains in**  
 pre-reading appear  
 to occur only after  
 reaching at least a 3



**35%**

**54%**

**13%**

**Percent of Classrooms in each Range**

# Implications of thresholds study

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- **For more positive social outcomes there appear to be strong effects in classrooms scoring over a 5 on Emotional Support (included Behavior Management in this study)**
- **For more positive academic outcomes (except early reading) there appear to be advantages to even small differences in Instructional Support between a 1 and 3**
- **More positive early reading skills may require higher levels of Instructional Support**
- **Need to use caution in interpreting these results for policy purposes**

# Implications of our work P-12

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- **Focus regulation and training on teachers' interactions with children—standards and measures**
- **Strive toward moving instructional dimensions and implementation “up” the scale of quality interactions**
- **Develop training and support approaches that address teachers' interactions with children**
- **Approach these goals systematically and scientifically with standardized, validated observations at core**
- **Incentives, supports, and targets for teacher behavior/performance in classrooms**

# Support for high-quality interactions

