



# Instructions for Completing the Updated GFTA–3 Record Form

In response to clinicians' feedback about the GFTA–3 Record Form, Pearson has redesigned the layout to increase usability and to clarify interpretation of test results. The format changes do not alter the target words that are presented during testing nor what is considered a correct versus incorrect response. Q-global and Q-interactive response capture and reports are unchanged.

## Getting Acquainted With the Updated GFTA–3 Record Form

The updated GFTA–3 Record Form layout includes a three-column design for recording errors in initial, medial, and final word positions. The columns are color coded (purple shading for initial position, green shading for medial position, blue shading for final position) so that error patterns, based on word position, are easier to see at a glance. The following instructions are provided for how to mark responses and calculate scores.

*NOTE.* If you ordered GFTA–3 before July 18, 2016, your Manual presents instructions for completing the original Record Form. Use the following instructions to complete the updated GFTA–3 Record Form.

## Recording Responses

### Recording Correct Responses

If the individual's response matches the target word (no errors), proceed to the next test item. Do not mark the phonemes in the IPA Transcription column and leave the Response column blank. Do not write in the columns labeled Initial, Medial, or Final.

Accepted dialectal or regional variations of Standard American English are considered correct responses. Refer to the GFTA–3 Manual, Appendix E for examples of accepted dialectal variations.

### Recording Incorrect Responses

Substitutions, omissions, or distortions of consonants are counted as errors and are included in the Total Raw Score. Follow the directions below for recording speech sound errors in the individual's response.

#### Recording substitutions

Mark through each misarticulated phoneme in the transcribed word in the IPA Transcription column. If the individual's response contains multiple speech sound errors, consider transcribing the individual's response in the Response column. Then refer to the adjacent Initial, Medial, and Final columns. Mark through each misarticulated phoneme and write the substituted phoneme(s) in the space(s) provided. See Figure 1.

Item	Target Word	IPA Transcription	Response	Initial	Medial	Final
39	vegetable	<del>v</del> ɛdʒtəbəl	bɛdtəbəl	<del>b</del>	<del>d</del>	l
40	brushing	brʌʃɪŋ		br	ʃ	ŋ
41	blue	blu		bl		
42	yellow	<del>j</del> ɛlo		<del>l</del>	l	
43	brother	brʌðə		br	ð	ə
44	frog	frɔʒ		fr		<del>d</del>
45	green	grɪn		gr		n

**Figure 1.** Example of Recording a Substitution

## Recording omissions

Mark through each omitted phoneme in the transcribed word in the IPA Transcription column. If the individual's response contains multiple sound errors, consider transcribing the individual's response in the Response column. Then refer to the adjacent Initial, Medial, and Final columns. Mark through each omitted phoneme and write a dash (–) for each omission in the space provided. See Figure 2.

30	finger	fɪŋgə	f	ŋ g	ə
31	ring	rɪŋ	r		ŋ
32	thumb	<del>θ</del> ʌm	<del>θ</del> –		m
33	elephant	eləfənt <i>fənt</i>		/ <del>ɪ</del> –	nt
34	vacuum	vækjʊm	v	k j	m
35	shovel	ʃʌvəl	ʃ	v	l
36	teacher	ti:tʃə	t	tʃ	ə
37	zebra	zɪbrə	z	br	
38	giraffe	dʒərəʃ	dʒ	r	/ –

**Figure 2.** Example of Recording an Omission

## Recording distortions

A distortion refers to a speech production that is recognized as the target phoneme, but is acoustically inaccurate. Distortions are counted as errors. Recording distortions may require narrow transcription using diacritic marks. Transcribe the response in the Response column. Then refer to the adjacent Initial, Medial, and Final columns. Mark through each distorted phoneme and write the phoneme and diacritic mark in the space provided. You may also write a note (e.g., “lateral release”). See Figure 3.

1	house	haʊ <sup>ʰ</sup> (lateral release)	h		<del>ʰ</del> s <sup>l</sup>
2	door	dɔːr	d		r
3	pig	pɪg	p		g

**Figure 3.** Example of Recording a Diacritic Mark for a Distortion

There are instances when a response that is transcribed with a diacritic mark is not considered an error response. A response where articulators are slightly misplaced (e.g., dentalization), but the sound produced is acoustically accurate is not counted as a speech sound error. In addition, a response that is considered a dialectal variation is not considered an error response. For both of these instances, transcribe the individual's response in the Response column; however, do not mark the adjacent Initial, Medial, and Final columns. See Figure 4.

13	fish	fɪʃ	f		ʃ
14	watch	watʃ	w		tʃ
15	spider	spɪdər	sp	d	ər
16	web	wɛb <i>wɛb<sup>ˈ</sup></i>	w		b

**Figure 4.** Example of Recording a Diacritic Mark for a Response Not Considered an Error

### Recording No Response (NR)

Indicate No Response when an individual does not provide a response for the target word, even after multiple prompts. Mark through all phonemes in the target word and write “NR” in the Response column. Then refer to the adjacent Initial, Medial, and Final columns. Mark through the phonemes and write a dash (–) for each in the spaces provided. See Figure 5.

39	vegetable	<del>vɛdʒɪbəl</del>	NR	<del>—</del>	<del>—</del>	<del>—</del>
40	brushing	brʌʃɪŋ		br	ʃ	ɪŋ
41	blue	blu		bl		
42	yellow	jɛlo		j	ɪ	
43	brother	<del>brʌðə</del>	NR	<del>—</del>	<del>—</del>	<del>—</del>

**Figure 5.** Example of Recording No Response

### Recording an Error in Final /l/ and /r/

Target words that have /l/ or /r/ in final word position are transcribed with vowel + /l/, vowel + /r/, or /ə/. When an individual vocalizes the final /l/ or /r/ sound (i.e., produces only a vowel sound instead of the vowel + /l/ or vowel + /r/), mark the vowel preceding the /l/ or /r/ as omitted and the /l/ or /r/ as substituted by the vowel. For example, on Item 2 door, if the individual produces [dɔ], record the vowel /ɔ/ as omitted and the consonant /r/ as substituted by /o/. Likewise on Item 6 apple, if the individual produces [æpɔ], record the vowel /ə/ as omitted and the consonant /l/ as substituted by /o/. See Figure 6.

Item	Target Word	IPA Transcription	Response	Initial	Medial	Final
1	house	haʊs		h		s
2	door	<del>dɔr</del>	<del>o/r</del> do	d		<del>o</del>
3	pig	pɪg		p		g
4	cup	kʌp		k		p
5	boy	bɔɪ		b		
6	apple	<del>æpl</del>	<del>ə/l</del> æpɔ		p	<del>o</del>
7	go	gə		g		
8	duck	dʌk		d		k
9	quack	kwæk		kw		k

**Figure 6.** Example of Recording an Error in Final /l/ and /r/

Recording errors on target words transcribed with /r/ in final word position requires careful attention. For target words where /r/ is preceded by a vowel, a vowel substitution may occur in two ways: the individual omits the vowel and substitutes the /r/ with a vowel (e.g., [tʃə], [dɔ]), or the individual produces the vowel but substitutes the /r/ with a vowel (e.g., [tʃɛə], [diə]). Refer to Figure 7 for examples for recording both types of vowel substitutions with target words ending in /r/.

24	lion	laɪən	l		n
25	chair	tʃɹ / tʃɛə	tʃ		ə
26	soap	sop	s		p

  

24	lion	laɪən	l		n
25	chair	tʃɹ / -/ɛ / ə/r tʃə	tʃ		ə
26	soap	sop	s		p

Picture 2	Jim guesses it's a deer.	Intelligibility Rating: ① 2 3 4	10	Jim	dʒɪm	dʒ		m
	That is a silly guess.	Intelligibility Rating: ① 2 3 4	11	deer	dj / dio	d		ə
	A deer isn't little.	Intelligibility Rating: ① 2 3 4	12	silly	sɪli	s	l	
	A deer is big.	Intelligibility Rating: ① 2 3 4	13	guess	ges	g		s
			14	deer	dj / dio	d		ə
			15	little	lɪtəl	l	t	l
			16	deer	dj / dio	d		ə
			17	big	bɪg	b		g

Picture 2	Jim guesses it's a deer.	Intelligibility Rating: ① 2 3 4	10	Jim	dʒɪm	dʒ		m
	That is a silly guess.	Intelligibility Rating: ① 2 3 4	11	deer	dj / -/i / ə/r do	d		ə
	A deer isn't little.	Intelligibility Rating: ① 2 3 4	12	silly	sɪli	s	l	
	A deer is big.	Intelligibility Rating: ① 2 3 4	13	guess	ges	g		s
			14	deer	dj / -/i / ə/r do	d		ə
			15	little	lɪtəl	l	t	l
			16	deer	dj / -/i / ə/r do	d		ə
			17	big	bɪg	b		g

Figure 7. Examples of Recording Final /r/

## Recording Variations of the Target Response

### Recording Additional Sounds

A response that includes additional sounds (e.g., [swɪŋz] for /swɪŋ/) should be noted. However, the additional sounds are not counted as error productions of the target phonemes, nor included in the Total Raw Score. Transcribe the individual's response in the Response column. Do not write in the adjacent Initial, Medial, and Final columns. See Figure 8.

21	slide	slaɪd	sl		d
22	swing	swɪŋ swɪŋz	sw		ŋ
23	guitar	gɛtər	g	t	r

Figure 8. Example of Recording an Addition

NOTE: If you see consistent productions of additional sounds that are not attributable to dialectal variations and are relevant to an individual's error patterns, note the additions in your report of the individual's performance.

## Recording Vowel Substitutions

An individual may produce a vowel sound that does not match the target word. The vowel substitutions are not included in the Total Raw Score. Transcribe the vowel substitution in the Response column. Do not write in the adjacent Initial, Medial, and Final columns. See Figure 9.

Story 1: What Animal Do You Think It Is?								
Story Text	Item	Target Word	IPA Transcription	Response	Initial	Medial	Final	
The <u>children</u> look under the bush's <u>thick</u> branches. Intelligibility Rating: (1) 2 3 4	33	children	tʃɪldrən	tʃɪldrən	tʃ	ɪ dr	n	
	34	thick	θɪk	θɪk	θ		k	
	35	branches	bræntʃəz		br	n tʃ	z	
They <u>shout</u> , "It's a puppy!" Intelligibility Rating: (1) 2 3 4	36	shout	ʃaʊt		ʃ		t	
The puppy sees the <u>kids</u> . Intelligibility Rating: 1 2 3 4	37	kids	kɪdz	kidz	k		dz	
It <u>drops</u> a <u>green</u> ball from its <u>mouth</u> . Intelligibility Rating: (1) 2 3 4	38	drops	draps		dr		ps	
	39	green	grɪn		gr		n	
	40	ball	bɔl		b		l	
	41	mouth	maʊθ		m		θ	
It barks, " <u>Play</u> catch with me!" Intelligibility Rating: (1) 2 3 4	42	play	ple		pl			
	43	catch	kætʃ		k		tʃ	

Figure 9. Example of Recording a Vowel Substitution

**NOTE.** If you see consistent productions of vowel substitutions that are not attributable to dialectal variations and are relevant to an individual's error patterns, note the vowel substitutions in your report of the individual's performance.

## Recording Self-Corrections

Sometimes an individual will revise his or her response to a target word, or self-correct. If the change in response occurs before the next item, write SC (self-correction) next to the recorded error and if necessary, transcribe the revised response in the Response column for clarification of the corrected speech sound. See Figure 10.

1	house	haʊs	h		t	(SC)
2	door	dɔr	d		r	
3	pig	pɪg	p		g	
4	cup	kʌp	k		-	(SC)
5	boy	bɔɪ	b			
6	apple	æpl̩		b	(SC)	o
7	go	gəʊ	g			

Figure 10. Example of Recording Self-Corrections

# Scoring Responses

Phonemes in consonant clusters and phonemes in medial position have specific guidelines in how they should be scored.

## Scoring Consonant Clusters

Each consonant cluster is scored as one phoneme. Whether one sound in the consonant cluster or all sounds of the consonant cluster are substituted or omitted, count one error. For example, Item 21 slide has the initial consonant cluster /sl/. Whether the phoneme is produced as [sw], [tw], [s-], [-l] or not produced at all, one error is counted toward the Total Raw Score. See Figures 11, 12, 13, and 14 for examples on scoring speech sound production errors in a consonant cluster in either the Sounds-in-Words or Sounds-in-Sentences tests.

20	shoe	ʃu	ʃ		
21	slide	<del>sl</del> aid	<del>s</del> tw	1 error	
22	swing	swɪŋ	sw		

Figure 11. Example of Scoring When Both Phonemes Are Substituted in a Consonant Cluster

Story 1: What Animal Do You Think It Is?							Initial	Medial	Final
Story Text	Item	Target Word	IPA Transcription	Response					
Three friends are walking home from school. Intelligibility Rating: ① 2 3 4	1	walking	wɔkɪŋ		w	k	ŋ		
	2	school	<del>sk</del> ul		<del>sk</del> -	1 error			
They see something little, furry, and black. Intelligibility Rating: ① 2 3 4	3	something	sʌmθɪŋ		s	m θ	ŋ		
	4	little	lɪtəl		l	t	l		
	5	furry	fɜri		f	ɜ			
They see it zoom by and hide under a bush. Intelligibility Rating: ① 2 3 4	6	black	<del>bl</del> æk		<del>bl</del> -	1 error	k		
	7	zoom	zum		z		m		
	8	hide	haɪd		h		d		
	9	bush	bʊʃ		b		ʃ		

Figure 12. Example of Scoring When Both Phonemes Are Omitted From the Consonant Cluster

20	shoe	ʃu	ʃ		
21	slide	<del>sl</del> aid	<del>sl</del> sw	1 error	
22	swing	swɪŋ	sw		

Figure 13. Example of Scoring When One Phoneme is Substituted in a Consonant Cluster

Story 1: What Animal Do You Think It Is?							Initial	Medial	Final
Story Text	Item	Target Word	IPA Transcription	Response					
Three friends are walking home from school. Intelligibility Rating: ① 2 3 4	1	walking	wɔkɪŋ		w	k	ŋ		
	2	school	<del>sk</del> ul		<del>sk</del> -k	1 error			
They see something little, furry, and black. Intelligibility Rating: ① 2 3 4	3	something	sʌmθɪŋ		s	m θ	ŋ		
	4	little	lɪtəl		l	t	l		
	5	furry	fɜri		f	ɜ			
They see it zoom by and hide under a bush. Intelligibility Rating: ① 2 3 4	6	black	blæk		<del>bl</del> -	1 error	k		
	7	zoom	zum		z		m		
	8	hide	haɪd		h		d		
	9	bush	bʊʃ		b		ʃ		

Figure 14. Example of Scoring When One Phoneme is Omitted in a Consonant Cluster

## Scoring Adjacent Medial Consonant Sounds

Phonemes in medial word position may occur adjacent to each other. Some are considered consonant clusters (e.g., /br/ in zebra), whereas others are not considered a consonant cluster due to syllable boundaries (e.g., /ŋ/ and /k/ in monkey). In the Initial, Medial, and Final columns, consonant clusters are shown as a pair of sounds together while adjacent sounds that are separated by a syllable boundary have a space between them. When adjacent phonemes are separated by a syllable boundary, score them separately. See Figure 15.

10	table	tebəl	t	b	l
11	monkey	mʌŋki	m	ŋ k	l error
12	hammer	hæmə	h	m	ə

Story 1: What Animal Do You Think It Is?								
Story Text	Item	Target Word	IPA Transcription	Response	Initial	Medial	Final	
The <u>children</u> look under the bush's <u>thick branches</u> . Intelligibility Rating: ① 2 3 4	33	children	tʃɪdrən		tʃ	dr	n	
	34	thick	θɪk		θ		k	
	35	branches	bræŋtʃɪz		br	n tʃ	z	
They <u>shout</u> , "It's a puppy!" Intelligibility Rating: ① 2 3 4	36	shout	ʃaʊt		ʃ		t	

Story 1: What Animal Do You Think It Is?								
Story Text	Item	Target Word	IPA Transcription	Response	Initial	Medial	Final	
The <u>children</u> look under the bush's <u>thick branches</u> . Intelligibility Rating: ① 2 3 4	33	children	tʃɪdrən		tʃ	dr-w	n	2 errors
	34	thick	θɪk		θ		k	
	35	branches	bræŋtʃɪz		br	n tʃ	z	1 error
They <u>shout</u> , "It's a puppy!" Intelligibility Rating: ① 2 3 4	36	shout	ʃaʊt		ʃ		t	

Figure 15. Example of Scoring Adjacent Medial Consonant Sounds

## Calculating Item Subtotals for Sounds-in-Words

After you complete administration for Sounds-in-Words, refer to the Initial, Medial, and Final columns for Items 1–29. Sum the recorded phoneme errors (i.e., consonants, consonant clusters) in the Initial column (purple) and record this value in the purple Subtotals box. Follow the same procedure for summing phoneme errors for the Medial and Final columns, and record the values in the Medial Subtotals box (green) and Final Subtotals box (blue).

Refer to the Initial, Medial, and Final columns for Items 30–60. Follow the same procedure to sum phoneme errors and to record the values for Initial Subtotal (purple), Medial Subtotal (green), and Final Subtotal (blue). See Figure 16.

## Calculating Total Raw Score for Sounds-in-Words

To calculate the Total Raw Score, transfer the values for Items 1–29 Subtotals that you have calculated to the identified boxes labeled Transfer Items 1–29 Subtotals here. Add the values for all the subtotals (6 subtotals) and write the sum in the Total Raw Score box. See Figure 16.

26	soap	<del>s</del> op	<del>t</del>		p			
27	glasses	glæsɪz	gl	s	z			
28	tiger	tɪdʒə	t	<del>t</del>	ʒ			
29	puzzle	pʌzəl -l ə o/l	p	z	o			
Items 1–29 Subtotals			4	3	6			
55	red	rɛd	r		d			
56	juice	dʒʊs	dʒ		s			
57	zoo	<del>z</del> u			<del>d</del>			
58	star	stɑː	st		r			
59	five	fɑɪ	f		<del>b</del>			
60	seven	sɛvən	s	<del>b</del>	n			
Items 30–60 Subtotals			4	2	4			
Transfer Items 1–29 Subtotals here			4	3	6			
Total Raw Score			23					

**Figure 16.** Example of Calculating Subtotals and Total Raw Score for Sounds-in-Words

## Calculating Item Subtotals for Sounds-in-Sentences

Story 1: What Animal Do You Think It Is? is presented on pages 4 and 5 of the Record Form. After you complete administration for Story 1, refer to page 4 that presents Items 1–32. Sum the recorded phoneme errors (i.e., consonants, consonant clusters) in the Initial column (purple) and record this value in the purple Subtotals box. Follow the same procedure for summing phoneme errors for the Medial and Final columns, and record the values in the Medial Subtotals box (green) and Final Subtotals box (blue).

Refer to page 5 that presents Items 33–43. Follow the same procedure to sum phoneme errors and to record the values for Initial Subtotal (purple), Medial Subtotal (green), and Final Subtotal (blue). See Figure 17.

For Story 2: A Terrible Day, all items are presented on page 6. Follow the directions presented above to sum and record the values in the Initial, Medial, and Final Subtotals boxes.

## Calculating Total Raw Score for Sounds-in-Sentences

To calculate the Total Raw Score for Story 1, transfer the values for Items 1–32 Subtotals that you have calculated on page 4 to the boxes labeled Transfer Items 1–32 Subtotals here on page 5. Add the values for the subtotals (6 subtotals) and write the sum in the Total Raw Score box. See Figure 17.

For Story 2, add the values for the subtotals (3 subtotals) and write the sum in the Total Raw Score box.

Picture 4	Vinny guesses it is a <u>rabbit</u> .	26	Vinny	vɪni	v	n	
	Intelligibility Rating: ① 2 3 4	27	rabbit	<del>ræbɪt</del>	<del>w</del>	b	t
	That is a <u>silly</u> guess.	28	silly	sɪli	s	l	
	Intelligibility Rating: ① 2 3 4	29	guess	ges	g		s
Picture 4	A <u>rabbit</u> will not <u>run</u> .	30	rabbit	<del>ræbɪt</del>	<del>w</del>	b	t
	Intelligibility Rating: 1 ② 3 4	31	run	<del>rʌn</del>	<del>w</del>		n
	A <u>rabbit</u> will hop.	32	rabbit	<del>ræbɪt</del>	<del>w</del>	b	t
	Intelligibility Rating: ① 2 3 4						
Items 1–32 Subtotals					6	1	1
Picture 5	The <u>children</u> look under the bush's <u>thick</u> branches.	33	children	<del>çɪldrən</del>	<del>ç</del>	ɪ dr	n
	Intelligibility Rating: 1 ② 3 4	34	thick	<del>θɪk</del>	<del>θ</del>		k
		35	branches	brænz	br	n	z
	They <u>shout</u> , "It's a puppy!"	36	shout	ʃaʊt	ʃ		t
	Intelligibility Rating: ① 2 3 4						
	The puppy sees the <u>kids</u> .	37	kids	<del>kɪd</del>	k		<del>d</del> ds
	Intelligibility Rating: 1 ② 3 4						
	It drops a <u>green</u> ball from its <u>mouth</u> .	38	drops	draps	dr		ps
	Intelligibility Rating: 1 ② 3 4	39	green	<del>grɪn</del>	<del>g</del> gw		n
		40	ball	bɔl	b		l
	41	mouth	<del>maʊθ</del>	m		<del>θ</del> t	
It barks, "Play <u>catch</u> with me!"	42	play	ple	pl			
Intelligibility Rating: 1 ② 3 4	43	catch	<del>kætʃ</del>	k		<del>ç</del> ʃ	
Items 33–43 Subtotals					3	1	3
Transfer Items 1–32 Subtotals here					6	1	1
Total Raw Score					15		

  

Intelligibility Rating Subtotals			
1 Good	2 Fair	3 Poor	4 NR
8	12	0	0

Note. Misarticulation or omission of one or more phonemes in a cluster counts as one error. Distortions are counted as errors.

**Figure 17.** Example of Calculating Subtotals and Total Raw Score for Sounds-in-Sentences

## Interpreting Results for Speech Sound Emergence and Mastery

Speech sound acquisition is best described as a developmental progression in which an individual begins to correctly produce a sound in some context (e.g., single syllable words, consonant singletons) or in specific words. With exposure and practice over time, an individual produces a sound correctly in almost all contexts and words.

Tables showing the age of emergence and mastery of phonemes by age and sex are presented on page 8. Table D.1 indicates the age at which 50%, 75%, and 90% of children in the GFTA–3 normative sample produced phonemes correctly one or more times during test administration. Table D.2 indicates the ages at which 90% of the children in the GFTA–3 normative sample articulated the phonemes in initial, medial, and final word positions with at least 85% accuracy.

### Recording Errors on Table D.1 (Emergence of Phonemes by Age)

Table D.1 is provided separately for females and males. Use the purple table for females and the blue table for males.

To complete Table D.1, first complete the Sounds-in-Words Phonetic Error Analysis. Refer to the individual’s speech sound errors marked on the Sounds-in-Words Phonetic Error Analysis. For phonemes marked as incorrect in all occurrences (e.g., all items with /s/ are marked as errors), circle those phonemes on Table D.1. Then, using the individual’s age, locate the appropriate age range and draw an “age line” under the age range. If the individual is age 9 or older, draw a line under the oldest age range. See Figure 18.

### Interpreting Information About the Emergence of Phonemes

The phonemes above the “age line” were produced correctly at least one or more times by the GFTA–3 normative sample of the same age and sex. That is, in comparison to same age, same sex peers, an individual’s speech sound profile should include one or more correct productions of each phoneme above the “age line.” The phonemes circled above the “age line” are ones that should have been produced correctly in at least one context, but have not for the individual tested. The phonemes below the “age line” are those that had not emerged by the GFTA–3 normative sample of the same age and sex. The individual you tested would not be expected to produce these phonemes.

### Recording Errors on Table D.2 (Mastery of Phonemes by Age)

Table D.2 is provided separately for females and males. Use the purple table for females and the blue table for males.

To complete Table D.2, first complete the Sounds-in-Words Phonetic Error Analysis. Refer to the individual’s speech sound errors marked on the Sounds-in-Words Phonetic Error Analysis. If one instance of a phoneme is produced incorrectly in a given word position, circle that phoneme on Table D.2. Then, using the individual’s age, locate the appropriate age range and draw an “age line” under the age range. If the individual is age 9 or older, draw a line under the oldest age range. See Figure 18.

### Interpreting Information About the Mastery of Phonemes

The phonemes above the “age line” are those that were mastered (produced correctly at least 85% of the time) by the GFTA–3 normative sample of the same age and sex. Error phonemes circled above the “age line” are those that should have been mastered by the individual tested. The phonemes below the “age line” are those that had not been mastered by the GFTA–3 normative sample of the same age and sex. The individual you tested would not be expected to produce these phonemes with at least 85% mastery.

**Table D.1** Ages at Which Phonemes Were Present in 50%, 75%, and 90% of Normative Sample (Female)

		Produced by 50% of children	Produced by 75% of children	Produced by 90% of children	
FEMALE	Emergence* of Phonemes by Age	2:0-2:5	/ə/ /v/ /j/ /nt/	/g/ /ŋ/ /z/ /ʃ/ /tʃ/ /dʒ/ /r/ /w/ /h/	/p/ /b/ /t/ /d/ /k/ /m/ /n/ /f/ /s/ /l/
		2:6-2:11	/b/ /br/ /kw/ /sw/	/ə/ /v/	/g/ /ŋ/ /z/ /w/ /j/ /h/
		3:0-3:5	/dr/ /gl/ /gr/ /kr/ /pl/ /pr/ /sl/ /st/ /tr/	/br/ /nt/ /sp/	/v/ /tʃ/
		3:6-3:11	/ð/ /fr/	/st/	/ə/ /dʒ/ /r/
		4:0-4:5	/θ/	/b/ /gl/ /kw/ /pl/ /sl/ /sw/	/ʃ/ /nt/ /sp/ /st/
		4:6-4:11		/ð/ /dr/ /gr/ /kr/ /pr/	/br/ /fr/ /gl/ /pl/ /tr/
		5:0-5:11		/θ/	/ð/ /b/ /dr/ /kw/ /pr/ /sl/ /sw/
		6:0-6:11			/θ/ /gr/ /kr/
		7:0-7:11			
		8:0-8:11			

**Table D.2** Ages at Which 90% of the GFTA-3 Normative Sample Mastered Consonants and Consonant Clusters by Initial, Medial, and Final Position (Female)

		Initial position	Medial position	Final position	
FEMALE	Mastery** of Phonemes by Age	2:0-2:5		/p/	
		2:6-2:11	/m/		
		3:0-3:5	/b/ /d/ /k/ /n/ /w/ /h/	/d/ /g/ /m/ /n/ /f/	/p/
		3:6-3:11	/f/		/n/
		4:0-4:5	/t/ /sp/ /st/	/b/ /k/ /ŋ/ /z/ /j/	/d/ /k/ /m/ /f/ /v/ /nt/
		4:6-4:11	/tʃ/ /dʒ/ /l/ /j/ /fr/ /gl/ /pl/ /tr/	/tʃ/ /l/	/b/ /t/ /g/ /ʃ/ /tʃ/
		5:0-5:11	/p/ /s/ /z/ /ʃ/ /b/ /dr/ /kw/ /pr/ /sl/ /sw/	/ʃ/	/s/ /l/
		6:0-6:11	/v/ /ð/ /r/ /br/ /gr/ /kr/	/v/ /s/ /dʒ/ /r/ /br/	/ə/ /ŋ/ /z/ /tr/
		7:0-7:11	/g/ /θ/	/t/ /ð/	/θ/
		8:0-8:11			

**Table D.1** Ages at Which Phonemes Were Present in 50%, 75%, and 90% of Normative Sample (Male)

		Produced by 50% of children	Produced by 75% of children	Produced by 90% of children	
MALE	Emergence* of Phonemes by Age	2:0-2:5	/ə/ /v/ /dʒ/ /j/ /kw/ /nt/	/n/ /ŋ/ /f/ /s/ /z/ /ʃ/ /tʃ/ /l/ /r/ /w/ /h/	/p/ /b/ /t/ /d/ /k/ /g/ /m/
		2:6-2:11	/br/ /tr/	/v/	/ə/ /n/ /f/ /r/ /w/ /h/
		3:0-3:5	/b/ /sp/ /st/ /sw/	/j/ /nt/	/ŋ/ /v/ /s/ /z/ /ʃ/ /tʃ/ /dʒ/ /l/
		3:6-3:11	/ð/ /dr/ /fr/ /gl/ /gr/ /kr/ /pl/ /pr/ /sl/	/kw/ /st/ /sw/	/j/ /nt/
		4:0-4:5	/θ/	/br/ /kr/ /pl/ /sp/	/kw/
		4:6-4:11		/pr/ /sl/ /tr/	
		5:0-5:11		/ð/ /dr/ /fr/ /gl/ /gr/	/b/ /p/ /sp/ /st/ /sw/
		6:0-6:11		/θ/	/ð/ /br/ /dr/ /gl/ /gr/ /kr/ /tr/
		7:0-7:11			/θ/ /fr/ /pr/ /sl/
		8:0-8:11			

**Table D.2** Ages at Which 90% of the GFTA-3 Normative Sample Mastered Consonants and Consonant Clusters by Initial, Medial, and Final Position (Male)

		Initial position	Medial position	Final position	
MALE	Mastery** of Phonemes by Age	2:0-2:5			
		2:6-2:11	/m/	/p/	
		3:0-3:5	/b/ /d/ /n/ /f/ /h/	/d/ /g/ /m/ /ŋ/ /f/	/p/ /n/ /f/
		3:6-3:11	/k/ /w/	/n/ /z/ /j/	/b/ /d/ /k/ /m/ /nt/
		4:0-4:5	/t/ /kw/	/b/ /k/	/g/ /v/
		4:6-4:11	/s/ /ʃ/ /tʃ/ /dʒ/	/ʃ/ /tʃ/	/v/ /ʃ/ /tʃ/
		5:0-5:11	/p/ /z/ /l/ /j/ /b/ /pl/ /sp/ /st/ /sw/	/s/ /l/	/ŋ/ /z/
		6:0-6:11	/g/ /v/ /dr/ /gl/ /gr/ /kr/ /tr/	/r/	
		7:0-7:11	/ð/ /r/ /br/ /fr/ /pr/ /sl/	/v/	/ə/ /l/ /r/
		8:0-8:11		/t/ /ð/ /dʒ/ /br/	/θ/ /s/
> 8:11	/θ/				

**Figure 18.** Examples of Recording Errors for Emergence and Mastery Interpretation