Identifying Language Impairment in Bilingual Children Using Discriminant Analysis.

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Abstract

Using standardized tests alone does not allow us to accurately identify Language Impairment (LI) in sequential bilingual children (Kohnert et al., 2006). It is important to discriminate bilingual children with LI from typically developing bilingual children. Thus, studies have suggested processing based tasks which tap learning ability such as 'quick incidental learning' (Ullman & Pierpont, 2005) and memory ability such as 'nonword repetition' or 'counting span' to accurately identify bilingual children with LI. Additionally, developmental history, current levels of achievement in both languages and general ability to learn or use language in a real life situation from parental perspectives have been suggested as accurate identifiers (Paradis et al., 2010) in bilingual children. However, questions still remain whether which tasks are the best combination of identifying LI in this population.

Thus, in this study the followings are the research questions. First, are there significant differences between bilingual children with and without LI on assessment measurements(parental report, memory tasks, and learning tasks)? Second, are correlational tendencies among tasks differ between groups? Lastly, what is the best combination of assessment tools to accurately discriminate LI in this group?

Methods

Participants were 40 Korean-English bilingual children (21 bilingual children without LI and 19 bilingual children with LI) between 5 and 7 years old. Children used Korean at home and English at school. They were exposed to English after 3 years old and used English and Korean at least for 3 years. Standardized tests to measure receptive vocabulary in Korean and English, REVT(Kim et al., 2009) and PPVT-IV (Dunn & Dunn, 2007) were used. A composite scoring was applied to collect the overall receptive concept score. For parental reports, Alberta Language and Development Questionnaire (ALDeQ, Paradis et al. 2010) was used. Bilingual children with LI were defined when they met the following three criteria 1) score less than 1.25 below on ALDeQ, and score less than 1.5 below on REVT, and PPVT. Quick Incidental Learning and Novel Bound Morpheme Generalization tasks were learning tasks. Nonword repetition, sentence repetition and Matrix were used to tap working memory.

The study conducted Two-way ANOVA to examine the group difference on all dependent

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variables. Pearson's simple correlation was used to identify the correlations among tasks. Finally, stepwise discriminant analysis was used to identify which assessment tools best discriminate bilingual children with LI from bilingual children without LI.

Results and Discussion

The results of the study were as follows. First, bilingual children with LI were statistically significantly lower than children without LI on standardized language tests(REVT: $F(1, 38) = 36.47$, $p < .001$, PPVT: $(F(1, 38) = 24.79$, $p < .001)$), learning tasks(QUIL: $(F(1, 38) = 7.71$, $p < .05)$, NBMG: $F(1, 38) = 9.90$, $p < .05)$, memory tasks(short-term: $(F(1, 38) = 8.93$, $p < .05)$, and working memory: $(F(1, 38) = 4.19$, $p < .05))$. Second, typical bilingual children showed a significant correlation between receptive vocabulary on PPVT and working memory ($r = .531$, $p < .05$) yet bilingual children with LI showed a significant correlation ($r= .696$, $p < .05$) between with receptive vocabulary PPVT and short-term memory. Receptive vocabulary scores on REVT were significantly correlated with short-term memory ($r=.694$, $p < .05$), and parental report ($r=.752$, $p < .05$) in children with LI. Third, the result of phased discrimination analysis in order to discriminate LI showed, ALDeQ($x2(1, 38) = 47.27$, $p < .001$), reports of parents (words, the family history's realm about language) ($x2(2, 37) = 34.31$, $p < .001$) and the task of receptive and expressive vocabulary ability($x2(3, 36) = 27.29$, $p < .001$). The results which analyzed the groups of bilingual children by using discriminating equation illustrated 89.5% of sensitivity and 100% of specificity($y = -84.91 + 0.11 * REVT + 0.62 * PARENT\_2 + 0.22 * ALDeQ$).

In sum, results indicated the importance of learning and memory measurements predicting language skills and suggested the importance of parental reports in order to accurately identify LI in bilingual children.

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