RESEARCH-TO-PRACTICE SUMMARY

Prioritizing Interactions to Support Children's Academic Achievement

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This article summarizes research on the use of dimensions of the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008) to predict pre-k children's achievement outcomes. The CLASS is widely used to examine the quality of teachers' interactions with students. The CLASS provides information about 10 dimensions that are usually averaged into three domains. Given the broad nature of the domains, policy makers and school personnel may find it difficult to identify starting points for professional development or training. In this study, we looked at which specific dimensions of the CLASS were most strongly predictive of children's achievement. Results indicated that Positive Climate, Productivity, and Concept Development were the best predictors of the four academic outcomes. The results suggest that these three dimensions should be given priority when it comes to policies, professional development, and observations meant to change or monitor student academic achievement.

Many Head Start programs use the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008) in their monitoring of program quality. The CLASS measures one aspect of program quality – the quality of teachers' interactions with children. As designed, the person observing the classroom (be they a principal, a school psychologist, or a researcher) observes for 20 minutes and then subsequently makes ratings on 10 dimensions on a 1 – *low* to 7 – *high* scale. These 10 dimensions include: Positive Climate, Negative Climate, Teacher Sensitivity, Regard for Student Perspectives, Behavior Management, Productivity, Instructional Learning Formats, Concept Development, Quality of Feedback, and Language Modeling. These 10 dimensions are usually then aggregated into three domains: Emotional Support, Classroom Organization, and Instructional Support.

As a research tool, the CLASS has provided much insight into what is important in classrooms for children's learning. Higher levels of Emotional Support have been associated with children's social competence and fewer problem behaviors (Mashburn et al., 2008; Wilson, Pianta, & Stuhlman, 2007), more academic learning (Early et al. 2007; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2003; Pianta, Belsky et al., 2008), and more behavioral engagement (Downer, Rimm-Kaufman, & Pianta, 2007). Higher levels of Classroom Organization have been positively associated with higher levels of children's self-control (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock,

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2009) and academic achievement (Cameron, Connor, & Morrison, 2005; Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009). Higher levels of Instructional Support have been found to relate positively to children's academic skills (Howes et al., 2008; Mashburn et al., 2008). However, those interested in providing professional development around teachers' classroom interactions may not know the best place to start. The CLASS domains are quite broad, whereas the dimensions are more tangible. However, research has not focused on relations at the dimension level, so there is little empirical guidance available regarding which aspects of teachers' social interactions most strongly predict children's academic achievement. Thus, the purpose of the present study was to examine the relations between the 10 CLASS dimensions and four academic outcomes covering language, literacy, and mathematics achievement. We will thus be able to identify which, if any, of the dimensions are most consistently and strongly related to children's academic outcomes.

SUMMARY OF RESEARCH METHODS

Participants

This study used data that was collected by the National Center for Early Development and Learning (NCEDL). NCEDL conducted two longitudinal studies of pre-k in 11 states (Early et al., 2005) between 2001 and 2004: The Multi-State Study of Pre-Kindergarten (MS Study) and the State-Wide Early Education Programs Study (SWEEP Study). The children that participated in these studies represented nearly 80% of children in the US that attended state-funded pre-k programs at the time of the studies. Approximately 15% were part of a Head Start program (Early et al., 2005). A total of 2938 children participated in either the MS or SWEEP studies. We only included children in our analyses if they had spring assessments and spoke English. In total, participants included 2,439 children (1,194 boys and 1,245 girls) from 671 pre-k classrooms.

Each classroom was observed using the CLASS measure as it existed at the time (LaParo, Pianta, Hamre, & Stuhlman, 2002; Pianta, LaParo et al., 2008). Trained observers went into classrooms from the time the children arrived at the center until they started naptime or, for those who attended half-day programs, until they went home. For each 30-minute observation cycle (20 minutes of observation, 10 minutes of rating), nine dimensions were coded: Positive Climate, Negative Climate, Teacher Sensitivity, Overcontrol, Behavior Management, Productivity, Instructional Learning Formats, Concept Development, and Quality of Feedback. Multiple cycles of observation were combined to form the dimension averages used in the analyses. The present study used the 2002 version of the CLASS, which used Overcontrol (reversed) instead of Regard for Student Perspectives (not reversed). Also, Language Modeling was not included in the measure as an indicator of Instructional Support.

Children's academic skills were assessed at the beginning of the fall and at the end of the spring while they attended pre-k. The assessments included measures of children's receptive vocabulary using the Peabody Picture Vocabulary Test- third edition (PPVT; Dunn & Dunn, 1997), expressive language using the Oral & Written Language Scale (OWLS; Carrow-Woolfolk, 1995), as well as rhyming and applied problem solving, both from the Woodcock-Johnson III Tests of Achievement (Woodcock, McGrew, & Mather, 2001).

MAJOR FINDINGS

Results indicated that three dimensions accounted for most of the relations with children's academic outcomes. These three dimensions were: Positive Climate, Productivity, and Concept Development. Positive Climate was the only predictor that was significantly associated with all four academic outcomes including receptive vocabulary, expressive language, rhyming, and problem solving. Productivity was significantly associated with three of the four academic outcomes including receptive vocabulary, expressive language, and problem solving. Concept Development was also significantly associated with three of the four academic outcomes including receptive vocabulary, expressive language, and problem solving. These three dimensions not only provided the most numerous associations, but they were also the strongest predictors (except in one instance).

IMPLICATIONS FOR PRACTICE

The present study suggests that when it comes to promoting academic achievement among pre-k children, priority should be given to helping teachers create classrooms which are characterized as positive, productive, and conceptually oriented. The present study is not a study of an intervention, and thus we will not go into great detail about changing these practices. However, other research indicates that teachers can change their practices and describes interventions that have been effective in changing how teachers interact with children (e.g., Downer, Pianta, Fan, Hamre, Mashburn, & Justice, 2011; Raver et al., 2008). The present study suggests that Positive Climate is the best starting point for professional development (and intervention work) in regards to improving academic achievement because it was related to all four academic outcomes. Positive Climate includes aspects of interactions such as affect (e.g., smiling) and getting to know students on an individual basis.   Many teachers are already offering classroom environments that are generally positive. Productivity then may offer another area to focus on. A classroom where children are constantly occupied with something to do characterizes high productivity. For example, if children have completed a task (such as brushing teeth), what should they be doing next? Transitions can include a lot of lost learning time for children and thus should be quick and efficient.   Finally, Concept Development represents an aspect of classroom interactions when the teacher is promoting deeper conceptual understandings instead of rote understandings. There are many ways to integrate higher levels of Concept Development into everyday interactions. During Circle Time, a teacher can ask a why or how question (e.g., "How does water get into the clouds?) rather than simply telling students (e.g., "Clouds are made up of tiny drops of water."). Or conversations during breakfast/snack can connect what they are eating to the real world (e.g. bread is made out of wheat, which grows in fields).

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