

# The Effects of Native Language Instruction on the Language and Literacy Achievement of PreK-6<sup>th</sup> Language-Minority Students

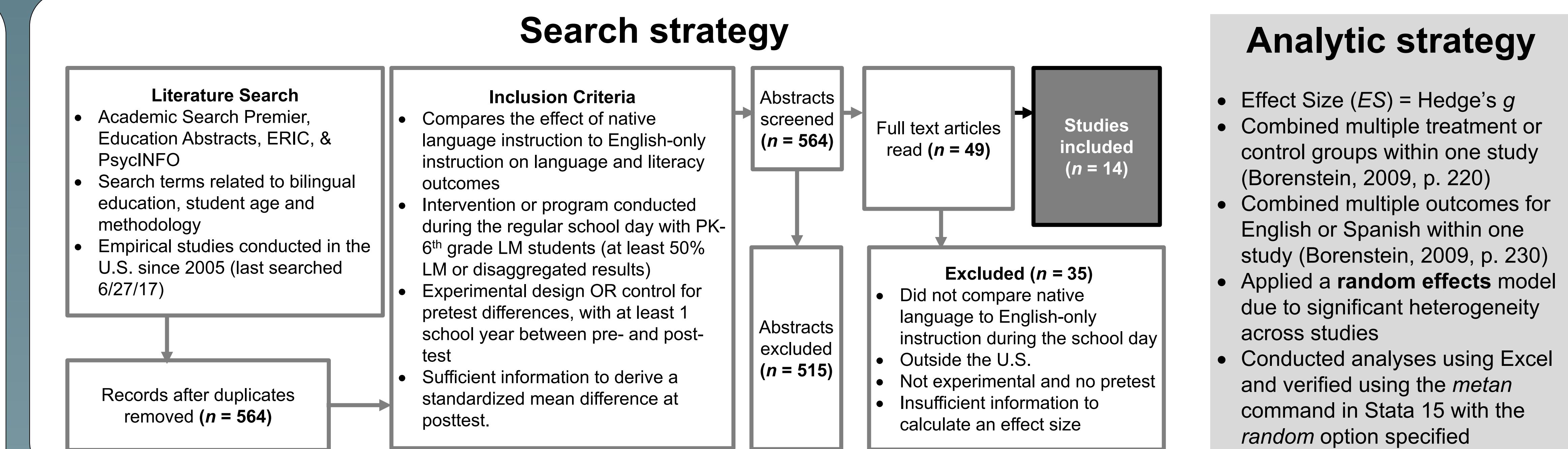


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## Abstract

The question of how schools can best serve language minority (LM) children continues to be the subject of ongoing debate. Previous syntheses have found small positive effects of bilingual education on the English outcomes of LM students. Few have examined native language outcomes and none have included studies conducted in PreK. This study updates and extends previous research by meta-analyzing 14 studies published from 2005 to 2015. A mixed-effects model was used to 1) pool the effect of bilingual education—defined as native language instruction during the school day—on English and Spanish outcomes; 2) determine whether the effect differed by grade level; and 3) examine differences by literacy skills. Results show that, compared to LM students receiving English-only instruction, those in bilingual education performed significantly better on literacy outcomes measured in their native language (Spanish), as well as in English. Though not significantly different, the effect size of native language instruction on English outcomes was larger for PreK than for K-6<sup>th</sup> grade. The mean effect size was also larger for constrained literacy skills as compared to unconstrained skills in both English and Spanish. These results echo previous work showing that bilingual education strengthens students' native language skills without compromising English acquisition.

## Methods



## Analytic strategy

- Effect Size (*ES*) = Hedge's *g*
- Combined multiple treatment or control groups within one study (Borenstein, 2009, p. 220)
- Combined multiple outcomes for English or Spanish within one study (Borenstein, 2009, p. 230)
- Applied a **random effects** model due to significant heterogeneity across studies
- Conducted analyses using Excel and verified using the *metan* command in Stata 15 with the *random* option specified

## Results in Context

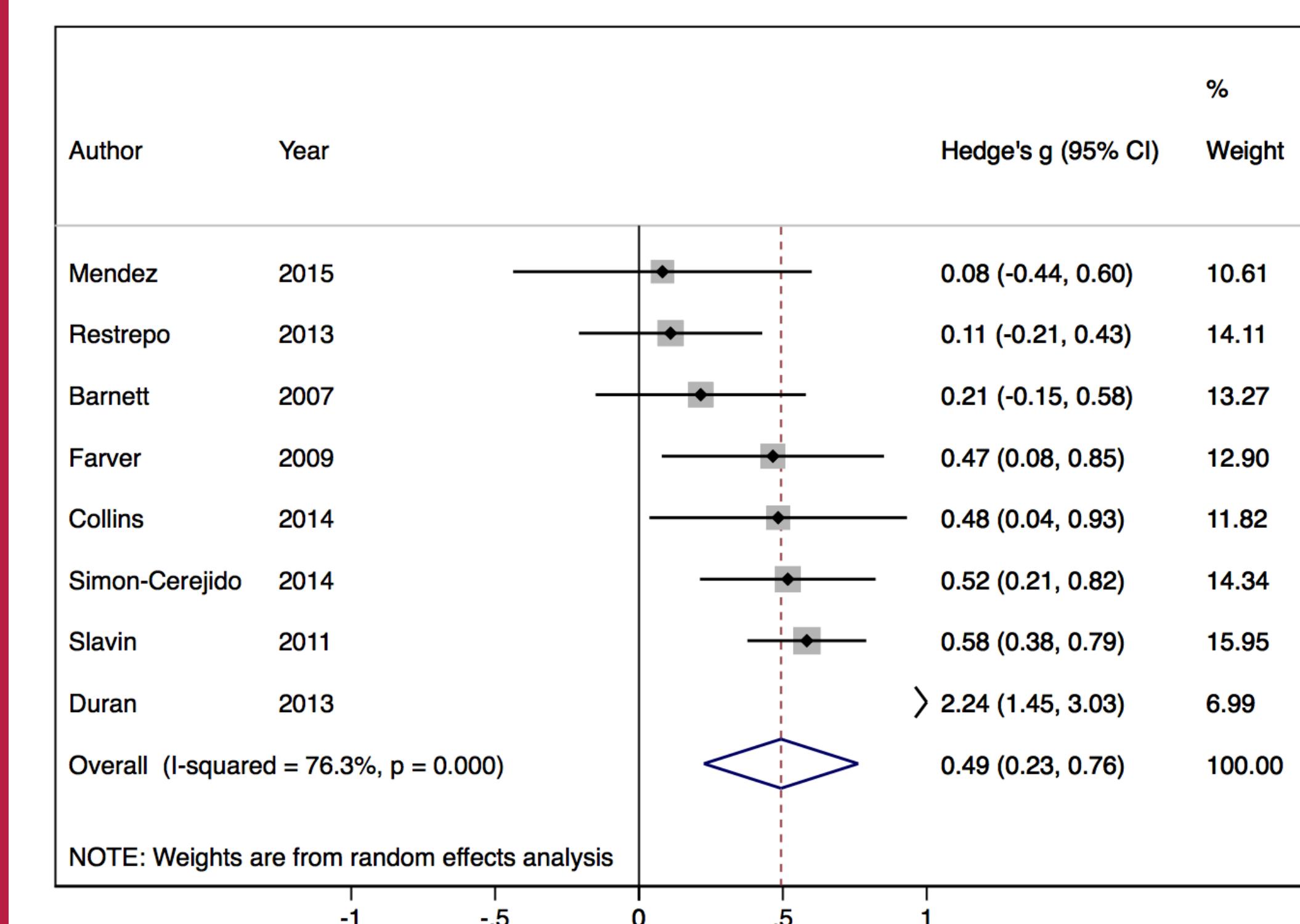
| Past Meta-Analyses                     | Criteria   | Number of studies | Spanish M ES | English M ES |
|--|--|-------------------|--------------|--------------|
| Willig, 1985                           | Instruction during the school day; U.S. or comparable societal context         | 23                | N/A          | .63          |
| Greene, 1997                           | Programs that lasted at least 1 academic year; no duplicate samples            | 11                | N/A          | .21          |
| Slavin & Cheung, 2005                  | Elementary reading for Spanish-dominant children; Best evidence synthesis      | 17                | N/A          | .33          |
| Rolstad, Mahoney, & Glass, 2005        | English and Spanish outcomes; included unpublished studies                     | 17                | .86          | .23          |
| Francis, Lesaux, & August, 2006        | English reading only; all but three studies overlap with Slavin & Cheung, 2005 | 15                | N/A          | .37          |
| <b>The Current Meta-Analytic Study</b> | <b>Included PreK; no overlap with previous reviews</b>                         | <b>14</b>         | <b>.49</b>   | <b>.19</b>   |

## Background

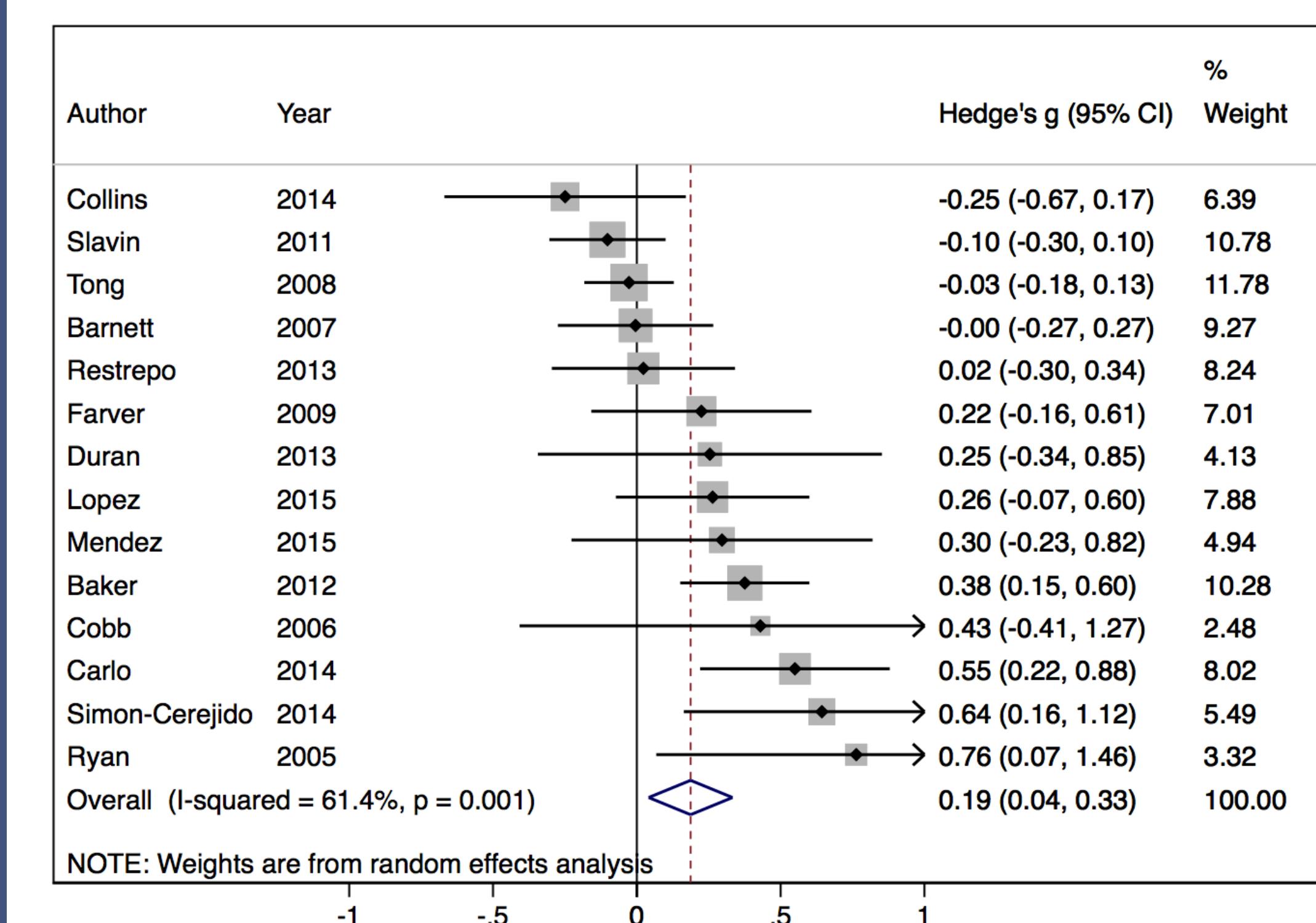
- There is growing research on the benefits of bilingualism (Bialystok, Craik, & Luk, 2012; Garcia, 2009) yet the debate persists regarding the role of the native language in the classroom in promoting LM students' language and literacy development.
- Past meta-analyses:
  - Willig** (1985) found a large, positive effect (*ES* = 0.63) for programs which used native language instruction during the school day compared with English-only programs on the achievement of LM students.
  - Greene** (1997) found an effect size of 0.21 in favor of native language instruction when implemented for least one year.
  - Slavin and Cheung** (2005) reported an overall positive effect (*ES* = 0.33) of bilingual education.
  - Rolstad, Mahoney, and Glass** (2005) also found bilingual education to be superior to English-only approaches in English (*ES* = 0.23) as well as native language outcomes (*ES* = 0.86).
  - In **Francis, Lesaux, and August** (2006), a positive effect (*ES* = 0.37) of native language instruction was found on the English reading outcomes of LM students.
- The present meta-analysis
  - Reviews studies from 2005-2015
  - Looks at bilingual education's effect on outcomes in both English and in the native language (Spanish)
  - Is the first to include studies conducted during the preschool years
- Using Paris' (2005) distinction between constrained (e.g. decoding) and unconstrained (e.g. comprehension) literacy skills, we investigate the moderating effects of type of literacy outcomes on language and literacy achievement in both English and Spanish.

## Results

### Spanish outcomes



### English outcomes



## Sensitivity Analyses

Using Rosenthal's 1979 "Fail-safe *N*" formula, we found that it would take 156 additional studies with a null result to change our significantly positive combined mean effect for Spanish outcomes, and 64 studies for English outcomes.

## Research Questions

- What are the effects of native language instruction on the achievement outcomes of PreK-6<sup>th</sup> grade language minority students in the US?
- Does grade level, or student age, moderate the effects of native language instruction on the achievement outcomes of PreK-6<sup>th</sup> grade language minority students in the US?
- Does type of literacy outcome moderate the effects of native language instruction of PreK-6<sup>th</sup> grade language minority students in the US?

### Developmental Differences

- To examine developmental differences in the effect of native language instruction on **English outcomes**, we compared the pooled *ES* by grade (PreK vs. K-6<sup>th</sup>).
- The mean effect size for PreK (*ES* = 0.23 [CI: 0.03, 0.43]) was larger than for K-6<sup>th</sup> (*ES* = 0.15 [CI: -0.06, 0.36]), but the difference between the mean effect sizes was not statistically significant.

## Moderator Analyses

### Constrained vs. Unconstrained Literacy Skills

- To examine differences by type of literacy outcome, we compared the pooled *ES* by outcome type.
- English outcomes:** Constrained skills (*ES* = 0.26 [CI: 0.05, 0.48]) > unconstrained skills (*ES* = 0.13 [CI: -0.002, 0.26]).
- Spanish outcomes:** Constrained skills (*ES* = 0.92 [CI: 0.24, 1.59]) > unconstrained skills (*ES* = 0.44 [CI: 0.22, 0.65]).

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