Children with Literate Language Deficits: Dynamic Assessment of Morphological Skills
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Background:
Individuals with language deficits present with impaired comprehension and/or use of oral and/or written language which may involve phonology, morphology, syntax, semantics and/or pragmatics (ASHA, 1993). Remediation of these areas helps to allow for academic success. Understanding of morphological patterns facilitates vocabulary growth throughout the school aged and young adult population. Reading comprehension of academic materials relies on knowledge of the Latin and Greek influences on the Anglo-Saxon system. Spelling proficiency is additionally impacted by knowledge of morphology.

- Currently, the standardized measures utilized by Speech-Language Pathologists assess grammatical morphemes for the younger population.
- Limited assessment for targeting knowledge/use of more advanced derivational morphology for older students is available.
- Larsen and Nippold (2007) have proposed a well designed, easy to replicate dynamic assessment appropriate for typically developing middle school children.
- Use of dynamic assessment allows for the collection of qualitative as well as quantitative data which can lead to a more comprehensive view of the student’s needs and abilities.

Purpose:
Given the link of morphological skills to broader literacy abilities, this study was designed to:

- Address three research questions.
  1. Do children with language impairment perform differently on the Dynamic Assessment Task of Morphological Analysis (DATMA, Larsen & Nippold, 2007) as compared to typically developing children?
  2. Is the performance on the DATMA associated with the child’s “word knowledge” as measured by the PPVT?
  3. Can this probe provide clinically relevant information to inform treatment?
- Allowed graduate student clinicians to participate in a small research project and realize the process of utilizing Evidence Based Practice (EBP) to influence assessment and treatment.

Method:
Participants: Five male middle school students (mean age: 11;6, range: 11;2-13;1 ) with documented literate language disabilities, who were receiving treatment at the Northern Illinois University Speech-Language-Hearing Clinic, participated in this study. They attended various public and private schools in the north-central Illinois region. All were referred with academic concerns due to deficits in spoken and written language abilities. All participants exhibited cognitive abilities within the average range.

Procedure: Each participant was administered the Peabody Picture Vocabulary Test, 4th edition (PPVT-4) and the Dynamic Assessment Task of Morphological Analysis (DATMA, Larsen & Nippold, 2007) during a weekly session. The graduate student clinicians assigned to the case had reviewed the protocol with the clinical supervisors and had practiced as a group to ensure fidelity of administration. Sessions were audio and video recorded. All sessions were reviewed by a second clinician to assess inter-scorer reliability.

Measures:
-PPVT-4 assesses receptive vocabulary at the single word level through a standardized format.
DATMA is a dynamic assessment designed to ensure that children use their morphological knowledge to ascertain the meaning of the words presented.

- Target words are low-frequency (< 37) derived words with high frequency (≥ 50) roots (Carroll, Davies, & Richman, 1971)
  Example: Beast = 52.30, Beastly = 31.40; Odor = 50.8, Odorous = 34.6
- Scaffolding of cues clearly delineated
- Scoring clearly linked to scaffold

Results:
PPVT-4 and the DATMA were scored according to authors’ instruction. Inter-scorer reliability for the DATMA was 93%. Discussion of the few disagreements resulted in 100% agreement. As noted in typically developing children (Larsen & Nippold, 2007), children with language impairment exhibited a range of performance on this measure.

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Range</th>
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<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD*</td>
<td>12;2</td>
<td>10;9-12;10</td>
</tr>
<tr>
<td>LI+</td>
<td>11;6</td>
<td>11;2-13;1</td>
</tr>
<tr>
<td>PPVT-III (std score)</td>
<td></td>
<td></td>
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<tr>
<td>TD*</td>
<td>112.72 (9.84)</td>
<td>91-134</td>
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<tr>
<td>PPVT-4 (std score)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD*</td>
<td>98.60 (6.88)</td>
<td>89-108</td>
</tr>
<tr>
<td>PPVTMA (raw score)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD*</td>
<td>51.03 (7.99)</td>
<td>23 - 68</td>
</tr>
<tr>
<td>LI+</td>
<td>49.80 (8.46)</td>
<td>44 – 64.5</td>
</tr>
</tbody>
</table>

+Present Study; * Larsen & Nippold (2007)

Using SPSS 16.0, a Kendall’s tau correlation was run instead of Pearson’s correlation coefficient due to the small data set. The results of the DATMA and PPVT-4 was not significant ($r = .00, p = 1.00$) indicating that for this small sample, “word knowledge” as measured by the PPVT-4 was not associated with performance of the DATMA. Larsen and Nippold ran a Pearson correlation on their typically developing children and found it to be significant ($r = .36, p = .01$).

Examples of Client Responses

Cookery: In response to how did you know that? "Because it says cook and the 'y' makes it like a place."

Flowery: "like beautiful, like a flowery" In response to prompt 3-Does the word have any smaller parts? What are those parts? "no just has flower."

Puzzlement: "There's puzzle..sounds like a little dog. Puzzle, ummm, like a confused..or many pieces ..and ment like a breath mint. Puzzlement is a confused mint? I can't remember what ment means."
Corrective: "Did we have 'ive' before? I just don't know."

<table>
<thead>
<tr>
<th>Group</th>
<th>Score</th>
<th>LI*</th>
<th>Low*</th>
<th>Average*</th>
<th>High*</th>
<th>Combined* (Low,Avg.,High)</th>
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</thead>
<tbody>
<tr>
<td>Word/5</td>
<td>4.00</td>
<td>1.20</td>
<td>1.55</td>
<td>2.33</td>
<td>1.76</td>
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<tr>
<td>Morpheme 4.5</td>
<td>3.20</td>
<td>3.00</td>
<td>4.64</td>
<td>4.50</td>
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<tr>
<td>Knowledge 4</td>
<td>1.40</td>
<td>3.00</td>
<td>3.27</td>
<td>4.00</td>
<td>3.48</td>
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<tr>
<td>Syntax/2</td>
<td>0.60</td>
<td>0.10</td>
<td>0.32</td>
<td>0.22</td>
<td>0.24</td>
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<td>Semantic 1</td>
<td>2.60</td>
<td>4.30</td>
<td>3.32</td>
<td>2.94</td>
<td>3.38</td>
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<tr>
<td>Contextual Cues 0</td>
<td>2.80</td>
<td>3.10</td>
<td>1.73</td>
<td>0.78</td>
<td>1.66</td>
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<tr>
<td>Total</td>
<td>15.00</td>
<td>15.00</td>
<td>15.00</td>
<td>15.00</td>
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<td></td>
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</tbody>
</table>

* Present study; * Larsen & Nippold (2007)

**Discussion:**

The identification of students with morphological deficits is critical given the connection to vocabulary levels and success in school-based literacy skills such as reading comprehension (Carlisle, 2000). The DATMA allows for quantitative as well as qualitative assessment of derivational morphological skills. Performance on the DATMA has been linked to broader literacy levels in typically developing children (Larsen & Nippold, 2007). Qualitative data are crucial for designing treatment. This small study was designed to ascertain morphological abilities and aid in designing remediation for the individuals with language impairment while promoting research and use of EBP by graduate student clinicians. Additionally, it expanded the use of this new dynamic tool to include students with documented disabilities.

As with the typically developing children in Larsen and Nippold’s study, a range of scores was noted in the children with language impairment. Pattern analysis of mean frequencies of DATMA scores indicated a similar generalized pattern to that of the typically developing children. Two of the participants did very well on the initial prompt and were able to discuss the word based on the constituent morphemes. If the participant did not spontaneously recognize the morphemes, the scaffolding at the word/morpheme level given in the 3rd and 4th prompts did not appear to provide enough support for the child to successfully assign meaning to the word. They were, however, able to utilize the syntax contextual clue provided in prompt #5 and successfully made use of the semantic clues of prompt #6.

Results from this study indicate that the scores on the DATMA were not significantly associated with “word knowledge” as measured by the PPVT in this small group of children with language impairment as they were found to be in the typically developing children (Larsen and Nippold, 2007). State testing was not available for 2 of the 5 participants, so no quantitative comparison to reading comprehension was attempted as it was in Larsen and Nippold’s study. However, reading comprehension is a current therapy goal for all of the participants. Since this was a small convenience sample of children receiving treatment for literate language impairment, it may not be reflective of the performance of a more inclusive sampling of children with language impairment.

Qualitative results from testing 4 of the 5 participants provided subjective information that was used to design an eight week unit on morphology. Graduate student clinicians utilized grade level
content area vocabulary lists to address word structure and meaning given the Latin and Greek influences on the English language. The prompting scaffold that the students learned and used with the DATMA was adapted for use in the therapy unit (Pena and Kiran, 2008). The students designed goals and activities based on the pattern they noted for the individual participant.

Given the wide range of performance for this age of both typically developing and students with language impairment on this measure, further studies are necessary to refine/design age-appropriate dynamic assessment tools such as/similar to the DATMA for a range of ages. Accurate determination of deficits in derivational morphological knowledge in children who appear to be typically developing as well as those with documented language impairment is crucial to academic success. Dynamic assessment allows the professional to ascertain where the breakdown in skills occurs which serves to inform effective remediation.

**Graduate Student Comments Regarding Probe:**

“What I found difficult about the administration/scoring was determining on the spot whether or not the client's answer was "correct" so I would know what prompt to give next.”

“I think it was challenging to score because the correct answers that the probe gave were scholarly written. Many kids do not talk like that so it is hard to know when to give them credit or not.”

“This probe helped me see that my client was unable to segment words and/or break them down into smaller parts. By doing that, he was missing key information in vocabulary that is used in his academics.”

**Limitations:**

This was a small pilot study \( (n = 5) \) that utilized Larsen and Nippold’s dynamic assessment (2007) to determine derivational morphological knowledge in male middle school language impaired students and inform treatment. As such, the convenience sample was limited in age, gender and range of disability.

**References:**


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