Title: Evaluating the Efficacy of a Supplemental Kindergarten Vocabulary Intervention Implemented within a Tiered Instructional Framework

Background / Context: Description of prior research and its intellectual context.

Researchers and practitioners have long recognized the importance of early vocabulary development to future reading success (Becker, 1977; Cunningham & Stanovich, 1997; National Early Literacy Panel, 2009; National Reading Panel, 2000; RAND Reading Study Group, 2002; Tannenbaum, Torgesen, & Wagner, 2006). Recently, however, there has been a growing recognition of the urgency of accelerating vocabulary development in young school-age children through targeted intervention efforts (Biemiller, 2001; Catts et al., 2005). This sense of urgency is the result of the recognition of the strong relationship between early language development and later reading outcomes and the increasing number of student with diverse learning needs entering kindergarten with limited exposure and experiences with language and literacy. For example, consider the following:

- As early as kindergarten, “meaningful differences” exist between students’ vocabulary knowledge (Hart & Risley, 1995). While some children enter school with thousands of hours of exposure to books and a wealth of rich oral language experiences, other children begin school with very limited and impoverished knowledge of language and word meanings.
- Most of the vocabulary differences between children occur before grade three, at which point children with high vocabularies know thousands more word meanings than children who are experiencing delays in vocabulary development (Biemiller & Slonim, 2001).
- Currently, very little direct, systematic vocabulary instruction takes place in schools, particularly before third grade (Baumann, Kame`enui, & Ash, 2003; Wanzek, 2013). As Biemiller (2001) asserted, “educators do virtually nothing before grade 3 or 4 to facilitate real vocabulary growth. By then it is too late for many children” (p. 28).
- Moreover, because vocabulary knowledge develops relatively independently from beginning reading skills such as decoding, instruction that only targets code-based skills is insufficient to meet the needs of students who are at-risk for experiencing reading disabilities because of language and vocabulary difficulties (Catts, Hogan, & Adolf, 2005; Storch & Whitehurst, 2002; Velluntino, Tunmer, Jaccard, & Chen, 2007).
- Finally, unlike beginning reading/decoding, there are few evidence-based vocabulary interventions available for schools to implement, especially for those students most at-risk for language and literacy disabilities (Gersten, et al., 2009).

There is a great need for rigorous evaluations of fully developed interventions that can accelerate the vocabulary and literacy learning of young students at-risk for language and learning disabilities. This need was articulated by the National Reading Panel (2000) in its “Directions for Further Research.” The Panel concluded that: “Our knowledge of vocabulary acquisition exceeds our knowledge of pedagogy. That is, the Panel knows a great deal about the ways in which vocabulary increases under highly controlled conditions, but the Panel knows much less about the ways in which such growth can be fostered in instructional contexts. There is a great need for the conduct of research on these topics in authentic school contexts, with real teachers, under real conditions” (p. 4-27). This is still the case more than 10 years later, particularly with young students most at-risk for disabilities (Elleman, et al., 2009).

The purpose of this proposal is to present initial results from an IES funded Goal 3 RCT designed to evaluate the efficacy of the Early Vocabulary Intervention (EVI). The Early
Vocabulary Intervention is a Tier II vocabulary intervention designed to supplement Tier I classroom vocabulary instruction for kindergarten students who are at-risk for language and learning disabilities within a multi-tiered, or RTI, system of support.

**Purpose / Objective / Research Question / Focus of Study:** Description of the focus of the research

1: What is the impact of the Early Vocabulary Intervention on the language and literacy achievement of kindergarten students at-risk for language and learning disabilities?

2: How does the language and literacy achievement of at-risk kindergartens who receive the Tier II Early Vocabulary Intervention compare to typically achieving kindergarteners who only receive classroom vocabulary instruction.

**Setting:** Description of the research location.

The research was conducted with kindergarten classrooms from public school districts in Connecticut, Rhode Island, and Oregon serving large percentages of students at risk for language and learning difficulties.

**Population / Participants / Subjects:** Description of the participants in the study: who, how many, key features or characteristics.

All kindergarten students in participating classrooms were screened in the fall on the Peabody Picture Vocabulary Test (PPVT), a standardized measure of receptive vocabulary knowledge that is highly predictive of response to classroom vocabulary instruction and future language development (Coyne et al., 2010). Students performing below the 30% compared to national norms were considered at-risk for language and learning disabilities and qualified for participation in the study and were randomly assigned to either the treatment (n = 495) or control conditions (n= 461). A separate group of students with PPVT standard scores between 95-105 were identified to serve as a typically achieving comparison condition (n = 480).

**Intervention / Program / Practice:** Description of the intervention, program, or practice, including details of administration and duration.

The Early Vocabulary Intervention (EVI) is a Tier II vocabulary intervention designed to supplement Tier I classroom vocabulary instruction for kindergarten students who are at-risk for language and learning disabilities. The Early Vocabulary Intervention is characterized by the following:

- School-based interventionists implement the Early Vocabulary Intervention with small groups of students identified through screening measures as at-risk for language and literacy disabilities. Groups meet outside the classroom for 20 minutes per day, 4 days per week over 22 weeks.
• The Early Vocabulary Intervention re-introduces students to the target vocabulary taught during Tier I instruction. Interventionists provide students with the target word, a student-friendly definition, and an anchor picture and sentence that represent the target word. Each student has an opportunity to pronounce the word (to reinforce strong phonological representations), state the definition, and repeat the anchor sentence (to provide meaningful contextual support and to scaffold extended language use).

• The Early Vocabulary Intervention provides students with interactive activities that reinforce target word learning, support sentence level comprehension, and develop metalinguistic awareness. For example, students discriminate examples and nonexamples of pictures representing target words, use target words to describe personal experiences, describe pictures using target words, and engage in dialogic discussion with peers using target words. Activities are designed to maximize students’ exposures to target words in multiple supportive contexts.

• The small group setting and highly specified hierarchy of interventionist prompts in the Early Vocabulary Intervention promote extended language use. During activities, interventionists continually model appropriate use of target words and expansive language. Interventionists also follow up student responses with prompts designed to elicit elaborated and expanded language use.

Research Design: Description of the research design.

Project EVI is a multi-year multi-site cluster randomized control trial of a Tier 2 vocabulary intervention. In this study, all students in the Kindergarten class receive Tier 1 instruction; at-risk students are randomly assigned to either receive additional Tier 2 instruction within small intervention groups or to only receive the classroom instruction only (control).

In the early fall, all kindergarten students within participating schools were screened for vocabulary knowledge, using the PPVT. Students who scored below the 30th percentile on the PPVT; were identified as at-risk. Within schools, we created small groups/clusters of 3-4 these at-risk students, who were matched by initial PPVT scores. The treatment and control clusters were matched to ensure that the cluster means were similar and that the individual scores were matched as closely as possible. Then these 3-4 student clusters were randomly assigned to either the treatment or the control condition. In addition, we collected information on a cluster of “reference” students, who had average PPVT scores.

Data Collection and Analysis: Description of the methods for collecting and analyzing data.

Data were collected in the fall of Kindergarten, prior to beginning the Tier 2 intervention on a variety of literacy measures, including researcher developed measures of expressive and receptive vocabulary knowledge of a sample of the words that were presented in the vocabulary units, standardized vocabulary measures, such as the EVT and the PPVT, and other measures of early literacy and language skills. At the end of the year, following the intervention, the same measures were again collected from all students in the treatment, control, and comparison groups.

To examine the effects of the Early Vocabulary Intervention on the vocabulary knowledge and literacy related outcomes for at-risk students, we will conduct a series of 3-level
multilevel analyses where students (level-1) are nested within classes (level-2), classes are nested within schools, and the intervention is delivered at the student level (level-1). In other words, we will estimate a three-level multilevel model with treatment delivered at level-1. This design is sometimes referred to as a three level randomized block design (Hedges & Rhoads, 2010). We plan to include relevant covariates such as students’ pretest PPVT score at level-1. We plan to include relevant school-level variables such as school mean PPVT score and school SES as covariates at level-3. We will group-mean center students’ PPVT scores around their school’s mean PPVT score.

**Findings / Results**: Description of the main findings with specific details.

Data collection and analysis is ongoing; therefore, we present preliminary comparisons of the main effect of the Tier 2 intervention for a sample of 956 at-risk students from years 1 and 2 of the study. The treatment and control groups were balanced on all of the pre-assessment measures. At post-test, the treatment students outperformed the control students on both the researcher developed measures of expressive and receptive word knowledge of the words that were introduced during the vocabulary units, and these treatment effects were large. The Cohen’s d effect sizes were over 1.1 for each of these assessments. In addition, the post-test scores of the intervention students on these proximal measures were similar to those of the not-at-risk comparison students. However, treatment students and control students scored similarly on post-assessments of generalized expressive and receptive vocabulary knowledge.

**Conclusions**: Description of conclusions, recommendations, and limitations based on findings.

Results suggest that the Tier 2 supplemental EVI vocabulary intervention implemented within a multi-tiered system of support had a large impact on the target vocabulary learning or students identified as at risk for language and learning disabilities. Moreover at-risk students who received a combination of Tier 1 classroom vocabulary instruction plus the EVI supplemental small-group vocabulary intervention experienced similar learning outcomes on proximal measures as not at-risk students who only received classroom instruction. The EVI intervention, however, did not show an impact on more distal measures of vocabulary knowledge.