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Test-retest reliability of independent phonological measures of 2-year-old speech

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Background

Informal Assessment Measures

- Assessment tool not intended for comparison to larger group
- Often used along with standardized, norm-referenced assessments in a comprehensive evaluation of speech-language skills
- E.g., analysis of communication samples, observational

Independent Phonological Measures

- Measure speech-sounds without comparison to adult standard
- Used to obtain descriptive information to establish treatment baseline
- E.g., *Phonetic inventory* (PI): Record of different sounds used, even sounds not produced in appropriate word positions ("*t*at" for "*c*at")
- *E.g., Word Shape Analysis* (WS): Record of sound combination complexity used to form words ("cat" represents CVC shape)

Test-Retest Reliability

- Degree to which a measurement is stable over time
- Short-term reliability critical for indications of baseline performance and progress tracking over the course of treatment

Significance

- ASHA acknowledged need for evidence-based practices in assessment and treatment (ASHA 2004, 2005) to satisfy eligibility guidelines and provide effective services
- SLPs may assume commonly used informal measures are reliable, but little evidence to support.

Existing Literature

- Morris (2009) found test-retest (within one week) instability for PIs with typically developing 18- to 22-month-olds.
- Preston, Ramsdell, Oller, Edwards, and Tobin (2011) found that weighted measures of sound accuracy has similar reliability and validity as a relational phonological measure (PCC-R) for a variety of normative and clinical child populations.
- Heilmann, DeBrock, and Riley-Tillman (2013) noted test-retest reliability for other informal measures calculated from communication samples obtained from kindergarten-age children.

Aim of current study

- Pilot the extension of Morris' (2009) work for determining test-retest reliability of independent phonological analyses over time for slightly older child population, 24- to 36- month olds.

Research Question

- What is the test-retest reliability (within one week) of the phonetic inventory and word shape analysis measures calculated using intelligible words produced during a 20-minute conversational speech sample for 24- to 36-month old children?

Descriptor	Participants		
	Participant 1	Participant 2	Participant 3
Age	2;9	2;6	2;5
Gender	M	F	F
MLU Session 1	3.32	2.5	1.98
MLU Session 2	3.7	2.42	1.66
PLS-5 Exp.			
Raw	43	41	36
SS	126	119	119
%ile	95	90	90
PLS-5 Aud.			
Raw	42	39	31
SS	120	112	103
%ile	91	79	58
CDI/CDI III			
Raw	589/62	654/	397
%ile	75/65	90/90	25
Total Words Produced -Session 1	402	284	230
Total Words Produced -Session 2	319	573	197

Method

Participants. (n = 3); Ages 29 months to 33 months (*M* = 30.66, *SD* = 2.08); mono-lingual English speaking

- Identified as typically developing using the following criteria: SS > 85 on *Preschool Language Scale -5* (PLS-5); > 25th percentile on *MacArthur Bates Communicative Development Inventory* (CDI)

Procedures. Parent-child dyads participated in two 20-minute play sessions one week apart in a university clinical setting. Toys for each session were randomly assigned and communication samples were obtained during play sessions.

- Sessions were video recorded for later viewing and transcription using the international phonetic alphabet (IPA). Transcribers were the 1st author and two trained student research assistants majoring in speech-language pathology. Following procedures used by Morris (2009), initial inter-rater reliability was just above 62%; however, the transcribers re-watched each instance of disagreement up to three times, discussed, and reached agreement. Transcribers agreed on 100% of re-watched instances.
- The 1st author calculated PIs and WS analyses for each participant each session. Inter-rater reliability was established with the faculty advisor who re-analyzed 20% of the data. PI Inter-Rater Reliability was an average of 87% (Range = 85-90%.); WS Inter-Rater Reliability was 100%.

Results

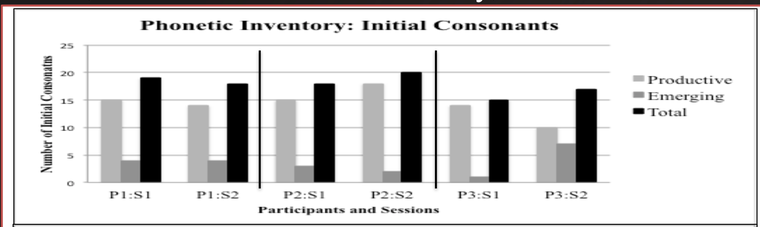
Phonetic Inventory. Initial consonants (productive): P1 was consistent (15 in S1; 14 in S2; P2 and P3 were inconsistent (15;18 and 4;10, respectively)

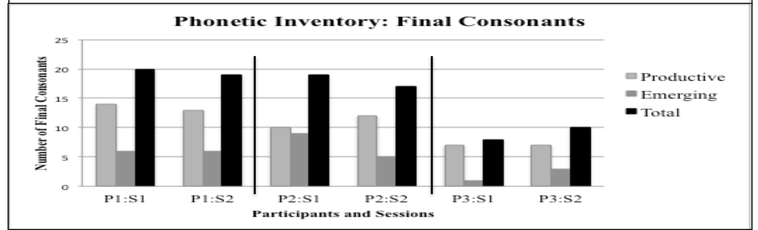
- Final consonants (productive) - all relatively consistent (14;13, 12;10, 7;7)
- Consonant clusters (productive) – P1 and P2 were inconsistent (16;12, 5;13) P3 was consistent (4;4)

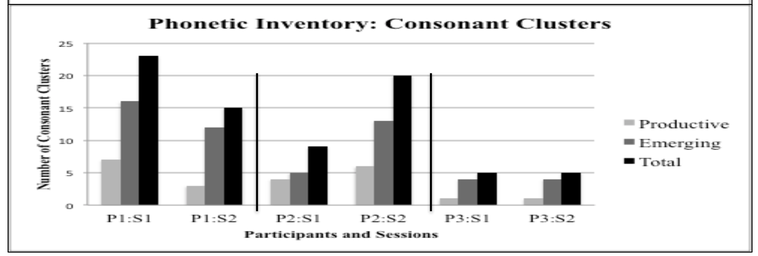
Word Shape Analysis. No substantive differences noted across sessions; all produced at least two different words in each of eight target word shape categories (V, CV, CVCV, VC, CVC, CCVC, CVCC, CVCVC).

Conclusions and Implications

- Some support for extension of Morris (2009) findings to older child population. Two of three participants obtained consistent Word-Initial PIs, differences were noted for one participant.







- Findings related to consonant cluster PIs did indicate instability over time for two of three participants.
- WS findings consistent with Morris (2009).
- Preliminary findings indicate replication with larger sample size warranted.

Limitations & Future Directions

- Larger n; additional age ranges included; less homogeneous population

Selected References

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