Georgia's
**Pre-K Professional
Development Evaluation:**
Final Report

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Georgia's Pre-K Professional Development Evaluation: **Final Report**

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Georgia's Pre-K Professional Development Evaluation

Executive Summary

Georgia has been at the forefront of the pre-kindergarten movement since implementing its pre-k program in 1992 and creating the nation's first state-funded universal pre-k program in 1995. Georgia's Pre-K, administered by Bright from the Start: Georgia Department of Early Care and Learning (DECAL), aims to provide high-quality preschool experiences to four-year-olds to help prepare them for kindergarten. Past research indicates that participation in state-funded pre-k is linked to higher academic and social skills in children when they enter school (Gormley, Gayer, Phillips, & Dawson, 2005), with higher quality programs linked to greater gains (Howes et al., 2008). Thus, the quality of classroom practices and teacher-child interactions is critical to ensuring that pre-k provides maximum benefits to children.

This study evaluated the impact of two professional development models—Making the Most of Classroom Interactions and MyTeachingPartner™—on teacher-child interactions in Georgia's Pre-K classrooms. At the start of each school year of this three-year study (2011-12, 2012-13, 2013-14), lead teachers (*n* = 486 over the entire project) were randomly selected to participate and randomly assigned to one of the professional development models or a control group. Because of this rigorous design, we can be confident that any differences between the groups at the end of the study were caused by the professional development activities and that the findings reflect the type of change we would anticipate among Georgia's Pre-K teachers if these models were broadly implemented. Data collection included pre- and posttest classroom observations and teacher questionnaires, as well as coach/instructor questionnaires and administrative information regarding participation in the professional development activities.

Professional Development Models

The two professional development models evaluated in this study are designed to improve teacher-child interactions as measured by the *Classroom Assessment Scoring System™ (CLASS)*. The *CLASS* focuses on three domains of teacher-child interaction: Emotional Support, Classroom Organization, and Instructional Support. The supports for both models were delivered by Georgia's Pre-K consultants, as part of their regular job duties.

Making the Most of Classroom Interactions (MMCI). MMCI is a face-to-face professional development model, in which a group of teachers meets regularly with trained instructors to learn to identify and analyze effective interactions in classrooms and discuss ways to interact intentionally to increase children's learning. Teachers have access to an online library of video clips demonstrating best practice in various aspects of teacher-child interactions, and complete homework assignments that involve watching specific videos and practicing interactions in the classroom. For the current project, the 10 MMCI workshops were delivered over five training days.

MyTeachingPartner™(MTP). MTP is a one-to-one, remote coaching model that provides specific feedback to teachers about Emotional Support, Classroom Organization, and Instructional Support using a standardized coaching cycle format. Additionally, teachers have access to an online library of video clips demonstrating best practice in various aspects of teacher-child interactions.

Primary Evaluation Questions

This evaluation was designed primarily to address two major questions:

1. Were the interventions effective in improving teacher-child interactions in pre-kindergarten classrooms?
2. How were the interventions perceived by Georgia's Pre-K consultants and teachers?

In addition to these major questions, Georgia's Pre-K leaders were interested in examining whether the interventions were more effective in certain circumstances, for certain kinds of teachers, or with certain types of consultants.

Method

- 486 Georgia's Pre-K lead teachers were randomly selected to participate from counties being targeted for support by Georgia's Race to the Top (RT3) K-12 grant.
- Selected teachers were randomly assigned to one of three groups: 175 to MMCI, 151 to MTP, 160 to control.
- *CLASS* observations and teacher questionnaires were collected in the fall and spring.
- MMCI instructors and MTP coaches also completed questionnaires and participated in semi-structured interviews.

Results

The 10-session MMCI course, which used a cohort model to improve teacher-child interactions, was an effective means of increasing emotional and instructional support in Georgia's Pre-K classrooms. Further, teachers who took part in MMCI had greater knowledge of effective teacher-child interactions after participation than did their peers in the MTP or control groups and thought their professional development was more valuable than did their peers in the control group. Their

Summary of Evaluation Findings

	MMCI vs. control	MTP vs. control	MMCI vs. MTP
Emotional Support	MMCI > control	MTP > control	No difference
Classroom Organization	No difference	No difference	No difference
Instructional Support	MMCI > control	No difference	No difference
Knowledge of Effective Teacher-Child Interactions	MMCI > control	No difference	MMCI > MTP
Perceived Value of the Professional Development	MMCI > control	MTP > control	No difference
Relationship with the Coach/Instructor	Not applicable	Not applicable	MTP > MMCI

relationships with their instructors were positive, but somewhat less positive than those reported by teachers participating in MTP. Interviews with MMCI instructors suggest that they had very positive experiences with the model and felt it was a good fit for the state.

Teacher-child interactions among teachers in the one-to-one MTP coaching group also showed some improvement, but less than the MMCI teachers. Emotional Support increased as a result of participation in MTP; Classroom Organization, Instructional Support, and knowledge of effective teacher-child interactions did not. MTP teachers saw their professional development activities as more valuable than control-group teachers, and MTP teachers reported more positive relationships with their coach than did MMCI teachers.

Conclusions

Georgia's Pre-K teachers benefited from and liked both the MMCI and MTP interventions. This study sought to test MMCI and MTP as possible ways to improve teacher-child interactions in real-world conditions, such as delivery of the intervention by program staff and randomly selecting teachers rather than asking for volunteers. When compared to teachers in the control group, MMCI resulted in improvements in two domains; MTP resulted in improvements in one domain. Pre-k teachers rated both interventions more favorably than did teachers in the control group.

MMCI is a feasible intervention for large-scale adoption. MMCI requires fewer staff members and less time to implement than MTP, which makes it more feasible and sustainable for large-scale implementation. Georgia's Pre-K consultants, who served as MTP coaches and MMCI instructors, also expressed their support of the relative feasibility of MMCI. MTP coaches reported that although they valued the MTP experience, statewide implementation was not achievable and that its costs (in terms of time, money, and effort) were too great for the amount of benefit. MMCI, on the other

hand, was generally viewed by instructors as both practicable and beneficial for teachers.

Additional research is needed to understand better the circumstances under which MMCI and MTP are most likely to support meaningful improvements in teacher-child interactions. The findings from this evaluation add to the literature about the MMCI and MTP interventions (e.g., Downer et al., 2009; Hamre et al., 2012) and provide some data about the factors (e.g., teacher education, ratios) that may influence the effectiveness of the interventions. There are many important questions still to answer about these interventions. For instance, is there a minimum, maximum, or ideal number of MTP cycles that yields the greatest change in teacher practice? This study provides important information about the likely attainable dosage within a large-scale implementation, which was less than the dosage received when MTP was implemented by its developers (Pianta et al., 2014). We need additional work, however, to understand the range of supports teachers and coaches need to ensure that the models are implemented in a way that provides maximum benefit.

Advancements in early childhood professional development are still needed. Using these well-defined, evidence-based professional development models, some statistically significant findings emerged. The improvements, however, were small and instructional support in all three groups remained in the low-to-middle range. Thus, additional work is needed, including refinement of existing models and creation of new approaches to professional development, to best support all pre-k teachers in engaging in high-quality interactions with their students.

Georgia's Pre-K Professional Development Evaluation

Introduction

Georgia has been at the forefront of the pre-kindergarten movement since implementing its pre-k program in 1992 and creating the nation's first state-funded universal pre-k program in 1995. Georgia's Pre-K, administered by Bright from the Start: Georgia Department of Early Care and Learning (DECAL), aims to provide high-quality preschool experiences to four-year-olds to help prepare them for kindergarten. Past research indicates that participation in state-funded pre-k is linked to higher academic and social skills in children when they enter school (Gormley, Gayer, Phillips, & Dawson, 2005), with higher quality programs linked to greater gains (Howes et al., 2008). Thus, the quality of classroom practices and teacher-child interactions is critical to ensuring that pre-k provides maximum benefits to children.

Georgia's Pre-K is offered in all 159 counties across the state and served over 81,000 four-year-olds in the 2013-14 school year. The program is offered in a variety of settings, including private childcare, local schools, Head Start centers, military bases, technical colleges, and not-for-profit programs. All lead teachers are required to hold a minimum of a four-year degree in early education or a related field, and in 2013-14 over 75% of the teachers were certified to teach early childhood education. Each classroom also employs an assistant teacher who is required to have at least a Child Development Associate (CDA) credential. A strength of Georgia's Pre-K is its monitoring and technical assistance system. Each program is assigned a pre-k consultant, who ensures compliance with the program's standards while also providing training and technical assistance. A recent evaluation concluded that participation in Georgia's Pre-K program significantly improved children's school readiness skills across a wide range of language, literacy, math, and general knowledge measures (Peisner-Feinberg, Schaaf, LaForett, Hildebrandt, & Sideris, 2014).

For the past few years, DECAL has used the *Classroom Assessment Scoring System™* (*CLASS*; Pianta, LaParo, & Hamre, 2008) to understand better the instructional practices and teacher-child interactions in its pre-k classrooms and to provide a framework for its pre-k teachers' professional development. The *CLASS* is an observational tool focused on the aspects of teacher-child interactions that are most closely aligned with children's social, emotional, and academic outcomes. DECAL's efforts regarding professional development for pre-k teachers were greatly expanded in 2010, when Georgia was awarded a $400 million federal Race to the Top (RT3) grant. The purpose of the RT3 grant was "to equip all Georgia students, through effective teachers and leaders and through creating the right conditions in Georgia's schools and classrooms, with the knowledge and skills to empower them to (1) graduate from high school, (2) be successful in college and/or professional careers, and (3) be competitive with their peers throughout the United States and the world" (Georgia Department of Education, n.d.). To meet these goals, Georgia undertook seven initiatives. As part of the Improving Early Learning Outcomes initiative, DECAL received RT3 funds to provide professional development based on the *CLASS* to a sample of pre-k teachers in selected counties in Georgia. Existing Georgia's Pre-K development funds also supported this work. The current project was designed to evaluate the effectiveness of two different professional development models—both based on the *CLASS*—on improving the quality of teacher-child interactions.

Professional Development Models

The two professional development models evaluated in this study were designed to improve teacher-child interactions as measured by the *CLASS*. The two models and the *CLASS* observation tool were developed by researchers at the University of Virginia. Those same researchers founded an organization called Teachstone to train individuals on the use of the *CLASS* and to support implementation of the professional development models. For the current study, the two professional development models were delivered by pre-k consultants in Georgia who were trained and supported by Teachstone.

Making the Most of Classroom Interactions (MMCI).

MMCI is a face-to-face professional development model, in which a group of teachers meets regularly with trained instructors to learn to identify and analyze effective interactions in classrooms and discuss ways to interact intentionally to increase children's learning. Enrolled teachers have access to print and web-based resources aligned with the *CLASS* measure. Between in-person sessions, teachers complete homework assignments that involve watching specific videos and practicing interactions in the classroom. MMCI consists of 10 two-and-a-half-hour workshops. Hamre and colleagues (2012) found that a similar course based on the *CLASS* was effective in improving teacher knowledge, Emotional Support, and Instructional Support as measured by the *CLASS*. In this study, Georgia's Pre-K consultants served as MMCI

instructors, with each MMCI cohort being team-taught by a pair of Georgia's Pre-K consultants. For the current project, the 10 sessions were delivered over five training days, spread across five months.

MyTeachingPartner™(MTP). MyTeachingPartner is a one-to-one, remote[1] coaching model that provides specific feedback to teachers about emotional climate, organizational structure, and instructional support using a standardized coaching cycle format. During each cycle, the participating pre-k teacher makes a video recording of her or himself interacting with children in the classroom and sends it to the coach, who then reviews the video and posts feedback and questions about the interactions with children to Teachstone's secure website for the teacher to review. The coach's prompts provide detailed feedback and help teachers observe their classroom interactions more closely. After the teacher responds to the prompts, the teacher and coach have a one-to-one conference call to further discuss the teacher's practice. The feedback and discussions focus on what the teacher is doing well and how the teacher could continue to develop in specific areas, using the *CLASS* as the framework for understanding elements of interactions that support children's development and learning. Shortly after the one-to-one conference call, the coach sends the teacher a brief summary of the main topics covered during the conference and the action plan, detailing the mutually agreed upon plan for the next cycle. Additionally, teachers have access to an online library of video clips demonstrating best practice in various aspects of teacher-child interactions. Pianta and colleagues (2008) found that teachers who took part in MTP showed more growth in teacher-child interactions than teachers who had access to web-based materials only. Mashburn, Downer, Hamre, Justice, and Pianta (2010) found that children in MTP classrooms made greater language and literacy gains compared to children in comparison group classrooms. For this project, Georgia's Pre-K consultants served as MTP coaches. A cycle requires a minimum of two weeks to complete. Coaches and teachers were instructed to complete as many cycles as possible during the year, and when possible the data collection team waited until at least eight cycles had been completed before conducting the posttest.

Primary Evaluation Questions
This evaluation was designed primarily to address two major questions:
1. Were the interventions effective in improving teacher-child interactions in pre-kindergarten classrooms?

2. How were the interventions perceived by Georgia's Pre-K consultants and teachers?

In addition to these major questions, Georgia's Pre-K leaders were interested in examining whether the interventions were more effective in certain circumstances, for certain kinds of teachers, or with certain types of consultants.

Key Strengths of the Implementation
This project was designed to help DECAL evaluate the utility of these professional development models when implemented under "real-world" conditions. Previous research has established that the two models can improve teacher-child interactions when used by teachers who have volunteered to participate and the supports are delivered by university researchers (Pianta et al., 2008; Hamre et al., 2012). This project expands on that work by considering their impact when implemented as they would be if adopted as part of a statewide professional development framework.

To that end, this project has two key strengths. First, existing state agency staff—rather than model developers—delivered the intervention. Teachstone staff members trained the pre-k consultants to serve as MMCI instructors and MTP coaches and provided support and advice throughout the project, but they were not directly responsible for delivering the interventions. For these professional development models to be viable in large systems such as Georgia's Pre-K, it is important that they can be implemented by trained agency staff. Relying solely on the model developers is not feasible on a large scale. Thus, this study represents a more real-world test of the interventions by examining the extent to which more novice coaches and instructors, who have other work responsibilities, can implement the interventions and change classroom practices.

Second, in this study, pre-k lead teachers were randomly selected to participate in the professional development. In similar studies of professional development models, teachers elected to participate (Pianta et al., 2008; Hamre et al., 2012), meaning only individuals who were interested in changing their practice took part. In the current project, the two professional development models were provided to teachers as part of the ongoing, required professional development for pre-k teachers in participating counties. For a system such as Georgia's Pre-K to improve classroom quality on a large scale, it cannot rely only on teachers who have elected to participate. Again, this study represents a more real-world test of the interventions by examining the extent to which they can change the practices of teachers who vary in their motivation, interest, and commitment to the professional development opportunity.

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[1]MTP is intended to provide remote coaching. In the current study, however, a coach may have met with a teacher in person one or two times to deliver the coaching, if proximity allowed. This was not consistent or sustained.

Method

Highlights

- 486 Georgia's Pre-K lead teachers were randomly selected to participate from counties being targeted for support by Georgia's K-12 Race to the Top (RT3) grant.
- Selected teachers were assigned at random to one of three groups: 175 in MMCI, 151 in MTP, and 160 in control.
- In the fall and spring, independent data collectors employed by the research team conducted *CLASS* observations and collected teacher questionnaires.
- MMCI instructors and MTP coaches also completed questionnaires and participated in semi-structured interviews regarding their experiences in delivering the professional development models.
- At the start of the study, the three groups were equivalent in terms of observed teacher-child interaction, as well as teacher, classroom, and program characteristics.
- Study attrition was low and was equally distributed across the three groups.

Study Overview

This study's primary purpose was to evaluate the impact of two professional development models on teacher-child interactions in Georgia's Pre-K classrooms. Teachers were randomly selected to participate and were assigned to one of the professional development models or a control group. Because of this rigorous design, we can be confident that any differences between the groups at the end of the study were caused by the professional development activities and that the findings reflect the type of change we would anticipate among Georgia's Pre-K teachers if these models were broadly implemented. Data collection included pre- and posttest classroom observations, teacher questionnaires, coach and instructor questionnaires, and administrative information regarding participation in the professional development activities.

Teacher Selection and Random Assignment

During this three-year study (2011-12, 2012-13, 2013-2014), a new cohort of lead teachers was selected for participation at the start of each school year. As a first step, each year DECAL selected counties for participation based on the Georgia's Pre-K consultants' capacity to serve various geographic areas. Eligible counties were those where the school system had elected to participate in Georgia's K-12 RT3 initiative.[2] Across the three years, almost all RT3 school systems were included. See Figure 1 for a map of counties that were selected each year for participation in this study. Within the selected counties, all types of Georgia's Pre-K providers (e.g., schools, childcare centers, military bases) were eligible for participation.

Once the counties were selected, DECAL sent a list of all Georgia's Pre-K schools/centers and classes in each county to the FPG evaluation team for random selection and assignment of lead teachers to one of the professional development groups (i.e., MTP, MMCI, or control). DECAL determined the size for each group for each year, based on their consultants' availability, their resources to fund the supports, and targets they had set in their original RT3 scope of work, resulting in slightly different numbers of teachers in each group. See Table 1 for sample sizes.

Teachers were given $100 in the fall and $100 in the spring, in recognition of their time and effort. All teachers were eligible to participate in this study except: (1) those who were in their first year as a Georgia's Pre-K teacher or (2) those who would be absent most of the year (due, for example, to a medical condition or pregnancy). First-year teachers were excluded because DECAL provides introductory professional development to all first-year Georgia's Pre-K teachers, and DECAL thought it was important for all teachers to experience that program.

Table 1. Sample Sizes by Year[3]

	Year 1 2011-12	Year 2 2012-13	Year 3 2013-14	Total
MMCI	50	69	56	175
MTP	45	65	41	151
Control	51	63	46	160
TOTAL	146	197	143	486

Table 2 provides descriptive information about the participating teachers. Participating pre-k teachers were well-educated, with almost all having a Bachelor's degree or higher. On average, they had spent over six years teaching in Georgia's Pre-K, but there was variability in teaching experience across teachers. Average class size, as observed during the *CLASS* observation, was about 19 students.[4] More than half of the pre-k classrooms were in private settings (i.e., not public schools), and the sample was fairly evenly split between the Atlanta metro area and elsewhere.

In order to ensure that the groups were equivalent at the start of the study, teachers and classrooms in each of the three professional development groups were compared on all characteristics listed on Table 2. No between-group differences on these characteristics were found. Additionally, the groups were

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[2]During the third year, a few non-Race to the Top counties were included.
[3]These values reflect the number of teachers who took part in both the pre- and posttest.
[4]At the start of each *CLASS* cycle, the observer counted the number of children present. Each classroom's group size was calculated by taking the average of those cycles.

Figure 1. Counties Selected for Participation in Georgia's Pre-K Professional Development Evaluation
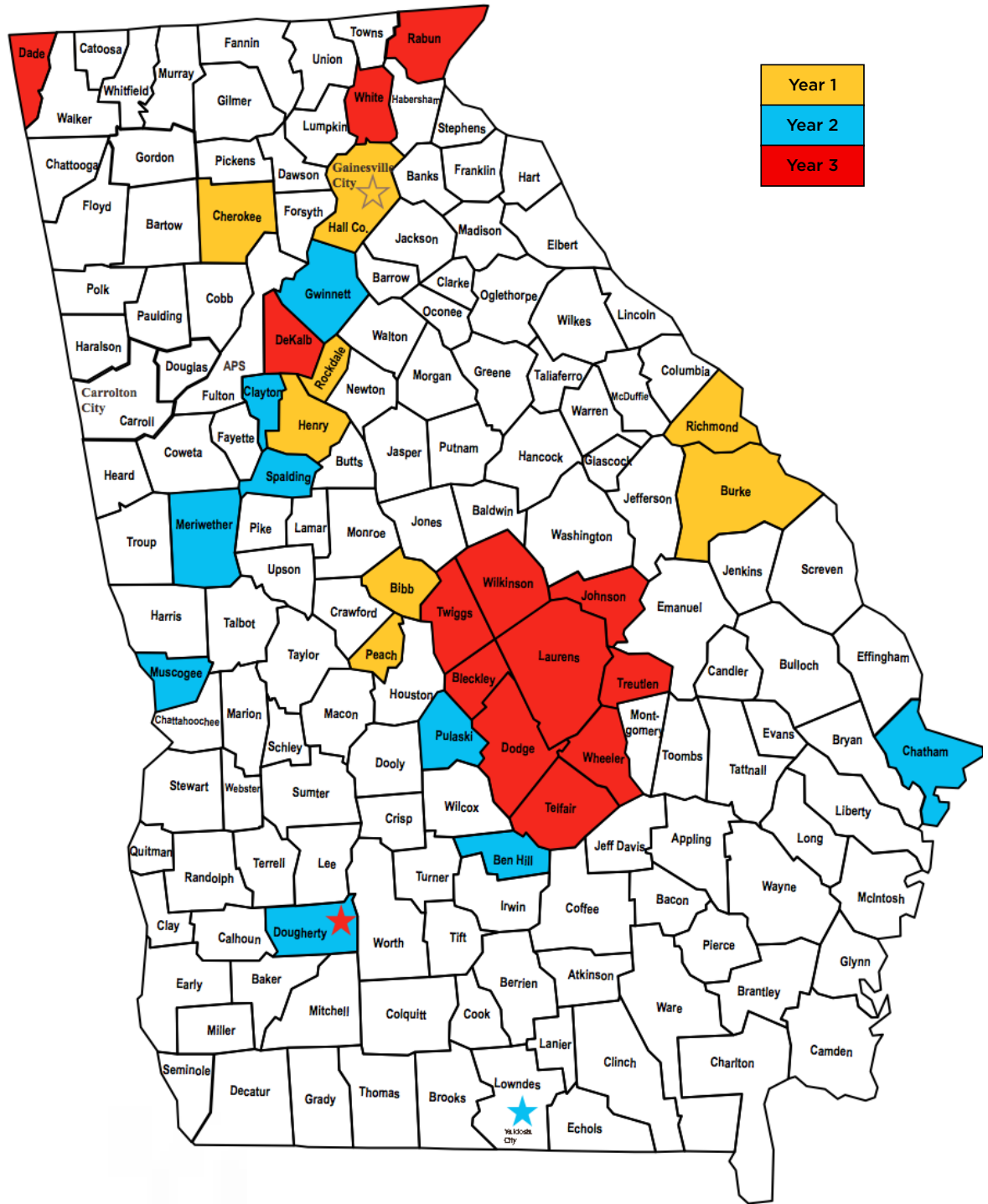
Year 1	Year 2	Year 3	
Bibb	Ben Hill	Bleckley	Telfair
Burke	Chatham	Carrolton City	Treutlen
Cherokee	Clayton	Dade	Twiggs
Gainesville City	Dougherty (centers only)	DeKalb	Wheeler
Hall	Gwinnett	Dodge	White
Henry	Meriwether	Dougherty (public schools)	Wilkinson
Richmond	Muscogee	Johnson	
Rockdale	Pulaski	Laurens	
	Spalding	Rabun	
	Valdosta City		

Table 2. Teacher, Classroom, and Program Characteristics

	Overall	MMCI	MTP	Control
Teacher Characteristics				
Mean (range) years teaching in Georgia's Pre-K	6.11 (1 to 25)	5.97 (1 to 25)	6.30 (1 to 20)	6.08 (1 to 21)
Educational attainment[5]				
Less than BA/BS	9%	8%	9%	9%
BA/BS	65%	66%	68%	62%
Advanced degree	26%	26%	23%	29%
Mean (range) years of education	16.50 (13 to 21)	16.51 (13 to 21)	16.43 (14 to 21)	16.56 (13 to 21)
Classroom Characteristics				
Mean (range) observed class size	18.95 (9 to 28)[6]	19.21 (9 to 28)	19.12 (11 to 27)	18.51 (11 to 22)
Mean (range) observed children per adult	9.36 (4 to 13)	9.42 (5 to 13)	9.48 (4 to 13)	9.17 (5 to 13)
Program Characteristics				
Center based/ school-based	63%/37%	59%/41%	69%/31%	61%/39%
In Metro Atlanta/out of Metro Atlanta	48%/52%	46%/54%	50%/50%	47%/53%

compared on proportion of enrolled children whose families were receiving public assistance, and pretest *CLASS* scores. Again, no between-group differences were found. The lack of between-group differences suggests that the randomization process was successful in creating comparable groups. Coupled with the random assignment, this lack of difference further increases our confidence that differences found after participating in the intervention were caused by the professional development, rather than by some other differences between the groups.

Participation in the Professional Development Activities

In general, implementation of the professional development models was successful, with most teachers taking advantage of the supports provided. As described below, however, there were some exceptions. The analyses presented in this report are based on an intent-to-treat approach in which all teachers were retained in the sample after assignment, regardless of actual participation in the professional development activities. The only exceptions were 27 teachers (5%; 8 MMCI, 8 MTP, 11 control) who stopped teaching in Georgia's Pre-K between the pre-and posttest.

Including all originally selected teachers in this way is a conservative test of the interventions' effectiveness and means that findings from this study tell us about the types of changes we would likely see if such supports were implemented broadly. Studies where teachers elect to participate rather than being randomly selected, or where teachers are excluded from the analyses if they do not take part in the professional development activities, only provide information about the types of effects seen in ideal circumstances.

In the real world, participation in any sort of intervention varies; by including all teachers who were selected, regardless of actual participation, we gain a clearer picture of real-world effects. DECAL did a good job of encouraging teachers to take advantage of the supports, but as with any intervention, there was variation in the extent to which teachers took part. Details regarding the implementation of each of the interventions appear below.

MMCI. The MMCI sessions began in October or November of each year and continued through February or March, with approximately one training day per month.

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[5]Teachers were asked to indicate on the questionnaire the highest level of education they had completed. All teachers had at least some college. For educational attainment, those who reported some college or an AA/AS degree were considered "less than a BA/BS," those who had a BA/BS or some graduate coursework were considered "BA/BS," and those with an MA/MS degree or an Ed.D. or Ph.D. degree were considered "Advanced Degree." For years of education: some college = 13, AA/AS Degree = 14, BA/BS degree = 16, some graduate coursework = 17, MA/MS = 18, Ed.D. or Ph.D. = 21
[6]Only two teachers had observed average class sizes over 23. In both cases, those were due to periods of the day when multiple classes were combined.

Each training day covered two of MMCI's 10 sessions. On a typical training day, participants would complete one session in the morning, then break for lunch, and reconvene for a second session in the afternoon. Sessions were co-taught by teams of Georgia's Pre-K consultants. The group sizes ranged from 8 to 20 teachers, with an average of 11. Sessions were located in various regions throughout the state to minimize the travel time for teachers. When multiple teachers from the same school or center were in the MMCI group, they were typically in the same MMCI session; however, all MMCI sessions contained teachers from multiple schools/centers. Of the 175 teachers in the MMCI group, 170 (97%) attended all 10 MMCI sessions. Of the five remaining teachers, one attended eight sessions, one teacher attended two sessions, and three did not attend any sessions.

MTP. MTP coaching began in September of each year and typically continued through April. Cycles of videotaping, sending the tape to the coach for review, and receiving feedback typically took two weeks to complete, but could take longer. There was no pre-determined goal for the number of MTP cycles teachers should complete. Instead, coaches and teachers were instructed to complete as many cycles as possible during the year, and when possible the data collection team waited until at least eight cycles had been completed before conducting the posttest. The average number of cycles completed before the posttest was 7.6 (*range = 2 to 13*). Forty-four teachers (29%) completed more than eight cycles; 40 (27%) completed exactly eight cycles; 59 (39%) completed five, six, or seven cycles, and eight teachers (5%) completed less than five.

Control group. In the first year of the study, teachers in the control group (*n* = 51) had access to the same online library of video clips demonstrating best practices in various aspects of teacher-child interactions as the MTP teachers. In the second and third years, teachers in the control group (*n* = 109) participated in the same types of professional development as Georgia's Pre-K teachers who were not in the study. DECAL contracted with Georgia State University to provide this training. Topics varied, but included behavior management, child assessment, outdoor learning, and others. None of their professional development focused on the *CLASS*.

Information Collected
Classroom Assessment Scoring System™. The *CLASS* is an observation tool measuring teacher-child interactions. Both MTP and MMCI are designed to improve teacher-child interactions, as defined and measured by the *CLASS*. The *CLASS* is made up of 10 dimensions, organized into three domains. The Emotional Support domain includes the dimensions of positive climate, negative climate, teacher sensitivity, and regard for student perspectives. The Classroom Organization domain includes behavior management, productivity, and instructional learning formats. The Instructional Support domain includes concept development, quality of feedback, and language modeling. Each dimension is rated from one to seven, with one or two indicating the classroom is low on that dimension; three, four, or five indicating that the classroom is in the mid-range; and six or seven indicating the classroom is rated high on that dimension. Observers rate the classrooms and teachers on the 10 dimensions roughly every 30 minutes throughout the observation morning. For this project, six 30-minute observation cycles were completed in each room. At the start of each of the six *CLASS* cycles, data collectors noted the number of children and staff present.

For this project, independent data collectors conducted a *CLASS* observation in the classroom of each participating teacher at the start and the end of the school year. On average, there were 194 (SD = 29, range 128 to 259) calendar days between the pre- and posttest observations. Data collectors did not collect posttests in classrooms in which they had collected pretests and were unaware of the project's design and blind to the teachers' professional development group assignment.

All data collectors were trained and certified by Teachstone as able to reliably use the *CLASS*. Approximately 10% of the observations were conducted as reliability visits, in which two data collectors were present for the observation to ensure that all data collectors were continuing to score in the same manner. See the Technical Appendix for details about inter-rater reliability.

Teacher questionnaires. Each participating teacher was asked to complete a questionnaire at the same time as the *CLASS* observations were conducted. The response rate was high, with 484 of 486 teachers (99.6%) completing the pretest questionnaire and 465 (95.7%) completing the posttest questionnaire.

The pretest teacher questionnaire included information about teacher characteristics (e.g., education, experience), *Knowledge of Effective Teacher-Child Interactions*[7] *and* Adult-Centered Beliefs. The posttest questionnaire included both of those scales again, as well as *Perceived Value of the Professional Development* and *Relationship with Coach/Instructor* (MMCI and MTP teachers only). All scales are described below.

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[7]This scale was included on the pretest questionnaire only in the second and third years of the study. Analyses of the scale were conducted using posttest questionnaires only, which included this scale in all three years.

Knowledge of Effective Teacher-Child Interactions
(Hamre & LoCasale-Crouch, 2009). Sometimes knowledge changes before practice (Hamre et al., 2012), so in addition to observations of practice, we also gathered information about teachers' knowledge of effective teacher-child interactions. This nine-item scale tests teachers' knowledge of interactions that lead to positive development, using a *CLASS* framework. It presents respondents with scenarios that they might encounter in the classroom and asks them to select the best response to each from four alternatives. Using a slightly longer version of this tool (14 items), Hamre and colleagues (2012) found that teachers who participated in a course on effective teacher-child interactions, similar to MMCI, scored higher than control-group teachers. A sample of an item reads:

> Before reading a story about autumn, the teacher wants to develop the children's understanding of autumn concepts by making connections to previous learning. One strategy she can use is: (1) having children share what they remember about the book they read yesterday, (2) sing a song that cues the class it is time for book reading, (3) review the letter sounds and parts of the word fall, and (4) remind them about their discussion of leaves falling off trees.

Adult-Centered Beliefs. Teachers' adult-centered beliefs were measured with a 16-item scale adapted from Schaefer and Edgerton's (1985) parental modernity scale. These items distinguish between traditional or relatively adult-centered perspectives of interactions with children and more modern or progressive child-centered perspectives. Teachers responded using a five-point scale ranging from strongly disagree to strongly agree. Teachers with more adult-centered views agreed with statements such as "Children should always obey the teacher." Teachers with more child-centered beliefs endorsed statements such as "Children have a right to express their own point of view and should be allowed to express it." Pianta and colleagues (2005) found that teachers with more adult-centered beliefs scored lower on several measures of classroom quality, including teacher-child interactions as measured by the *CLASS*. Those authors argue that more child-centered beliefs may reflect a better understanding of children's developmental needs and teachers' comfort and skill in interacting with young children.

Perceived Value of the Professional Development
(LoCasale-Crouch, Downer, & Hamre, 2009a). In the spring, all teachers were asked to respond to nine items regarding their perceptions of the professional development they had received that year, using a five-point scale ranging from strongly disagree to strongly agree. The items were first used by the National Center for Research on Early Childhood Education (n.d.) for evaluating MTP and a course similar to MMCI. Sample items include "I feel more confident in my role as a teacher than I did before this professional development," and "This professional development stimulated my enthusiasm for further learning."

Relationship with Coach/Instructor
(LoCasale-Crouch, Downer, & Hamre, 2009a). MMCI and MTP teachers were asked to respond to an additional five items, using the same five-point scale. These items specifically addressed the role and relationship with the coach/instructor. Control teachers were not asked to respond to these because their professional development did not necessarily involve a coach/instructor (e.g., access to online materials). A sample item reads: "The instructor/coach was enthusiastic about teaching/coaching."

MTP coach and MMCI instructor questionnaires. Each spring, MTP coaches and MMCI instructors[8] were asked to complete questionnaires that included items about educational background, years of experience as a consultant, and the *Knowledge of Effective Teacher-Child Interactions* and *Adult-Centered Beliefs* scales described above. Additionally, coaches and instructors responded to questions regarding their confidence in their understanding of the *CLASS* tool and ability to be an effective coach/instructor, using five items written by LoCasale-Crouch, Downer, and Hamre (2009b). An example of an item on the *Confidence* scale reads: "I am confident teachers will change their practice as a result of working with me." Coaches/instructors responded using a five-point scale ranging from strongly disagree to strongly agree. Questionnaire data from 28 of the 30 (93%) coaches and instructors who took part in this project at any point are included in the current analyses.

Semi-Structured Interviews with MTP Coaches and MMCI Instructors
As part of the evaluation, in the spring of the final year an independent researcher conducted semi-structured interviews with 21 Georgia's Pre-K consultants who were serving as an MTP coach, MMCI instructor, or both during the project's third year. Consultants were asked a range of questions about the effectiveness and ease of delivery of the programs, components that worked well or not so well, changes in themselves and in the teachers they coached, and the value and sustainability of the program. Consultants who participated in the interviews had an average of 6.9 years of experience as Georgia's Pre-K consultants, with a range of 2.5 to 11 years. Over the course of the evaluation, 11 of them had served as both MTP coaches and MMCI instructors, while 10 had served only as MTP coaches.

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[8]MMCI sessions were co-taught by pairs of Georgia's Pre-K consultants. All analyses reported here average the responses of each pair prior to analysis.

Table 3. Descriptive Statistics for Key Variables by Professional Development Group

	MMCI (n = 175)[9]		MTP (n = 151)		Control (n = 160)	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Emotional Support						
Mean	5.63	5.87	5.53	5.73	5.57	5.58
Range	2.79 to 6.83	2.50 to 6.96	2.88 to 6.92	3.38 to 6.88	2.83 to 6.92	2.21 to 6.75
Classroom Organization						
Mean	5.25	5.50	5.11	5.39	5.19	5.30
Range	2.22 to 6.89	2.44 to 6.89	1.50 to 6.83	2.56 to 6.83	2.33 to 6.67	2.72 to 6.72
Instructional Support						
Mean	2.56	2.92	2.61	2.76	2.65	2.65
Range	1.06 to 5.22	1.17 to 5.28	1.00 to 5.61	1.06 to 5.50	1.11 to 4.94	1.06 to 4.61
Number Correct on the Knowledge of Effective Teacher-Child Interactions						
Mean	NA	7.57	NA	7.20	NA	7.20
Range	NA	2 to 9	NA	3 to 9	NA	3 to 9
Perceived Value of the Professional Development						
Mean	NA	4.27	NA	4.22	NA	3.95
Range	NA	1.63-5.00	NA	1.00-5.00	NA	1.00-5.00
Relationship with the Coach/Instructor						
Mean	NA	4.54	NA	4.72	NA	NA
Range	NA	3.40 to 5.00	NA	1.00 to 5.00	NA	NA

Table 4. Summary of Evaluation Results

	MMCI vs. control	MTP vs. control	MMCI vs. MTP
Emotional Support	MMCI > control	MTP > control	No difference
Classroom Organization	No difference	No difference	No difference
Instructional Support	MMCI > control	No difference	No difference
Knowledge of Effective Teacher-Child Interactions	MMCI > control	No difference	MMCI > MTP
Perceived Value of the Professional Development	MMCI > control	MTP > control	No difference
Relationship with the Coach/Instructor	Not applicable	Not applicable	MTP > MMCI

Results

This section begins with descriptive information about the key outcomes. Next, we turn to the main research questions regarding how the professional development models affected teacher-child interactions. Those are followed by findings about between-group differences in knowledge of effective teacher-child interactions, perceived value of the professional development, and perceptions of the coach/instructor. (See Table 4 for a summary of the main results.) Finally, we describe some analyses that consider teacher, classroom, site, and coach/instructor characteristics that might be linked to greater benefits from the professional development models. It is important to note that these follow-up analyses are

correlational—meaning we cannot be sure that the various characteristics tested caused the change in teaching—but they do give us some direction for future investigation and hints as to conditions under which these professional development models might be most beneficial. This report focuses only on information that was collected regarding both MMCI and MTP teachers. See the Technical Appendix for a detailed description of all analyses and findings.

Descriptive Information

As a first step in understanding between-group differences, we considered the descriptive statistics for each of the key variables. Table 3 presents those values. As seen on this table, in all three groups, the

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[9]As described in the Method section, there were some missing teacher and coach/instructor questionnaires. The values on this table represent all teachers and coaches/instructors who responded.

average scores on Emotional Support and Classroom Organization were at the upper end of the mid-range at both pre- and posttest. On Instructional Support, on average, all three groups were at the upper end of the low range at both pre- and posttest.

Did MTP or MMCI Lead to Better Teacher-Child Interactions?

To test this question, we conducted statistical analyses comparing the posttest *CLASS* scores of the three groups (MMCI, MTP, and control) in each of the three domains (Emotional Support, Classroom Organization, and Instructional Support). The analyses accounted for the fact that some schools/centers included more than one participating teacher and controlled for teachers' pretest *CLASS* scores to adjust for any differences between teachers at the start to the project.

Findings indicated that at the end of the year, MMCI teachers scored significantly higher on Emotional Support ($p < .001$) and Instructional Support ($p < .05$) than teachers in the control group. On Classroom Organization the two groups were similar ($p < .10$). MTP teachers scored higher on Emotional Support ($p < .05$) than teachers in the control group at the end of the year. No improvement was seen among MTP teachers on Classroom Organization ($p > .10$) or Instructional Support ($p > .10$) relative to teachers in the control group. There were no statistically significant differences between MMCI and MTP teachers in any of the three domains (all $p > .10$).

Improvements in teacher-child interactions resulting from participation in MMCI and MTP, as measured by the *CLASS*, were small in size. Effect sizes for the statistically significant findings ranged from .22 for the effect of MTP on Emotional Support to .36 for the effect of MMCI on Emotional Support. As a reference, researchers often consider an effect size of .20 as *small*, an effect size of .50 as *moderate*, and an effect size of .80 as *large* (Cohen, 1992).

Did MTP or MMCI Lead to High-Quality Interactions?

Another way to think about the effects of these professional development models is to consider the proportion of teachers who reached a level of quality that we expect to improve children's outcomes. A recent evaluation found that participating in Georgia's Pre-K benefited children (Peisner-Feinberg et al., 2014), but it is possible that improved teacher-child interaction could increase those benefits. Some past research using a precursor to the current *CLASS* tool concluded that an Emotional Support score of 5.00

or more and an Instructional Support score of 3.25 or more is needed for pre-k programs to meaningfully contribute to children's social and academic outcomes (Burchinal, Vandergrift, Pianta, & Mashburn, 2010).

Findings from the current study indicate that after the year of professional development, 34% of MMCI teachers, 30% of MTP teachers, and 23% of control teachers attained a 5.00 or higher on Emotional Support and a 3.25 or higher on Instructional Support. Statistical analyses that accounted for teachers' pretest scores indicated that MMCI significantly increased a teacher's odds of attaining this level of quality as compared to the control group, but MTP did not. Importantly, in all three groups, only a minority of teachers reached that threshold. Thus, the gains produced by the interventions were not at the level needed for pre-k programs to optimize children's outcomes.

Did Teachers' Knowledge of Effective Teacher-Child Interactions Change?

As described in the Method section, sometimes knowledge changes before practice (Hamre et al., 2012), so we were interested in learning if MMCI or MTP changed teachers' knowledge of effective teacher-child interactions. To measure teachers' knowledge, teachers were asked to identify one best answer for each of nine classroom scenarios. Teachers' scores reflected the number they correctly answered. This evaluation question was answered using statistical analyses similar to those presented above for the *CLASS*. See the Technical Appendix for details about the analysis strategies.

Findings indicated that MMCI teachers' posttest knowledge of effective teacher-child interactions was significantly greater than that of either control ($p < .05$) or MTP ($p < .05$) teachers. There was no difference between MTP and control teachers on this measure ($p > .10$).

Did the Groups Vary in How They Viewed the Professional Development?

At the end of their participation in the study, teachers in all three professional development groups answered nine questions regarding their perceptions of the value of the professional development, using five-point scales where higher scores indicated more positive perceptions. The nine items were averaged together to create a *Perceived Value of the Professional Development* score. Statistical analyses were conducted to compare the different groups' scores on that scale, following the same strategy used to compare teachers' *Knowledge of Effective Teacher-Child Interactions*.

Findings indicated that both MMCI and MTP teachers perceived their professional development as more

valuable than did control teachers (*p* < .001 for both groups). There was no difference between MMCI and MTP teachers on this measure (*p* > .10).

Five additional questions were asked only of the teachers in the MMCI and MTP groups. Those questions were about the teachers' perceptions of the coach/instructor and the teachers' relationship with the coaches/instructors. Teachers in the control group did not necessarily have a coach or instructor, so those questions were not asked of control-group teachers. The five items were averaged together to create a *Relationship with the Coach/Instructor* score and statistical analyses were conducted to compare MMCI and MTP teachers on that score. Both groups rated their relationship with their coach/instructor quite high (see Table 3 for means); however, MTP teachers had more positive perception of their coach/instructor and their relationship than did MMCI teachers (p < .001).

Did MMCI or MTP Benefit Some Teachers More Than Others?

One goal of this study was to find out what types of teachers and conditions were associated with the greatest benefits from the professional development models. To answer this question, a number of teacher, classroom, site, and coach/instructor characteristics were considered. It is important to note that these analyses are *correlational*, meaning that it is not possible to know if the characteristics tested caused change or if they are simply related due to some other factor. The characteristics tested were:

- Teacher's years of experience as a Georgia's Pre-K teacher
- Teacher's years of education
- Teacher's *Adult-Centered Beliefs*
- Class size
- Child-to-adult ratio
- Proportion of children in the classroom whose family reported receiving public assistance
- Center vs. school
- In vs. outside the metropolitan Atlanta area
- Coach/instructor's *Adult-Centered Beliefs*
- Coach/instructor's *Knowledge of Effective Teacher-Child Interactions*
- Coach/instructor's self-reported *Confidence*
- Coach/instructor's years of experience as Georgia's Pre-K Consultant

Findings indicated that among MMCI teachers, those with fewer years of education demonstrated greater improvement in Emotional Support and Classroom Organization than those with more years of education (both *p* values < .05), and MMCI teachers in the metropolitan Atlanta area showed greater improvement in Instructional Support than those outside metropolitan Atlanta (*p* < .05). Further, MMCI teachers

whose instructors had more years of experience as a DECAL consultant had higher Instructional Support posttest scores, after controlling for pretest scores and other instructor characteristics (*p* < .05). Among MTP teachers, those in classes with fewer children per adult demonstrated more improvement in Instructional Support than those with more children per adult (p < .05). None of the other links between the professional development models and teacher, class, site, or coach/instructor characteristics were significantly associated with improvements in *CLASS* scores (all *p* values > .05).

How did MMCI Instructors and MTP Coaches View the Interventions?

The semi-structured interviews with instructors and coaches offered some additional insights into the findings. Overall, consultants reported seeing MMCI as more effective than MTP. Consultants noted the group approach, teachers having time to reflect on the videos and discuss strategies, a focus on dimensions of the *CLASS* instrument, and the direct connection of learning activities to classroom experience as especially effective aspects of MMCI. For example, one noted "...the fact that teachers could see other teachers teaching [in the videos] and see the positive things and also maybe the things that needed to be changed or tweaked a little bit." Other factors they saw as working well included working with a partner/coach and the format and pacing of the program. What worked less well was doing the 10 training sessions in only five days, which reduced the opportunities for homework or practice about specific *CLASS* dimensions.

While most consultants reported that MMCI was highly effective, MTP elicited more diverse responses. Those who rated MTP the highest did so because they saw progress in teachers' understanding of how classroom practices connect to children's learning. They liked the one-to-one relationship and focus on teachers' self-reflection on specific behaviors. They also were positive about the organization and structure of MTP, specifically the videotaping, feedback, examples, and flexibility of when to do the work. Others rated MTP lower in terms of effectiveness due to the lack of buy-in and engagement of some teachers. As one said, "Some teachers bought into it, and they were excited. Other teachers felt like they were being punished, and the expectation was too much, and they were merely going through the motions of doing the minimal to get by."

MMCI was seen as easier to deliver than MTP. Consultants noted that MMCI was well-organized and straightforward, with each lesson or session following the same format. They felt comfortable with the information and also liked working with a partner. One instructor summed up why she loved doing MMCI:

I think the sessions are concise enough that you can hold teachers' attention … each session follows the same format. You become familiar with that. I think for teachers it takes some of the intimidation off by having the videos because it's not them we're talking about. It's some other teacher that we're able to talk about. I think that makes them more comfortable in opening up.

Few difficulties were mentioned, but those that were included the amount of time teachers were required to be out of their classrooms in order to participate in the sessions, and scheduling the training. Although consultants noted that the MTP program was straightforward—they knew what they needed to do—they viewed it as more difficult to deliver because of the intensity and time-consuming nature of the steps involved, and the lack of investment by some teachers. One coach indicated that she was of two views: MTP was easy because the coaches were familiar with the *CLASS* tool, but it was difficult when teachers did not want to participate. The issue of time reverberated throughout the MTP interviews, with consultants noting how difficult it was to manage all the tasks on top of their other responsibilities.

Consultants saw changes in themselves and teachers due to participation in MMCI or MTP. For both programs, a majority of consultants said they had increased knowledge of the *CLASS,* had become better observers, and had gained new perspectives about how to interact and communicate with teachers in concrete ways and using a common language. Thirteen of the MTP coaches stated that they witnessed teachers engaging in more conversations and questions with the children, and many mentioned the increase in teachers' knowledge of *CLASS* dimensions and how to implement them. For example, one consultant said, "They really started connecting the dots. Why they do certain things, and why they should do certain things." MMCI instructors were unable to observe teachers in the classroom but believed the program worked to increase teachers' knowledge and awareness of best classroom practices. Regarding their own increased understanding, one instructor stated, "I have noticed that I incorporate a lot of that *CLASS* language into my day-to-day work with teachers and with directors, but I think it helps me to focus on specific things when I'm in a classroom."

As for MMCI, all but one instructor thought the program was worth the investment. These supporters endorsed the model and content of the lessons as well as the face-to-face personal interactions. They believed teachers increased their knowledge and awareness, and that would in turn benefit the children. Aspects they would like to continue include: use of the *CLASS* instrument and language, small group approach, partnering of instructors, monthly training,

and access to videos. One instructor echoed the opinion of most in saying, "I would hope that they would actually implement the MMCI instruction across the state …. This is something that I think would be beneficial to all pre-k teachers across the state." In contrast, only four coaches thought MTP was worth the investment. The other 17 either equivocated or were firm in saying it was not worth the time given the small number of teachers it impacted. Several noted that the program could not be sustained with a large number of teachers, but they did endorse the videotaping and one-to-one feedback as elements they would like to see sustained. One coach expressed this common theme:

Not to say that we didn't learn some wonderful things, and some teachers came away with some great new knowledge and ability to do some things different in their classrooms. But when you're looking at a statewide project -- I mean it took us about the first three months for the consultants to figure out 'Okay. We could never do this statewide.' We just knew how much -- how time intensive it was.

Discussion and Conclusions

MMCI, which used an in-person, cohort model to improve teacher-child interactions, was an effective means of increasing emotional and instructional support in Georgia's Pre-K classrooms, compared with control-group teachers. Further, teachers who took part in MMCI had greater knowledge of effective teacher-child interactions after participation than did their peers in the MTP or control groups and thought their professional development was more valuable than did their peers in the control group. Their relationships with their instructors were positive, but somewhat less positive than those reported by MTP teachers. Interviews with MMCI instructors indicated that they had very positive experiences with the model and thought it was a good fit for the state.

Teacher-child interactions among teachers in the MTP group, which involved one-to-one, remote coaching, also showed improvement. Emotional Support increased as a result of participation. Classroom Organization, Instructional Support, and *Knowledge of Effective Teacher-Child Interactions* did not improve. There were no differences between MTP and MMCI teachers at the end of the study on any of the three CLASS domains. MTP teachers saw their professional development activities as more valuable than control-group teachers, and MTP teachers reported more positive relationships with their coaches than did

MMCI teachers with their instructor. Interviews with MTP coaches suggest that their experiences with the model were more mixed than those of the MMCI instructors, with many feeling that it was too time intensive and not worth the state's investment.

There was some correlational evidence that different groups of teachers benefited more from the professional development models than others. MTP teachers in classrooms with fewer children per adult showed greater improvements in Instructional Support, and MMCI teachers with fewer years of education showed greater improvements in Emotional Support and Classroom Organization. These findings make some intuitive sense. The teaching environment is less stressful when there are more favorable child-to-teacher ratios, and this lower stress may allow the teacher to focus more on improving her interactions. Likewise, the content delivered in MMCI might be more novel for less educated teachers, thereby having a greater influence on their practice. Previous research by Pianta and colleagues (2008), however, has not identified child-to-teacher ratios or teacher education as a factor associated with change in practices.

Strengths of the Study Design

This study has four particular strengths in evaluating the professional development models: teachers were randomly selected for participation, teachers were randomly assigned to a professional development group, professional development activities were led by regular Georgia's Pre-K consultants, and a mixture of quantitative and qualitative methods was used. Most similar studies of professional development strategies, including those by Pianta and colleagues investigating the efficacy of MTP and MMCI, rely on teachers who have elected to participate (Downer et al., 2009; Hamre et al., 2012; Pianta et al., 2008). That type of research tells us about the types of benefits we might see if teachers are invested in changing their practice. The current study is more broadly applicable to large systems such as Georgia's Pre-K because it tells us about the benefits of these models for all teachers, not just those who elect to participate.

The random assignment of teachers to a professional development group is a second strength of the study. Due to the random assignment, we can be confident that the changes we saw were caused by participation in the professional development activities. If teachers had been allowed to select their own professional development model, there might be systematic differences between the groups that led them to choose a particular model and also led them to change (or not) during the course of the year. By randomly assigning teachers to a professional development group, we can

be fairly certain that the only difference between the groups is the professional development they received and that changes are therefore due to that experience.

The fact that the MMCI and MTP supports were provided by Georgia's Pre-K consultants adds to the applicability of these results in real-world settings. Consultants reported that they benefited from participation as well. In past research on these strategies, the coaches and instructors have been Teachstone or university employees who are very experienced in delivering *CLASS*-based professional development. To be cost-effective, feasible, and sustainable, systems that are interested in employing such professional development models on a large scale would need to use their own consultants or technical support staff. This study demonstrates that improvements in teacher-child interactions are possible when program staff deliver a well-defined intervention. Relying on DECAL consultants to deliver the intervention has a further benefit: the consultants can continue to use MMCI and MTP strategies and methods in their regular consulting work after this project.

Finally, this study's mixed methods approach of combining the quantitative data with coach and instructor interviews means that we can quantify the models' benefits and have some insights into the coach and instructor experiences as a means of understanding the pattern of findings.

Study Limitations

As with all research, this study also had some limitations. The single day of observation by a single observer in the fall and spring means that the ratings of teacher-child interactions are not exact. Teacher-child interactions vary from day-to-day, and it is always possible that an observation took place on a particularly good or bad day. Additionally, although the observers were well-trained and monitored, it is impossible for independent observers to be entirely accurate and consistent in their ratings. Likewise, the teacher and consultant questionnaires rely on written, self-reports which may include some error if questions are misunderstood or misread.

It is important to remember that all studies take place within a context, and we cannot know exactly how these findings would or would not generalize to other contexts, like childcare or Head Start. Some characteristics that might differentiate this context from others include: the high education level of Georgia's Pre-K teachers, the low attrition in this study indicating low teacher turnover, and the fact Georgia spent the few years prior to this intervention building knowledge of the *CLASS* among its staff and pre-k teachers statewide.

Conclusions

Georgia's Pre-K teachers benefited from and liked both the MMCI and MTP interventions. This study purposefully sought to test MMCI and MTP as possible ways to improve teacher-child interactions in real-world conditions, such as delivery of the intervention by program staff and randomly selecting teachers rather than asking for volunteers. When compared to teachers in the control group, MMCI resulted in improvements in two domains; MTP resulted in improvements in one domain. Pre-k teachers rated both interventions more favorably than did teachers in the control group.

MMCI is a feasible intervention for large-scale adoption. MMCI requires fewer staff members and less time to implement than MTP, which makes it more feasible and sustainable for large-scale implementation. DECAL put a great deal of effort into implementing both models with a high level of fidelity. That effort resulted in almost all MMCI teachers attending all ten sessions; however, only 56% of MTP teachers completed eight or more cycles of coaching. This difference illustrates the challenges associated with MTP implementation.

The interviews with coaches/instructors provided some insight into this issue. MTP requires a major time commitment on the part of the coach and was seen as difficult to implement with teachers who are not highly committed to the process. While coaches typically reported valuing the MTP experience and believed that their own understanding of high-quality teacher-child interactions had improved, most believed that its widespread implementation in Georgia was not achievable and that its costs (in terms of time, money, and effort) were too great for the benefit. MMCI, on the other hand, was generally viewed by instructors as both practicable and beneficial for teachers.

Additional research is needed to understand better the circumstances under which MMCI and MTP are most likely to support meaningful improvements in teacher-child interactions. The findings from this evaluation add to the literature about the MMCI and MTP interventions (e.g., Downer et al., 2009; Hamre et al., 2012) and provide some data about the factors (e.g., teacher education, ratios) that may influence the effectiveness of the interventions. There are many important questions still to answer about these interventions. For instance, is there a minimum, maximum, or ideal number of MTP cycles that yields the greatest change in teacher practice? This study provides important information about the likely attainable dosage within a large-scale implementation, which was less than the dosage received when MTP was implemented by its developers (Pianta et al., 2014). We need additional work, however, to understand the range of supports teachers and coaches need to ensure that the models are implemented in a way that provides maximum benefit.

Advancements in early childhood professional development are still needed. Using these well-defined, evidence-based professional development models, some statistically significant findings emerged. The improvements, however, were small and instructional support in all three groups remained in the low-to-middle range. Thus, additional work is needed, including refinement of existing models and creation of new approaches to professional development, to best support all pre-k teachers in engaging in high-quality interactions with their students.

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