Short-Term Test-Retest Reliability of Informal Phonological Analysis for 2-year-old Late Talkers

Jordan Gearheart  
*University of Nebraska at Omaha*

Ann Walker  
*University of Nebraska at Omaha*

Shari L. DeVeney  
*University of Nebraska at Omaha, sdeveney@unomaha.edu*

Follow this and additional works at: [http://digitalcommons.unomaha.edu/spedfacproc](http://digitalcommons.unomaha.edu/spedfacproc)  
Part of the [Phonetics and Phonology Commons](http://digitalcommons.unomaha.edu/spedfacproc) and the [Special Education and Teaching Commons](http://digitalcommons.unomaha.edu/spedfacproc)

**Recommended Citation**


[http://digitalcommons.unomaha.edu/spedfacproc/7](http://digitalcommons.unomaha.edu/spedfacproc/7)

This Poster is brought to you for free and open access by the Department of Special Education and Communication Disorders at DigitalCommons@UNO. It has been accepted for inclusion in Special Education and Communication Disorders Faculty Proceedings & Presentations by an authorized administrator of DigitalCommons@UNO. For more information, please contact unodigitalcommons@unomaha.edu.
Background and Significance

Late Talkers
- 2-year-old children identified with expressive language delay without a causal factor (e.g., autism spectrum disorder, intellectual deficits)
- Few words; limited to no two-word utterances ("Mommy eat")
- Approximately 10-15% of all 2-year-old children

Phonological Skills
- Correlation between the size of a child’s phonological repertoire and expressive vocabulary
- Late talkers may exhibit deficits in phonological skills (e.g., fewer complex syllable structures in words, limited speech sound repertoires)

Speech-language pathologists (SLPs) in Practice
- Planning appropriate intervention begins with comprehensive evaluation of both speech and language skills.
- Often collect and analyze conversational speech samples using informal measures (i.e., those not compared to normative group; used for descriptive purposes)

Two Types of Informal Phonological Measures

- Independent:
  - Allow for speech sound analysis that is descriptive rather than comparative (e.g., what the child DOES produce instead of what child DOES NOT produce)
  - Includes Phonetic Inventory (PI) and Word shape analysis (WS)
  - Relational:
  - Used to evaluate ability to produce sounds in a word compared to the adult form (e.g., comparing a child’s production of “tat” to the adult form, “cat”)
  - Includes Place-manner voice analysis (PMV) and Percent consonants correct-revised (PCC-R)

Test-Retest Reliability
- Measurement stability over time; short-term (i.e., one-week) reliability important for accurate baseline performance indicators and tracking treatment progress

Significance
- Need for evidence-based practices in assessment (ASHA 2004, 2005)
- SLPs may assume informal measures are reliable, but lack of evidence

Aim of current study
- Extension of Morris’ (2009) procedures for determining test-retest reliability of phonological analyses with a clinically-relevant population (e.g., late talkers); inclusion of relational analyses

Research Question
- What is the short-term test-retest reliability (over a one-week time period) of independent and relational informal phonological analyses calculated using intelligible words produced during a 20-minute speech sample for young children identified as late talkers?

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>25 months</td>
<td>31 months</td>
<td>24 months</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Male</td>
<td>Male</td>
</tr>
<tr>
<td>PLS-S Exp. (Ss %)</td>
<td>85 (21)</td>
<td>77 (6)</td>
<td>82 (13)</td>
</tr>
<tr>
<td>PLS-S Aud. (Ss %)</td>
<td>82 (16)</td>
<td>81 (10)</td>
<td>94 (14)</td>
</tr>
<tr>
<td>M-CHAT</td>
<td>PASS</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>CDI/CDI III %</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>ASQ-3</td>
<td>PASS 2/5</td>
<td>PASS 5/5</td>
<td>PASS 5/5</td>
</tr>
<tr>
<td>Words Produced</td>
<td>22/11</td>
<td>10/10</td>
<td>7/7</td>
</tr>
<tr>
<td>MU &amp; S1</td>
<td>1.08</td>
<td>1.08</td>
<td>1.08</td>
</tr>
<tr>
<td>MU &amp; S2</td>
<td>1.00</td>
<td>1.22</td>
<td>1.08</td>
</tr>
</tbody>
</table>

Procedures
- Modeled after Morris (2009) study procedures
- Two 20-minute conversational speech samples were obtained from each child while interacting with his/her parent and playing with age-appropriate, researcher-supplied toys
- Each speech sample was transcribed by the first two authors using the International Phonetic Alphabet (IPA); Inter-rater reliability was 81.83% (range = 72-91%)
- The first author calculated PIs and WS analyses for each participant session based on final agreed-upon transcriptions. Inter-rater reliability for independent analyses was established with the faculty advisor on 20% of the data. PI Inter-Rater Reliability was an average of 96% (range = 89-100%); WS Inter-Rater Reliability was 100%.
- The second author calculated all PMV and PCC-R analyses. Inter-rater reliability was established with faculty on 20% of the data. PI Inter-Rater Reliability ranged from 84-93%; PCC-R Inter-Rater Reliability ranged from 89-95%.

Results
- Phonetic Inventory
  - Initial consonants: P1 and P2 were reliably consistent for productive initial consonants (6 in S1; 7 in S2; 6 in S1; 6 in S2); however P3 was not (2 is S1; 7 in S2)
  - Final consonants: P1 was reliably consistent with productive final consonant sounds, but not for emerging (0 in S1, 3 in S2); P2 was consistent in that he did not produce any in either session; P3 was not consistent for productive final consonants (2 in S1; 4 in S2)

Word Shape Analyses
- Finds indicated substantive unreliability for two of the three participants. P1 (33% consistency; 2/6 word shapes produced consistently across the two data collection sessions), P2 (50% consistency; 2/4), P3 (80% consistency; 4/5)

Place Manner Voice Analysis
- Findings indicate a discrepancy between session one and two for all three participants: at least 2 phonemes differed for each session

Method

- Participants
  - (n = 3); Ages 24 months to 31 months (M = 26.67, SD = 3.79)
  - Identified as a late talker: (1) <10th percentile on the MacArthur Bates Communicative Development Inventory: Words and Sentences (CDI) test. (2) one standard deviation below the mean on the Preschool Language Scale-5th edition (PLS-5) Expressive Communication subtest.
  - Receive a passing score on the Modified Checklist for Autism in Toddlers (M-CHAT) and at least two subsections of the Ages and Stages Questionnaire-3 (ASQ-3)

Differences noted across all sessions for each participant; resulted in change of severity rating for two of three participants:

| PI/S1: 47% (severe disorder) and P1: 34% (severe) |
| P2: 53% (moderate/severe) and P2: 65% (mild/moderate) |
| P3: 71% (mild/moderate) and P3: 50% (mod/severe) |

Implications and Limitations

- Findings indicate that each informal phonological analysis outcome was inconsistent for at least one-third of participants across samples
- Small sample size; replication with larger sample size is warranted.

Selected References


Acknowledgements

This project was funded through the Fund for Undergraduate Scholarly Experiences (FUSE) grant awarded to the first two authors. The authors would like to thank the participants for their involvement in the study and student research assistants from the Toddler Communication Lab for their contributions.