Abstract Title Page

Title: Measuring Data Use Beliefs and Practices in Early Education Settings

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Abstract Body

Background / Context:
In recent years, the early childhood field and the systems that support and govern it have placed an increased emphasis on data collection and data use for continuous quality improvement, professional development, and compliance and accountability. Indeed, the proliferation of Quality Rating and Improvement Systems in states across the country and the Head Start Act reauthorization in 2007 have pushed early childhood programs to embrace a more intensive culture of "data-driven decision-making" (OHS, 2013). In addition, the newly proposed Head Start Performance Standards would require programs to "implement a process for using data to identify program strengths and needs, develop and implement plans that address program needs, and continually evaluate progress towards achieving program performance goals" (OHS, 2015). But despite this growing expectation of data use, there is as yet only an emerging body of evidence on effective models of data use in early childhood education settings, and even less information about how to measure its frequency and intensity. The Educare Learning Network's Implementation Study (IS) provides an opportunity to explore the measurement of data use practices in a nationwide sample of high-quality early education programs serving income-eligible and at-risk children age birth through five and their families.

Educare is a network of enhanced Early Head Start (EHS)/Head Start (HS) programs that implement innovative Research-Program Partnerships (RPPs) to engage researchers, program leaders, staff, and at times, other stakeholders in a collaborative approach to supporting data use practices for decision-making and continuous quality improvement at the school and network levels. These RPPs have been informed by the local evaluation partnerships developed for the Early Head Start Impact Study (Love et al., 2005) and the principles of utilization-focused evaluation (Patton, 2008) and participatory evaluation (Ryan & DeStefano, 2000). Based on research noting the importance of providing data "with sufficient frequency and in contexts that will inspire educators to develop, utilize, and disseminate effective interventions" (Downs & Strand, 2006), the RPPs use data from a variety of quantitative and qualitative sources (e.g., standardized measures to compare children's skills to national norms, curriculum-based assessment, progress monitoring tools, teacher/parent ratings, interviews, focus groups, etc.) to provide a fuller picture of program functioning and impact (Scott-Little et al., 2003). As such, the Educare Learning Network offers an ideal context in which to examine the measurement of data use. Furthermore, this study represents a critical step in advancing RPP models and the early education field's conceptualization by leveraging the IS's rich data use data to develop a measure of early educators' data use beliefs and practices.

Purpose / Objective / Research Question / Focus of Study:
This study develops a measurement strategy for quantifying data use in center-based early education settings. To do so, we seek to identify specific constructs of data use among early childhood educators. Specifically, this study aims to (1) identify distinct constructs of data use practices and beliefs from a self-report measure of early care and education staff; (2) understand how these data use constructs operate at the individual and site levels; and (3) examine associations between data use constructs and key early educator individual characteristics and experiences of their work environment.

Setting:
Data for this study were collected in 16 Educare sites, located in urban, rural and suburban areas across 13 states in the spring of the 2014-2015 school year. Each program is housed in a new or remodeled early education center that includes infant, toddler, and preschool classrooms.

Population / Participants / Subjects:
The data for this study were collected as part of the Educare Implementation Study and includes 503 teachers, specifically lead teachers (n=198), assistant teachers (n=172), teacher aids (n=103), and other teaching staff (n=28) across 16 Educare sites during the 2014-2015 academic year. The sample is racially diverse (44% white, 38% black, and 18% Hispanic). On average, respondents have worked in early education for nearly 12 years and at Educare for about 3 years. Nearly all respondents were female (97%), and 51% have a B.A. degree or higher.

The final presentation will also include survey data from 38 master teachers (staff that supervise and provide embedded professional development and coaching to teaching teams) and 76 family support staff (staff that work directly with families) from these same Educare sites.

Intervention / Program / Practice:
Educare is an enhanced, high-quality birth to age 5 early education program designed to reduce the achievement gap for children from low-income families (Guss, Norris, Horm, Monroe, & Wolfe,2013; Stein, Freel, Hanson, Pacchiano, & Eiland-Williford, 2013;Yazejian, Bryant, & Kennel, 2013). Educare incorporates four innovative practices through partnerships with university researchers and community agencies (e.g., public schools, philanthropists) that show promise for improving children's outcomes: data utilization, coaching and ongoing professional development, high-quality teaching and interactions, and strong school-family partnerships. Although it is an EHS/HS program, Educare represents somewhat of a hybrid between the national public program and a model demonstration. Approximately 80% of the funding for Educare comes from public sources (HS, but also, depending on geographic location, child care subsidies and public pre-kindergarten funds), with the remaining 20% of costs covered by private philanthropy.

Educare has a variety of quality features that go beyond EHS/HS standards, but that draw from the literature on effective practices in early care and education. Most salient to this study is that collecting and using data for program improvement is a core feature of Educare. All sites have a PhD-level local evaluation partner (LEP) who collects child, family, program practice and staff survey data that are shared back with the program leaders and staff as part of the RPP processes described above and submits the data to a coordinating center for the cross-site study.

Teachers included in the current study are supervised by master teachers, all with a B.A. and 76% with an M.A. degree, who each serve 4.5 classrooms, on average. Master teachers provide teachers with ongoing professional development and coaching on research-based best practices. At least three times a year, teachers use a curriculum-based progress monitoring tool to track children's development, modify goals if necessary, and share results with parents. Annual classroom observations and assessments are conducted by trained and reliable LEPs and shared with teaching teams for continuous quality improvement.

Research Design:
The current study employs factor analytic techniques to identify latent constructs in early educators' self-report of data use practices and understandings, and explores the presence of these constructs at the site-level. As that there is little prior research that attempts to measure data use among early educators, the initial analyses included in this abstract are exploratory in approach.

Data Collection and Analysis:
Data Collection
Educator surveys were sent to teachers, master teachers, and family support staff in all 16 Educare schools via email and completed online in the Spring of the 2014-2015 school year. In terms of data use, the staff surveys included four items about the amount of data used (scores range from 1, "Not enough" to 3, "Too much"); how informed staff felt about different types of data (scores ranged from 1, "I need more information" to 3 "I know a lot about these data"); and how frequently they participated in data dialogues (scores ranged from 0, "Never" to 4, "Monthly") and used data for various purposes (scores ranged from 1, "Weekly" to 7, "Never"). These last scores were reverse coded such that higher scores indicate higher rates of data use, understanding, and frequency across all items. The staff survey include questions about more general characteristics such as gender, age, race/ethnicity, primary language spoken, education level and type, current enrollment in training, and professional experience in the field and specifically at Educare.

Staff surveys also included existing measures of teacher beliefs including a shortened version of the Child Care Worker Job Stress Inventory (CCW-JSI), a self-report measure designed to capture three dimensions of job stressors experienced by child care providers: job control, job resources, and job demands (Curbow et al., 2000). Higher scores on these subscales indicate that staff felt more control in their daily activities and routines, had greater resources at their work, and experienced more work-related demands. Finally, staff responded to the Modernity Scale, a 30-item measure of educators' Traditional, authoritarian beliefs and Progressive, democratic beliefs about how young children learn (Schaefer & Edgerton, 1985).

Analysis
Exploratory factor analysis was conducted using Geomin oblique rotation to account for predicted correlation among data use factors (Browne, 2001) and maximum likelihood estimation to account for missing data. Items' factor membership was defined such that a factor included all items with standardized factor loadings above .30 on that factor and lower standardized loadings on all other factors. Items with standardized factor loadings below .30 on all factors were not retained in any factor. Factor scores were then created by converting all item scores to a 0-1 scale and averaging items within each factor. We examined the associations of our newly identified construct factors with individual teacher characteristics to understand how self-reported data use is related to key teacher qualifications (e.g., education, experience) and beliefs (e.g., job stress, modernity). Finally, we examined the intraclass correlations (ICCs) of factor scores as a first step towards understanding whether teacher self-report can help us to understand site-level constructs of data use. Future analyses to be included in the final presentation will enhance our understanding of site-level data use by repeating these processes

with data collected from master teachers and family support staff, and conducting confirmatory and sensitivity analyses to compare findings across staff roles, sites, and model specifications.

Findings / Results:
Exploratory factor analysis results indicate two underlying data use factors (χ^2=2005.24, *df*=229, *p*<.001). Four items related to the amount of data collected were dropped due to standardized factor loadings below .30 on both factors. The Data Use Practices factor includes 14 items related to the frequency with which early educators use data in a variety of ways and the Informed about Data factor includes 6 items related to early educators' familiarity with different types of data (see Table 1). Both factors demonstrate high internal consistency (α=.91 for Data Use Practices and α=.85 for Informed About Data). Scores on each range between 0 and 1, with means of .39 and .49 and standard deviations of .22 and .24, respectively. The final factors are moderately correlated with one another (*r*=.39, *p*<.01) and with key teacher characteristics and qualifications in the expected directions (see Table 2). Finally, our analyses provide preliminary evidence that both Data Use Practices and Informed About Data may also be salient constructs at the site level (ICC=.52 for both factors); future analyses to be included in the final presentation will further explore site-level measurement of data use.

Conclusions:
Two latent data use constructs were identified from the analysis of teachers' self-report measures of data use: Informed About Data and Data Use Practices. These data use constructs are positively correlated with one another, suggesting that feeling informed about data and using data do not often occur independently. In addition, preliminary analyses suggest that each construct is related to key individual educator characteristics in ways that we might expect, providing initial evidence of the concurrent validity of these new constructs. Of particular interest is that both constructs were positively correlated with experiencing more/better reflective supervision and interdisciplinary practice among teaching and family support staff. Additional analyses to be included in the final presentation will explore these area further, with the goal of understanding data use among master teachers and family support staff—as well as teachers. Finally, preliminary analyses suggest that 52% of the variance in each construct lies between sites rather than between individuals within sites; additional analyses will explore this notable finding further in an effort to define data use constructs at the site-level as well as the individual-level.

Given the current emphasis on data use in the field of early education and social policy more broadly, there is growing need to measure data use practices, knowledge, and experience among early educators. Such measures could help to inform program improvement, professional development, and program monitoring. This study represents a first step towards identifying robust measures of data use in center-based early childhood programs across the country. However, the data for the current study come from a network of high-quality early childhood programs with unusually robust RPP supports in place. As such, future research is needed to explore the associations of these new measures with indicators of program quality and child outcomes, as well as the infrastructure, processes, and resources necessary to support strong data use practices in the diversity of early education programs across the country.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

Table 1. Exploratory factor analysis factor loadings.

	Data Use Practices	Informed About Data
Shape site's overall data use plan	**.42**	.01
Data use with LEP	**.31**	.07
Use data to set professional development goals	**.41**	.01
Use data to monitor child progress	**.34**	.10
Use data to with families	**.44**	.07
Staff dialogues about individual parent interviews	**.71**	-.02
Staff dialogues about individual child assessments	**.55**	.11
Staff dialogues about classroom-level child/family data	**.73**	-.04
Staff dialogues about site-level child/family data	**.83**	-.06
Staff dialogues about school's community data	**.85**	-.07
Family dialogues about individual parent interviews	**.79**	-.01
Family dialogues about individual child assessments	**.58**	.06
Family dialogues about site-level child/family data	**.87**	-.11
Family dialogues about school's community data	**.88**	-.09
Informed about child assessment data	.04	**.69**
Informed about parent interview data	.07	**.70**
Informed about classroom observation data	.12	**.72**
Informed about staff survey data	.07	**.75**
Informed about school community data	.18	**.59**
Informed about school quality data	.14	**.61**
Amount of child data	.00	.13
Amount of family data	.04	.13
Amount of school data	.01	.12
Amount of data reports	.02	.14

Note: Standardized factor loadings >.3 are bolded.

Table 2. Correlations of factor scores with key teacher characteristics

	1	2
1. Data Use Practices Factor Score	-	
2. Informed about Data Factor Score	.39**	-
3. Years taught at Educare	.06	.14**
4. Years worked in early care and education	.04	.09*
5. Job Control	.26**	.12**
6. Job Rewards	.22**	.18**
7. Job Stress	-.12**	-.14**
8. Modernity Scale	-.03	.09
9. Work Environment	.23**	.19**
10. Reflective supervision scale	.26**	.31**
11. Teacher-family support interaction	.38**	.25**

* $p<.05$; ** $p<.01$