

# Suggested Procedures for Employing Clinical Judgment<sup>1</sup>

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## Step 1. Determine Overall Metric of Phonological Development

Collect adequate data via Goldman-Fristoe Test of Articulation-2, the Computerized Articulation and Phonology Evaluation System (CAPES), or a spontaneous speech sample of approximately 200 words.<sup>2</sup> Determine the standard score and percentile rank from the GFTA-2 score and the Percent Consonants Correct from CAPES or the spontaneous speech sample.

## Step 2. Interpretation of Scores.

Data Indicating Ineligibility. If the child's overall metric is higher than the following cut-off levels, there is a reasonable chance that the speech errors are developmental and will normalize over time. The child would be considered ineligible for services for Sound System Disorder.

Goldman-Fristoe-2: PR > 5 and a Standard Score of 86 or above

PCC		
	Boys	Girls
Age 3	>77.4	>78.6
Age 4	>78.3	>84
Age 5	>88.3	>89.5
Age 6	>90	>89.5

Data Indicating Eligibility. If the child's overall metric is lower than the following cut-off levels, there is a reasonable probability that the speech errors are not developmental, will not normalize by the time the child is in early elementary grades, and may be associated with poor literacy development. The child would be considered eligible for services for Sound System Disorder.

GFTA-2: Percentile Rank of 5

PCC		
	Boys	Girls
Age 3	73.5	70.3
Age 4	74.8	76.9
Age 5	73.4	76.1
Age 6	78.8	86.4

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<sup>1</sup> These procedures were originally developed for consideration for DESE, who chose an alternative system for state normative data. The evidence upon which this system is based may be found in the associated document (Research Base for SSD). This information is shared with DESE's permission.

<sup>2</sup> The authors have researched the relationship between developmental errors and overall metrics derived from the GFTA-2, CAPES, and spontaneous speech. Other test instruments are certainly appropriate, but we have not yet compared their results to developmental error data.

Data Indicating Questionable Eligibility. If the child’s score falls between the scores listed above, the IEP team should consider specific phoneme and cluster acquisition data, intelligibility levels, and presence of concomitant poor language skills. The ranges of scores on the overall metric that are associated with questionable eligibility appear below.

Goldman-Fristoe: PR > 5, but a standard score of 85 or below

PCC		
	Boys	Girls
Age 3	73.6-77.4	70.4-78.6
Age 4	74.9-78.3	77-84
Age 5	73.5-88.3	76.1-89.5
Age 6	78.9-90	86.5-89.5

**Additional Factors**

	<i>Monitor Development</i>	<i>Provide Services</i>
<i>Language Abilities</i>	Within Normal Limits	Below Normal Limits
<i>Intelligibility (see Table 1)</i>	At Expected Levels	Below Expected Levels
<i>Nature of Errors (see Tables 2-6)</i>	Developmental	Not Developmental

**Table 1. Intelligibility: Expected Levels**

Age	Intelligibility
3:0-3:6	75%
3:6-4:0	80%
4 and beyond	90%

**Table 2. Mismatches potentially developmental for age 3.**

	Acquired	Potentially Developmental Errors:
<b>Single Sounds</b>		
Nasals	/m/, /n/	n/ŋ
Stops	/b/ /d/ /p/ /t/ (I) /k/ (F) GFTA-2 sample has /k/ /g/ by 3:6	Deletion of /t/, /p/ (F) (Not in GFTA sample [<85%]) /k/ -> [t] /g/ -> [d] (I,F) /g/ -> [k] (F) <i>Fronting Velars, Devoicing Final Consonants</i>
Glides	/w/	Deletion of /j/ /j/ -> [w]
Fricatives	/f/ /h/	/v/ -> [b] or [f] (I) /v/ -> [b] or [f] or deleted (F)  /θ/ -> [f], [s], [t], [d] (I) /θ/ -> [f], [s] (F) /ð/ -> [d]  /s/ -> [t], dentalized (I) /s/ -> [t], dentalized, deleted (F) /z/ -> [d], [ts], [s], [dʒ], dentalized (I) /z/ -> [d], [ts], [s], dentalized, deleted (F)  /ʃ/ -> [s], [t], [d] (I) /ʃ/ -> [s], [t], dentalized, deleted (F)  <i>Stopping Fricatives</i> <i>Fronting Palatals</i> <i>Devoicing Final Consonants</i> <i>Dental Distortion of Sibilants</i>
Affricates		/tʃ/ -> [t], [d], [ʃ], [ts] /dʒ/ -> [d] (I) /dʒ/ -> [dz], [tʃ] (F)  <i>Stopping Affricates</i> <i>Fronting Palatals</i>
Liquids		/l/ -> [w] (I) /l/ -> [w], [d] (intervocalic) /l/ -> vocalized, deleted (F) /r/ -> [w], derhoticized (distorted) (I) /r/ -> vocalized, deleted (F)  <i>Gliding Liquids</i> <i>Derhoticized (Distortion) of /r/</i> <i>Vocalization of Liquids</i> <i>Deletion of Liquids</i>
<b>Clusters</b>		
Stop+/w/	/tw/, /kw/ (Age 3:6)	Some reduced to stop
Consonant + Liquid		Liquid deleted or replaced by [w] or derhoticized (/s/ usually reduced to [s]); however, may be reduced to [l]) (Note: Remaining consonant may be affected by substitution affecting single sounds at this age)
/s/ + Consonant		/s/ deleted (/s/ usually reduced to [s]); however, may be reduced to [l]) (Note: Remaining consonant may be affected by substitution affecting single sounds at this age)
/s/+Consonant + Consonant		kw typically reduced to [k], which may also be affected by the same substitution that affects singletons pr/ and /spl/ typically reduced to [p]

**Table 3. Mismatches potentially developmental for age 4**

	Acquired	Potentially Developmental Errors
<i>Single Sounds</i>		
	Acquired	Potentially Developmental Errors
Nasals	/m/, /n/ /ŋ/	
Stops	/b/ /d/ /p/ /t/ /k/ /g/	
Glides	/w/ /j/	
Fricatives	/θ/ /h/	/v/ → [b] (I) /v/ → [b] or [f] or deleted (F)  /θ/ → [f], [s], [t], [d] (I) /θ/ → [f], [s] (F) /ð/ → [d] (I, F)  /s/ → dentalized /z/ → [d], [ts], [s], dentalized  /ʃ/ → [s]  <i>Fronting Palatals</i> <i>Dental Distortion of /s/ and /z/</i>
Affricates		/tʃ/ → [t], [d], [ʃ], [ts] (I, F) /dʒ/ → [d] (I) /dʒ/ → [dz], [tʃ] (F)  <i>Stopping Affricates</i> <i>Fronting Palatals</i>
Liquids	GFTA-w has /l/ (I,M) by 4:6	/l/ → [w] (I) /l/ → [w], [d] (intervocalic) /l/ → vocalized (F) /r/ → [w], derhoticized (distorted) (I) /r/ → vocalized (F)  <i>Gliding Liquids</i> <i>Derhoticized (Distortion) of /r/</i> <i>Vocalization of Liquids</i>
<i>Clusters</i>		
Stop + /w/	/tw/, /kw/	
Consonant + Liquid	C + /l/ (girls 4:6)	Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons
/s/ + Consonant		Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons
/s/+Consonant + Consonant		Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons

Table 4. Mismatches potentially developmental for age 5

	Acquired	Potentially Developmental Errors
<b>Single Sounds</b>		
Nasals	/m/, /n/ /ŋ/	
Stops	/b/ /d/ /p/ /t/ /k/ /g/	
Glides	/w/ /j/	
Fricatives	/θ/ /v/ (F) /ð/ (I) /f/ /h/  (GFTA-2 has /s/ and /z/ (I,M) by 5:0)	/v/ -> [b] (I)  /θ/ -> [f], [s], [t], [d] (I) /θ/ -> [f], [s] (F) /ð/ -> [d] (F)  /s/ -> dentalized /z/ -> [d], [ts], [s], dentalized  <i>Dental Distortion of /s/ and /z/</i>
Affricates	(GFTA has affricates by 4:6)	/tʃ/ -> [ts] (I, F) /dʒ/ -> [dz](I, F)  <i>Fronting Palatals</i>
Liquids	/l/ (I) (GFTA has final /l/ by 5:0)	/l/ -> [w], [d] (intervocalic) /l/ -> vocalized (F) /r/ -> [w], derhoticized (distorted) (I) /r/ -> vocalized (F)  <i>Gliding Liquids</i> <i>Derhoticized (Distortion) of /r/</i> <i>Vocalization of Liquids</i>
<b>Clusters</b>		
Stop + /w/	/tw/, /kw/	
Consonant + Liquid	/bl/ (boys 5:0) /fl/, /pl/, /kl/ (boys 5:6)	Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons
/s/ + Consonant	/sp/ (girls 5:0) /sw/, /sm/ /sk/ (girls 5:6) /st/ (boys 5:6)	Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons
/s/+Consonant + Consonant		Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons

Table 5. Mismatches potentially developmental for age 6.

	Acquired	Potentially Developmental Errors
<i>Single Sounds</i>		
	Acquired	Potentially Developmental Errors
Nasals	/m/, /n/ /ŋ/	
Stops	/b/ /d/ /p/ /t/ /k/ /g/	
Glides	/w/ /j/	
Fricatives	/θ/ /s/ /θ/ /ð/ (I) /s/ /z/ /ʃ/ /h/	/ð/ -> [d] (F) GFTA-2 doesn't have /θ/ or /ð/ until 7:0
Affricates	/tʃ/ /dʒ/	
Liquids	/l/ GFTA has /r/ in all positions by 6:0	/r/ -> [w], derhoticized (distorted) (I) /r/ -> vocalized (F)  Gliding, Derhoticized /r/ Vocalization of final /r/ Derhotization (Distortion) Vocalization of Liquids
<i>Clusters</i>		
Stop + /w/	/tw/, /kw/	
Consonant + Liquid	/bl/ (boys 5:0) /fl/, /pl/, /kl/  C + r (girls 6:0) /dr/, /kr/ (boys 6:0)	Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons
/s/ + Consonant	/sp/ (girls 5:0) /sw/, /sm/ /sk/ (girls 5:6) /st/ (all) /sn/, /sl/ (girls 6:0)	Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons
/s/+Consonant + Consonant	/skw/ (girls 6:0)	Cluster intact, but individual consonants may be affected by substitutions that affect them as singletons

### Table 6. Age 7 and Beyond

No errors on single consonants

Boys may continue to make errors on consonants in /s/ + Consonant clusters and Consonant + /r/ clusters through Age 7

Both boys and girls may continue to make errors in consonants in /s/ + Consonant + Consonant through Age 8