

Title: The Ups and Downs of Classroom Quality Over the Preschool Year and Relations to Children's School Readiness

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Background/Context

Direct observations of classroom quality are increasingly included in high-stakes early childhood accountability systems. One of the most frequently used observational tools is the Classroom Assessment Scoring System (CLASS™; National Center on Early Childhood Quality Assurance, 2017; Office of Head Start, 2016). Yet research suggest that the CLASS™ has positive, but small associations with children’s learning (Keys et al., 2013; Perlman et al., 2016; Zaslow et al., 2016). Several reasons for small associations have been put forth, including questions about inter-rater reliability or possible threshold effects (Burchinal, 2018). An alternative possibility is that current measurement choices, which typically assess teachers on a given day, may miss variation in teacher quality over the school year that is meaningful for children’s development.

Studies have documented fluctuation in CLASS™ scores within the school year in K-12 settings (Curby et al., 2013; Malmberg et al., 2010) and preschool classrooms (Hamre et al., 2012). Yet less is known about how trajectories of classroom quality over the preschool year relate to children’s well-being. For example, dips in classroom quality over the year may be due to rising teacher stress levels that can have negative consequences for children (Malmberg et al., 2010). In contrast, teachers displaying a “mastery effect” may have low initial levels of quality that rise over time; associations between quality at a single point during the year and child outcomes may not capture this quality improvement (Malmberg et al., 2010).

Research Questions

In the current paper, we refine past efforts to measure classroom quality, testing whether and how distinct patterns of classroom quality over an academic year relate to children’s developmental outcomes. Specifically, we rely on multiple observations of more than 300 teachers to address the following research questions: (1) are there distinct trajectories of growth in observational measures of classroom quality in preschool classrooms over the school year?; (2) do year-long patterns of classroom quality relate to children’s early language and literacy outcomes?; (4) does variability in classroom quality relate to children’s early language and literacy outcomes?; and (3) can an intensive teacher professional development intervention increase the likelihood that teachers display more successful year-long patterns of quality instruction?

Data and Sample

The present study includes 305 preschool teachers from the National Center for Research on Early Childhood Education and Professional Development Study. Preschool teachers across nine U.S. cities were randomly assigned to a web-based coaching program or to a control group (Pianta et al., 2017). Teachers submitted videos of instruction throughout the school year; teachers received feedback from coaches on these videos. Each video was scored using CLASS™. On average, teachers submitted 7.6 videos of instruction throughout the school year.

Our primary outcomes of interest include four measures of children’s early language and literacy development collected in the fall and spring: the Peabody Picture Vocabulary Test (PPVT); the Test of Preschool Early Literacy (TOPEL) Print Knowledge; the TOPEL Phonological Awareness; and the Woodcock Johnson Picture Vocabulary test.

Analytic Approach

We first use a growth mixture modeling to examine whether there exist subgroups of teachers with growth trajectories of classroom quality (Jung & Wickrama, 2008). Specifically, we estimate growth mixture models to classify our sample of teachers into distinct subgroups based on patterns of growth in emotional support, classroom organization, and instruction support. We consider trajectories of growth in the three CLASSTM domains simultaneously using a parallel process approach.

Next, we estimate multilevel models to examine whether teachers' group membership predicts child early language and literacy. Specifically, we examine whether group membership predicts child outcomes after controlling for a range of child, teacher, and school covariates. We will then use logistic regression to examine whether the random assignment of teachers to receive intensive professional development impacts whether teachers display patterns of growth that are positively associated with child outcomes.

Finally, we will use a growth modeling approach to examine the role of stability in classroom quality. First, we will estimate traditional growth models to obtain estimates of individual growth curves for each teacher. We will then examine whether teacher-specific patterns of change in classroom quality (e.g., steepness of growth curves; residual variation in quality unexplained by growth over the year) are associated with children's outcomes. We will then examine whether teachers' assignment to receive professional development impacts whether teachers display these patterns of growth.

Preliminary Results

Preliminary results of growth mixture models indicate the presence of two latent classes of teachers with distinct growth trajectories. Teachers in first group (*fluctuating and lower quality*) are characterized by lower initial levels of quality as well as lower rates of growth across all three domains. In this first group, teachers' emotional support shows dips during middle of the year, while classroom organization decreases throughout the school year. In the second group (*increasing and higher quality*), teachers demonstrate increasing levels of quality over the school year. Teachers in this group show accelerating growth in emotional support and decelerating growth classroom organization over the year. While teachers in both groups demonstrate increasing levels of instructional support towards the end of the year, we observe more growth in the second group.

Preliminary results also yield some evidence that patterns of quality growth are a significant predictor of children's early language and literacy. After controlling for child, classroom, and school characteristics, we observe that children in classrooms with consistently increasing levels of teacher-child interaction quality over the preschool year have higher TOPEL Print Knowledge scores (0.11 SD, $p < 0.05$) and TOPEL Phonological Awareness scores (0.10 SD, $p < 0.10$) relative to children in other classrooms.

Finally, results of estimating a logistic regression model indicates that teachers' assignment to participate in the coaching intervention significantly impacted the probability that they would display the high-quality pattern of growth. This suggests that intensive treatment can indeed impact the likelihood that teachers demonstrate patterns of growth that are associated with improvements in children's early learning outcomes.

Conclusions

Results have important implications for assessing and increasing the quality of early education for accountability purposes. The presentation will present final analyses and discuss limitations.

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Table and Figures

Figure 1. Average growth trajectories for teachers in class 1 and class 2, from a 2-class parallel latent class growth analysis.

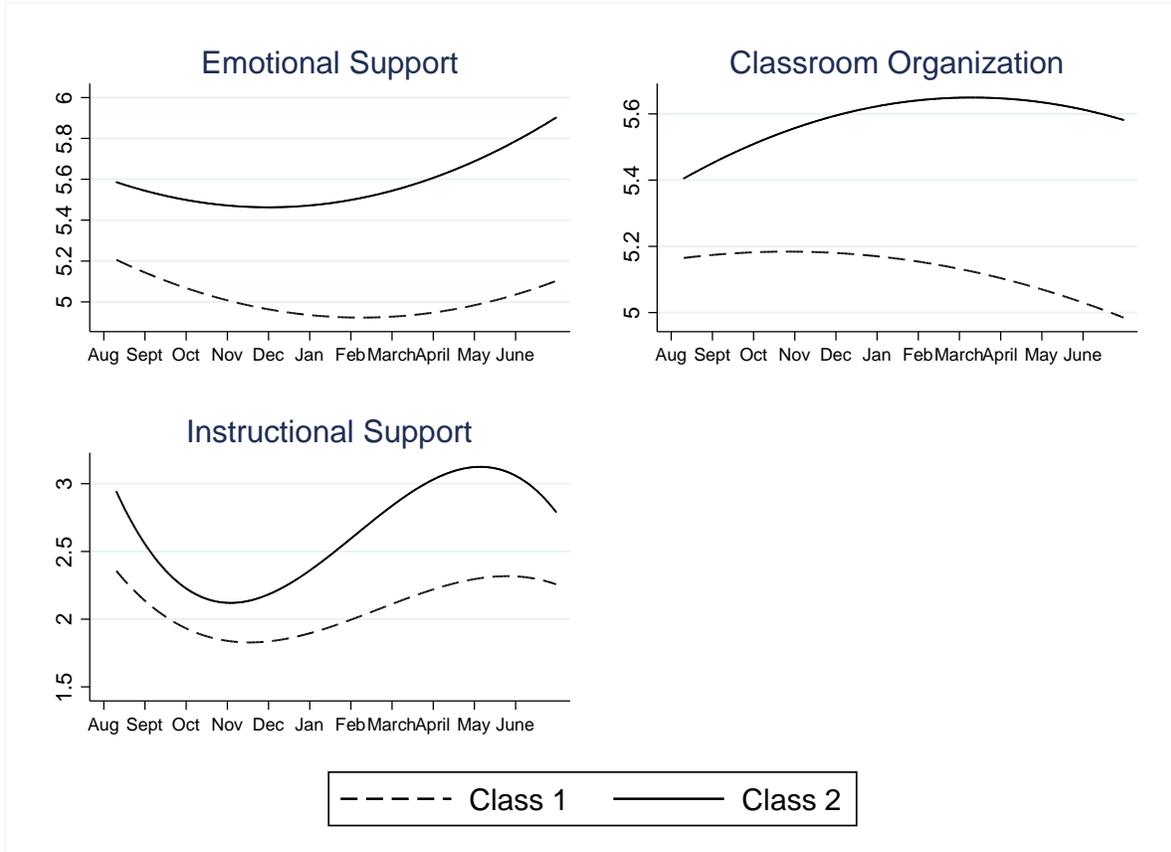


Table 1. Predicting children’s early language and literacy outcomes based on class membership

	PPVT	TOPEL Print Knowledge	TOPE Phonological Awareness	Woodcock Johnson Picture Vocabulary
Class 2; High-quality	0.024 (0.045)	0.105* (0.049)	0.095+ (0.057)	0.007 (0.047)
Observations	1,109	1,109	1,085	1,106

Standard errors in parentheses. Includes controls for fall pretest score, child age, child race/ethnicity, child gender, teacher education, teacher years of education, classroom poverty, whether the classroom was in a Head Start program or public school, and site (city). All outcomes z-scored. ⁺ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.