Reading Achievement Growth in Children with Language Impairments

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Introduction

It is well recognized that oral language development lays the foundation for reading achievement. Children with typical language development generally demonstrate normal reading achievement, whereas children with developmental language impairments (DLI) often experience difficulties learning to read. Most studies that have examined the reading outcomes of children with LI have been limited to the early school grades. As a result, very little information is available concerning the growth of reading achievement across the school grades in this population.

In this study, a structural equation modeling (SEM) framework was utilized to examine the growth in reading achievement of children with LI and children with typical language (TL) across the school grades. We examined whether the growth trajectories of children with LI showed a delayed pattern (initial deficit followed by faster growth than typical children), a deficit pattern (initial deficit followed by similar growth to typical children), or a Matthew effect pattern (initial deficit followed by slower growth than typical children).

Methods

The participants were 225 children with LI and 379 children with TL. Language status was determined on the basis of a test battery administered in kindergarten (see Table 1). The Test of Language Development-2-P and a narrative task (Colalata, Page & Ellis, 1983) were used to measure language status. The criteria for a language impairment was consistent with that used by Tomblin et al. (1997). A measure of nonverbal cognitive ability was also administered in kindergarten. Finally, all children were given measures of word recognition and reading comprehension, groups showed high initial acceleration followed by slower growth between 4th and 10th grade (see Figures 1 and 2). Finally, the composite of nonverbal cognitive abilities was entered in the LGC model as a covariate. This model indicated that nonverbal cognitive abilities were moderately related to the intercept of reading achievement but essentially unrelated to growth.

Results

Multiple-group CFAs indicated that the constructs of word recognition and reading comprehension were stable across groups and across grades. Follow-up testing indicated that the groups should not be collapsed and a multiple group LGC model was specified. A two-group multivariate level and shape LGC model was specified. The intercept factors for word recognition and reading comprehension were specified with fixed basis weights (i.e., loadings) of 1 across all grades. The shape factors for word recognition and reading comprehension were specified with fixed basis weights of 0 for 2nd grade and 1 for 10th grade. The basis weights for 4th and 8th grades were freely estimated for the shape constructs in both groups. The shape factor represents the changes in the growth trajectory found across the repeated measures. The level and shape model allows the shape of the growth trajectories to be optimally estimated, which could uncover nonlinearity if present. All intercept and slope factors were allowed to vary within each group.

The results of the LGC analysis indicated that children with LI displayed a deficit pattern of reading growth. This was characterized by initial impairment in reading achievement followed by comparable growth to that of children with TL. There was no evidence that children with LI caught up in their reading achievement or got increasingly worse (i.e., the Matthew effect) in their initial levels for word recognition and reading comprehension. No group differences were observed in the shape of growth trajectories. For word recognition and reading comprehension, groups showed high initial acceleration followed by slower growth between 4th and 10th grade (see Figures 1 and 2). Finally, the composite of nonverbal cognitive abilities was entered in the LGC model as a covariate. This model indicated that nonverbal cognitive abilities were moderately related to the intercept of reading achievement but essentially unrelated to growth.

Implications

This study investigated the growth in reading achievement of children with LI and TL across the school grades. The results indicated that children with LI displayed a deficit pattern of reading growth. This was characterized by initial impairment in reading achievement followed by comparable growth across grades. The results suggest that screening and referral systems need to be in place to identify children with LI at the beginning of kindergarten or earlier. These early identification methods seem critical to identify these children early and provide intervention. Early screening and referral systems need to be in place to identify children with LI at the beginning of kindergarten or earlier. These early identification methods should incorporate not only traditional measures such as letter identification and phonological awareness but should also include measures assessing language skills such as vocabulary and listening comprehension.

Acknowledgments

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Table 1. Language status in kindergarten

<table>
<thead>
<tr>
<th>Kindergarten Language Status</th>
<th>Test of Language Development-2-P</th>
<th>Whecker Preschool and Primary Scale of Intelligence-Revised</th>
<th>Narrative Comprehension</th>
<th>Nonverbal Cognitive Status</th>
<th>Reading Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Picture Identification</td>
<td>Oral Vocabulary</td>
<td>Grammatic Understanding</td>
<td>Grammatic Completion</td>
<td>Sentence Imitation</td>
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<tr>
<td>LI</td>
<td>80 (50)</td>
<td>80 (50)</td>
<td>80 (50)</td>
<td>80 (50)</td>
<td>80 (50)</td>
</tr>
<tr>
<td>TL</td>
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<td>80 (50)</td>
<td>80 (50)</td>
<td>80 (50)</td>
<td>80 (50)</td>
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</tbody>
</table>

Table 2. Measures

<table>
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<th>Reading Achievement</th>
<th>Word Recognition</th>
<th>Reading Comprehension</th>
<th>Diagnostic Achievement Battery-2</th>
<th>Qualitative Reading Inventory-2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Woolcock Reading Mattry Tests-Revised</td>
<td>Woolcock Reading Mastery Tests-Revised</td>
<td>Reading Comprehension</td>
<td>Qualitative Reading Inventory-2</td>
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<tr>
<td></td>
<td>80 (50)</td>
<td>80 (50)</td>
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<td>80 (50)</td>
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</tbody>
</table>

Figure 1. Growth for word recognition

Figure 2. Growth for reading comprehension

*The constructs were standardized to have a common metric (M=80, SD=10) across grades

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