

# Examining the fit between teachers' and children's classroom interactions observed at the classroom and individual child level



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## Background

- Preschoolers who experience higher quality interactions show greater academic and social-emotional development
- Particularly true for children at risk due to low SES (Mashburn et al., 2008)
- Observational studies of preschools at the classroom level show wide variability in children's interaction (Pianta et al., 2005)
- Children are active participants in their environments—individual children within the same classroom have disparate experiences
  - For example, teachers exhibit different patterns of interactions with certain students, such as those with and without behavioral deficits (Howes et al., 2000)

## Research Aims

- To explore how the fit between the quality of teacher and child interactions assessed at the classroom and individual child levels impacts children's language and self-regulation development during preschool

## Child- & Classroom-level Interactions

The *Classroom Assessment Scoring System* (CLASS) measures teacher-child interaction quality at the classroom level using 3 domains and 10 dimensions (Pianta et al., 2008; see Figure 1)

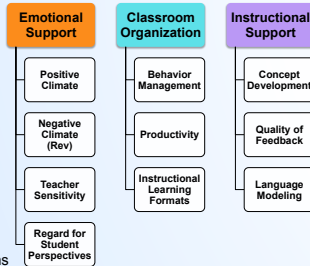


Figure 1: CLASS Domains & Dimensions

The *Individualized Classroom Assessment Scoring System* (inCLASS) measures an individual child's interactions in the classroom using 4 domains and 10 dimensions (Downer et al., 2010; see Figure 2)

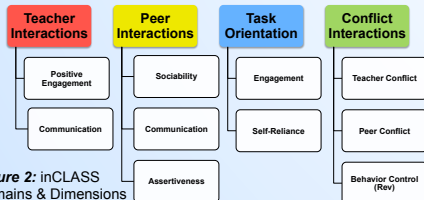


Figure 2: inCLASS Domains & Dimensions

## Methods

- 610 preschool children randomly sampled from 314 early childhood classrooms (across 10 sites). The sample of children was diverse, tended to be from lower SES families, and equal across gender.

- 47% Black/African-American, 30% Latino/Hispanic, 12% White, 9% other, 2% no response
- Mother's years of education ( $M = 12.82$ ,  $SD = 2.10$ )

**Procedure:** Data were collected during the 08-09 & 09-10 academic years. Child covariates were collected in the fall. CLASS and inCLASS observations were conducted in the winter. Outcome data were collected in the spring.

### Outcome Measures:

Language & Literacy	Self-Regulation
Receptive Vocabulary – PPVT-III	Inhibitory Control – Pencil Tap
Expressive Vocabulary – Picture Vocabulary, WJ-III	Working Memory – Backward Digit Span
Phonological Awareness – TOPEL	Learning Behaviors – Preschool Learning Behaviors Scale
Emergent Language and Literacy – Academic Rating Scale	

## Data Analysis

- Multilevel latent class analysis using Mplus Version 6.1 (Muthén & Muthén, 1998-2010)
  - Identify classes of children based on the 3 CLASS and 4 inCLASS domains
  - Take into account the nested structure of the data

Covariates tested: child-level (age, sex, ethnicity, mother's education) and class-level (site, intervention)

- Class-level covariates: intervention and site removed from the model

Different class solutions were compared by examining relative fit indices (e.g., AIC, BIC, and adjusted BIC) and classification quality (i.e., entropy)

Class posterior probabilities (probability each child belonged to each class) used as predictors of children's gains in language and self-regulation skills, controlling for child covariates

## Results

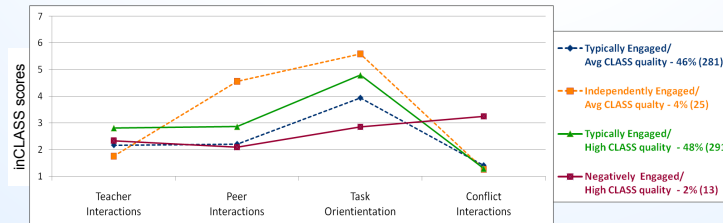
- Four-class solution (two within classes and two between classes) indicated best fit to the data
  - Entropy = .877
- Four child profiles: two in classrooms with "high" classroom quality ratings and the other two in classrooms with "average" classroom quality ratings

### High CLASS quality ratings:

- Emotional support – 5.707
- Classroom organization – 5.506
- Instructional support – 2.821

### Average CLASS quality ratings:

- Emotional support – 4.492
- Classroom organization – 4.540
- Instructional support – 1.903



## Results

- Some differences on language and literacy and self-regulation skills at the beginning of the year
- Children in the **Typically Engaged/High Quality** profile had significantly higher receptive and expressive vocabulary and phonological awareness in the Fall, compared to children in the **Typically Engaged/Average Quality** profile
- Children in the **Negatively Engaged/High Quality** profile had significantly lower learning behaviors in the Fall, compared to children in the other profiles
- Probability of belonging to a profile was related to gains in language and self-regulation skills, controlling for fall scores and child covariates
- Probability of being in the **Typically Engaged/High Quality** profile was associated with significant gains in receptive language ( $B = .08$ ,  $SE = .03$ ), expressive language ( $B = .07$ ,  $SE = .03$ ), phonological awareness ( $B = .08$ ,  $SE = .03$ ), and working memory ( $B = .11$ ,  $SE = .04$ )
- Probability of being in the **Typically Engaged/Average Quality** profile was related to significantly fewer gains in receptive language ( $B = -.07$ ,  $SE = .03$ ), expressive language ( $B = -.08$ ,  $SE = .03$ ), phonological awareness ( $B = -.11$ ,  $SE = .03$ ), and working memory ( $B = -.12$ ,  $SE = .04$ )

- Probability of being in the **Independently Engaged/Average Quality** profile was related to significant gains in phonological awareness ( $B = .07$ ,  $SE = .03$ )
- Probability of being in the **Negatively Engaged/High Quality** profile was unrelated to any of the outcomes

## Discussion

### Results suggest:

- Comparison of **typically engaged children for an average quality classroom** with **typically engaged children for a high quality classroom** suggests:
  - The quality of interactions at the classroom level may serve to increase children's individual engagement in the classroom as well as children's gains in school readiness skills during preschool
- Children who are **independently engaged within an average quality classroom** made significant gains in phonological awareness and so may show some resilience to exposure to a lower quality classroom environment

### Limitations and Future Directions:

- The small group sizes for the **Independently Engaged/Average Quality** and **Negatively Engaged/High Quality** profiles limited our power to detect effects for these groups
- Future analyses may look at prediction of profiles of children based solely on the inCLASS moderated by continuous CLASS scores
- This examination is observational in nature and so causal claims cannot be made

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