

## Capturing the Heterogeneity in Quality within Early Care and Education Programs Serving Preschool-Age Children

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**Grant Number:** 90YE0124/01

**Period of Funding:** 2009 - 2013

### Project Description.

The goal of this study is to improve our understanding of the variation in quality within and across classrooms. To achieve this goal we use two sources of rich data on program quality and child outcomes from centers serving preschool-age children. The study has three aims:

- Determine how to combine measures of the characteristics of individual staff members in a classroom to best capture quality at the classroom level.
- Determine whether quality should be measured at the level of the staff member, classroom or center.
- Determine whether there are ways to improve the efficiency of measuring quality at the center, classroom, and staff-member levels.

### Research questions.

1. How should staff quality attributes be combined to create classroom level scores that reflect actual quality?
2. What is the optimal unit of analysis in studying ECE quality?
3. Are there ways to increase efficiencies in assessing ECE center quality?

**Sample.** The work exploits data collected by the study team as well as administrative data from Qualistar Colorado. The RAND California Preschool Study data provide observational assessments of multiple dimensions of program quality for nearly 250 classrooms and education and training measures for all classroom staff. The Qualistar Colorado data include measures of classroom quality for all classrooms in a large sample of centers, as well as data on

staff education and training for all classroom staff. Additional data collected by RAND as part of an evaluation of Colorado's Qualistar Quality Rating and Improvement System (QRIS) include some child outcome measures.

**Methods.** We are using three general methods to address the research questions: descriptive analysis of variation in quality scores; construction of summary measures of quality; and multivariate regression analysis.

#### *Descriptive Analysis of Quality Variation*

With data for all staff within classrooms and all classrooms within centers, we are using variance component analysis, which partitions the variance in nested data, to measure the within versus between variation at the classroom or center level.

#### *Construction of Summary Measures of Quality*

ECE classrooms typically employ multiple staff; centers are comprised of multiple classrooms. To capture classroom-level quality we need summary measures of staff quality characteristics; we also need center-level summary measures of classroom quality. These summary measures will be used in regression models as predictors of global classroom quality or child outcomes.

#### *Multivariate Regression Analysis*

Two general forms of multivariate linear models will be estimated. The first set of models will examine relationships at the classroom level between global measures of classroom quality as a function of classroom-level or center-level

characteristics. The second set of models will estimate the relationship between child-level developmental outcomes and quality attributes at the classroom and center level.

**Progress Update.** Findings documented in an article under review show considerable variability in quality across classrooms in the same center. For example, based on a variance decomposition analysis in the Colorado sample of about 1,400 classrooms in just over 400 centers, we have estimated that 25 to 30 percent of the variation in the environment rating scale (ERS) is variation across classrooms within centers serving the same age group of children versus variation between centers. We examine the implications of this degree of within-center heterogeneity for how quality rating systems (QRSs) capture center-level quality based on classroom-level quality and for the ability of within-center classroom sampling rules to classify centers in the same QRS rating tier that would apply when all classrooms were assessed.

In a second paper, we find in the Colorado sample that centers staff classrooms in different ways and do not appear to follow an identifiable staffing policy. The most prevalent pattern combines a BA-level teacher with one or more non-degreed teachers in what we call a high-skill Apprentice Model. Another common model includes no staff members with a post-secondary degree, which we call a low-skill Similarity Model. Most centers do not employ a consistent staffing model across classrooms.

We used staff education and training (e.g., highest degree attained, number of ECE credits, and years of experience) to predict ECERS-R scores in the Colorado administrative dataset. We find that classroom quality is highest when the best-

educated staff member in the classroom has a bachelor's or master's degree; the degree level of the person with the least education also predicts quality. The higher the maximum number of ECE credits among the staff in the classroom, the higher the quality as measured by the ECERS-R; years of experience of the classroom staff has no relationship to ECERS-R score.

### **Implications for policy/practice**

Our findings highlight the amount of variability across classrooms within a center. Our findings raise concern about the appropriateness of basing center-level quality ratings on the center average without reference to the range of quality within the center and of aggregating measures of classroom quality from a small number of sampled classrooms to a center-level quality score, both practices employed in most QRSs. This intra-center variability is also important for parents to understand as they choose centers, not classrooms.

### **Implications for research**

Study results will shed important light on the measurement of quality in ECE centers. Data on staffing patterns may clarify the appropriateness of measuring staff capacity by identifying a single, "lead" teacher, and will provide currently unavailable data on staffing patterns.

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