

Introduction

Bilingual individuals have often been suggested to have an advantage in executive functioning skills due to practicing switching between languages. Some studies have demonstrated evidence of a 'bilingual advantage' in domains such as working memory (WM), processing speed (PS), and attention.

Less is known, however, about whether similar patterns appear in students who have not yet mastered a second language, and available evidence is conflicting. For example, in Hansen et al. (2016), young students classified as limited English proficient (LEP) outperformed monolingual peers in WM; however, the opposite was found in Castillo et al. (2022). In both studies, the group differences did not persist into adolescence, and other studies at this age show no difference between LEP and monolingual students (Low & Siegel, 2005). Research on LEP students and PS is sparse, but most existing studies show no difference between monolinguals and bilinguals or LEP students (Barac et al., 2014). Visual attention (VA) has rarely been studied in this context. However, one study of adults found no difference in visual attention between monolinguals and bilinguals (Bouffier et al., 2020).

Here, we compare groups of students who are classified as LEP or not. Given that the majority of prior research shows no difference between groups, and given the age and limited second-language proficiency of our subjects, we hypothesized that there would be no difference between groups in WM and PS; the limited research on VA does not allow for a directional hypothesis.

Participants/Procedures

Participants were 199 students from four diverse middle schools in Texas, whose mean age was 12.97 (0.86); 54% were male. Most (80%) students were Hispanic, and 54% were classified by their schools as LEP; 88% received lunch assistance.

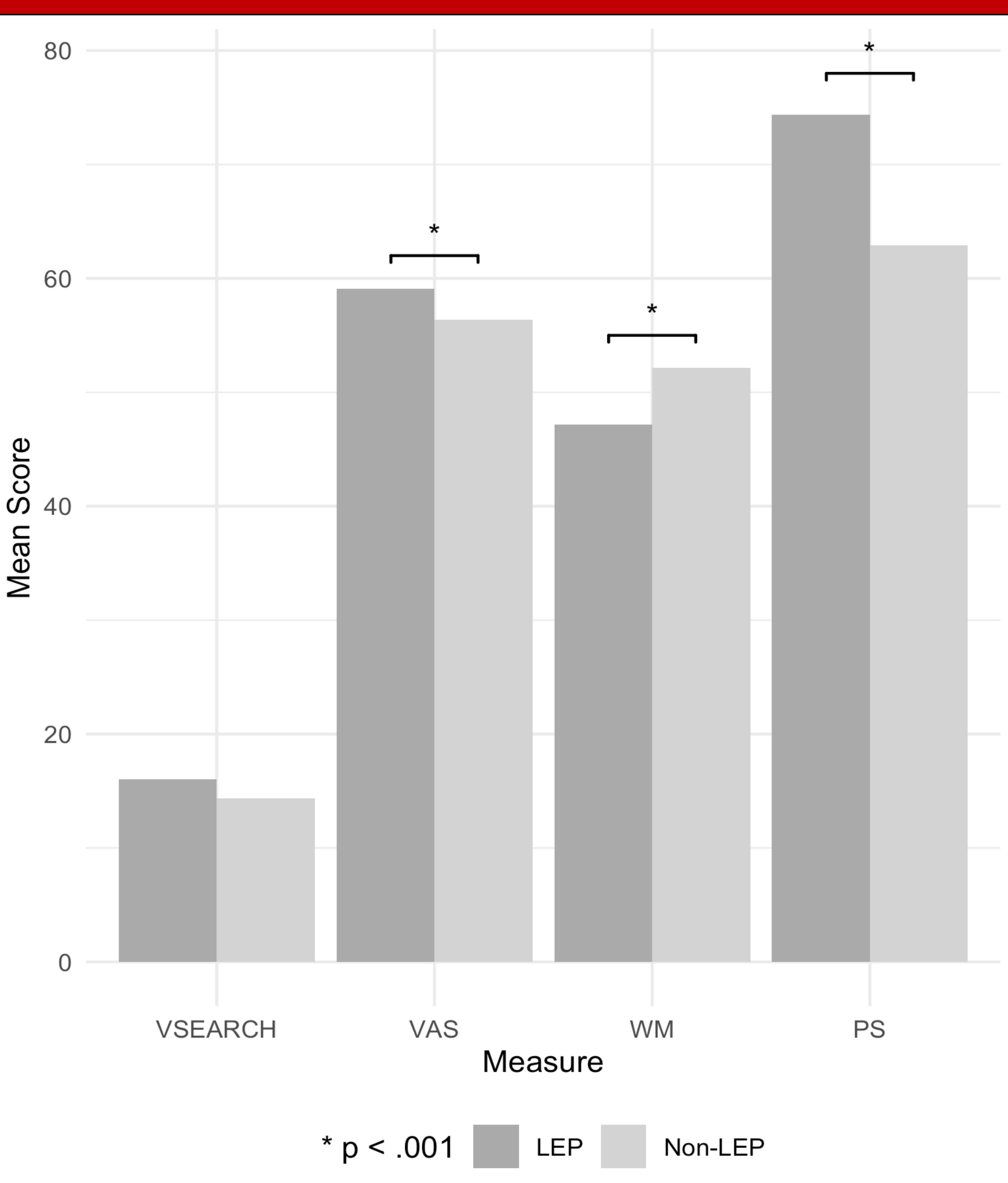
Working Memory and Processing Speed were assessed via the respective indices of the WISC-V (Wechsler, 2014). Attention was evaluated with two versions (letters/numbers) each of a visual attention span (VAS) measure and two versions of a visual search (VSEARCH) measure. VAS involved rapid presentation (200 msec) of 5 stimuli at a time, and VSEARCH required crossing out targets from perceptually similar distractors.

We considered covariates of age, nonverbal reasoning, and phonological processing. Analyses were ANCOVA, with a grouping variable of LEP status.

Table 1. Demographics

N	199
Age (Mean (SD))	12.97 (0.86)
LEP Status (% LEP)	54.27
Gender (% Female)	45.73
Ethnicity (%)	
Hispanic	79.90
White	7.54
African American	2.01
Two or more races	1.01
Asian	0.50
Native Hawaiian/Pacific Islander	0.50

Figure 1. Comparison by Language Status



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Results

Descriptively, on measures where standard scores were available, performances in the sample as a whole were generally in the low average range (SS equivalents range 85 to 88). Students designated as LEP had lower WM performances, $p < .001$. For PS, the reverse was true, with LEP students having significantly higher scores in PS, $p < .001$. For attention, results were mixed; performance on VAS was similar between groups, $p = .174$, whereas for VSEARCH, LEP students had significantly higher performances, $p < .001$. All results held in the context of any combination of covariates.

Discussion

Results were interesting but differed from expectations. For WM, there was a disadvantage for students classified as LEP, whereas the opposite was true for PS and VSEARCH. Most previous research has focused on bilinguals who have a similar proficiency in both languages, but the current sample demonstrated an imbalance in language proficiency. Thus, the results highlight the need to consider these and similar cognitive individual differences in the context of second language learning, and a need to consider the balance of proficiency across languages. Supporting this possibility, a meta-analysis found that studies of balanced compared to unbalanced bilinguals are more likely to report an advantage in WM and attention (Yurtsever et al., 2023). Overall, this study adds to a limited body of evidence on cognitive processes in students with exposure to, but not mastery of, multiple languages. Future studies could focus on PS and VA in LEP students across age ranges and across a wider range of proficiencies.

Key References

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