



April 2019

TO: 2020 Young Scholars Program Applicants

RE: Examples of strong responses to Full Application questions

Dear Prospective Applicant,

Thank you for your interest in the Young Scholars Program (YSP). Please use the following packet as an additional resource when developing your proposal for the 2020 YSP LOI and Full Application process. This packet is a compilation of exemplary responses to the following sections:

- 1) Research Project Basis and Research Questions
- 2) Current State of Knowledge and the Significance of the Present Study
- 3) Public Policy and/or Practice Relevance
- 4) Methodologies and Measures
- 5) Data Analysis Approach

The examples represent excerpted written responses from various, previously awarded proposals. With each example, an overview of the project, the form question, the applicant's response and annotations are provided. While the responses in this packet are highlighted as strong written examples of question responses at the Full Application stage, please keep in mind that additional revisions to the proposal might have been made after final Advisory Committee review and pre-award.

Also, please be advised that the following examples reflect responses to a previous version of the Full Application. The Foundation revised the application form for the current cycle, so please pay close attention as some of the question details might have changed. For additional questions regarding YSP please contact: ysp@fcd-us.org.

Good luck, we are looking forward to receiving your application!

Research Project Basis and Research Questions Example

Research Project Basis and Research Questions Anna D. Johnson, Ph.D. Georgetown University

Project Overview:

This proposed primary research project will examine the workforce supports and wellbeing of early care and education (ECE) teachers across a range of publicly funded center-based ECE settings in Tulsa, Oklahoma. The Tulsa preschool program aims to prepare low-income children, including dual language learners (DLLs) and children with disabilities, for Kindergarten. The study will investigate the relationships between ECE workforce supports and teacher well-being, children's school readiness skills in prekindergarten and Kindergarten, and preschool classroom quality.

Research Project Basis and Research Questions

Describe your proposed program or policy implementation research, the theoretical or empirical foundation, the specific research questions, and the working hypothesis(es) which underlie your proposed work. All research must focus on the ways in which the knowledge, skills, and dispositions of the early care and education workforce can support young children's development across the birth through age eight continuum within Foundation's priority populations. Please refer to the YSP Guidelines Purpose and Research Focus, especially item "III. Research Focus."

Early care and education (ECE) teachers play pivotal roles in ECE classrooms, as they instruct children in academic content, support the development of underlying capacities that enable children to learn, and foster a classroom environment characterized by supportive adult-child and peer relationships (IOM & NRC, 2015; Diamond, Justice, Siegler, & Snyder, 2013). Yet ECE settings with teachers who, for example, lack professional and economic supports in the workplace, experience high rates of stress and depression, and are in poor physical health correlate with lower quality care and worse child outcomes (DeSchipper et al., 2009; IOM & NRC, 2015; Jeon, Buettner, & Snyder, 2014; Whitaker, Dearth-Wesley, & Gooze, 2015). Just as research links maternal stress and depression to reductions in maternal responsiveness and sensitivity (e.g., Goodman et al., 2011; Lovejoy et al., 2000; Wachs et al., 2009), ECE teachers who experience stress and depression and other challenges struggle to build healthy relationships with their students and have lower quality teacher-child interactions (e.g., Jeon et al., 2014; Roberts, LoCasale-Crouch, Hamre, & DeCoster, 2016). This may be especially true of ECE teachers in publicly funded programs targeted to low-income children, many of whom themselves come from stressful environments (e.g., Aikens et al., 2010); for instance, teachers who serve low-income children are more likely to be low-income themselves, and the programs in which they work may have fewer resources and supports, which contributes to workplace stress (Whitaker et al., 2015). Without knowing (1) the status and variation in ECE workforce wellbeing and supports among publicly funded ECE setting teachers, (2) whether these ECE teacher wellbeing and support factors link to children's

Research Project Basis and Research Questions Example

school readiness outcomes, and (3) whether these ECE teacher wellbeing and support factors link to observed classroom quality, it is impossible to know how best to direct policy and program efforts to improve ECE teacher and, ultimately, student outcomes. The proposed study is designed to address these unanswered questions.

Specifically, the proposed study will document and describe the ECE supports and overall wellbeing of ECE teachers across the range of publicly funded center-based ECE settings currently occupying center stage in policy and education debates. These settings – public school-based pre-kindergarten (pre-k), Head Start, and other public preschool programs – offer an opportunity to launch low-income and otherwise vulnerable children on trajectories of educational success by helping close early school readiness gaps that exist at kindergarten entry and persist as children age (Lee & Burkam, 2002; Reardon, 2011; Yoshikawa et al., 2013). The proposed study will be among the first to comprehensively document a rich set of ECE workforce supports and wellbeing factors across the full landscape of public ECE programs serving low-income children, including those who are dual language learners (DLLs) and who have disabilities. I will go on to assess links between these ECE workforce characteristics and children’s school readiness, first directly and then indirectly via classroom quality. All of the proposed work will take place in a state “laboratory” (Tulsa, OK) that is home to a renowned public pre-k program that serves predominantly low-income students, including high proportions of DLLs and children with disabilities. Tulsa has a mixed delivery system of public pre-k for 4-year old children, providing pre-k education in Tulsa Public Schools (TPS) school-based classrooms and Community Action Program (CAP)-Tulsa Head Start classrooms; outside of the Tulsa pre-k education system (TPS pre-k plus CAP-Tulsa Head Start), low-income children in Tulsa also attend community-based child care centers (CBCs) funded via federal child care subsidies, administered by the Oklahoma Department of Human Services (OK DHS). Through a larger, ongoing study that I am co-directing, I have built relationships with administrators in TPS, CAP-Tulsa Head Start, and OK DHS (see attached Letters of Support); these relationships assure the proposed project unique access to the full landscape of publicly funded center-based ECE programs that serve low-income preschool-aged children, including those who are DLLs and have disabilities.

Using these unique data, the proposed project will pursue 3 Specific Aims. Aim 1 seeks to document and describe variation in ECE workforce supports and wellbeing factors across the full range of publicly funded center-based ECE settings that enroll low-income children, including subgroups of DLLs and children with disabilities. To accomplish this, I will collect teacher responses to a rich, comprehensive set of questions tapping key dimensions of workforce supports, wellbeing, stress, and other experiences, and compare those responses (and their predictors) across public ECE settings. I hypothesize that teachers in TPS school-based public pre-k classrooms will have the greatest number of supports and the highest wellbeing, followed next by teachers in Head Start centers, with CBC teachers lagging the farthest behind. TPS school-based pre-k teachers receive wages and benefits on the same scale as K-12 teachers, and as a result may have better financial health, access to physical and mental health services, and a more professional identity, which could promote feelings of self-worth and self-esteem. Although CAP-Tulsa Head Start programs are affiliated with TPS, their teachers are typically paid at a somewhat lower hourly rate given their 12-month program year; they are also not co-located in public schools. However, they still may benefit from established infrastructure and linkages to the larger TPS system and early education community in Tulsa. I anticipate that support and wellbeing will be lowest among CBC teachers who serve

Commented [MOU1]: PI provides a brief statement about the motivation for the proposed research and includes references for its theoretical and empirical foundation.

Commented [MOU2]: PI’s primary research question is related to one of the Foundation’s three workforce goals.

Commented [MOU3]: PI’s research proposal is on the ECE workforce serving YSP’s ‘priority populations’ (see Section II. of 2020 YSP guidelines).

Commented [MOU4]: PI states specific aim to address the primary research question.

Commented [MOU5]: PI provides a hypothesis for Aim 1.

Commented [MOU6]: PI articulates rationale for Aim 1 hypothesis.

Research Project Basis and Research Questions Example

subsidized children, as these programs tend to have fewer administrative supports, are not formally linked with TPS and its early childhood system, and have a less qualified and lower-paid staff. Indeed, prior research with national data suggests CBCs serving children with child care subsidies provide lower quality care than Head Start or state pre-k centers (Johnson, Ryan, & Brooks-Gunn, 2012).

Aim 2 of the proposed project is to test for links between the ECE workforce supports and wellbeing factors identified in Aim 1, and children's school readiness in the pre-k year and in kindergarten. In light of theoretical and empirical work linking teacher-child interactions in ECE settings to children's early development (see Hamre, 2014), and under the assumption that ECE teacher experiences and wellbeing shape teacher-child interactions (e.g., Roberts et al., 2016; Whitaker et al., 2015), I hypothesize that children in classrooms led by teachers with lower levels of support and wellbeing will have reduced school readiness outcomes at the end of the pre-k (age 4) year and in kindergarten.

Aim 3 of the proposed project is to determine, if ECE workforce supports and wellbeing factors are associated with children's school readiness, whether this association is mediated by pre-k year classroom quality. Teacher-child interaction – especially as it relates to the delivery of instructional content, emotional support, and classroom management, predicts children's development and learning gains (see Hamre, 2014 for a review). As part of a larger study, my research team and I will gather detailed classroom observational data on instructional quality and additional measures designed to capture classroom features that may be especially sensitive to variation in teacher supports and wellbeing; these features include the presence of consistent and supportive teacher-child relationships, predictably enforced behavioral norms, and strong supports for constructive peer interactions (see Table 1 for full list). These "self-regulatory" features of the classroom may be particularly important for the early learning and development of DLLs and children with disabilities because such features are expected to increase opportunities for positive peer interaction and social inclusion, which would benefit children who struggle with classroom integration due to linguistic or social barriers. I hypothesize that these classroom features will partially mediate associations between ECE workforce supports and wellbeing, and school readiness outcomes. Further, I anticipate that the mediating role of the non-instructional, self-regulatory features of ECE classrooms in particular will be stronger for DLLs and children with disabilities than for children in the general population.

Across all Aims, I will leverage additional resources by incorporating program administrative data as well as data collected as part of a larger, longitudinal study of young learners in Tulsa's public ECE programs that I am co-directing. Quantitative statistical methods will be used to illuminate variation in ECE workforce characteristics across the different public programs (Aim 1) and to predict school readiness directly from ECE workforce characteristics (Aim 2) as well as indirectly from workforce characteristics via observed classroom quality (Aim 3). Together, addressing these research aims will contribute to a small but growing knowledge base around the needs and challenges of the publicly funded center-based ECE workforce, illuminating policy mechanisms to better support ECE workforce wellbeing and children's development and early learning.

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Commented [MOU8]: PI articulates rationale for Aim 2 hypothesis.

Commented [MOU9]: PI provides a hypothesis for Aim 2.

Commented [MOU10]: PI states Aim 3.

Commented [MOU11]: PI articulates rationale for Aim 3 hypothesis.

Commented [MOU12]: PI provides hypothesis for Aim 3.

Commented [MOU13]: PI previews how proposed research design will address each hypothesis across all aims.

Current State of Knowledge and the Significance of the Present Study
Carola Oliva-Olson, Ph.D.
California State University, Channel Islands

Project Summary

The proposed primary research two-year project will analyze the relative significance of two measures of classroom quality, two classroom language models, and explore whether initial language performance predicts language outcomes for young dual language learners (Spanish-speaking). The two measures of classroom quality are the Classroom Assessment Scoring System (CLASS) and the Classroom Assessment of Supports for Emergent Bilingual Acquisition (CASEBA). The research will occur in preschools utilizing two classroom language models: a) Instruction in English with systematic home language support; and b) Dual language instruction (English and Spanish) in a balanced bilingual approach.

Current State of Knowledge and the Significance of the Present Study

Please discuss the significance of the proposed project, how it relates to the current state of research knowledge and specifically how it contributes to the research field.

Latino students represent the fastest growing segment of the public school population in the United States (Hernandez, 2010; Kena et al., 2014; U.S. Census Bureau, 2013). Currently, there are around 13 million Latino students in U.S. public schools, and around 4 million of them are classified as DLLs, of whom 79% speak Spanish as their primary language (Batalova & McHugh, 2010; Kena et al., 2014; Snyder & Dillow, 2015). DLLs are defined as children who are born in bilingual or multilingual environments and are learning more than one language concurrently or children who grow up in a single-language medium and are exposed to an additional language—generally English—later in their childhood (Office of Head Start, 2009). One third of Head Start preschool children are DLLs and are enrolled in 87% of classrooms nationwide. DLLs account for 60% of California’s 0-5 year-old children. How these students fare in the educational system in coming years will substantially determine the overall success of public education (Rumberger & Arellano, 2009) and will therefore affect the future social, political, and economic viability of the United States. Public education in the United States cannot succeed without a high level of Latino and DLL student engagement and efforts that help them succeed in school and in life.

A key factor in the later academic success of young Spanish-speaking DLL students is the early development of English language skills (Burchinal et al., 2012; Castro, García, & Markos, 2013; Farver, Xu, Eppe, & Lonigan, 2006; Lilles et al., 2015). The development of strong language skills in both English and Spanish during the early elementary grades is associated with later success in school, particularly in reading and literacy (Castro et al., 2013). Although some believe that English-only instruction will result in the most exposure to the language and thus promote faster acquisition, studies suggest that DLLs may have two separate

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Current State of Knowledge and the Significance of the Present Study Example

language systems that emerge very early in life and that the different languages influence and strengthen one another (Castro et al., 2013; Goodrich, Lonigan, & Farver, 2013). One study by Dunn Davison, Hammer, and Lawrence (2011) found that early growth in either English or Spanish receptive language predicted later reading outcomes in either language. The connection between emerging language proficiency in both English and Spanish during preschool and first grade reading outcomes is important because English reading skills represent the critical gateway to developing other academic skills and accessing content in the elementary grades and beyond in a K-12 educational environment where English is the dominant language. Given such findings, the necessity and urgency for preschools to support optimal language development in both English and Spanish for Spanish-speaking DLLs is clear.

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Increased kindergarten performance in reading, writing, and math are more pronounced among Spanish-speaking DLLs who have attended preschool (Burchinal et al., 2012). The efficacy of English-only immersion programs for young DLL children in general has not been substantiated in the current literature. High quality preschools with a dual language development focus in particular have been shown to help Spanish-speaking DLLs acquire English language abilities, as well as early reading and math skills (Barnett, Yarosz, Thomas, Jung & Blanco, 2007; Burchinal et al., 2012). Dual language instruction can contribute to cross-linguistic transfer of early literacy skills, such as phonological awareness and vocabulary knowledge (Durán et al., 2010; Goodrich et al., 2013; Páez, Tabors, & López, 2007). These findings emphasize the importance of preschool experience for Spanish-speaking DLL children and provide preliminary evidence that fostering proficiency in both languages supports school readiness and early achievement for these students.

Commented [MOU3]: PI provides current state of knowledge and identifies the next research steps.

As noted above, culturally-sensitive programs that employ a student's home language (i.e., generally in a transitional bilingual or dual immersion model) result in the most significant gains in English and Spanish language development (Espinosa, 2013; Barnett et al., 2007; Durán, Roseth, & Hoffman, 2010; López et al., 2015). Within the context of such programs, certain types of teacher-child interaction and language modeling appear to promote language acquisition (Cohen, Kramer-Vida, & Frye, 2012; López et al., 2015; Wallace Jacoby & Lesaux, 2014). In the Migration Policy Institute's 2013 Early Education for Dual Language Learners: Promoting School Readiness and Early School Success report, Espinosa posits that instruction in classrooms with dual language learners must include "scaffolds, adaptation and enhancements" to support the unique language development needs of all DLLs. Espinosa stresses that all teachers, bilingual and monolingual, must and can provide systematic support to DLLs to learn English language skills while promoting DLLs' home language development. Classroom strategies include instruction of a limited number of words at a time from storybooks, using children's home language to develop comprehension, rereading stories to deepen understanding, understanding the rate and phase of the child's English language development, checking often for comprehension, and using gestures, movement, and photographs/images/illustrations to promote vocabulary and language growth (Gillianders & Castro, 2011).

Recognizing the limits of the evidence to date on DLLs in ECE and on the effects of inclusion of DLL supports, Peisner-Feinberg and colleagues (2014) issued a call for research that a) examines "a broader range of aspects early childhood education quality, including using both general and DLL-specific measures within the same studies... to document the level of quality for DLLs as well as to capture the full range of their experiences in ECE;" and that b) "utilizes bilingual observers who are able to adequately capture

Current State of Knowledge and the Significance of the Present Study Example

non-English interactions within the classroom and assess child outcomes in their home language and English” (p. 801). The proposed study would help to answer this call, aiming to contribute to the emerging literature by assessing the current state of preschool practices, identifying key factors, and analyzing how they relate to DLLs’ language development in English and Spanish, school readiness, and academic achievement.

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Public Policy and/or Practice Relevance of the Proposed Research
Kelly Purtell, Ph.D.
The Ohio State University

Project Summary

The proposed secondary data analysis research study examines the associations among preschool director characteristics (e.g., education and experience, leadership style), classroom-level factors (e.g., job satisfaction and depression, teacher-child interactions, teachers' professional development and classroom practices), and child outcomes.

Public Policy and/or Practice Relevance of the Proposed Research

Please describe the potential practical consequence on policy and/or practice relevance of the proposed research, and how these ideas could be communicated beyond scholarly outlets and used by the appropriate decision-makers. The research must have clear and actionable implications for public policy that have the potential to bring about positive change in the implementation of a program and/or policy at the federal, state, local, and/or organizational level.

The overarching aim of this project is to better understand the center-level processes within preschools that influence teachers and classrooms, and ultimately, their implications for the early learning and development of young children. By focusing on understudied center-level processes, this project is poised to provide new insight into the center characteristics that produce high quality developmental contexts for children during preschool. Below I describe six specific actionable implications of this work, from both a policy and practice perspective.

First, the proposed study will test the association between center director education and a variety of leadership processes, teacher satisfaction and behavior, and ultimately, children's early learning and development. Thus, research results will shed light on what types of educational pathways are most beneficial for center directors. Importantly, this inquiry will go beyond level of degree and will also examine content of degree and additional training. Although educational experiences focused on early childhood content are likely to be important for center directors, it is also plausible that other types of training, such as business or finance, may help them navigate the multitude of administrative challenges they face on a day-to-day basis. By focusing on this aspect of the early childhood workforce, this work will provide unique information on what type of background characteristics preschool programs should look for when hiring center directors. It will also provide initial information that can inform policymakers who set standards related to center director hiring priorities. These may include federal Head Start guidelines, or guidelines that apply to the numerous state and local preschool initiatives across the country.

Commented [MOU1]: PI articulates multiple ways in which both policy (e.g. expectations of director training, credentialing, duty assignments) and practice (e.g. implementation of policy decisions in those domains) can be affected by the results of the proposed research.

Commented [MOU2]: PI describes potential implications for Center Director qualifications which could inform hiring practice.

Public Policy and/or Practice Relevance of the Proposed Research Example

The second actionable implication of this research relates to the challenges that center directors' face and which ones are most likely to pose barriers to running an effective program. For example, I will examine how combining multiple funding sources relates to the time center directors can spend in other activities and how it is associated with their teachers' job satisfaction. Results may be used by states and other regulatory entities, those responsible for establishing standards for preschools, to determine which regulations are most burdensome and potentially problematic. It can also help centers identify what other supports are needed in order to maintain an effective center.

The third actionable item relates to the creation of future professional development activities for center directors. Analyses from this project will provide information on how supported teachers feel and how satisfied they are with their job. Associations between these teacher feelings and center director characteristics and behaviors will be tested. Results from this work will help shed light on which aspects of center director leadership behaviors are most predictive of teachers' satisfaction. For example, it may be lack of adequate communication from center directors that is most predictive of teachers' feelings of support. If so, this knowledge can be used to design future professional development programs for center directors that can help them improve their communication strategies in their center.

The fourth actionable item relates directly to the provision of high quality preschool education, especially for underserved (e.g., the children of immigrants) and low-income populations. By identifying what center-level factors are associated with classroom quality and other classroom supports and activities, the proposed work can provide information to programs and centers who are trying to increase their quality. Ultimately, the use of this knowledge to increase classroom quality has the potential to increase the school readiness of children across the country, including for vulnerable populations.

The fifth actionable item focuses on the specific supports provided to dual language learning students and their families, who represent a rising share of the U.S. population but remain underserved in early childhood programs. By identifying what center-level characteristics are associated with the availability of these supports, such as the availability of professional development focused on dual language learners, this study can provide information to policymakers who are trying to identify factors that lead to high quality experiences for children from immigrant families. At the same time, this work can simultaneously aid existing efforts that aim to boost the enrollment of dual language learners in early childhood programs by identifying the different ways in which center directors create more culturally responsive environments that might better fit the needs of this large and diverse segment of the population.

Lastly, this work will provide information that can be used by those taking action to directly improve children's school readiness. By identifying what center-level processes are associated with greater, or reduced, academic growth and social-behavioral development, this research will provide insights that can be used to design centers in ways that are optimal for children. The analyses that focus on associations between center-level challenges and children's outcomes will be particularly useful in the future as there is currently very little information available on this topic in preschool. Furthermore, because many of these challenges disproportionately affect preschools that serve vulnerable populations, including low-income children and dual language learners (e.g., multiple funding

Commented [MOU3]: PI outlines implications that lead to a more nuanced understanding of the center- & systems-level determinants of quality.

Commented [MOU4]: PI indicates how the proposed research has implications for YSP's 'priority populations'.

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Public Policy and/or Practice Relevance of the Proposed Research Example

sources and requirements), understanding these linkages may provide information that is most beneficial to children from disadvantaged backgrounds.

Because these actionable items have implications for multiple stakeholders, my dissemination strategy will target multiple audiences. In addition to peer-reviewed publications, I will prepare white papers (disseminated through the Crane Center for Early Childhood Research and Policy) that summarize study findings and are tailored to policymakers and practitioners. I will also present findings to local and national audiences, including a local early childhood education leadership council here in Ohio and other practitioner-oriented audiences.

Commented [MOU6]: PI provides a plan for disseminating results, strategy for targeting multiple audiences/stakeholders.

Commented [MOU7]: PI will utilize resources within host institution, moving beyond traditional academic outlets (e.g. conferences, journal publications, etc.)

Methodologies and Measurement Procedures and Data Analysis Approach Examples

R. Gabriela Barajas-Gonzalez, Ph.D.
New York University School of Medicine

Methodologies and Measurement Procedures and Data Analysis Approach Example

Project Summary

The proposed research project is a mixed-methods design focused on identifying the stressors and supports Pre-K-3rd grade teachers and social workers experience working with Latino children within immigrant families. Specifically, the project will examine how current federal immigration policy affects teachers and social workers in New York City (NYC) public schools, especially in the local context of NYC being a sanctuary city.

Methodology & Measurement Procedures

Describe your methodology and measures and how they are linguistically and culturally sensitive and appropriate. To upload diagrams and/or tables, please see Attachments.

- *If the proposed research involves working with community based organizations, schools and/or school districts, describe the planned process for gaining permission/access, whether the process has been initiated, and how far it has progressed. A letter of support confirming cooperation from each entity must be uploaded in the final section of the application.*
- *If your proposed study is longitudinal in design, please specify how you will sustain the participation of those involved, including plans for sample attrition.*
- *If your proposed study only involves qualitative or quantitative methods, please specify how you will use these methods and your specific analytic approaches for the data.*
- *Where both qualitative and quantitative approaches are proposed, describe the ways in which the combination enhances the proposed study.*

If Applicable. Please upload diagrams and/or tables that support the Methodology and Measurement Procedures section. If the diagrams and/or tables consist of multiple pages, please convert/save the pages as a single pdf and upload the pdf. Please add your name and request identifier to each page before uploading the required attachment.

We propose to collect survey data from 120 teachers and 30 social workers (at least 60% latino/immigrant) in NYC schools, and conduct semi-structured interviews with a subset of approximately 34 teachers and social workers. Feasibility: As of today, we have 20 PreK social workers who have indicated their willingness to be interviewed, as well as buy-in from the teachers and social workers at our 25 LINC's partner schools (PreK-3rd grade; please see letters of support). Dr. Jennifer Keys Adair, with expertise using qualitative methods in ECE settings, has agreed to be a consultant for the proposed study (please see letters of support).

Commented [NMI]: Measures development plan, sampling and design are appropriate.

The qualitative study approach is appropriate and will help to illuminate processes and patterns that might not otherwise be evident in quantitative measurement approaches. The analysis is structured appropriately, given the proposed data.

Note: Reliability and validity were addressed in a separate table of measures.

Methodologies and Measurement Procedures and Data Analysis Approach Examples

A mixed method design will be used for this research project. Quantitative findings will add to the qualitative foundation and triangulate data by providing a statistical explanation of the impact of immigration-related anxiety and concerns on teacher and social worker perceived well-being. For this proposed study, a purposeful sample of 150 NYC teachers and social workers will be selected. A purposeful sample will allow the researcher to select participants who work in schools and centers with a large Latino immigrant population, are willing to reflect on the topic of interest, and are willing to participate. In-depth, semi-structured interviews will be completed with 34 individual teachers and social workers. Interviews will be completed by the PI (who is fully bilingual in English and Spanish) in the participant's school or another mutually agreed upon location. Semi-structured interviews will be audio recorded and transcribed verbatim by bilingual, bicultural team members, should there be any code switching (English/Spanish) during interviews.

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Overview. The goals of the proposed study are: (1) to build on our previous needs assessment study with school social workers, and further study PreK-3rd grade teachers' needs in working with and engaging immigrant families and students; and (2) understand teachers' perspectives/attitudes related to immigration issues (Aim 1). In addition, this study will examine mechanisms of how immigration contextual indicators (at school, classroom, and school staff/individual levels) relate to teachers' practice and competency in providing support for students and families (Aim 2). Study results from Aims 1 and 2 and from our previous study with social workers will be used to guide intervention strategies and toolkit development to support school staff to work effectively with immigrant families and students (Aim 3).

Study Preparation and Measurement Development (MONTHS 1-9). During the preparation period, two key activities will be conducted: (1) School Recruitment (n=30). In partnering with NYC Department of Education (under our current NYU-NYC early childhood development promotion partnership), we will recruit 30 NYC public schools with high concentrations of Latina/immigrant students. Several of our LINC's partner schools have already agreed to participate. (2) Teacher and social worker recruitment. (3) Measurement development and study framework refinement. Because most immigration contextual and behavioral practice measures are not existed in the literature, we will first adapt the school, classroom environment (Huang et al., 2017), climate (Simpson, 2002), teacher attitudes/beliefs (Aarons, 2002), and competency/practice measures (Huang et al., 2017) that have been used in our previous school-based intervention implementation studies. To ensure the study measures and conceptual framework are comprehensive and capturing relevant immigrant-related contexts and behaviors, we will next conduct a qualitative individual interview study with 2 social workers and 15 teachers (PreK-3rd grade, at least 60% latino/immigrant). During the interview, we will ask questions regarding appropriateness and relevance of our conceptual framework (constructs) and adaptation of study measures. Each interview will be audiotaped and last about 1 hour. Qualitative data will be used to refine study measures and frameworks, which will be used for subsequent research Aim testing.

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Methodology for Aims 1 and 2 (Understand School Staff's Perception about Immigration Contexts and Needs; and Examine Mechanisms) (MONTHS 10-20). As shown in Figure 1, Aim 1 will focus on the yellow highlighted boxes. Guided by the ecological-transactional framework, we will study school staff's perspectives (with consideration of influences from larger Macrosystem and exosystem contexts). Multiple levels of school contexts and needs will be studied, including school-level immigration climate, classroom-level immigration-related contexts/needs, and staff-level wellbeing and perceive competency (e.g., distress, perceive

Methodologies and Measurement Procedures and Data Analysis Approach Examples

stress). Aim 2 will focus on mechanism testing (see Figure 1). Specifically, we will study influence of school immigration contexts on school staff's wellbeing, practice and competency in addressing student and family needs guided by stress models (LaRocco, House & French, 1980; Greenglass, Burke & Konarski, 1997).

Participant Recruitment, Procedure, and Study Measures.

Quantitative data will be collected from 150 school staff (120 early childhood teachers, 30 school social workers) from 30 public schools with high concentration of Latina/immigrants. To ensure multiple perspectives are captured, 4 teachers from each school, with 1 representative teacher from each grade [pre-K, K, 1st & 3rd grade]; and 1 representative social worker from each school will be recruited. All research participants will be consented prior to any research activities. All study participants will complete a survey. Survey measures will include demographic information such as gender, race, ethnicity, languages spoken, nativity and years experience in PreK-3rd grade setting. Measures to assess immigration-related worry in classrooms and teacher and social worker immigration-related uncertainty, stress, their perceived psychological (distress) physical wellbeing (self-rated physical health and sleep quality), social support and competency will be utilized. Measures assessing immigration-related worry and uncertainty have been adapted from other assessments as described below as there are currently no immigration-specific measures that capture these phenomena. Items are adapted to reflect responses from the needs assessment completed by PI with 104 NYC DECE social workers. Assessment measures for Aims 1 and 2 study constructs are listed in Table 1.

Methods for Aim 3 (To identify strategies and develop resources for supporting school staff in working with families and students impacted by immigration contexts). (MONTHS 21-36) Guided by findings from Aims 1 & 2, which will inform intervention and capacity gaps/needs for school staff, this aim is to focus on identifying strategies and developing resource/tools to address these gaps and needs. Based on our prior work with school social workers, we anticipate strategies for addressing (i) education/knowledge gaps (e.g. legal knowledge about immigrant rights in sanctuary cities; knowledge about influence of immigration-related stress on school community members' well-being), (ii) psychosocial support skill gaps (e.g. skills in using developmentally appropriate strategies to help immigrant students cope with anxiety), and (iii) unsafe school climate may be needed. Additional gaps and needs may be identified from Aims 1 & 2, which will be added to study list. To develop relevant resources/tools/strategies to address the needs, this study will be guided by Proctor's (2011) service implementation framework, which proposes adapting relevant existing evidence-based interventions (EBIs) for special populations (instead of re-developing a new intervention) and incorporating additional implementation strategies (e.g., engagement, empowerment) to enhance utilization of the EBI strategies. Three research activities will be carried out. We will first conduct a literature review and identify relevant EBIs (i.e., stigma, discrimination, violence, trauma-based interventions) that have shown efficacy/effectiveness evidence in improving knowledge, attitude, social support, wellbeing, and climate. Systematic literature search through Ovid MEDLINE, PsycInfo, and EBM Reviews databased will be applied. Next, the mental health professionals from the CEHD research team will modify the intervention based on Aims 1 & 2 findings as well as with input from the PI. A qualitative study will then be conducted to study appropriateness of the adapted intervention and identify any additional intervention/capacity building strategies from school teachers' and social workers' perspective. Semi-structured interviews with 2 social workers and 15 early childhood teachers will be conducted. Interviews (last about 1 hour and be audiotaped) will focus on discussion around the fit, acceptability, feasibility, perceive effectiveness of the proposed adapted interventions, and additional

Commented [MOU4]: Relevant to cultural and linguistic sensitivity.

Methodologies and Measurement Procedures and Data Analysis Approach Examples

suggestions strategies/tools/ resources to support school staff. Findings will be disseminated via presentations with the CEHD/DOE team, presentations at national conferences, policy briefs and manuscripts.

Data Analysis Approach

Please describe in detail your data analysis approaches. The analytic plan should align with the research questions, the proposed measures, and the working hypothesis(es).

Preliminary Analyses. Qualitative data collected during Year 1 preparation period (for measurement development and understand appropriateness of the study framework (Figure 1) will be transcribed by a professional transcription service and analyzed by the PI and a research assistant. Coding will focus on themes related appropriateness of the framework and measures, and additional constructs and factors that may be added to the framework and measures. Coding of qualitative data will apply constructivist grounded theory. In this tradition, it is assumed that the research process is an interpretive portrayal of the studied world; that is, findings are co-constructed through the researcher's involvement and interactions with participants, perspectives (i.e., theories and literature), and research practice (Charmaz, 2006). A constant comparative approach will be used within and between interview transcripts. The transcripts will be read, reviewed, labeled, and categorized using initial and focus coding. Initial coding will be completed independently by two team members, one of whom is the PI. In a collaborative process, analytical decisions will be made about categorizing the data into inclusive and comprehensive themes. Codes will then be used to complete focused coding. During focused coding, the most significant codes from the initial coding will be applied to the remaining data. Axial coding will be used within and across participants to derive dimensions and properties of themes. During axial coding we will also examine the relation between the major themes. Thematic development will involve a search for "core consistencies or meanings" in the dimensions being investigated. To optimize study rigor, we will conduct research team debriefings after each interview to discuss the interview process and address ethical concerns. We will record all analytic decisions, as well as discussions surrounding discrepancies among codes and consensus on the final codes and concepts. In accordance with the principles of qualitative research, we will rely on direct quotes as much as possible to ground our findings and interpretations. In summary, results of the qualitative data will be used to refine study framework and measurement tools.

Analysis Plan for Aim 1. Psychometric properties of the study measures will be examined first. Only reliable and valid measures will be used in the subsequent analyses. In addition, for measures that evaluate similar constructs, composite scales will be created (to minimize number of analyses). To characterize the school immigration contexts and needs (i.e., immigration climate, teacher and social worker well-being, classroom immigration related needs, and teacher and social workers' perceived competency in addressing classroom and family needs), a series of descriptive analyses and correlation analyses (to examine inter-relationship among three-level of immigration related contexts) will be conducted. Descriptive data will be used to understand the extent to which teachers and social workers observe immigration-related worry in classrooms as well as experience immigration related uncertainty. Bivariate correlations will allow us to examine the associations between worry, uncertainty, psychological distress and self-reported health.

Commented [NMS]: Data Analysis
Strong organization of analysis by research question.
The research plan aligns well with the research aims.

Methodologies and Measurement Procedures and Data Analysis Approach Examples

Chi-square tests will be conducted to see whether there are differences in worry and distress by respondent race, ethnicity, nativity or levels of perceived social support. Structural equation modeling will be used to understand the links between immigration related worry and uncertainty, perceived competency, stress, emotional exhaustion, sleep, and self-reported health to identify important points of intervention (e.g. resources for coping with stress, resources and skills to improve perceived competence). To test hypothesis 1a (association between school immigration contexts and school staff's wellbeing and perceive competency in address students' needs in classroom), we will model staff's wellbeing and perceive competency as a function of a set of school-level contextual factors. To consider school staff nested within schools, we will apply linear mixed effect models, using SAS PROC MIXED. School be included as a random effect. To test hypotheses 1b (immigrant and non-immigrant staff differences on school immigration context perception and needs), similar mixed effect models will be conducted (i.e., including staff's immigration status as the predictor, and perception of contexts as the outcomes).

Analysis Plan for Aim 2. To test hypotheses 2a &b (influence of school immigration-related climate, classroom immigration related needs, and school staff's wellbeing on school staff's behavioral competency/practice skills in addressing the needs), we will model 3 levels of immigration-related contexts as predictors, and school staff's practice competency in address classroom and family needs as the outcomes. Three sets of analyses will be conducted (one set for each level of predictors). Similar to Hypothesis 1a analysis, linear mixed effect models will be conducted.

Analysis Plan for Aim 3. For Aim 3, only qualitative data will be used. Literature review (of relevant EBIs) and individual interview data (to understand fit of the adaptive intervention and identify additional strategies) will be utilized. For the literature review, comparisons of relevant EBIs on their intervention contents, impacts, and potential needs for adaptation will be conducted. Summary tables will be created. For the interview data, similar qualitative data analysis approach as described above (during research preparation period) will be applied. Coding will focus on themes related to fit, acceptability, feasibility, perceive effectiveness of the proposed adapted interventions, and additional suggestions strategies/tools/ resources to support school staff. Products of this aim will be feasible intervention strategies/tools for supporting school staff that are ready for future implementation study.

Commented [MOU6]: Relevant to cultural and linguistic sensitivity

Methodologies and Measurement Procedures and Data Analysis Approach
Holly Schindler, Ph.D.
University of Washington, Seattle

Project Summary

This is a primary research project to implement and evaluate a father-focused video-coaching program, Filming Interactions to Nurture Development (FIND-F), to strengthen responsive parenting. Data will be collected from 50 father-child dyads (low-income Mexican American fathers and their children ages six to 47 months) who will be randomly assigned to FIND-F or a control group.

Methodology & Measurement Procedures

Describe your methodology and measures and how they are linguistically and culturally sensitive and appropriate. To upload diagrams and/or tables, please see Attachments.

- *If the proposed research involves working with community based organizations, schools and/or school districts, describe the planned process for gaining permission/access, whether the process has been initiated, and how far it has progressed. A letter of support confirming cooperation from each entity must be uploaded in the final section of the application.*
- *If your proposed study is longitudinal in design, please specify how you will sustain the participation of those involved, including plans for sample attrition.*
- *If your proposed study only involves qualitative or quantitative methods, please specify how you will use these methods and your specific analytic approaches for the data.*
- *Where both qualitative and quantitative approaches are proposed, describe the ways in which the combination enhances the proposed study.*

If Applicable. Please upload diagrams and/or tables that support the Methodology and Measurement Procedures section. If the diagrams and/or tables consist of multiple pages, please convert/save the pages as a single pdf and upload the pdf. Please add your name and request identifier to each page before uploading the required attachment.

Intervention

FIND-F is based on the original FIND program designed for mothers by Dr. Phil Fisher and informed by the Marte Meo method from the Netherlands. Marte Meo translates from Latin to mean “on one’s own strength,” reflecting the central premise of the method, which is to “identify, activate, and develop skills to enable and enhance constructive interaction and development.” FIND-F includes several adaptations from the original FIND program based on a months-long process of conducting interviews with fathers and home visitors. Analyses of interviews revealed a number of critical insights about making the program feasible and effective for fathers as a target population, including the need to: (1) reduce the number of sessions from 10 to 6; (2) offer sessions at different times of the day, including evenings and weekends; (3) ask fathers about their comfort level with male versus female home visitors; and (4) maintain a central focus on fathers versus couples. FIND-F also adapted the images and text used in materials to reflect fathers’ roles in the family.

Commented [MOU7]: Randomized Control Trial is well formulated, with intervention fidelity attended to and room for attrition based on findings from a recent pilot study.

Recruitment plans are sound and the available population seems adequate.

Measures of both father and child outcomes were used in the pilot and are appropriate for the population.

PI acknowledges the limitations of the waitlist control procedure and of the small sample size.

Strong methodology employed, including the use of a manualized certification process for home visitors in the adapted FIND-F model, an intensive 3-day training, and fidelity checks.

Appropriate standardized measures will be used to assess parental stress, etc.

Commented [MOU8]: The adaptation of the FIND-F for Latino fathers is through a process of collaboration with fathers and community groups. Measures have been used with and are appropriate for this population.

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FIND-F begins with the home visitor taking a 10-minute video of the father and child engaging in an everyday activity. Then, that video is carefully edited to emphasize the specific strengths observed in the father-child interactions. The brief, edited videos are then reviewed with the father the following week. In reviewing the video clips, the home visitor uses micro-analytic narration, highlighting the frame-by-frame sequence of events that fosters the child's development. In this way, the goal of FIND-F is to shift the father's perceptions of himself and of his child, enabling the father to become more engaged and responsive.

FIND-F takes place over the course of 6 manualized sessions. In the first session, fathers are introduced to the program. Each subsequent session focuses on a specific element of serve and return interaction, using the edited films to support fathers in learning about that element. The five elements are: 1) Sharing Child's Focus- when the father notices what the child is interested in and puts his attention there too); 2) Supporting and Encouraging- when the father responds to the child's "serve" through soothing, comforting, or praising the child; 3) Naming- when the father provides a word or explanation for what the child is seeing, doing, for feeling; 4) Back and Forth- when the father and child continue interacting in a longer back-and-forth manner; and 5) Endings and Beginnings- when a child signals the end of an activity and the father follows the child's lead. Each session includes a review of the prior elements, an introduction to the new element, a review of the film to show examples of that element, a check for understanding, and a new video recording. Fathers are also provided with a summary sheet and are encouraged to look for opportunities to use that element during the coming week.

In the proposed study, FIND-F will be delivered by home visitors from the partner community organization. Each FIND-F home visitor will undergo a manualized certification process beginning with an intensive 3-day training that includes practice sessions and individualized feedback. After the training, home visitors will be required to complete 3 sessions with scores of adequate or higher on a fidelity scoring sheet before applying for certification. Once certified, they can begin coaching families in the proposed study. However, each coaching session throughout the study will continue to be recorded, viewed by the research team, and marked with a fidelity checklist. Feedback will then be provided to the home visitors to ensure the ongoing fidelity of the intervention.

Adapting FIND-F to Reflect Unique Cultural Characteristics (Aim 1)

Based on the principles of community-based participatory action research, I will consult an advisory board that will include two Mexican American fathers who previously completed FIND-F and two home visitors who serve predominately Mexican American families. Together, we will review and adapt FIND-F materials, procedures, and measures. A similar approach using focus groups has been found to be successful in informing intervention development for other hard-to-reach populations (Julion, Breitenstein, & Waddell, 2012; Lengua, et al., 1992). I will also seek input at this stage of development from an external consultant, Dr. Natasha Cabrera from the University of Maryland, who is an expert in Latino populations and ethnic and cultural variations in fathering (see also Relevant Experience section).

Evaluation of FIND-F (Aims 2 through 4)

Sample. Once the FIND-F adaptation is completed, we will recruit 50 father-child dyads from Children's Home Society of Washington's (CHSW) Early Head Start and Parent-Child Home Program over the course of 2 years. Fathers will be matched with a

Commented [MOU9]: Excellent use of consultants and advisory board to increase cultural relevance and sensitivity.

Methodologies and Measurement Procedures and Data Analysis Approach Examples

home visitor of their preferred gender and language and will receive \$100 as compensation for their time in the study. I have a long history of working with CHSW, including conducting the feasibility test of FIND-F, and they have already enthusiastically agreed to collaborate on the proposed project (see attached letter of support). The target population will be low-income Mexican American resident fathers of children between 6 and 47 months of age. Of the 250 resident-father families served by CHSW's King County home visiting programs each year, 105 are Mexican American. Approximately 70% of the fathers in those families are first-generation immigrants.

Randomization Procedures. As fathers enroll, they will be randomly assigned by the research team to either FIND-F (Group 1) or a wait list control group (Group 2). A wait list control group design is proposed based on CHSW's views that it would be unethical to deny consenting, eligible fathers access to FIND-F. The wait list control group will be told that they will still receive FIND-F, but with a later scheduled start time. Both groups will be assessed at 3 time points (see Figure 2).

Measures. Several implementation measures will be collected to examine the degree to which FIND-F is implemented as intended. We will collect data on number of sessions completed, the length of each session, the number of weeks taken to complete FIND-F, and adherence to the curriculum. For the latter measure, a graduate student will rate each session using 16 items that describe the extent to which the home visitor implemented the FIND-F curriculum with fidelity.

Several other measures for addressing aims will be collected at all 3 time points from both groups. Fathers' positive parenting skills will be observed via video-taped father-child interactions and coded by graduate students blinded to randomization assignments using the PICCOLO-D protocol (Dads' Parenting Interactions with Children Checklist of Observations Linked to Outcomes). The PICCOLO-D is a strength-based measure and has previously been validated in both English and Spanish by observing 400 low-income, ethnically diverse fathers (Anderson, Roggman, Innocenti, & Cook, 2013).

Fathers' parenting stress will be measured using the Parenting Stress Index-Short Form (PSI-SF). The PSI-SF will ask fathers to indicate their level of agreement or disagreement in reference to 36 statements on a 5-point scale regarding their level of stress, how difficult their child is to manage, and whether parenting fits their expectations. The PSI-SF is available in both English and Spanish and has been empirically validated with a number of diverse populations, including parents of Head Start children. Fathers' involvement will be measured with both the Who Does What (WDW) questionnaire (Cowan & Cowan, 1990) and the PIE (Cowan & Cowan, 1991). In the WDW, both fathers and mothers will separately rate fathers' involvement in 25 daily care tasks (e.g., playtime with child, consoling child, deciding about child's meals/ feedings). In the PIE, fathers will be asked to list the main roles in their lives and then divide a circle (pie) into pieces so that the size of each piece represents the importance of that role. In this study, the degrees of the circle that represent fathering will be examined. Both father involvement measures have been used in evaluations of other fathering programs, including one of the few programs targeting Mexican American fathers (Cowan, Cowan, Pruett, & Wong, 2009).

Children's behavior problems will be measured using the infant and toddler version of the Parent Daily Report (PDR) (Chamberlain & Reid, 1987). Both fathers and mothers will report whether or not their child has exhibited 23 problems in the past 24 hours. Since this

Methodologies and Measurement Procedures and Data Analysis Approach Examples

measure has been less widely used with diverse populations than other proposed measures, the advisory board will be asked to vet this measure prior to implementation. Children's expressive language will be assessed with the expressive communication subscale of the Preschool Language Scale (PLS) (Zimmerman, Steiner, Pond, 2012). The PLS is a normed-based measure for children birth to age 7 that has been validated for English, Spanish, and Dual Language administration.

In addition to the above measures, a demographic questionnaire that includes measures of the father's adverse childhood experiences (ACEs), acculturation (i.e., generation status), and child's gender will also be administered at Assessment 1. All measures, with the exception of the PLS and generation status, were also collected in the feasibility test of FIND-F. A summary of measures and their characteristics can be found in Figure 3.

Data Analysis Approach

Please describe in detail your data analysis approaches. The analytic plan should align with the research questions, the proposed measures, and the working hypothesis(es).

Statistical Analyses

After adapting the intervention to better reflect Mexican American fathers' strengths, values, and needs (Aim 1), subsequent aims will be addressed through a series of quantitative analyses.

Aim 2. I will first compare baseline characteristics across group A (FIND-F) and group B (wait list) to identify any imbalances between groups despite randomization and to identify potential covariates (e.g., pretest scores, household income, father's education, father's acculturation, father's ACEs, child's age, and child's gender). Aim2a, whether FIND-F improves fathers' positive parenting practices, will then be tested in a series of steps. First, I will conduct a simple t-test in which the treatment condition will be used to predict parenting practices at assessment 2. Specifically, group A's parenting practices at assessment 2 will be compared with group B's parenting practices at assessment 2 (see Figure 2). This will provide an unbiased estimate of the difference between fathers who were randomly assigned to receive FIND-F and fathers who were randomly assigned to the wait list. Then, to increase precision, I will conduct a one-way analysis of covariance, with a control for parenting practices at assessment 1, followed by controls for other baseline differences. Analyses will be conducted using data from the full intention-to-treat sample. Intention-to-treat impacts will answer the important policy question of what the effects of the program are for all fathers who are offered FIND-F (National Forum on Early Childhood Program Evaluation, 2007). Effect sizes will be calculated to detect meaningful differences and interpreted using the criteria suggested by Cohen (1988), in which .20 represents a small effect, .50 represents a moderate effect, and .80 represents a large effect. I will use the same approach to test whether FIND-F improves additional father outcomes (i.e., parenting stress, father involvement) and child outcomes (i.e., behavior problems and expressive language) (Aim 2b).

As a robustness check of treatment effects, I will compare changes in group A's outcomes from pretest-1 to posttest-1 to changes in group B's outcomes from pretest-2 to posttest-1. To make this comparison, I will use repeated measures analyses of variance and will examine the time*condition interaction in each model. In these analyses, both groups will have received FIND-F, and I will be

Commented [MOU10]: Data analysis approach is appropriate for the type of data and research questions proposed.

Methodologies and Measurement Procedures and Data Analysis Approach Examples

testing whether the changes in the dependent variables from before and after receiving FIND-F are the same or different for group A and group B. Ideally, the time*condition variable will not be significant as the hope is that FIND-F has similar effects for both groups.

To address Aim 2c, which is to examine whether changes in fathers' positive parenting practices mediate changes in father and child outcomes for the treatment model, I will employ a series of standard linear regression analyses with the group A sample (Suchman, DeCoste, Castiglioni, McMahon, Rounsaville, & Mayes, 2010). Specifically, I will examine whether changes in positive parenting from pretest-1 to posttest-1 predict corresponding changes in fathers' parenting stress, fathers' involvement, children's behavior problems, and children's expressive language.

Aim 3. A set of analyses to explore fathers' acculturation, history of adversity, and child's gender as moderators will also be conducted. Tests of moderation will be carried out by adding each treatment condition*moderator effect to the one-way analyses of covariance models described in Aims 2a and 2b, also including the main effect of the moderator variable. Each interaction term will assess the extent to which the effects of FIND-F vary for these different populations.

Aim 4. One disadvantage of using a wait list control group is that groups cannot be compared in follow-up analyses since both groups will have received FIND-F. Hence, analyses for this aim should be considered a short-term first look at persistence of effects. To address Aim 4, group A's changes in positive parenting practices, father outcomes, and child outcomes from posttest-1 to posttest-2 will be analyzed using a paired sample t-test. No differences from posttest-1 to posttest-2 would provide preliminary evidence that effects were sustained 6 weeks post treatment. Improvements from posttest-1 to posttest-2 would suggest that effects increased over the 6 week period after fathers completed FIND-F, indicating improvement in the trajectories of father-child relationships. Decreases in effects over the 6 week period following FIND-F would suggest that program effects did not persist and that more research is needed on ways to sustain impacts (e.g., increasing dosage of FIND-F, offering booster sessions, pairing FIND-F with another intervention).

Statistical Power

Having completed a successful feasibility test of FIND-F, the goals of the proposed pilot study include tailoring FIND-F to a specific population and conducting a small randomized controlled-trial with a short-term follow-up that can inform the design of a larger longitudinal study. Given these purposes, Hertzog (2008) recommends a sample size of 15 to 20 participants per group. Based on the feasibility test of FIND-F, the estimated attrition rate is 20%, which would result in 40 out of 50 recruited fathers completing the study (20 in the FIND-F group and 20 in the wait list control group), a number that is in line with Hertzog's recommendation. At a minimum, this number of participants will provide reasonable, unbiased estimates of effect sizes (Hertzog, 2008). Though a pilot is not typically expected to be fully powered for detecting statistical significance, it is also possible that this number of participants will provide sufficient power to do so. Based on effect sizes from the feasibility test, estimated power to detect main effects with an alpha of .05 that was calculated using G*Power is high, ranging from .91 (for WDS) to .98 (for PSI-SF).

Commented [MOU11]: Appropriate use of a power analysis.

Methodologies and Measurement Procedures and Data Analysis Approach
Michelle Maier, Ph.D.
MDRC

Project Summary

This project is a secondary data analysis of a large-scale randomized control trial, Making Pre-K Count (MPC), of the evidence-based math curriculum, Building Blocks, which is being implemented within New York City early care and education programs. The implementation of the Building Blocks curricula also included extensive teacher training and in-classroom coaching. Within this larger effort, this study will examine how specific teacher classroom practices are predictive of child outcomes and will identify effective professional development supports for teachers in preschool classrooms.

Methodology & Measurement Procedures

Describe your methodology and measures and how they are linguistically and culturally sensitive and appropriate. To upload diagrams and/or tables, please see Attachments.

- *If the proposed research involves working with community based organizations, schools and/or school districts, describe the planned process for gaining permission/access, whether the process has been initiated, and how far it has progressed. A letter of support confirming cooperation from each entity must be uploaded in the final section of the application.*
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- *If your proposed study only involves qualitative or quantitative methods, please specify how you will use these methods and your specific analytic approaches for the data.*
- *Where both qualitative and quantitative approaches are proposed, describe the ways in which the combination enhances the proposed study.*

If Applicable. Please upload diagrams and/or tables that support the Methodology and Measurement Procedures section. If the diagrams and/or tables consist of multiple pages, please convert/save the pages as a single pdf and upload the pdf. Please add your name and request identifier to each page before uploading the required attachment.

Study Design. The proposed study will involve secondary analysis of quantitative data from the Making Pre-K Count (MPC) study because MPC provides a rich data set that is perfectly suited to answer research questions about associations among specific teacher practices, teacher professional development, and a range of child outcomes. MPC is a cluster-randomized control trial evaluating the effect of an evidence-based math curriculum (Building Blocks) combined with extensive teacher training and in-classroom coaching on children's outcomes. A total of 69 full-day, DOE- and ACS-funded preschool sites—public schools and community-based centers, including Head Start—serving a low-income population of 4-year-old children were selected to reflect the

Methodologies and Measurement Procedures and Data Analysis Approach Examples

geographic, racial, and ethnic diversity of NYC's low-income population (the sample was not designed to be statistically representative). The final sample included 173 preschool classrooms in 69 sites in Brooklyn, the Bronx, Manhattan and Queens. Sites were randomized to receive two years of curriculum plus PD (program group), or to a "preschool-as-usual" control group. The study was conducted during the 2013-2014 ("Year 1") and 2014-2015 school years ("Year 2"). A total of 34 preschools were in the program group (88 classrooms) and 35 preschools (89 classrooms) were in the preschool-as-usual group. Data on children were collected in Year 2 (children received only one year of the program), when most teachers would have already taught the curriculum for a full year.

Sample. The research sample in the proposed study is confined to the lead teachers and their students in participating classrooms during Year 2 (2014-2015). The child sample has even proportions of boys and girls with an average age just above 4 years old at the start of preschool. Fifty-six percent of parents reported they were of Hispanic origin, and 36% were non-Hispanic Black. Nearly 20% of the children were predominantly Spanish speakers and therefore assessed in Spanish in the fall; 9% of children were assessed in Spanish in the spring. Lead teachers were mostly female (94%); and relatively evenly distributed by racial/ethnic group (approximately 32% Hispanic, 26% non-Hispanic Black, and nearly 34% non-Hispanic White.) A majority of teachers had a Master's degree (86%) and, on average, had over a decade of teaching experience ($M=15.2$ years, $SD=8.9$).

Measurement Plan. A host of quantitative data was collected in MPC from participants in program and preschool-as-usual sites, making this data set an excellent fit for answering the research questions posed. These data include various aspects of teachers' professional practices; provision of professional development; teacher and child demographic characteristics; and children's language, math, and executive function outcomes. In addition, detailed information was collected in program group classrooms on implementation of the math curriculum and teacher attendance at the training and coaching provided as part of the intervention. Thus, MPC data are uniquely situated to answer the proposed study's research questions about linkages among teacher practice, children's learning, and teacher PD because multiple measures of these constructs were collected, yet explicit modeling of the associations among these constructs was not a primary aim of the MPC study.

See Exhibit 2 for a list of constructs of interest for the proposed study, their data sources, and the timing of their collection. Various modes of data collection were used including classroom observations, direct child assessments, surveys and online logs. See Section VI for information on the plans for characterizing the constructs of interest through data reduction and measure creation as well as the analytic approach.

Multiple dimensions of teachers' professional practices were assessed by trained observers blind to treatment status via a 3-hour classroom observation on 2 days in spring of Year 2. During one visit, detailed data on classroom process quality was collected using the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008). During the other visit, time spent on different content areas and use of instructional groupings were captured using the Narrative Record (Farran & Bilbrey, 2004), and the amount and quality of math instruction was collected using the Adapted-COEMET (a version of the COEMET [Clements & Sarama, 2008] modified by MDRC for use in MPC).

Commented [MOU12]: PI provides a description of the dataset; how the data were collected; who the data represents.

Commented [MOU13]: PI provides description of sample, includes key characteristics that are relevant to the proposed research.

Methodologies and Measurement Procedures and Data Analysis Approach Examples

Child outcomes were collected by trained assessors via direct child assessments on a random subsample of children in Year 2 (5 children per classroom in the fall and 8 in the spring). Child math competencies were collected via Woodcock Johnson-III Applied Problems (Woodcock et al., 2001) and the ECLS-B math assessment (Najarian et al., 2010). Receptive language skills were assessed using the Receptive One-Word Picture Vocabulary Test (ROWPVT; Martin & Brownell, 2011). Children's executive function, which comprises working memory (ability to keep a number of pieces of information in the mind at once), cognitive flexibility (ability to flexibly shift between pieces of information), and inhibition (ability to stop or repress an immediate response) were assessed via a) Pencil Tap, a working memory and inhibition task (Diamond & Taylor, 1996; Luria, 1966); b) Corsi Blocks Forward Span, a short-term memory task (Corsi, 1972; Lezak, 1983); and c) Spatial Conflict Arrows, a cognitive flexibility task (Willoughby et al., 2012). Teacher characteristics, such as teacher education, teaching experience, PD experience, motivation to implement, and Spanish-speaking ability, were captured via teacher survey at entry to the study or at the end of Year 2. An administrator survey provided additional details on the PD provided to teachers. Online logs completed by coaches provided ongoing data on the provision of coaching, as well as the amount and quality of curriculum implementation, within the program group only. Child and parent demographic information was collected via a few questions on the parent consent form.

Data sources were carefully selected to be culturally and linguistically sensitive and appropriate. This was done through the execution of a systematic plan for reviewing potential measures and the convening of a group of advisors external to the project to help finalize measure selection. First, we identified a large group of potential classroom observational measures and direct child assessments that were purported to measure the constructs of interest. Second, we systematically reviewed the robustness and feasibility of the measures found in order to maximize the likelihood of detecting significant program impacts and to identify the benefits and drawbacks of specific research instruments. To review the robustness of the measures, we developed a list of criteria for consideration, some of which were deemed "foundational" (i.e., without which a measure could not be placed on the initial list). Such foundational criteria were: a) that the measure was appropriate for young children; b) had demonstrated evidence of reliability and validity; and for direct child assessments: c) had been developed with close attention to its cultural, linguistic and psychometric features. Next, we identified criteria that we considered "high priority." These criteria included: d) the administration time was not too long; e) the measure demonstrated evidence of predictive validity; and f) the measure assessed the appropriate content area. For the math assessments, in particular, we wanted to prioritize measures assessing a range of math content areas. Finally, other criteria considered included: ease of measure administration; use with populations similar to that of MPC (i.e., low-income, racially diverse, and language-minority populations); and use in prior studies in the field.

During data collection, we also took care to collect child assessments and observations in linguistically sensitive ways. First, a portion of the child assessors, as well as the classroom observers, were Spanish-English bilingual. Second, in both the fall and spring, the first measure in the child assessment battery (i.e., Simon Says and Art Show subtests from the preLAS) served as a language proficiency assessment to determine the language in which the battery should be administered. The preLAS (particularly these two subtests) has been used in previous studies as a screener for determining whether a child completes subsequent assessments in English or Spanish (Love et al., 2009; Moiduddin et al., 2012). In MPC, several "rules" were followed. If a child

Commented [MOU14]: PI describes process for how measures were chosen and the quality of each measure (e.g. reliability and validity, etc.)

Methodologies and Measurement Procedures and Data Analysis Approach Examples

scored low on the preLAS (6 or more items incorrect), they were assessed using the Spanish battery if their home language was Spanish; if their home language was something other than English or Spanish, they were not assessed at that time point (because the selected assessments had been validated only in English and Spanish). If a Spanish-speaking child in the fall was “on the cusp” of scoring low on the preLAS (5 items incorrect), they began the next assessment (ECLS-B math assessment) in Spanish. But the assessor could toggle between administering items in Spanish or English depending on which language the child appeared to understand best. The child would receive the remaining assessments in Spanish or English depending on how much toggling occurred (i.e., if at least half of the items were administered in English, the remaining assessments would be given in English and vice versa).

Data Analysis Approach

Please describe in detail your data analysis approaches. The analytic plan should align with the research questions, the proposed measures, and the working hypothesis(es).

Data Reduction Plan. As mentioned in the prior section and shown in Exhibit 2, multiple measures have been collected for most constructs of interest. Thus, data reduction is planned. First, descriptive statistics (means, standard deviations, frequencies, distributions, correlations) for the constructs of interest will be reviewed. Some measures proposed have already been determined to be reliable and valid through measurement work conducted as part of the original MPC study. This involved exploratory and confirmatory factor analysis, calculating alphas to evaluate measures’ internal consistency, and examining correlations with other outcomes to establish construct validity.

There are several constructs of interest whose measures were not created or examined in depth in the original MPC study, such as use of instructional groupings and administrator- and teacher-report of teacher training and coaching, among others. For these, data reduction will occur for a) sets of items that are thought to comprise a construct (e.g., items on motivation to implement), or b) multiple, individual items thought to capture the same or a similar construct (e.g., administrator and teacher reports of PD). For sets of items thought to capture a construct, factor analysis will be used to find distinct factors that explain variance in items. If a set of items have an expected factor structure (e.g., validated measures), confirmatory factor analysis will be used. If there is no prior research, exploratory factor analysis will be conducted. For individual variables capturing the same or similar constructs, criteria will be used to determine what variables to privilege: a) those that are straightforward and can be cleaned and used in a concise way; b) those from which some level of reliability or face validity can be assessed; c) those with multiple items so that we can assess internal consistency through alphas; and d) those that have the most variation and tell an interesting story.

Next, measurement models will be estimated for constructs with multiple data sources (e.g., training, coaching, aspects of teacher practice, child math and executive function outcomes). Measurement of such constructs may be adjusted based on results. For example, if different aspects of training (e.g., amount received by the district and from the teacher’s site) are not sufficiently correlated with one another to warrant creation of a latent construct, then they may be entered into model singly (that is, as an observed variable).

Commented [MOU15]: Relevant to cultural and linguistic sensitivity.

Commented [MOU16]: Clearly stated analytic plan, starting with data reduction and also describing both the variable-centered and person-centered approaches.

Good cross walk from question to analytic technique and use of profile analysis is appropriate.

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Analysis Plan. Research questions 1a-b examine the pattern of associations among pathways hypothesized in the conceptual model, linking the provision of PD to teacher practice to children's learning. Further, they explore whether these associations vary based on different subgroups of teachers/classrooms and children. As such, the full sample of lead teachers will be used to examine the strength of relations among a) amount of training and coaching teachers receive as reported by teachers and administrators, b) multiple aspects of teacher practice, such as classroom quality, time spent on language/literacy and math instruction, use of instructional groupings, and c) children's language, math, and executive function competencies. The analytic approach proposed is multilevel Structural Equation Modeling (SEM) for several reasons: a) SEM allows for simultaneous testing of multiple, hypothesized pathways and mediators; b) it accommodates multiple data sources, allowing for more precise measurement of constructs of interest; c) it can account for interdependences of measures (e.g., among child outcomes) and units (i.e., multilevel data where children are nested within classrooms in sites); and d) it can assess whether pathways differ for groups of teachers/classrooms or children. See Exhibit 3 for an illustration of the proposed structural equation model.

Analyses will be conducted in Mplus (Muthén & Muthén, 1998–2010). First, as mentioned above, measurement models will be estimated for constructs with multiple data sources. Constructs assessed with a single measure will be included in the model as they are (that is, as an observed variable). Next, to test the hypothesized pathways of influence, the total, direct, and indirect paths will be estimated. Error terms for mediators and outcomes will be allowed to covary, when appropriate (for example, when they come from the same observational tool). Models will include covariates such as baseline child outcomes, child age and gender, treatment condition, and dummy variables representing random assignment block. The appropriateness of the model for the data will be evaluated using standard fit indices (e.g., NFI, SRMR). Nonsignificant pathways will be trimmed to improve overall fit and to be parsimonious. The model—and relevant pathways—will be tested separately for different subgroups of teachers/classrooms (i.e., classrooms serving a majority of DLLs or not; teachers with more or less experience teaching preschool; and teachers who are Hispanic, non-Hispanic white, or Non-Hispanic black) and children (i.e., children who are a dual language learner or not; children who are Hispanic or Non-Hispanic black; and children with higher or lower initial skill levels). Comparisons of fit statistics will tell whether there is a reasonable likelihood that a model is different across subgroups.

Whereas the first set of research questions takes a variable-centered approach to answer questions about associations among constructs of interest, the second set takes a complementary, person-centered approach to better understand and describe differences among classrooms in how constructs of interest (namely classroom interactions and processes) are related to one another. Accordingly, research questions 2a-b focus on classroom interactions and processes, including curriculum implementation, with an explicit focus on math instruction. This analysis will use the subset of teachers who were in sites randomly assigned to receive extensive training and coaching on math—that is, program teachers.

The analysis plan will follow several steps. First, latent profile analysis in Mplus will be used to answer research question 2a—to empirically identify latent profiles and describe patterns of curriculum implementation and classroom math practices. This person-centered approach is a multivariate technique for classifying subjects by identifying groups or clusters of cases (i.e., classrooms in

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the proposed study) that are similar across a set of observable variables (e.g., Magnusson, 2003). This kind of approach has the advantage of addressing the interdependencies across these various measures of curriculum implementation and math practices.

In the proposed study, a profile will represent a group of classrooms observed to have similar curriculum implementation levels (in terms of dosage and quality) and classroom math practices (in terms of quantity and quality) across the different measures of the classroom environment (see Exhibit 2 for a list of the classroom variables under consideration). The multilevel nature of the data can be taken into account by using a sandwich estimator (the COMPLEX command) in Mplus. As recommended by Vermunt (2008) and Jung and Wickrama (2008), the number of profiles will be determined by comparing different profile solutions using multiple criteria: 1) the Bayesian Information Criterion (BIC; Schwarz, 1978) and sample-size adjusted BIC (ABIC; Burnham & Anderson, 2004), 2) the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR) and the Adjusted Lo-Mendell-Rubin likelihood ratio test (Adjusted LRT), 3) entropy, a summary value of the individual profile probabilities, and 4) the theoretical and practical applications of the profiles (Muthén, 2004). Lower values on BIC and ABIC indicate better fit. Likelihood ratio tests compare the current model to a model with one less profile; a significant p value suggests the model with one less profile should be rejected in favor of the current model (Lo et al., 2001; Nylund et al., 2008). High (greater than .80) entropy values signify a more accurate solution (Hix-Small et al., 2004). Standardized z scores for the curriculum implementation and math practice variables will be considered to facilitate model convergence and interpretation. After a solution is identified, the most likely profile membership for each classroom will be exported.

Second, multinomial logistic regression in SAS will be used to answer research question 2b and to examine how select teacher characteristics (education, experience, motivation to implement, Spanish-speaking ability) and classroom characteristics (percent DLL) are associated with the profiles resulting from the latent profile analysis. The outcome will be group membership in one of the profiles. See Exhibit 4 for the equation that will be used. Planned pair-wise comparisons between profiles will be conducted as a follow-up analysis to identify which profiles are significantly different from one another in terms of their association with teacher and classroom characteristics. The profile used as the reference group for all post hoc comparisons will be determined prior to running the multinomial logistic regression. Given the evidence base for an association between classroom quality and child outcomes, the profile chosen as the reference group is likely be the one considered to have the highest quality curriculum implementation and classroom math practices.