

## Summary of Pre-K CLASS™ Research

### I. Descriptive and Reliability Papers – Papers presenting descriptive information from CLASS™ or COS observations.

Justice, L. M., Mashburn, A. J., Hamre, B. K., & Pianta, R. C. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk pupils. *Early Childhood Research Quarterly*, 23(1), 51–68.

Policy-makers, administrators, researchers, and teachers are increasingly vested in ensuring the quality of preschool instruction, particularly in the areas of language and literacy. This research was conducted to characterize the quality of language and literacy instruction in 135 publicly funded preschool classrooms serving at-risk pupils. As all teachers in these classrooms were implementing the same language and literacy curriculum, we also studied the interrelationships among procedural fidelity to a prescribed curriculum and the quality of language and literacy instruction, determining whether procedural fidelity is associated or disassociated with quality instruction. Results showed that the quality of language and literacy instruction in classrooms was low, with few teachers delivering high-quality instruction. Although teachers were able to implement a prescribed language and literacy curriculum with a high degree of procedural fidelity, this was not associated with quality instruction. Few structural characteristics of classrooms or teachers were systematically associated with quality of instruction. Findings have important implications for professional development of teachers by suggesting a need for a sustained and coherent focus on the process of instruction to elevate instructional quality in language and literacy.

La Paro, K. M., Pianta, R. C., & Stuhlman, M. (2004). The Classroom Assessment Scoring System: Findings from the Prekindergarten Year. *The Elementary School Journal*, 104(5), 409.

Research on teacher-child relationships, classroom environments, and teaching practices provided the rationale for constructing a system for observing and assessing emotional and instructional elements of quality in early childhood educational environments: the Classroom Assessment Scoring System (CLASS). The CLASS provides a framework for observing key dimensions of classroom processes, such as emotional and instructional support, that contribute to quality of the classroom setting from preschool through third grade. This article provides information about the development, field testing, and use of this instrument in prekindergarten. Data from a national sample of 224 prekindergarten classrooms in 6 states are presented to provide reliability and validity information. The full range of the scale was used for the majority of ratings. Ratings reflected generally positive impressions of the classroom environment and teacher-child interactions. Factor scores from the CLASS were related to the Early Childhood Environmental Rating Scale (ECERS) total score and most strongly related to the ECERS interactions and language-reasoning subscales. Implications for policy and professional development from prekindergarten to third grade are discussed.

LoCasale-Crouch, J., Konold, T., Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., et al. (2007). Observed classroom quality profiles in state-funded pre-kindergarten programs and associations with teacher, program, and classroom characteristics. *Early Childhood Research Quarterly*, 22(1), 3–17.

In the past decade in the United States, pre-kindergarten programs for four year olds have expanded rapidly as a potentially powerful intervention intended to promote school readiness for children at-risk for future school failure. This paper describes in detail multi-dimensional profiles of observed quality across 692 classrooms in 11 states representing 80% of these available programs and examines teacher, program, and classroom characteristics associated in these profiles. Cluster analysis enabled the detection of patterns that fit profiles of high and low overall emotional and instructional support along with “mid-range” patterns in which emotional support is somewhat higher than instructional support. Associations between teacher characteristics and

program characteristics were generally not significant. However, the poorest quality profile was associated with classroom poverty level, suggesting that the children who need the highest quality educational experiences have teachers who are struggling the most to provide it.

Rohacek, M., Adams, G. C., & Kisker, E. E. (2010). *Understanding quality in context: Child care centers, communities, markets, and public policy*. Washington, D.C.: Urban Institute.

Children's earliest experiences can have substantial and long-lasting effects on their development. Early care and education can prepare children for school, but while some preschool and child care programs do an excellent job, others are inadequate and some may even harm healthy development. Why is there so much variation, and how can public initiatives help poor-quality programs improve?

**II. Validity Papers** – Papers documenting the ways in which teacher and classroom characteristics are associated with CLASS™ or COS observations, and linking observations to students' social and/or academic development.

Burchinal, M., Vandergrift, N., Pianta, R., & Mashburn, A. (2010). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly*, 25(2), 166–176.

Over the past five decades, the federal government and most states have invested heavily in providing publicly-funded child care and early education opportunities for 3- and 4-year-old children from low-income families. Policy makers and parents want to identify the level or threshold in quality of teacher–child interaction and intentional instruction related to better child outcomes to most efficiently use child care to improve school readiness. Academic and social outcomes for children from low-income families were predicted from measures of teacher–child interactions and instructional quality in a spline regression analysis of data from an 11-state pre-kindergarten evaluation. Findings suggested that the quality of teacher–child interactions was a stronger predictor of higher social competence and lower levels of behavior problems in higher than in lower quality classrooms. Further, findings suggested that quality of instruction was related to language, read and math skills more strongly in higher quality than in lower quality classrooms. These findings suggest that high-quality classrooms may be necessary to improve social and academic outcomes in pre-kindergarten programs for low-income children.

Curby, T. W., LoCasale-Crouch, J., Konold, T. R., Pianta, R. C., Howes, C., Burchinal, M., Bryant, D., et al. (2009). The Relations of Observed Pre-K Classroom Quality Profiles to Children's Achievement and Social Competence. *Early Education & Development*, 20(2), 346–372.

Research Findings: Recent evidence suggests that children benefit from pre-K programs in terms of both academic and social skills and that this growth is predicted by the quality of the interactions teachers have with students. Prior cluster analysis revealed 5 distinct quality profiles of teacher–child interactions in pre-kindergarten based on classroom observations of 692 teachers. In the present study, the links between these 5 quality profiles of teacher–child interactions and pre-kindergarten children's (n = 2,028) academic growth and social competence were examined using multilevel modeling techniques. Results indicate that students in the profile with the highest levels of concept development showed the greatest gains for both PPVT Receptive Vocabulary and WJ-III Applied Problems. The profile with the highest levels of emotional support dimensions had children who were rated highest in social competence the next year. Practice or Policy: These findings suggest that teacher–child interactions targeting preschoolers' analysis and inference combined with moderate levels of emotional and organizational supports could play a role in fostering students' achievement gains during pre-kindergarten.

Domínguez, X., Vitiello, V. E., Maier, M. F., & Greenfield, D. B. (2010). A Longitudinal Examination of Young Children's Learning Behavior: Child-Level and Classroom-Level Predictors of Change Throughout the Preschool Year. *School Psychology Review*, 39(1), 29–47.

The studies presented in this article longitudinally examined preschool children's learning behavior, which has received increased attention in recent years because of its positive influence on school readiness. The first study used a statewide database (N = 23,434) to examine whether and how learning behavior changed over time. The second study (N = 275) examined whether children's behavioral adjustment and classroom quality significantly predicted learning behavior baseline scores (learning behavior at the beginning of the preschool year) and rates of change throughout the year. Results from both studies indicated that children's learning behavior became more adaptive throughout the year. Results from the second study suggested that children's shyness was negatively associated with baseline scores and classroom organization was positively associated with rates of change over time. These findings highlight the importance of identifying children who exhibit underactive behavior such as shyness, as well as the potential role classroom quality may play in fostering adaptive learning behavior.

Guo, Y., Piasta, S. B., Justice, L. M., & Kaderavek, J. N. (2010). Relations among preschool teachers' self-efficacy, classroom quality, and children's language and literacy gains. *Teaching and Teacher Education*, 26(4), 1094-1103.

This study examined the relations among preschool teachers' self-efficacy (n = 67), classroom quality (instructional and emotional support), and children's (n = 328) gains in print awareness and vocabulary knowledge over an academic year in the US. Results indicated that teachers' self-efficacy and classroom quality served as significant and positive predictors of children's gains in print awareness but not vocabulary knowledge. However, results also showed a significant interaction among teachers' self-efficacy, classroom quality, and vocabulary gains: for children of teachers with higher levels of self-efficacy, higher levels of classroom quality (emotional support) were associated with higher vocabulary gains.

Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Ready to learn? Children's pre-academic achievement in pre-Kindergarten programs. *Early Childhood Research Quarterly*, 23(1), 27–50.

We examined children's growth in school-related learning and social skills over the pre-Kindergarten (pre-K) year in state-funded programs designed to prepare children for kindergarten. We expected that children's gains in academic and social skills could be attributed to variations in the structural and classroom process dimensions of program quality. Nearly 3000 (n = 2800) children were randomly selected, four per classroom, from approximately 700 randomly selected, state-funded pre-Kindergarten classrooms in eleven states. Enrollment in pre-K appeared related to gains in academic skills. Children showed larger gains in academic outcomes when they experienced higher-quality instruction or closer teacher-child relationships. Gains were not related to characteristics of the child or program (i.e., ratio, teacher qualifications and program location and length). These findings have implications for a range of state and local policy and program development efforts as well as for theories of contextual influences on development.

Mashburn, A. J., Justice, L. M., Downer, J. T., & Pianta, R. C. (2009). Peer effects on children's language achievement during pre-kindergarten. *Child development*, 80(3), 686–702.

This study examined associations between peers' expressive language abilities and children's development of receptive and expressive language among 1,812 four-year olds enrolled in 453 classrooms in 11 states that provide large-scale public pre-kindergarten (pre-k) programs. Higher peer expressive language abilities were positively associated with children's development of receptive and expressive language during pre-k. The positive association between peers' expressive language abilities and children's receptive language development was stronger for children who began pre-k with higher receptive language skills and within classrooms characterized by better

classroom management. Implications of these findings for understanding ecological inputs to children's language development and for designing effective pre-k programs are discussed.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., Burchinal, M., et al. (2008). Measures of Classroom Quality in Prekindergarten and Children's Development of Academic, Language, and Social Skills. *Child Development*, 79(3), 732-749.

This study examined development of academic, language, and social skills among 4-year-olds in publicly supported prekindergarten (pre-K) programs in relation to 3 methods of measuring pre-K quality, which are as follows: (a) adherence to 9 standards of quality related to program infrastructure and design, (b) observations of the overall quality of classroom environments, and (c) observations of teachers' emotional and instructional interactions with children in classrooms. Participants were 2,439 children enrolled in 671 pre-K classrooms in 11 states. Adjusting for prior skill levels, child and family characteristics, program characteristics, and state, teachers' instructional interactions predicted academic and language skills and teachers' emotional interactions predicted teacher-reported social skills. Findings suggest that policies, program development, and professional development efforts that improve teacher – child interactions can facilitate children's school readiness.

Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2005). Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions? *Applied Developmental Science*, 9(3), 144-159.

This study draws from the National Center for Early Development and Learning's Multi-State Pre-Kindergarten Study to examine the extent to which program, classroom, and teacher attributes of the program ecology predict observed quality and teacher-child interactions in a sample of 238 classrooms representing 6 states' pre-kindergarten programs. Quality was assessed observationally at the global level and for specific teaching practices. Quality was lower in classrooms with more than 60% of the children from homes below the poverty line, when teachers lacked formal training (or a degree) in early childhood education, and held less child-centered beliefs. Program and teacher attributes were statistically significant, albeit quite modest, predictors of observed quality. Location of the program in a school building, child:staff ratio, and length of day had no relation to quality. State-level factors not attributable to the teacher, program, and classroom factors examined accounted for the majority of explained variance in observed quality. Results suggest that the association between distal features of programs and teachers and quality in pre-kindergarten is more similar to elementary school settings than to child care settings and that quality appears most closely related to proximal teacher and child characteristics.

Vu, J. A., Jeon, H. J., & Howes, C. (2008). Formal education, credential, or both: Early childhood program classroom practices. *Early Education & Development*, 19(3), 479-504.

Research Findings: This study is intended to widen the debate around the bachelor's degree (BA) as preparation for early childhood teaching when head teachers possess various levels of credentials and education. We examined classroom quality and teacher involvement in 231 classrooms sponsored by 122 different agencies, staffed and supervised by teachers and program directors who had varying levels of credentials within the California Child Development Permit. We found that not only teachers' education and credential level but also the credential level of the program director as well as auspice predicted classroom quality. In private, nonprofit programs as well as Head Start/general child care programs, teacher BAs did predict classroom quality, but when classrooms were sponsored by school districts and the state, preschool program teacher BAs were not as predictive of classroom quality. Practice or Policy: These findings point to the importance of considering not only teachers' education but also the effects of supervision and auspice when examining the influences of variations in professional development on classroom quality.

**III. Intervention Papers** – Papers demonstrating the ways in which CLASST<sup>™</sup> or COS observation can document changes in teachers' practices.

Barnett, W. S., Jung, K., Yarosz, D. J., Thomas, J., Hornbeck, A., Stechuk, R., & Burns, S. (2008). Educational effects of the Tools of the Mind curriculum: A randomized trial. *Early Childhood Research Quarterly*, 23(3), 299–313.

The effectiveness of the Tools of the Mind (Tools) curriculum in improving the education of 3- and 4-year-old children was evaluated by means of a randomized trial. The Tools curriculum, based on the work of Vygotsky, focuses on the development of self-regulation at the same time as teaching literacy and mathematics skills in a way that is socially mediated by peers and teachers and with a focus on play. The control group experienced an established district-created model described as a “balanced literacy curriculum with themes.” Teachers and students were randomly assigned to either treatment or control classrooms. Children (88 Tools and 122 control) were compared on social behavior, language, and literacy growth. The Tools curriculum was found to improve classroom quality and children’s executive function as indicated by lower scores on a problem behavior scale. There were indications that Tools also improved children’s language development, but these effects were smaller and did not reach conventional levels of statistical significance in multi-level models or after adjustments for multiple comparisons. Our findings indicate that a developmentally appropriate curriculum with a strong emphasis on play can enhance learning and development so as to improve both the social and academic success of young children. Moreover, it is suggested that to the extent child care commonly increases behavior problems this outcome may be reversed through the use of more appropriate curricula that actually enhance self-regulation.

Domitrovich, C. E., Gest, S. D., Gill, S., Bierman, K. L., Welsh, J. A., & Jones, D. (2008). Fostering High-Quality Teaching With an Enriched Curriculum and Professional Development Support: The Head Start REDI Program. *American Educational Research Journal*, 46(2), 567-597.

This randomized controlled trial tested whether teaching quality in Head Start classrooms could be improved with the addition of evidence-based curriculum components targeting emergent language or literacy and social-emotional development and the provision of associated professional development support. Participants were lead and assistant teachers in 44 Head Start classrooms. Teachers received 4 days of workshop training along with weekly in-class support from a mentor teacher. End-of-year observations indicated that compared with the control group, intervention teachers talked with children more frequently and in more cognitively complex ways, established a more positive classroom climate, and used more preventive behavior management strategies. Results supported the conclusion that enriched curriculum components and professional development support can produce improvements in multiple domains of teaching quality.

Downer, J. T., Kraft-Sayre, M. E., & Pianta, R. C. (2009). Ongoing, Web-Mediated Professional Development Focused on Teacher–Child Interactions: Early Childhood Educators' Usage Rates and Self-Reported Satisfaction. *Early Education & Development*, 20(2), 321–345.

As the pre-kindergarten teacher workforce continues to grow in the United States, the promise of early childhood education depends in large part on in-service professional development. Given mounting evidence that the quality of teacher–child interactions is a fundamental ingredient for young children’s learning in classrooms, the challenge becomes how to develop and test models of teacher education that facilitate teachers’ development of these instructional interaction skills. In this article we describe how an innovative program, MyTeachingPartner (MTP), addresses the challenge of providing an enduring, classroom-focused, and scalable professional development experience that focuses on facilitating high-quality teacher–child interactions. Feasibility and usability results from two years of MTP implementation suggest high levels of teacher engagement, buy-in, and satisfaction, as well as some challenges related to sustaining these levels over time. Practice or Policy: Implications for scalable implementation of interaction-focused professional development in early childhood are discussed.

Fuller, B., Gasko, J. W., & Anguiano, R. (n.d.). *Lifting pre-K quality: Caring and effective teachers*. UC Berkeley Institute of Human Development.

Pre-k programs show enormous promise but yield uneven benefits for America's diverse children. Improving the quality of local Pre-k efforts – including public and private programs – is essential if we are to elevate the school readiness and long term success of all young children. This research report describes the latest evidence on how policy makers and early educators can best improve quality inside classrooms. Historically, policy makers and local early educators have attempted to improve quality through structural and program regulations, such as class size, teacher credentialing, and teacher-child ratios. Recent research, however, suggests that regulating quality through state regulation and structural change yields limited effects on teacher and child outcomes. Therefore, rather than relying only on state regulation to improve quality, the authors demonstrate stronger effects from recent efforts to raise quality by focusing on teacher development at the local level. Locally rooted teacher development models enrich instructional activities and relationships between children and teachers. The authors describe core elements of two promising teacher development programs, summarize new research on their benefits, and show how two states are nurturing implementation of these quality initiatives. This report speaks to early childhood educators, policy makers and advocates.

Morris, P., Raver, C., Lloyd, C. M., & Millenky, M. (2009). Can teacher training in classroom management make a difference for children's experiences in preschool? A preview of findings from the Foundations of Learning Demonstration. MDRC.

Policymakers recognize that early childhood education is a promising strategy for improving the school readiness of disadvantaged young children and for advancing their long-term academic success. Yet even as policymakers embrace greater investments in early childhood programs, they confront a difficult challenge: how can the quality of programs be maintained or enhanced when they are operated on a large scale? One critical aspect of quality is addressing children's emotional and behavioral development — that is, their ability to engage positively with peers and teachers and to focus their attention and behavior during classroom activities. Evidence suggests that improving young children's healthy emotional and behavioral development is both an important outcome in its own right and can also be a pathway to improved academic achievement. Recent research documenting high levels of behavior problems for children in preschool classrooms highlights the importance of this issue. Moreover, in survey after survey, teachers consistently emphasize their need for professional development and other supports to help them address children's behavioral issues.

This report offers a preview of promising findings from Foundations of Learning (FOL), a demonstration and random assignment evaluation in Newark and Chicago of an intervention that trains preschool teachers to better support children's behavior and emotional development. The model tested in Foundations of Learning combined teacher training in effective classroom management with weekly classroom consultation. Consultants coached and mentored the teachers in the new strategies learned in the training workshops and provided individualized support to the highest risk children.

Pianta, R. C., Mashburn, A. J., Downer, J. T., Hamre, B. K., & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, 23(4), 431–451.

As the workforce in state-funded pre-kindergarten programs continues to grow in the United States, the promise of these and other early education opportunities (e.g., Head Start) depends in large part on in-service professional development and training in key instructional and interaction skills. In this paper, we describe effects of MyTeachingPartner (MTP), a web-based system of professional development resources, that include video exemplars and web-mediated consultation on specific dimensions of interactions with children for 113 teachers in a state-funded pre-k program. Teachers assigned to receive on-line consultation and feedback targeted to their interactions showed

significantly greater increases in independent ratings of the quality of interactions than did those only receiving access to a website with video clips. The positive effects of consultation were particularly evident in classrooms with higher proportions of children who experienced economic risks. Implications of these findings for models of professional development and widespread needs for teacher access and support are discussed in relation to the effectiveness of early education.

Raver, C. C., Jones, S. M., Li-Grining, C. P., Metzger, M., Champion, K. M., & Sardin, L. (2008). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly*, 23(1), 10–26.

A primary aim of the Chicago School Readiness Project was to improve teachers' emotionally supportive classroom practices in Head Start-funded preschool settings. Using a clustered randomized controlled trial (RCT) design, the Chicago School Readiness Project randomly assigned a treatment versus control condition to 18 Head Start sites, which included 35 classrooms led by 94 teachers who served 602 children. Teachers in the treatment condition were invited to participate in behavior management training and their classrooms were visited weekly by mental health consultants who "coached" teachers as they implemented behavior management strategies. Estimation of hierarchical linear models revealed that the multi-component intervention provided statistically significant benefits: Head Start classrooms randomized to the treatment condition were found to have statistically significantly higher levels of positive classroom climate, teacher sensitivity, and behavior management than were classrooms in the control condition (with effect sizes ranging from  $d = 0.52$  to  $0.89$ ). Discussion of these findings reflects on policy implications and future research.

Whitaker, S., Kinzie, M., Kraft-Sayre, M. E., Mashburn, A., & Pianta, R. C. (2006). Use and Evaluation of Web-based Professional Development Services Across Participant Levels of Support. *Early Childhood Education Journal*, 34(6), 379-386.

When participating in a large-scale, web-based professional development program, to what degree do teachers participate? How useful do they find the program? To what degree do they feel supported in their efforts? What are the associations between participation, evaluation of services, and the level of service teachers receive? MyTeachingPartner provides several levels of support to teachers, and each participant's involvement in the project varies in terms of assigned level, frequency of logging in to the site, and the time she spends on it. This paper compared key data sources, including web navigation logs and teacher survey responses, to describe the relationship between teachers' perceptions of support, their specific project interactions, and the level of service they receive. We explored ways that a large-scale professional development project such as MTP can benefit from identifying and nurturing those elements that best foster teacher perceptions of support.