

Considerations in selecting vocal-verbal targets to improve communication skills

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National Autism Conference 2016
Pennsylvania State University
August 1, 2016

Video

Speech responses produce auditory stimuli

Fast
Altered by other responses

Fleeting
Variable

Considerations in selecting vocal-verbal targets to improve communication skills

- Critical background info about how speech is learned
- Who should select targets
- 5 selection tools

Considerations in selecting **vocal-verbal targets** to improve communication skills

- Vocal - responses are generated by vocal cords
- Verbal - responses are meaningful, functional

Vocal	Verbal
Activities using musculature related to speaking	
coughing, humming, crying, burping, screaming	
whispering	
making sounds like: <i>p t k ch f s th</i>	
making sounds like “raspberries”	
yodeling	
speaking or singing words	
Activities using musculature unrelated to speaking	
writing, sign, fingerspelling, Morse code, Braille	

Can't talk

(practicing sound-making)

Can talk

(functional speech)

When deciding what targets to select, chronological age is less important than “speaking practice age”

Today's topics

- Target Selection Team
- 4 “Must-Know Basics”
 - Reinforcement
 - Sound acquisition
 - Mechanics
 - Coarticulation
- 5 Tools for Target Selection
(to help define appropriate targets)

Tool # 1
Naïve Listener Test

Tool # 2
Echoic Assessment

Tool # 3
SAS
Sound Acquisition Sequence Checklist

Tool # 4
Shells

Tool # 5
Vocal-VB Skills

Topic 1

Target Selection Team

- Parents & other caregivers
- SLPs
- Behavior analysts & techs
- Teachers & teaching assistants
- Therapists (OT, PT)
- Psychologists

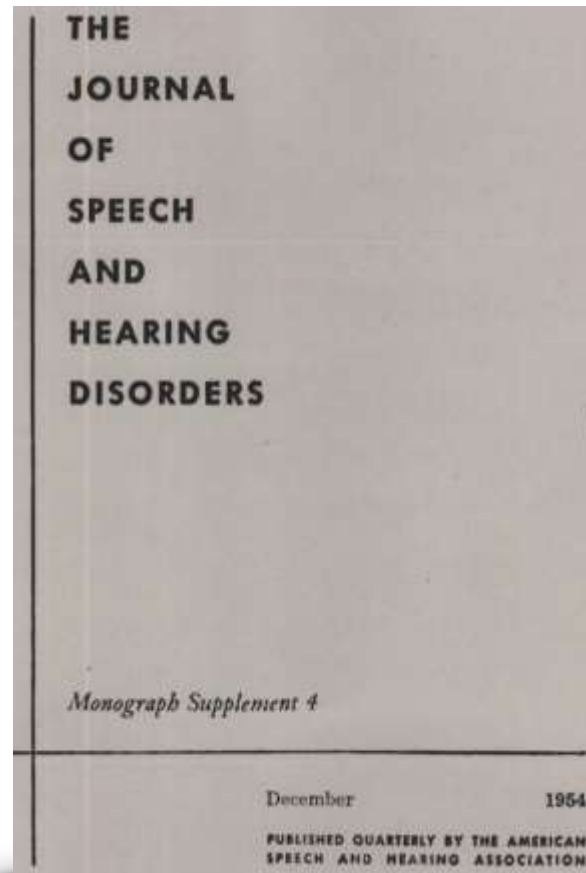
Target Selection Team

Who has a responsibility to teach communication skills?

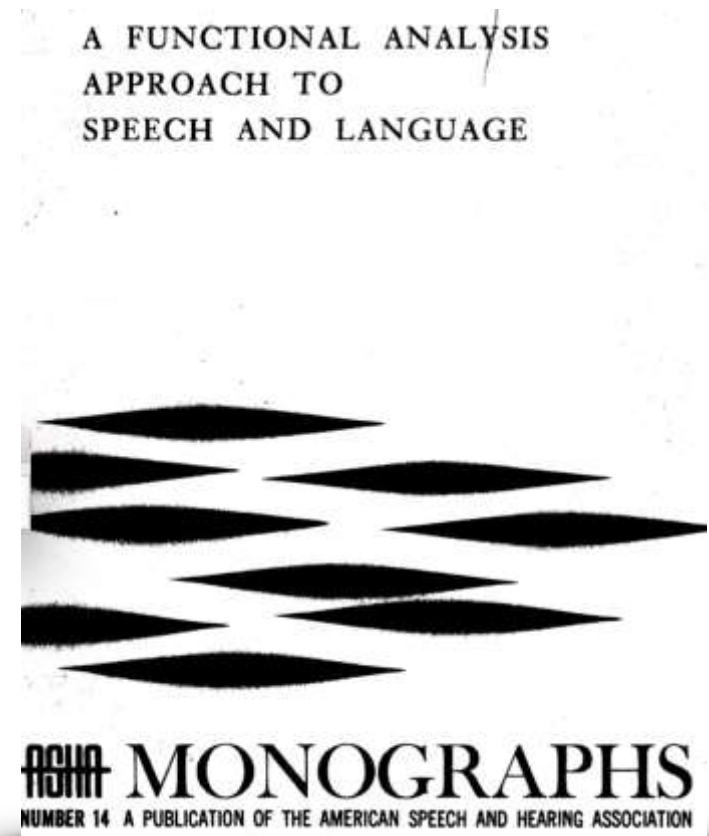
We all do because...

- ☑ speech-language is a social skill
- ☑ we're all part of the learner's social context

“Interdisciplinary” collaboration
...it’s a great advantage to the learner



ASHA



JOURNAL OF APPLIED BEHAVIOR ANALYSIS

1968, 1, 109-120

NUMBER 2

JABA

*ESTABLISHING USE OF DESCRIPTIVE ADJECTIVES IN
THE SPONTANEOUS SPEECH OF DISADVANTAGED
PRESCHOOL CHILDREN¹*

BETTY M. HART AND TODD R. RISLEY

Resources: Some good places to start

Professional literature

Books

- Hedge, M. N., & Maul, C.A. (2006). *Language disorders in children: An evidence-based approach to assessment and treatment*. Boston, MA: Allyn and Bacon.
- Peña-Brooks, A., & Hegde, M. N. (2007). *Assessment and treatment of articulation and phonological disorders in children* (2nd ed.). Austin, TX: Pro-Ed.

Peer-reviewed journals

- The Analysis of Verbal Behavior (<http://www.ncbi.nlm.nih.gov/pmc/journals/609/>)
- Journal of Speech, Language, and Hearing Research (<http://jslhr.pubs.asha.org>)
- Journal of Speech and Language Pathology - Applied Behavior Analysis (<http://psycnet.apa.org/journals/slp/>)
- Journal of Applied Behavior Analysis (<http://www.ncbi.nlm.nih.gov/pmc/journals/309/>)



www.behavioralspeech.com



**SPEECH
PATHOLOGY AND
APPLIED
BEHAVIOR
ANALYSIS**
**SPECIAL INTEREST
GROUP**

You can find out more about SPABA at the
Association for Behavior Analysis
International website at: [ABAI website](#).

Effective speech-teachers know...

How to

When to

Where to

- ☒ Start a speech program, based on a learner's current skills (know where to "set the bar")

- ☒ Reinforce *any* vocalizations
- ☒ Reinforce *specific* vocalizations

- ☒ Differentially reinforce (must know if response is better than previous)

- ☒ Prompt & fade prompts
- ☒ Transfer stimulus control

- ☒ Identify SAS level for target selection
- ☒ Write shell steps to shape better artic

- ☒ Increase syllable-length requirements
- ☒ Select vocal mand-tact targets (preferred and/or daily-use items)

Team members
may not have equivalent teaching skills

Seek SLP consultation

Seek BCBA consultation

Team members

may not identify the same targets as priorities

**SLP & BCBA
collaboration**

To identify

Form
(logical next-step topographies)

Function
(meaningful for communication)

To do

Assessment

Target selection

Periodic skill probes

Move program goals forward

Example of this collaboration: discrimination training

ma-dee vs ma-doe

1. Teach discrimination of dee-doe
2. Fade in the “same” part (ma)

Team members
can all support skill acquisition

... by assisting with critical strategies

Strategies that enhance artic assessment and acquisition are based on behavior analysis

Motivation centered
preference assessment, mand training

Reinforcement
of almost *any* speech response

Differential reinforcement
of correct speech response

Natural settings
play & leisure

Prompts & time delay

Simplified instructions

Team members

work together to evaluate program effectiveness

**Know the “Basics”
of speech acquisition**

**Know how to use the 5 Target
Selection Tools**

Summary points

- We all have responsibility for helping people learn to communicate effectively.
- Teaching requires sets of skills that include:
 - speech assessment
 - verbal function assessment
 - behavioral intervention (*contingency analysis*)
 - ...as well as specific background knowledge of typical speech development and appropriate speech target sequences

Topic 2

4 “Must-Know Basics”

- How it starts: reinforcement
- Sound acquisition
- Mechanics
- Coarticulation

How it starts: reinforcement

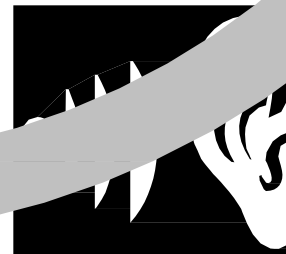
MUSCLE MOVEMENT

Reinforcing value
of these speech
sounds increases

Speech sounds
produced

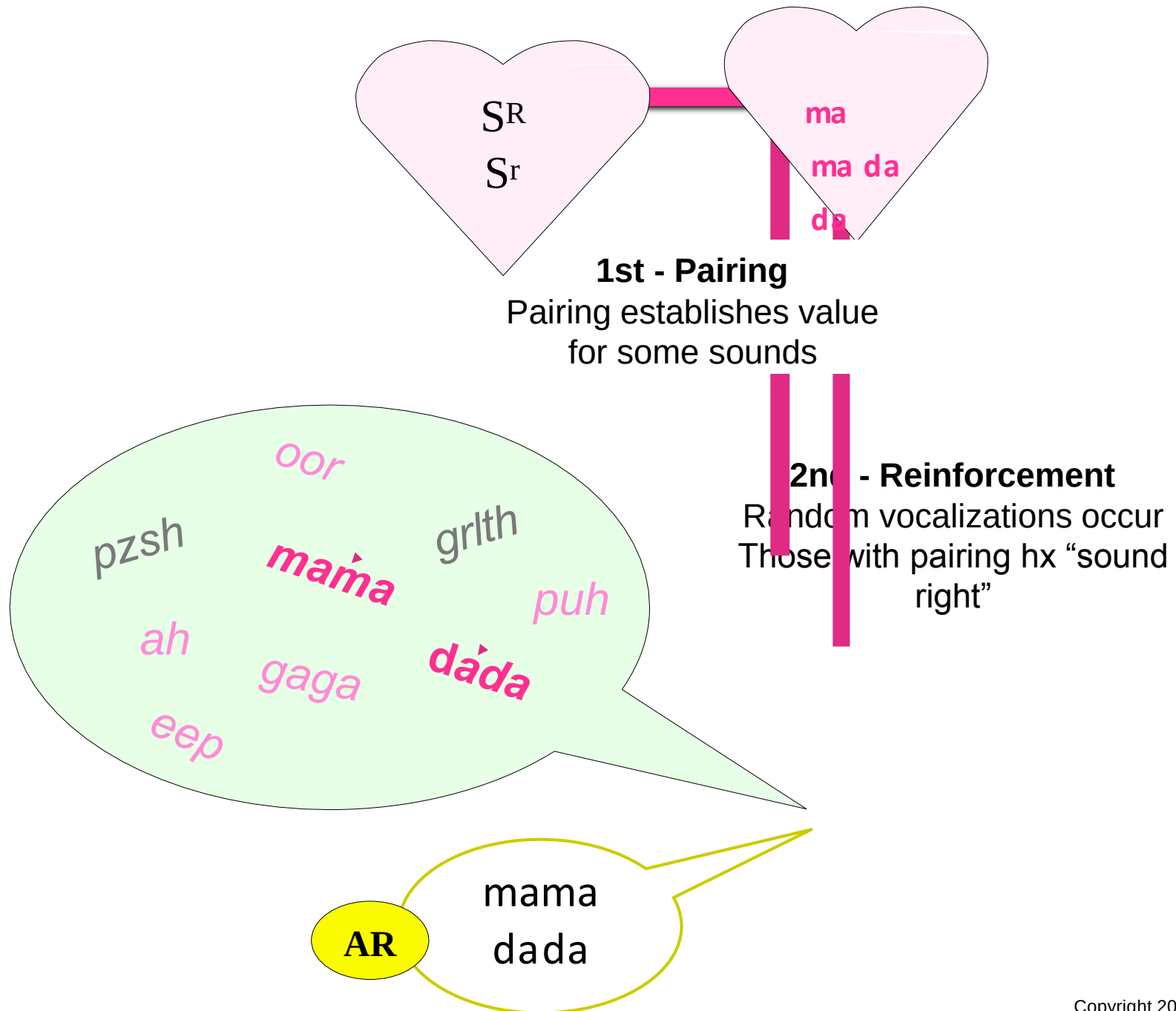
It sounds “right”

Observes sound



Early vocal-verbal (speech) acquisition

2-stage process



STEP 1

Get lots of sounds

STEP 2

Turn into functional speech

For an excellent discussion of speech acquisition and supporting research, see: Schlinger, H. D., Jr. (2010). Behavioral vs. cognitive views of speech perception and production. *Journal of Speech and Language Pathology - Applied Behavior Analysis*, 5(2), 150-165.

Sound-making

mechanical

practice

echoic

meaningful

mand

tact

intraverbal

Sound acquisition

How does “developing” speech sound?

Video

3 mos

3 mos

Sounds are strong & loud



There are lots of different sounds



Sounds are made fluently
easy to move tongue from one sound to another



Sounds in words are precise



Video

6 mos

6 mos

Sounds are strong & loud

Advantage!
Vocal control for
on/off

There are lots of different sounds

Advantage!
Easier to shape
new positions
and sounds

Sounds are made fluently
easy to move tongue from one sound to another

Sounds in words are precise

Acceptably imperfect for years
*Baby-talk: non-matching
“echoic” attempts*

Video

10 mos

Fluent, but still mostly vowels

18 mos

24 mos

Sounds are strong & loud

There are lots of different sounds

Sounds are made fluently
easy to move tongue from one sound to another

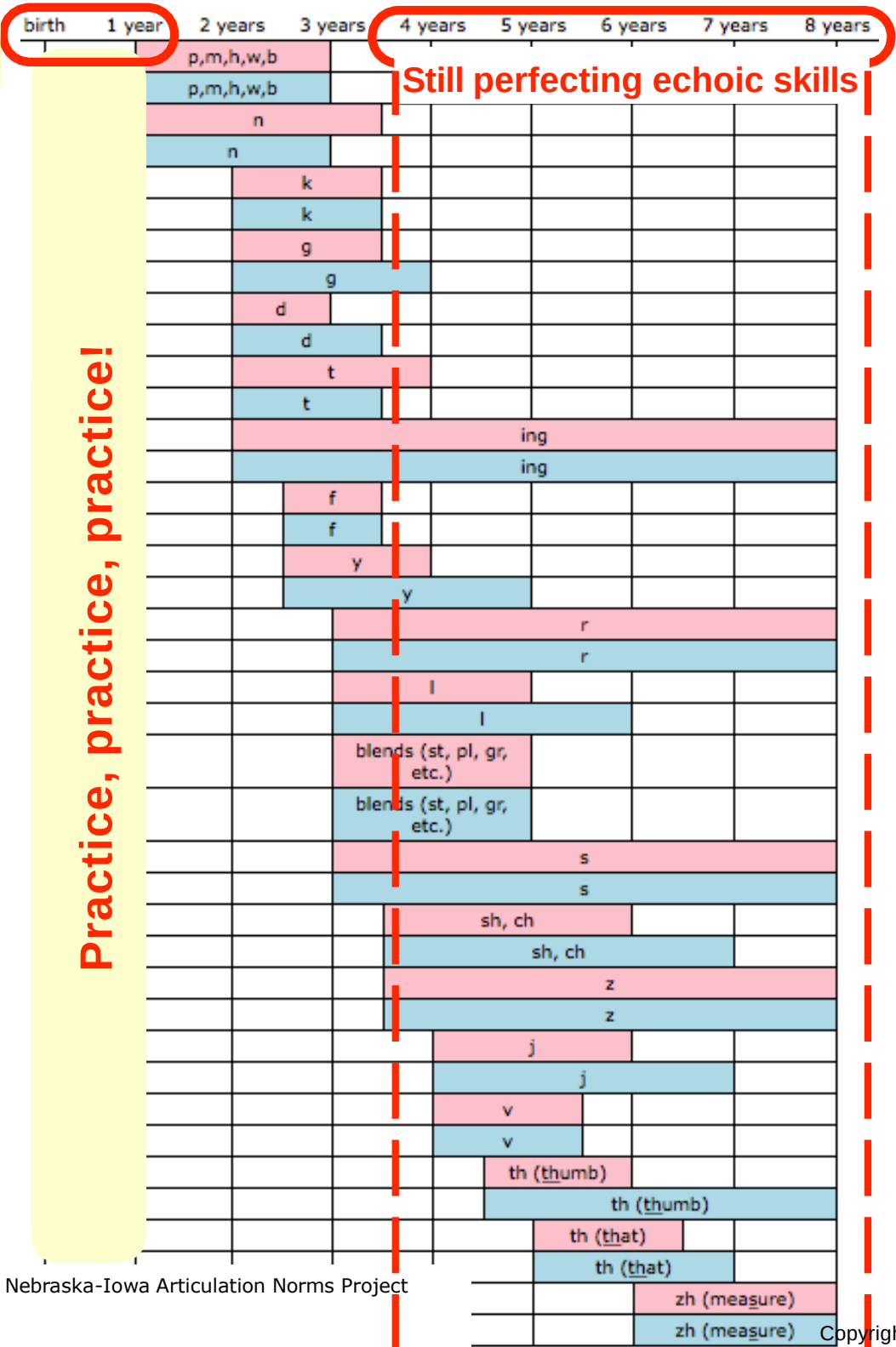
Sounds in words are precise

Speech Development Charts show a wide range of “normal” for early speech learners

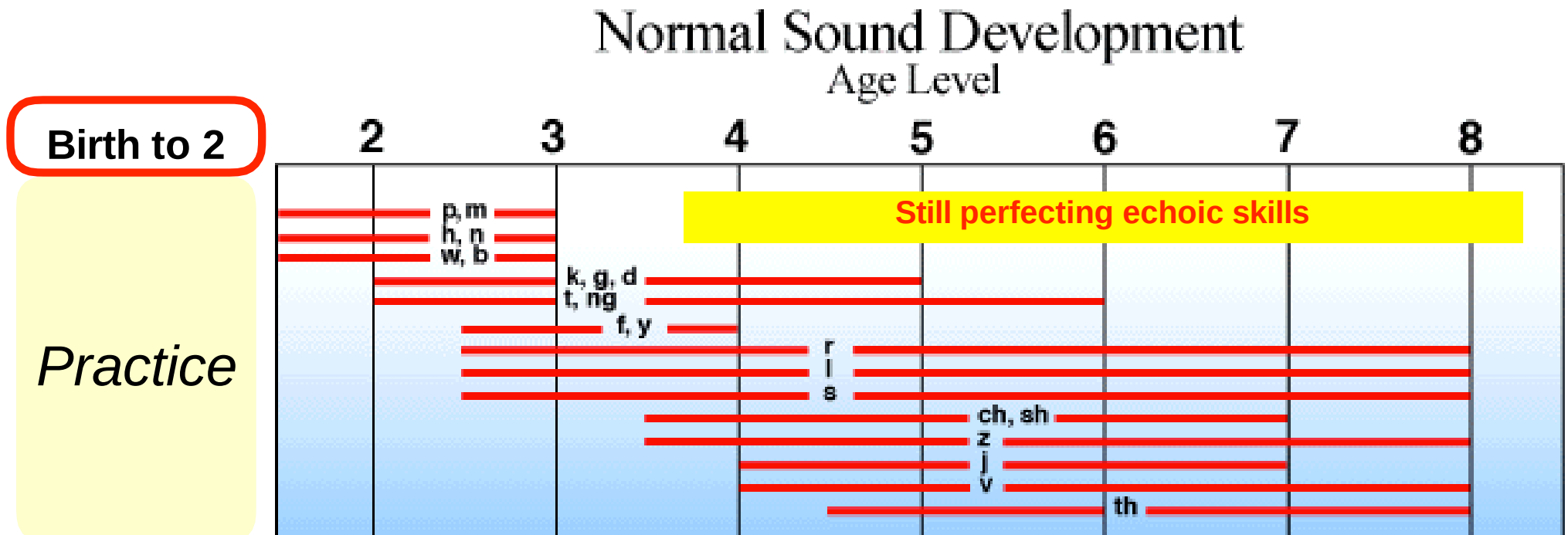
Resources

- asha.org (American Speech Language Hearing Association)
- nih.gov (National Institutes of Health)
- nidcd.nih.gov (National Institute on Deafness and Other Communication Disorders)

Speech development - sound acquisition



- Vocal control
 - Loudness
 - Pitch
 - Duration
- Tongue repositioning
- Blending sounds together
 - vowels
 - vowels & consonants
- Echoing



Adapted from: https://www.mbaea.org/en/special_education/special_education_services/speech_language_services/english/speech_sound_development/

Even with artic training, “earlier” forms are acquired before forms that “develop” later (Dyer, Santarcangelo, & Luce, 1987) .

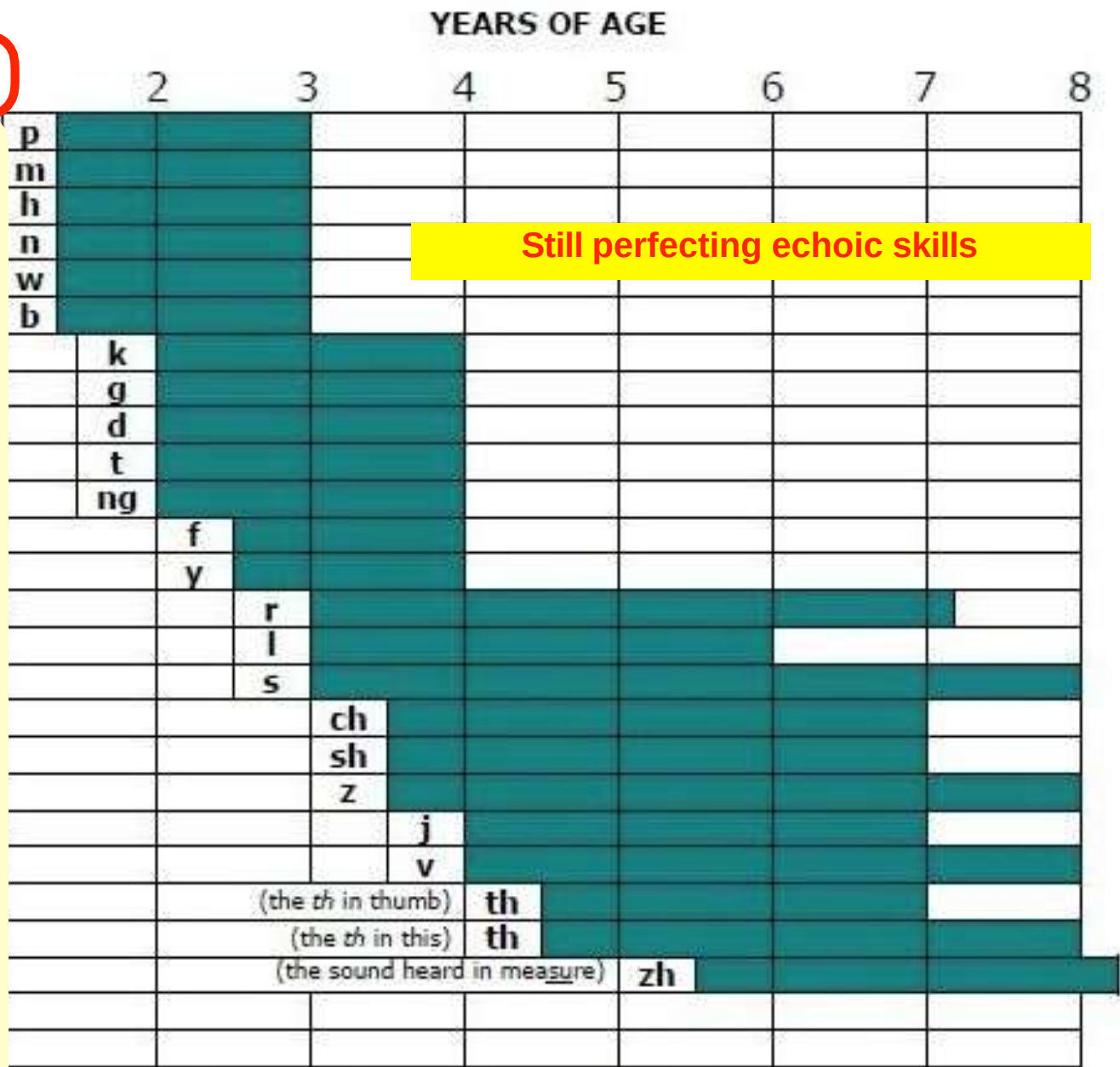
This argues for the need to achieve fluency with easier combos/forms that provides a “mechanical-skill foundation” for producing more complex combinations (i.e., *practice-makes-perfect*).

Speech Sound Development Chart

Horizontal bars indicate a range of typical sound development in children.

Birth to 2

Practice



Still perfecting echoic skills

Source: Sander, Eric K. "When Are Speech Sounds Learned?" JSHD, 37 (February 1972).

Components of speaking

- **Segmental** components
 - Vowels, diphthongs, consonants
 - Strings of these = syllables = words
 - Primary verbal function
(mand, tact, echoic/copy text, intraverbal, textual, transcription)
- **Suprasegmental** components
 - Loudness, pitch, duration, voice on/off
 - Autoclitic function (Skinner, 1957, p. 318)

All these components of speech are controlled by movements of “articulators”

Many subtleties to be mastered

Voiced

Final sound

Unvoiced

Longer

Vowel duration

Shorter



dog-guh

pig-guh

red-duh

frog-guh

This info informs treatment...

Voiced

Final sound

Unvoiced

Longer

Vowel duration

Shorter

bag

back

Problem: *Deletes final voiced consonant*

- Train a **longer vowel** instead of a stronger final sound (avoids the “intrusive schwa” - *bag-guh*)
- Accept the unvoiced final sound as a **placeholder** until overall artic skills improve

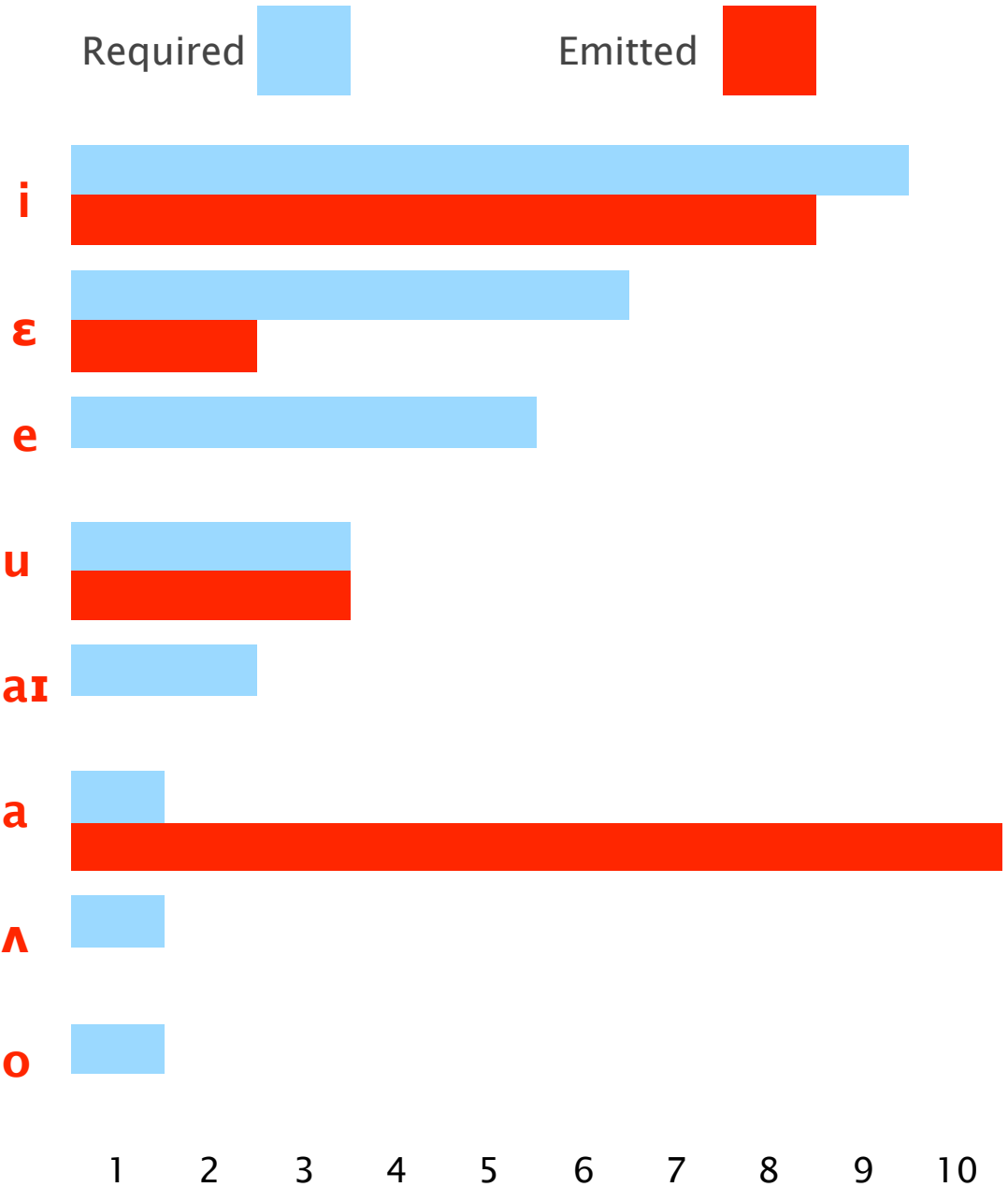
Video

24 mos

By 24 months...
Vowels?
Consonants?

	A	B	C	D	E	F	G
actual response.....	a	ba	hi	i	i	dε	i
correct response.....	e	bi	si	di	i	εf	dʒi
	H	I	J	K	L-M-N-O		P
	ba	ba	ba	ba	l~~~~~		bi
	etʃ	aɪ	dʒe	ke	ɛl εm εn o		pi
	Q	R	S	T	U		V
	ju	a	εθ	i	ju		vi
	kju	ar	εs	ti	ju		vi
	W	X	Y	(and)			Z
	da-ju	a	wa	wa			i
	dʌbɪju	εks	waɪ				zi

Vowel frequency in A-B-C song



accuracy

VS



ʃɪsɛlzsɪʃɛlzbaiðʌsɪfɔr

Video

Tongue twisters: SYSTEM LOAD!

- Syllable combos are atypical
- Not well-practiced
- Requires rapid tongue repositioning

**slow
&
accurate**

or

**fast
&
*inaccurate***

ʃ i s ɛ l z s i ʃ ɛ l z b a i ɔ̃ ʌ s i ʃ o r

At first, fluency over accuracy

<i>Dah-nel</i>	Daniel
<i>ina</i>	in the
<i>you</i>	your
<i>'ous</i>	house
<i>der</i>	there
<i>you ok</i> <i>oo-oh</i>	you're ok <i>oo-er-oh</i>

30 mos

Video

These misarticulations allow fluency with minimal loss of intelligibility

Mechanics of speaking

“...the development of effective prompting strategies requires knowledge of speech sound production as well as behavioral technology.”

Gerenser, J. (2009, p. 154).

There is no vowel at the end of D O G: Considerations for teaching speech production.

Journal of Speech-Language Pathology and Applied Behavior Analysis, 3(2-3), 154-163.

Speech structures

Physical
prompting may
not be effective -

Even though you
“move” the lips,
the tongue may
stay in same
position.

E.g., “ah” vs “oo” - tongue *must* change position

Video

Knowing the mechanics of speech production helps in target selection

- Omits /t/ or /d/ or /n/ from syllables

- Can say both “ee” and “uh”

Tongue position for t, d, n

“tuh”

or

“tee”

Video

Source: University of Southern California (Speech Production and Articulation Knowledge Group; sail.usc.edu/span/)

For visual analysis of phonetic placement for individual sounds, see:
Lawson, E., J. Stuart-Smith, J. M. Scobbie, S. Nakai (2015). Seeing Speech: an articulatory web resource for the study of Phonetics. University of Glasgow. 1st April 2015. <http://seeingspeech.ac.uk>

Coarticulation

Tongue placement to produce any sound
is affected by requirements of
adjacent phoneme positions

Tongue position for an **isolated** syllable is likely to be different than that for a **series of syllables**.

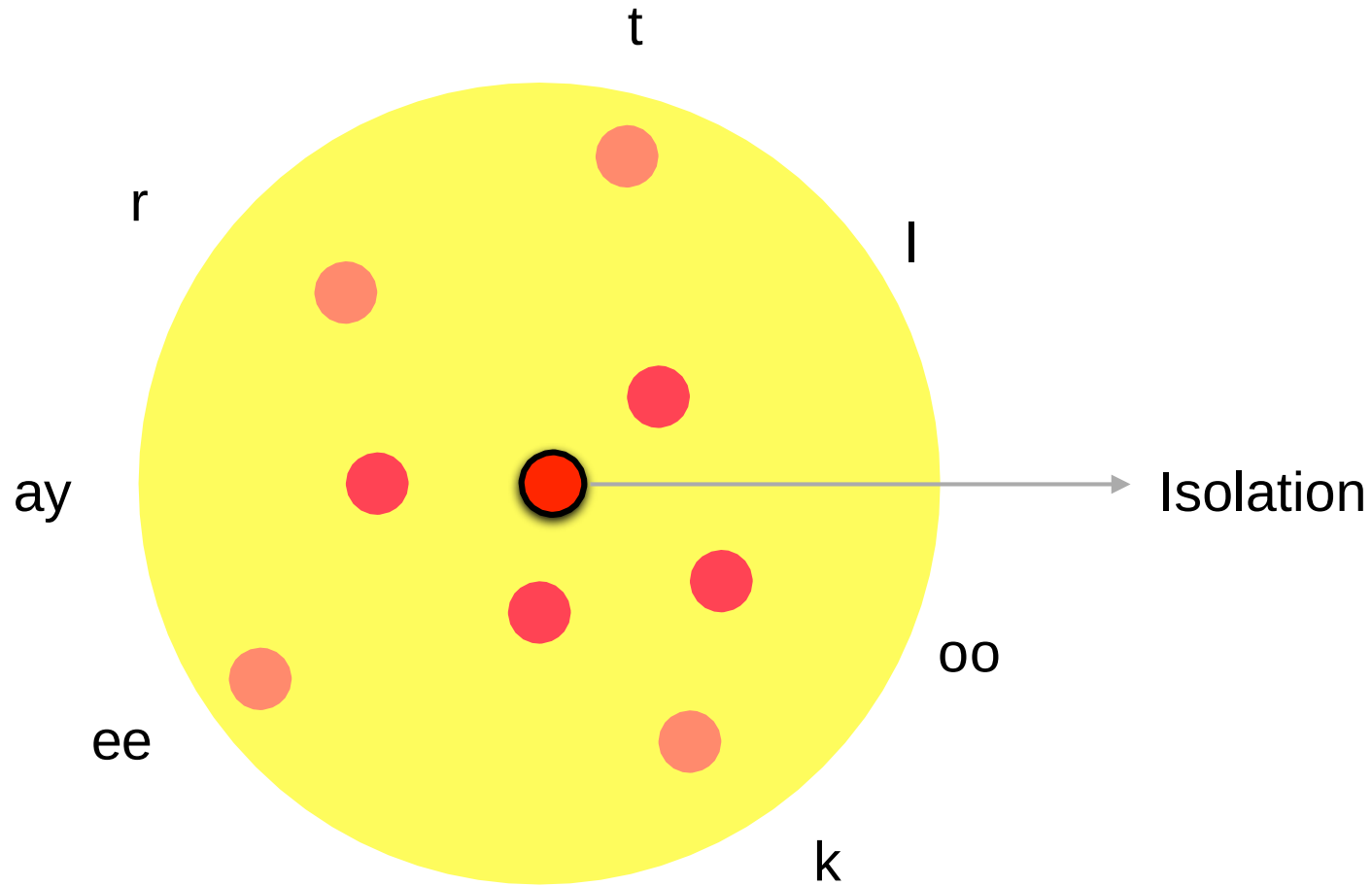


Figure shows area in mouth for any given speech position perceived as “correct”

This is why focusing on too-specific consonant articulation is *contraindicated* for early speech learners who don't yet produce fluent strings of syllables:



w a t ə

+ + - +

Vocal cords on/off

waTer or wadder?

w a d ə

+ + + +

Vocal cords on/off

We change our articulation to meet the demands of effective communication



Rapid speaking

(wadder)

Clarification

(waTer)

aɪ w a n t aɪ s k r i m p l i z

aɪ w a n t aɪ s k r i m p l i z

m a m i ε n d æ d ɪ

↑ ↑
front front

m a m i ε n k e d ɪ

↑ ↑
front back

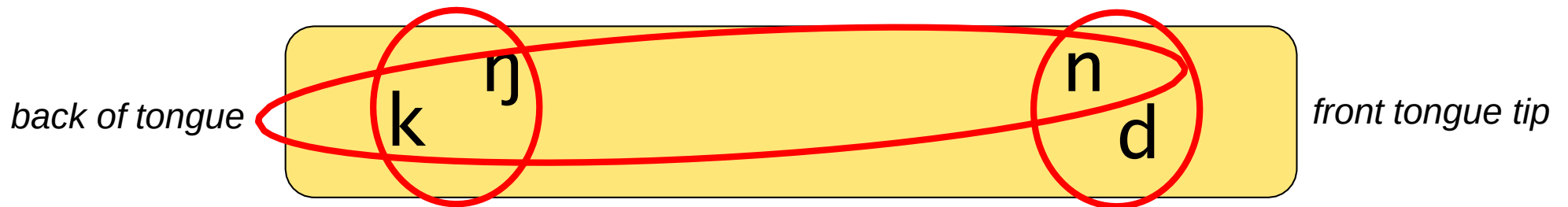
m a m i ε n d æ d ɪ

n - d

m a m i ε n k e d ɪ

k

m a m i ε n k e d ɪ

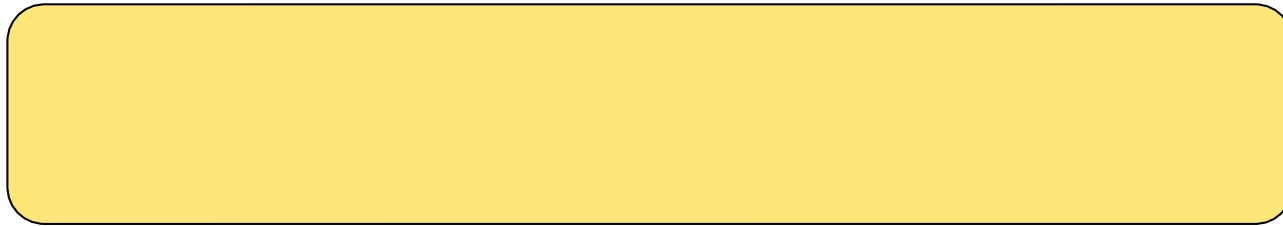


m a m i ε n d æ d ɪ

“Mark’s car does not start”

m a r **k s k** a r d ʌ z n a **t s t** a r t

back of tongue



front tongue tip

Summary points

- People just learning to talk achieve fluency before precision.
- These fluent, but often “misarticulated,” syllable strings are reinforced by the verbal community as mands, tacts, etc.
- The verbal community tolerates these “errors” for years, while the mechanical skills are acquired that produce complex, rapid movement combinations (i.e., connected speech)

Topic 3

5 Tools for Target Selection

Tool #1

Naïve Listener Test

A way to measure intelligibility and its improvement over time

Many ways you could do this.

This example is with tacts (easier to control the SD).

Naïve:

Listener doesn't know the evocative stimulus

Anyone can give this type of test.
The “pass” level is simply *intelligibility*.

This is not an articulation test.

It doesn't identify specific sounds or sound combos
that need to be targeted.

Its results are intuitive; any caregiver or professional
can interpret it and use the results.

Naïve Listener Test

intelligibility of acquired tacts

Listener faces away from tact stimuli being presented

Alternatively, listener can listen to audiotape

Naïve Listener Test

intelligibility of acquired tacts

1	Camera	_____
2	Slide	_____
3	phone	_____
4	spoon	_____
5	snake	_____
6	elephant	_____

Show 50-100 pix/obj

Use items already “acquired” as tacts

- Listeners understand & reinforce the current vocal form OR the sign

Nouns	Test 1 5,2,15	Test 2 6,6,15	Test 3 7,11,15	Transcription (BE) 618115
Fish	+	+	+	<i>fit</i>
Frog	+	+	+	<i>fo1go</i>
Fork	+	+	+	<i>pfo1go</i>
Glasses	+	+	+	<i>ga1tha</i>
Grapes	+	+	+	<i>graphth</i>
Giraffe	+	+	+	<i>jew1wah</i>
Guitar	+	+	+	<i>gi1tah</i>
Hat	+	+	+	<i>ha1tah</i>
Ice Cream	+	+	+	<i>ai1cree</i>
Keys	+	+	+	<i>key</i>
Phone	+	+	+	<i>fo</i>
Shoes	+	+	+	<i>shew</i>
Spoon	+	+	+	<i>beeyih</i>
Sheep	+	+	+	<i>sheep1ee</i>
Snake	+	+	+	<i>thak</i>
Slide	+	+	+	<i>shwai</i>
Star	+	+	+	<i>dah</i>
Scissors	+	+	+	<i>scizzih</i>
Spider	+	+	+	<i>ah1pah1duh</i>
Swing	+	+	+	<i>thwih</i>
Train	+	+	+	<i>tray</i>
Table	+	+	+	<i>tibuh</i>
Teddy Bear	+	+	+	<i>teh beh</i>
Umbrella	+	+	+	<i>oh1blah1lah</i>
Results	15/50	19/50	28/50	
	30%	38%	56%	Copyright 2016 B

Video

NLT 2 sample

NLT 2

NLT 3

Practice - NLT

chips
1
2
3
4
5
6
7
8
9
10

Video

Tool #1: Naïve Listener Test

	chips
1	shoes
2	chicken
3	cow
4	fish
5	fork
6	glasses
7	grapes
8	guitar
9	sheep
10	dinosaurs

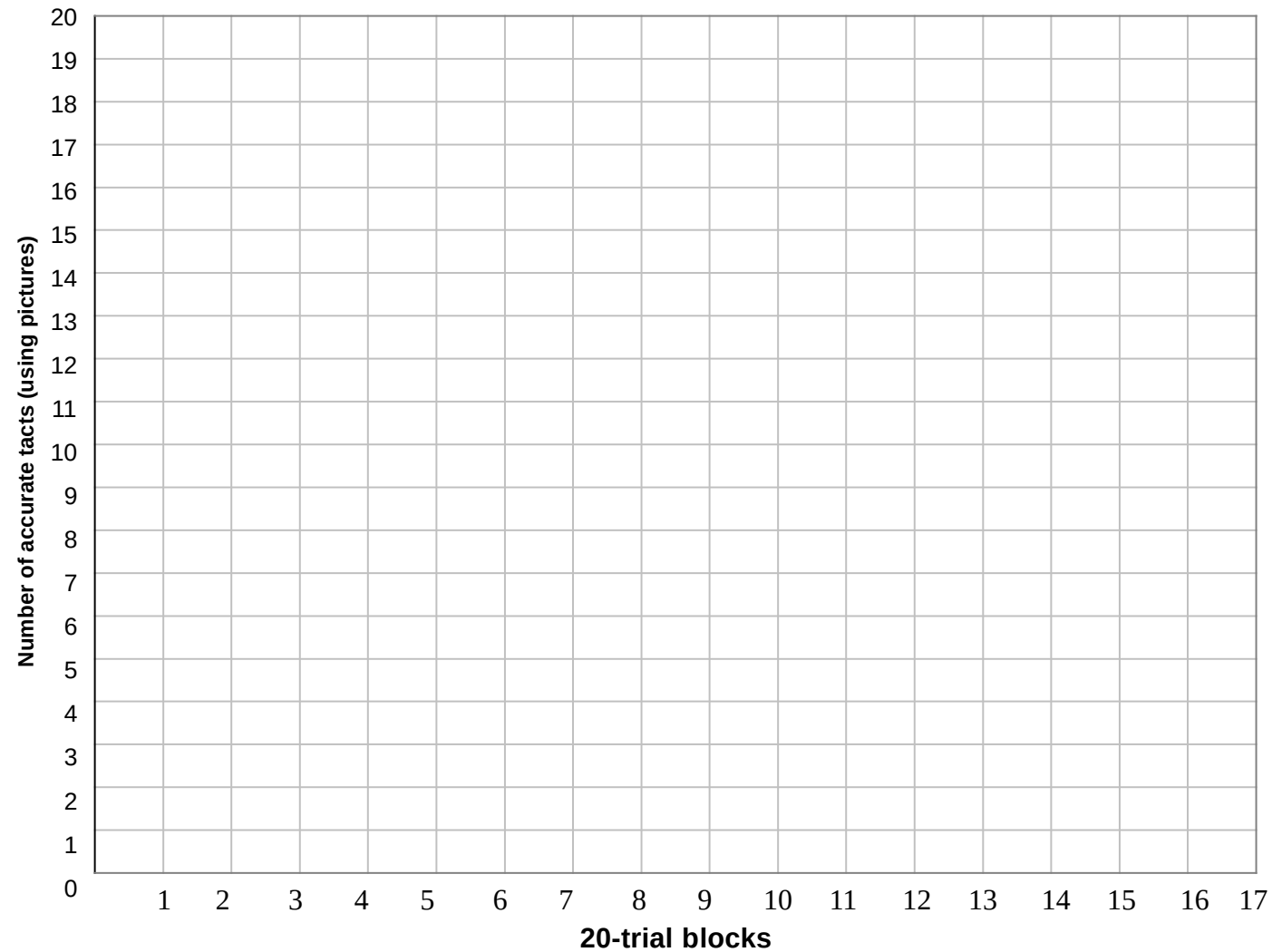
[illegible]

PICTURES

- 1 TOE
- 2 TACO
- 3 TWO
- 4 TABLE (tay2buh)
- 5 TOOTH
- 6 TV
- 7 TUB
- 8 TEETH
- 9 TUMMY
- 10 TIGER (ti2guh)
- 11 COW
- 12 BACON
- 13 BACKPACK
- 14 CAT
- 15 FORK
- 16 BEAK
- 17 CHICKEN
- 18 FRECKLES (feh2kos)
- 19 NICKEL (nih2ko)
- 20 PICKLE (pih2ko)

Contrast place (plosives t/k)

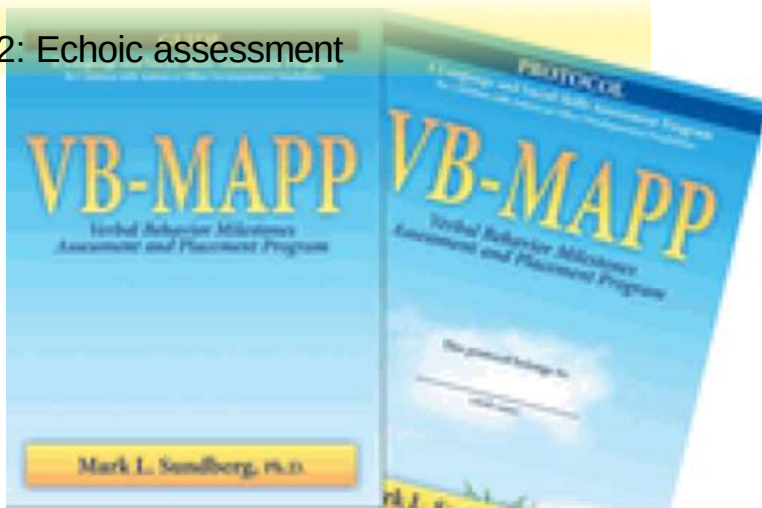
TACT accuracy



Shuffle picture cards after each block of 20 so presentation order is random.

Tool #2

Echoic Assessment



Early Echoic Skills Assessment (*EESA*)

- | | |
|---------|------------------------------------|
| Group 1 | Simple and reduplicated syllables |
| Group 2 | 2-syllable combinations |
| Group 3 | 3-syllable combinations |
| Group 4 | Prosody in phrases |
| Group 5 | Prosody: pitch, loudness, duration |

EESA

Early Echoic Skills Assessment (EESA)

Barbara E. Esch, Ph.D., BCBA, CCC-SLP

Scoring Groups 1-3: For each item, score the best response of up to 3 trials
X = correct sounds and correct number of syllables (1 point)
/ = recognizable response, but incorrect or missing consonants or extra syllables (½ point)
Blank = no response, incorrect vowels, or missing syllables (0 points)

**TOTAL
RAW SCORE:**
(Groups 1-5)

ASSESSMENT			
1ST	2ND	3RD	4TH

Group 1: Simple and reduplicated syllables

Targets: vowels, diphthongs, consonants p, b, m, n, h, w

Probe: t

- | | | | | |
|-------------------------------|----------------------------------|--------------------------------|------------------------------|--------------------------------|
| ☐ ah | ☐ bye bye | ☐ one | ☐ moo | ☐ we |
| ☐ wow | ☐ hop | ☐ my | ☐ up | ☐ boy |
| ☐ bee | ☐ mama | ☐ boo | ☐ may | ☐ wa wa |
| ☐ knee | ☐ papa | ☐ no no | ☐ pop | ☐ toy |
| ☐ oo | ☐ me | ☐ oh | ☐ too | ☐ baa |

ASSESSMENT			
1ST	2ND	3RD	4TH

Sub-total
Group 1

Group 2: 2-syllable combinations

Targets: Add consonants k, g, t, d, f, y, ng

- | | | | | |
|------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| ☐ baby | ☐ window | ☐ open | ☐ taco | ☐ icky |
| ☐ go eat | ☐ funny | ☐ oh boy | ☐ foo-ey | ☐ too hot |
| ☐ nighttime | ☐ meow | ☐ yum-o | ☐ hankie | ☐ monkey |
| ☐ bunny | ☐ kitty | ☐ potty | ☐ too bad | ☐ uh-oh |
| ☐ my foot | ☐ bow wow | ☐ pay dzy | ☐ cookie | ☐ daddy |
| ☐ yucky | ☐ mommy | ☐ pokey | ☐ puppy | ☐ hot dog |

ASSESSMENT			
1ST	2ND	3RD	4TH

Sub-total
Group 2

Group 3: 3-syllable combinations

- | | | | | |
|-------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|--------------------------------------|
| ☐ tubby toy | ☐ potato | ☐ do high five | ☐ tiny pan | ☐ how many |
| ☐ banana | ☐ go bye bye | ☐ oh foo-ey | ☐ peek a boo | ☐ potty time |
| ☐ fee fi foe | ☐ fat doggy | ☐ binky boo | ☐ teddy bear | ☐ giddy-up |
| ☐ yummy food | ☐ goofy goat | ☐ one cookie | ☐ doggy bone | ☐ wet mitten |
| ☐ daddy up | ☐ hey me too | ☐ open up | ☐ funny king | ☐ teepee boat |
| ☐ in a boat | ☐ my big toe | ☐ peanut hat | ☐ a hiccup | ☐ puppet game |

ASSESSMENT			
1ST	2ND	3RD	4TH

Sub-total
Group 3

Group 4: Prosody: spoken phrases (Model: Emphasize syllables in **bold italics**)

X = emphasis on correct syllables (1 point)
/ = emphasis on non-target syllables (½ point)
Blank = monotone response (no emphasis) (0 points)

- | | | | | |
|--|---|---|--|--|
| ☐ no WAY | ☐ ONE bunny | ☐ in a MIN -ute | ☐ TAKE it | ☐ my MOM -my |
| ☐ bug-a- BOO | ☐ UH -oh | ☐ MY mommy | ☐ bow- WOW | ☐ BUG -a-boo |

ASSESSMENT			
1ST	2ND	3RD	4TH

Sub-total
Group 4

Group 5: Prosody: other contexts

X = response correct or nearly so (1 point)
Blank = response does not closely match model (0 points)

- Pitch**
- ☐ Echoes pitch variations in 1-2 lines of a familiar song ☐ Echoes continuous warble (fire truck 00-00-00-00-00)
- Loudness**
- ☐ Echoes whispering ☐ Echoes quiet/loud voice (bye-bye vs. **BYE-BYE**)
- Duration**
- ☐ Sustains ahh for 3 seconds, echoically

ASSESSMENT			
1ST	2ND	3RD	4TH
			71

Sub-total
Group 5

Tool #2: Echoic assessment

Early Echoic Skills Assessment (EESA)
Barbara E. Esch, Ph.D., BCBA, CCC-SLP

Scoring Groups 1-3: For each item, score the best response of up to 3 trials.
(X = correct sound and correct number of syllables (1 point)
1 = recognizable response, but incorrect or missing consonants or extra syllables (1 point)
Blank = no response, repeated words, or missing syllables (0 points)

TOTAL
RAW SCORE:
(Groups 1-3)

Assessment
1st 2nd 3rd 4th

Group 1: Simple and reduplicated syllables
Targets: vowels, diphthongs, consonants p, b, m, n, h, w
Probe: t

☐ ah

☐ wow

☐ bee

☐ knee

☐ oo

☐ bye bye

☐ hop

☐ mama

☐ papa

☐ me

☐ one

☐ my

☐ boo

☐ no no

☐ oh

☐ moo

☐ up

☐ may

☐ pop

☐ too

☐ we

☐ boy

☐ wa wa

☐ toy

☐ baa

Sub-total
Group 1

Assessment
1st 2nd 3rd 4th

Group 2: 2-syllable combinations
Targets: Add consonants k, g, t, d, f, p, ng

☐ tinky

☐ go sat

☐ nighttime

☐ bunny

☐ my foot

☐ puffy

☐ window

☐ funny

☐ meow

☐ kitty

☐ bear waw

☐ monkey

☐ open

☐ ah boy

☐ pumpkin

☐ potty

☐ pig dog

☐ pockey

☐ oaco

☐ bow-ey

☐ hunkie

☐ too bad

☐ cooiee

☐ puaie

☐ ody

☐ too fast

☐ monkey

☐ uh-oh

☐ daddy

☐ hot dog

Sub-total
Group 2

Assessment
1st 2nd 3rd 4th

Group 3: 3-syllable combinations

☐ bubbly toy

☐ banana

☐ bee 6 bee

☐ yummy food

☐ daddy up

☐ in a boat

☐ parakee

☐ go bye bye

☐ fat doggie

☐ goofy goat

☐ hay me too

☐ my big toe

☐ do high five

☐ ah too-ey

☐ kooky bear

☐ wee wookie

☐ open up

☐ peanut hot

☐ tiny pen

☐ peek a boo

☐ waddy bear

☐ daggie bear

☐ funny king

☐ a hiccup

☐ how many

☐ potty time

☐ giddy up

☐ wee mitten

☐ teapots boat

☐ puppet game

Sub-total
Group 3

Assessment
1st 2nd 3rd 4th

Group 4: Prosody: spoken phrases (Model: Emphasize syllables in bold italics)

Group 1: Simple and reduplicated syllables

Targets: vowels, diphthongs, consonants p, b, m, n, h, w

Probe: t

☐ ah	☐ bye bye	☐ one	☐ moo	☐ we
☐ wow	☐ hop	☐ my	☐ up	☐ boy
☐ bee	☐ mama	☐ boo	☐ may	☐ wa wa
☐ knee	☐ papa	☐ no no	☐ pop	☐ toy
☐ oo	☐ me	☐ oh	☐ too	☐ baa

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Early Echoic Skills Assessment (EESA)
Barbara E. Esch, Ph.D., BCBA, CCC-SLP

Scoring Groups 1-3: For each item, score the best response of up to 3 trials.
X = correct sound and correct number of syllables (1 point)
I = recognizable response, but incorrect or missing consonants or extra syllables (1 point)
Blank = no response, incorrect vowels, or missing syllables (0 points)

Group 1: Simple and reduplicated syllables
Targets: vowels, diphthongs, consonants p, b, m, n, t, k, w

Probe: t

☐ ah	☐ type type	☐ am	☐ meow	☐ we
☐ wow	☐ top	☐ my	☐ up	☐ boy
☐ too	☐ mama	☐ boo	☐ may	☐ we we
☐ mmm	☐ papa	☐ na na	☐ pop	☐ try
☐ no	☐ me	☐ uh	☐ too	☐ too

Sub-total Group 1

Group 2: 2-syllable combinations
Targets: Add consonants k, g, t, d, f, y, ng

☐ baby	☐ window	☐ open	☐ taco	☐ icky
☐ go eat	☐ funny	☐ oh boy	☐ foo-ey	☐ too hot
☐ nighttime	☐ meow	☐ yum-o	☐ hankie	☐ monkey
☐ bunny	☐ kitty	☐ potty	☐ too bad	☐ uh-oh
☐ my foot	☐ bow wow	☐ pay day	☐ cookie	☐ daddy
☐ yucky	☐ mommy	☐ pokey	☐ puppy	☐ hot dog

Sub-total Group 2

Group 3: 3-syllable combinations

☐ baby toy	☐ porcupine	☐ do high five	☐ try pet	☐ how many
☐ banana	☐ go bye bye	☐ oh foo-ey	☐ peek a boo	☐ potty time
☐ see it fly	☐ let claps	☐ kooky bear	☐ ready bear	☐ giddy up
☐ yummy food	☐ goofy goat	☐ one cookie	☐ claps bear	☐ wee wee

Sub-total Group 3

Group 2: 2-syllable combinations

Targets: Add consonants k, g, t, d, f, y, ng

- | | | | | |
|------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| ☐ baby | ☐ window | ☐ open | ☐ taco | ☐ icky |
| ☐ go eat | ☐ funny | ☐ oh boy | ☐ foo-ey | ☐ too hot |
| ☐ nighttime | ☐ meow | ☐ yum-o | ☐ hankie | ☐ monkey |
| ☐ bunny | ☐ kitty | ☐ potty | ☐ too bad | ☐ uh-oh |
| ☐ my foot | ☐ bow wow | ☐ pay day | ☐ cookie | ☐ daddy |
| ☐ yucky | ☐ mommy | ☐ pokey | ☐ puppy | ☐ hot dog |

Tool #2: Echoic assessment

Early Echoic Skills Assessment (EESA)
Barbara E. Esch, Ph.D., BCBA, CCC-SLP

Scoring Groups 1-3: For each item, score the best response of up to 3 trials.
X = correct sounds and correct number of syllables (1 point)
/ = recognizable response, but incorrect or missing consonants or extra syllables (1 point)
Blank = no response, incorrect vowels, or missing syllables (0 points)

TOTAL
RAW SCORE:
(Groups 1-3)

Assessment
1st 2nd 3rd 4th

Group 1: Simple and reduplicated syllables
Targets: vowels, diphthongs, consonants p, b, m, n, h, w
Probe: t

☐ ah

☐ ee

☐ oo

☐ oo-ee

☐ oo

☐ type type

☐ hoop

☐ mame

☐ papa

☐ me

☐ one

☐ my

☐ boo

☐ no-ee

☐ uh

☐ meow

☐ up

☐ may

☐ pee

☐ too

☐ we

☐ say

☐ we-ee

☐ try

☐ bee

Assessment
1st 2nd 3rd 4th

Sub-total
Group 1

Group 2: 2-syllable combinations
Targets: Add consonants k, g, t, d, f, p, ng

☐ toby

☐ go-ee

☐ nighttime

☐ bunny

☐ my foot

☐ puffy

☐ window

☐ funny

☐ meow

☐ kitty

☐ bee-ee

☐ moo-ee

☐ open

☐ oh boy

☐ pumpkin

☐ potty

☐ pig dog

☐ puppy

☐ ooo

☐ bee-ey

☐ huckle

☐ too bad

☐ cookie

☐ puppy

☐ ody

☐ too fast

☐ monkey

☐ uh-oh

☐ daddy

☐ not dog

Assessment
1st 2nd 3rd 4th

Sub-total
Group 2

Group 3: 3-syllable combinations

☐ tubby toy

☐ banana

☐ fee fi foe

☐ yummy food

☐ daddy up

☐ in a boat

☐ potato

☐ go bye bye

☐ fat doggy

☐ goofy goat

☐ hey me too

☐ my big toe

☐ do high five

☐ oh foo-ey

☐ binky boo

☐ one cookie

☐ open up

☐ peanut hat

☐ tiny pan

☐ peek a boo

☐ teddy bear

☐ doggy bone

☐ funny king

☐ a hiccup

☐ how many

☐ potty time

☐ giddy-up

☐ wet mitten

☐ teepee boat

☐ puppet game

Assessment
1st 2nd 3rd 4th

Sub-total
Group 3

Group 4: Prosody: spoken phrases (Model: Emphasize syllables in bold italics)
X = emphasis on correct syllables (1 point)
/ = emphasis on non-target syllables (1 point)

Group 3: 3-syllable combinations

☐ tubby toy	☐ potato	☐ do high five	☐ tiny pan	☐ how many
☐ banana	☐ go bye bye	☐ oh foo-ey	☐ peek a boo	☐ potty time
☐ fee fi foe	☐ fat doggy	☐ binky boo	☐ teddy bear	☐ giddy-up
☐ yummy food	☐ goofy goat	☐ one cookie	☐ doggy bone	☐ wet mitten
☐ daddy up	☐ hey me too	☐ open up	☐ funny king	☐ teepee boat
☐ in a boat	☐ my big toe	☐ peanut hat	☐ a hiccup	☐ puppet game

Tool #2: Echoic assessment

Group 4: Prosody: spoken phrases
X = emphasis on correct syllables (1 point)
/ = emphasis on non-target syllables (½ point)
Blank = monotone response (no emphasis) (0 points)

(Model: Emphasize syllables in ***bold italics***)

☐ no **WAY**

☐ **ONE** bunny

☐ in a **MIN**-ute

☐ **TAKE** it

☐ my **MOM**-my

☐ bug-a-**BOO**

☐ **UH**-oh

☐ **MY** mommy

☐ bow-**WOW**

☐ **BUG**-a-boo

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Scoring Groups 1-3: For each item, score the best response of up to 3 trials.
X = correct sounds and correct number of syllables (1 point)
/ = recognizable response, but incorrect or missing consonants or extra syllables (½ point)
Blank = no response, incorrect vowels, or missing syllables (0 points)

TOTAL RAW SCORE:
(Groups 1-3)

Assessment

Group 1: Simple and reduplicated syllables
Targets: vowels, diphthongs, consonants p, b, m, n, h, w
Probe: t

☐ ah

☐ ee

☐ oo

☐ oo-ee

☐ oo-oo

☐ oo-ah

☐ type type

☐ hoop

☐ mame

☐ papa

☐ me

☐ am

☐ my

☐ bo

☐ no-ee

☐ ah

☐ me

☐ up

☐ may

☐ pee

☐ too

☐ we

☐ bo

☐ we-ee

☐ try

☐ too

Assessment

Sub-total Group 1

Group 2: 2-syllable combinations
Targets: Add consonants k, g, t, d, f, p, ng

☐ taty

☐ go-ee

☐ high-time

☐ bunny

☐ my foot

☐ patty

☐ window

☐ funny

☐ meow

☐ kitty

☐ bow-wow

☐ mommy

☐ open

☐ ah-boy

☐ pum-pu

☐ patty

☐ pig-dog

☐ patty

☐ oco

☐ bow-ey

☐ harkle

☐ too bad

☐ coo-coo

☐ patty

☐ ody

☐ too fast

☐ monkey

☐ uh-oh

☐ daddy

☐ hot dog

Assessment

Sub-total Group 2

Group 3: 3-syllable combinations

☐ tatty-oy

☐ banana

☐ too-ee

☐ yummy-foot

☐ tatty-up

☐ in a boat

☐ pum-pu

☐ go-tye-tye

☐ fat slugs

☐ goofy goat

☐ hay-mee-too

☐ my-eg-tee

☐ do-high-five

☐ ah-too-ey

☐ tatty-bow

☐ meow-ko

☐ open-up

☐ pum-pu

☐ my-pat

☐ peek-a-boo

☐ tatty-bow

☐ slugs-bow

☐ funny-bing

☐ a-hissup

☐ how-many

☐ patty-time

☐ giddy-up

☐ wee-mitten

☐ tatty-boat

☐ pum-pu-gee

Assessment

Sub-total Group 3

Group 4: Prosody: spoken phrases (Model: Emphasize syllables in ***bold italics***)
X = emphasis on correct syllables (1 point)
/ = emphasis on non-target syllables (½ point)
Blank = monotone response (no emphasis) (0 points)

☐ no WAY

☐ bug-a-BOO

☐ ONE bunny

☐ UH-oh

☐ in a MIN-ute

☐ MY mommy

☐ TAKE it

☐ bow-WOW

☐ my MOM-my

☐ BUG-a-boo

Assessment

Sub-total Group 4

Group 5: Prosody: other contexts
X = response correct or nearly so (1 point)
Blank = response does not closely match model (0 points)

☐ Echoes pitch variations in 1-2 lines of a familiar song

☐ Echoes continuous words (five max: OO-we-OO-we-OO)

☐ Loudness

☐ Echoes whispering

☐ Echoes quiet/loud voice (patty vs. BYE-BYE)

☐ Duration

☐ Holds off for 3 seconds, silently

Assessment

Sub-total Group 5

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Tool #2: Echoic assessment

Group 5: Prosody: other contexts

X = response correct or nearly so (1 point)

Blank = response does not closely match model (0 points)

Early Echoic Skills Assessment (EESA)
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Scoring Groups 1-3: For each item, score the best response of up to 3 trials.
X = correct sounds and correct number of syllables (1 point)
/ = recognizable response, but incorrect or missing consonants or extra syllables (1 point)
Blank = no response, incorrect vowels, or missing syllables (0 points)

TOTAL RAW SCORE: (Groups 1-3)

Assessment	1st	2nd	3rd	4th
Group 1				
Group 2				
Group 3				

Group 1: Simple and reduplicated syllables
Targets: vowels, diphthongs, consonants p, b, m, n, k, h, w

Probe 1:

☐ ah	☐ bye bye	☐ me	☐ meow	☐ we
☐ wow	☐ hup	☐ my	☐ up	☐ boy
☐ too	☐ mame	☐ boo	☐ may	☐ we we
☐ waaa	☐ papa	☐ no no	☐ pee	☐ try
☐ oo	☐ me	☐ ah	☐ too	☐ bee

Group 2: 2-syllable combinations
Targets: Add consonants k, g, t, d, f, p, ng

☐ baby	☐ window	☐ open	☐ ooo	☐ ody
☐ go eat	☐ funny	☐ oh boy	☐ bow-ty	☐ too fast
☐ nighttime	☐ meow	☐ pumpkin	☐ harkle	☐ morning
☐ bunny	☐ kitty	☐ patty	☐ too bad	☐ uh-oh
☐ my foot	☐ bow wow	☐ play day	☐ coo-coo	☐ daddy
☐ pushy	☐ morning	☐ pickup	☐ puppy	☐ hot dog

Group 3: 3-syllable combinations

☐ baby toy	☐ potato	☐ do high five	☐ my pen	☐ how many
☐ banana	☐ go bye bye	☐ oh two-ty	☐ peek a boo	☐ patty time
☐ tea & ice	☐ fat slug	☐ kooky koo	☐ ready bear	☐ giddy-up
☐ yummy food	☐ goofy goat	☐ wee wookie	☐ dapper bear	☐ wee mitten
☐ ducky up	☐ hay me too	☐ open up	☐ funny king	☐ respon boat
☐ in a boat	☐ my big toe	☐ peanut hot	☐ a hiccup	☐ puppet game

Group 4: Prosody: spoken phrases (Model: Emphasize syllables in **bold** italics)
X = emphasis on correct syllables (1 point)
/ = emphasis on non-target syllables (1 point)
Blank = monotone response (no emphasis) (0 points)

☐ no WAY	☐ ONE funny	☐ in a MIN ute	☐ TAKE it	☐ my MOM my
☐ hug = BOO	☐ UH-oh	☐ MY morning	☐ how WOW	☐ BUG = bee

Group 5: Prosody: other contexts
X = response correct or nearly so (1 point)
Blank = response does not closely match model (0 points)

Pitch
☐ Echoes pitch variations in 1-2 lines of a familiar song ☐ Echoes continuous warble

Loudness
☐ Echoes whispering ☐ Echoes quiet/loud voice (bye-bye vs. **BYE-BYE**)

Duration
☐ Sustains *ahh* for 3 seconds, echoically

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Pitch

☐ Echoes pitch variations in 1-2 lines of a familiar song ☐ Echoes continuous warble

Loudness

☐ Echoes whispering ☐ Echoes quiet/loud voice (bye-bye vs. **BYE-BYE**)

Duration

☐ Sustains *ahh* for 3 seconds, echoically

Early Echoic Skills Assessment

Video

Echoic “*Quick-checks*”

Video

- Fast trials
- Short sessions
- Tokens reinforce rapid, accurate responses

17 in 45s

Tool #3

SAS: Sound Acquisition Sequence Checklist

To identify level of speech syllables to target

- 1 Vocal control practice (babbling, general vocalizations)
- 2 Vowels
3. Consonants in 1-syllable combos
4. Consonants in 2-syllable combos
5. Consonant blends in 1-syllable combos

Level 1 Vocalizations

Pitch	Loudness	Duration	Hi voc BL
-------	----------	----------	-----------

Level 2 Vowels & Diphthongs

a	i	u				
			ai	oi	au	

Level 3 Consonants in 1-syllable combos

C-V	V-C	C-V-C
-----	-----	-------

Level 4 Consonants in 2-syllable combos

Reduplicated	<i>E.g., ma-ma, bye-bye</i>		
Mixed			
CV-CV	A – same C, diff V	<i>baby, cookie, daddy</i>	
	B – diff C, same V	<i>boo-hoo, tee-pee</i>	
	C – diff C, diff V	<i>potty, taco, funny</i>	
CVC-CVC	A – diff 1 st C, same V	<i>cat hat, put foot</i>	
	B – diff last C, same V	<i>cop car, pack pan</i>	
	C – diff 1 st /last C, diff V	<i>take bath, wash dog</i>	

Level 5 Consonant blends in 1-syllable combos

CCV, VCC	<i>blue, play, oops, ask, oink</i>
CCCV, VCCC	<i>spray, straw, asked</i>
CCVC	<i>green, clap, school</i>
CCCVC, CCCVCC	<i>street/streets, scratch/scratched</i>

Vocalizations

(adequate breath flow)

Duration Loudness Pitch

Vowels & Diphthongs

/a/ /i/ /u/

Simple syllables

ba	ba - ba	ba - bi
mi	mi - mi	ma - mi
	<i>reduplicated</i>	<i>alternated</i>

Blends & clusters

st-	sk-	sp-
-nt	-lt	-st

Manner differences

Front
Alveolar
Velar
Palatal

Example

m, b & p
n, t & d
ng, k & g
l, r

Later Priority

Voice-Voiceless differences

Sequential teaching is critical

ba	ba - ba	ba - bi
mi	mi - mi	ma - mi

Reduplicated syllables before
alternated vowel syllables

bye-bye before baby

Front consonants before
alveolar consonants

mommy before daddy

Alveolar **consonants** before
velar consonants

teddy before cookie

Note

Typical acquisition may not follow sequence exactly,
but *if speech teaching is needed*, the sequence can be supportive.

Skill set for /t/

ta

ti

tu

w/ main
vowels

ta-ta-ta

ti-ti-ti

tu-tu-tu

Repeated 3/s

ta-ti-tu

tu-ta-ti

ti-tu-ta

Repeated with
different vowels

ti-ma-bi

tu-bi-wi

no-ta-me

Alternated with
different consonants

tubby toy
to my house take me too

I want tacos
my teacher
it's Jack's turn

tuh
beet
ito
tum
tuhma
tay

meet
meetoo
tah
anta
ntak
ait

aitee
aiteetsh
eetsh
teetsh
its
ts

tsj
tsjae
st
ster
ter
tern

1. **Vocalizations**

	Level 1	Vocalizations					
	Pitch		Loudness		Duration		Hi voc BL

Prosody: Pitch, Loudness, Vowel Duration

Video

Vocalization baseline video

Video

Vocalization baseline – data during alone play

Vocalization BL – 42s sample – 3s intervals, playing with blocks

/	/			
/		/	/	/
/		/	/	

Total: **64%** (vocalization occurred on 9/14 3s intervals)

1. Vocalizations

✓	Level 1	Vocalizations					
✓	Pitch	✓	Loudness	✓	Duration	✓	Hi voc BL

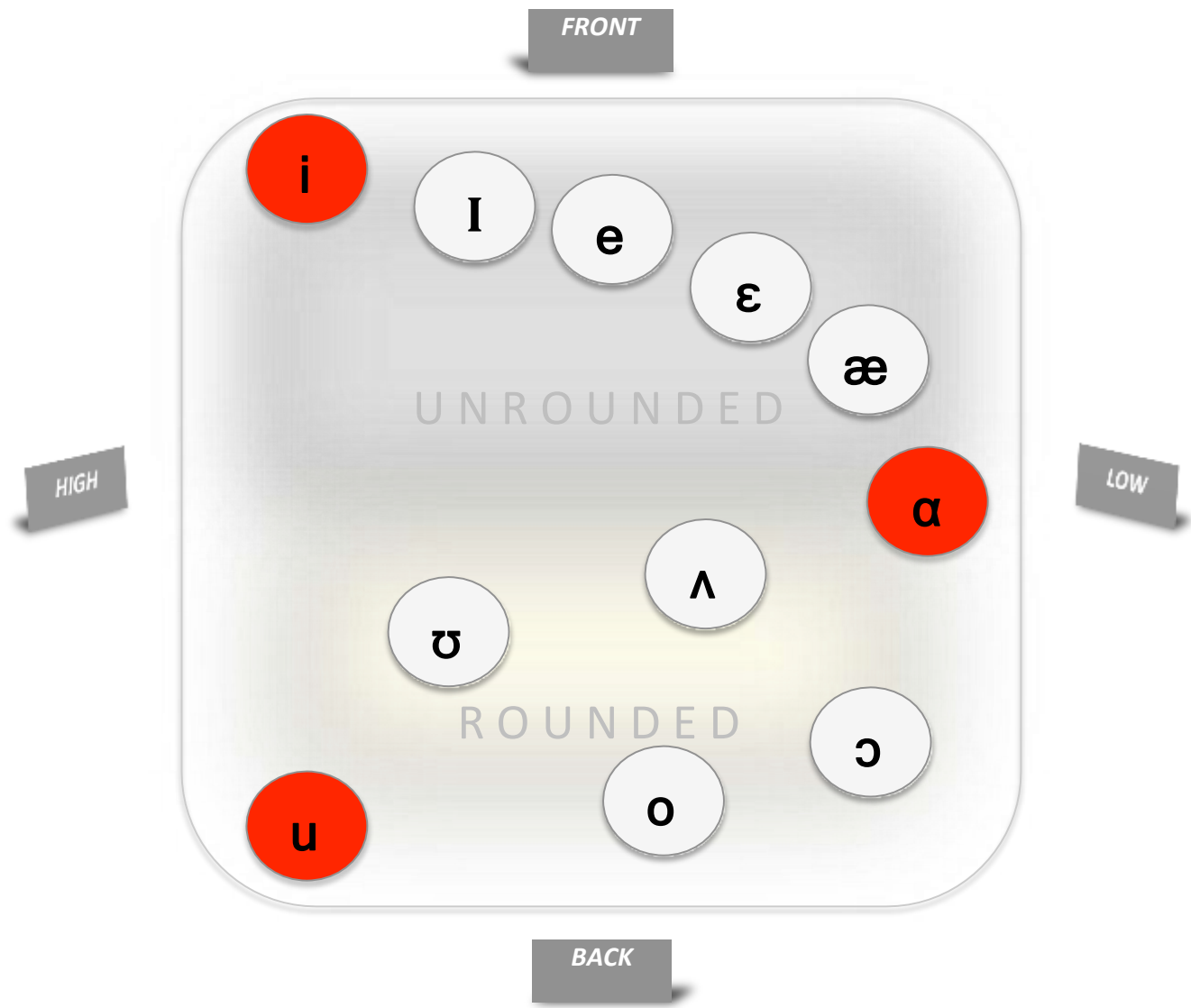
1. Vocalizations

2. Vowels

✓	Level 2 Vowels & Diphthongs										
✓	a		i	✓	u					✓	o
							ai		oi		au

Vowel Neighborhoods

1st and 2nd formant frequencies of vowels*



Key	
i	beet
ɪ	bit
e	bait
ɛ	bet
æ	bat
ɑ	lot
ʌ	love
ʌ	alone
ɔ	fall
o	boat
ʊ	full
u	fool

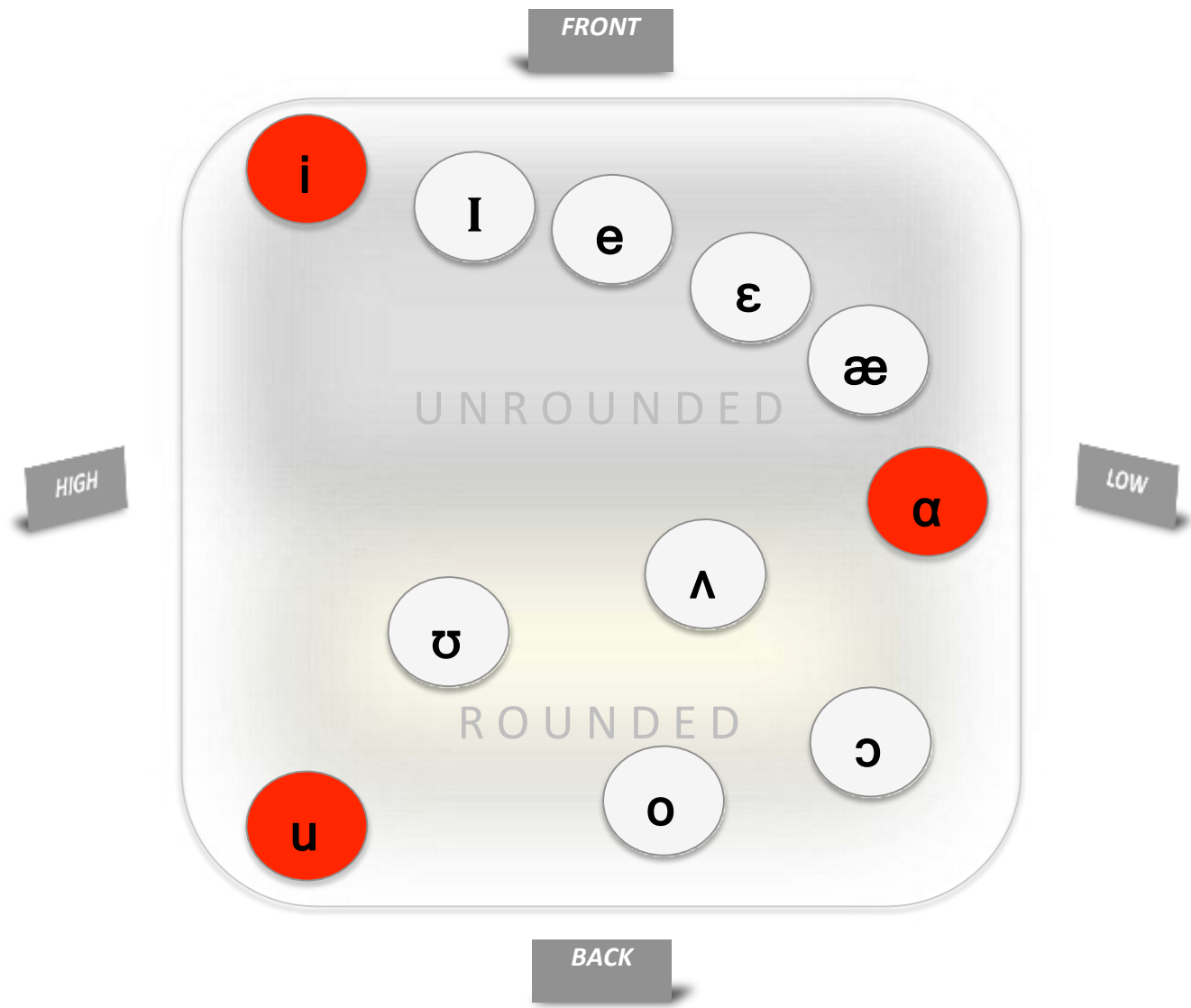
* Figure is stylized for simplicity and does not represent exact acoustic area for formant frequency ranges.

Barbara E. Esch, Ph.D., BCBA[®], CCC[®]/SLP

Video

Vowel Neighborhoods

1st and 2nd formant frequencies of vowels*



Key	
i	beet
ɪ	bit
e	bait
ɛ	bet
æ	bat
ɑ	lot
ʌ	love
ə	alone
ɔ	fall
o	boat
ʊ	full
u	fool

* Figure is stylized for simplicity and does not represent exact acoustic area for formant frequency ranges.

Barbara E. Esch, Ph.D., BCBA[®], CCC[®]/SLP

1. Vocalizations

2. Vowels

3. Consonants 1-syll combos

	Level 3	Consonants in 1-syllable combos			
		C-V		V-C	C-V-C

Consonants

*(These sounds are added during
SAS Levels 3 – 5)*

p - b	t - d	k - g	w
h	m f	n	ng
s - z	- v	th	sh
	r	er	l
	ch	j	

Speech Tracker Form

for early-skills syllable acquisition

	ee	ih or eh	ay	ae	ah	uh	oh	oo
p or b								
t or d								
k or g								
w								
m								
n								
s or z								
f or v								
th								
sh								
r								
l								
ch or j								

4. Consonants 2-syll combos

Level 4 Consonants in 2-syllable combos				
	Reduplicated			<i>E.g., ma-ma, bye-bye</i>
	Mixed			
	CV-CV	A – same C, diff V		<i>baby, cookie, daddy</i>
		B – diff C, same V		<i>boo-hoo, tee-pee</i>
		C – diff C, diff V		<i>potty, taco, funny</i>
	CVC-CVC	A – diff 1 st C, same V		<i>cat hat, put foot</i>
		B – diff last C, same V		<i>cop car, pack pan</i>
		C – diff 1 st /last C, diff V		<i>take bath, wash dog</i>

5. Consonant blends 1-syll combos

Level 5	Consonant blends in 1-syllable combos	
	CCV, VCC	<i>blue, play, oops, ask, oink</i>
	CCCV, VCCC	<i>spray, straw, asked</i>
	CCVC	<i>green, clap, school</i>
	CCCVC, CCCVCC	<i>street/streets, scratch/scratched</i>

Instructions for completing the SAS Checklist

General

- * Level 1: Observe in any environment where vocalization is likely to occur.
- * Levels 2-5: Echoic models are acceptable to use but are not required.
- * Examples are for reference only.
(Any exemplars of the skill are acceptable.)

Testing

1. At each Level, assess skills in blue/green boxes.
2. Check blue/green box if skill is acquired (i.e., skill occurs reliably).
3. If **all** blue/green boxes are marked, check the yellow Level box.

A check mark in the yellow box indicates that the entire Level skill has been acquired and thus supports skills at the next Level(s).

Exception: At Level 2, **any 3 blue boxes** are sufficient to check yellow

Level 1

Note: Vocalizations refer to “outloud” sounds (requiring vocal cord movement). Exclude unvoiced sounds (such as p, t, k, s, f, sh, ch) from scoring in this category.

- Pitch Look for hi/lo variations; not monotone
- Loudness Can voice be heard easily? Can speaker vary?
- Duration Can speaker easily vocalize any sounds for at least 3s?
- Hi voc BL In general, does speaker vocalize often (hi baseline)?

How to take a voc BL

Observe for 30 min in free play.

Divide period into 30s intervals.

Mark (+ –) if vocalizing occurs during interval.

Is there vocalizing in at least 80% of the intervals?

Level 2

- Write in any acquired vowel sounds, even if they are not listed.
- See Phonetics Cue Card for other Level 2 sounds to test.
- Any vowels are acceptable as long as they occur reliably and frequently.

Level 3

- Any combos are acceptable.
- Consult “developmental” guides (e.g., Vowel-Consonant Chart).
- Typical acquisition of consonants varies widely.

Levels 4 & 5

- See Echoic Phrases List for additional syllables in these categories.

Tool #4

“Shells”

“Every word can be reduced to its shell (this concept of word shells was introduced to me by Ms. Carole Goff, M.A., CCC/SLP).”

- Nancy Kaufman, <http://www.apraxia-kids.org/library/the-successive-approximation-method-of-therapy-for-children-with-apraxia-of-speech/>.

Writing targets in “shells” capitalizes on typical acquisition

Reduplication (ma...ma-ma)

Final consonant deletion (*chih* for chip)

Cluster reduction (*geen* for green)

These typical “errors” give clues about
how to simplify syllable combos

ba
ba ba
ba bo
ba do

buh
buh fai
buh duh fai
buh duh fwai

Phonetics help you “get it right” in target selection

Target: *chips*

Learner says: “*uh*”

Where to start?

Simplify to just “chip?”

Work on initial sound “ch?”

Teach substitute “tip?”

Target	tfip	tf	i	p
Continue to fill in missing sounds		t	i	p
Fill in missing sounds			i	p
Vowel “too wrong” - get correct vowel			i	
Current			Λ	

Use
placeholders
as needed

Target response too hard



Write a “shell”

- Easier responses
- Gradual steps
- Reinforce each step (shaping)



k æ t

Target syllable

t ʌ t

Current syllable - “tuht”

Shell step 3	kaet
Shell step 2	taet
Shell <i>start pt</i>	“taht”
Target vowel	/a/
Closest vowel	/a/
Vowel	Wrong

shoe

sh-oo

soo

too

oo



English Phonemes	Phonetic symbol	Sounds like
Plosives	p b	
	t d	
	k g	
Continuous, restricted airflow	s z	
	f v	
	θ ð	
	ʃ ʒ	<u>sh</u> oe
	tʃ dʒ	

shoe

sh-oo

soo

too

oo



*Shell sequence from Kaufman word approximations; <http://www.kidspeech.com>

Targets

		MAND <i>(vocal)</i>	ECH
Teaching steps			
End	7		
	6		
	5		
	4		
	3		
	2		
Start	1		
Prerequisite sounds			

balloon

		MAND tar	ECH tar
Teaching steps			
End	6		
	5	buh-loon	
	4	loon	buh-loon
	3	buh-loo	loon
	2	buh-oo	buh-loo
Start	1	buh	buh-oo
Prerequisite sounds		oo or uh	buh

Cheeto

Teaching steps		Mand tar	ECH tar
End	6		
	5	chee-to~	
	4	shee-to	chee-toe
	3	tee-toh	shee-toe
	2	tee-oh	tee-toh
Start	1	ee-oh	tee-oh
Prerequisite sounds		ee	ee-oh

music		Mand tar	ECH tar
Teaching steps			
End	6	myew-sic	
	5	moo-sic	myew-sic
	4	moo-see	moo-sic
	3	oo-see	moo-see
	2	oo-tee	oo-see
	1	oo-ee	oo-tee
Prerequisite sounds		oo	oo-ee

Practice

chip

	<i>Teaching steps</i>	Targets	Other possible syllables
<i>End</i>	8		
	7		
	6		
	5		
	4		
	3		
	2		
<i>Start</i>	1		
<i>Prerequisite sounds</i>			

Practice

pizza

	<i>Teaching steps</i>	Targets	Other possible syllables
<i>End</i>	8		
	7		
	6		
	5		
	4		
	3		
	2		
<i>Start</i>	1		
<i>Prerequisite sounds</i>			

- How do we know when to advance a target up or down?
-
- Have to monitor and probe skills at higher levels all the time, whenever you're working on speech.
 - We don't want to spend time working on some combos that are easily emitted - instead, for those combos, we can immediately build mand/tact opportunities.

Tool #5

Vocal VB Skills

“...a vocal response may be functionally independent under different environmental conditions despite similarity in topography.”

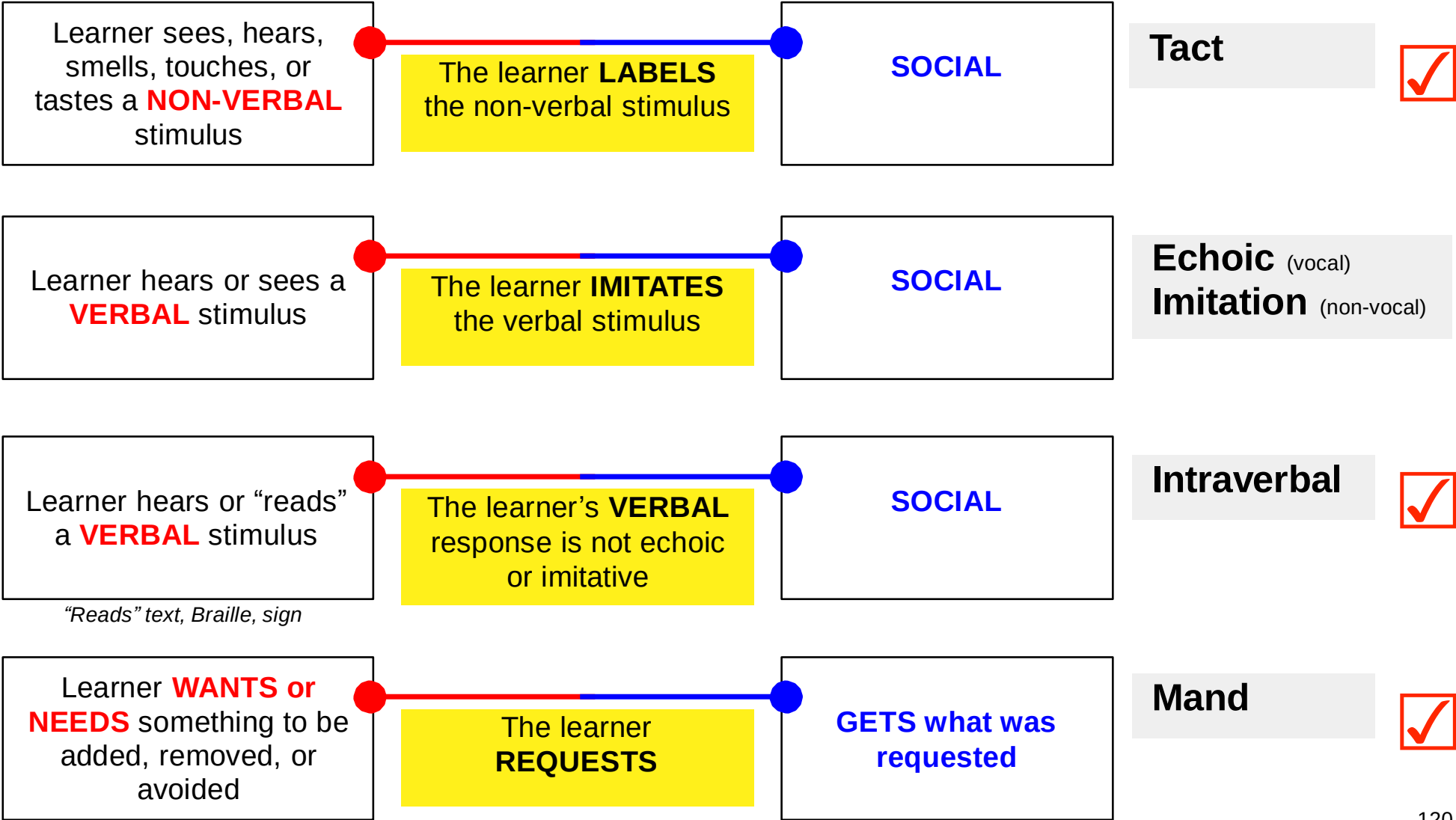
“The results of the current study...highlight the importance of conducting assessments of an individual’s vocal repertoire prior to language training... and during intervention.”

Kelley, M. E. et al. (2007).

Further evaluation of emerging speech in children with developmental disabilities: Training verbal behavior. *Journal of Applied Behavior Analysis*, 40, 431-445.

V e r b a l F u n c t i o n s

Are any of these verbal responses **vocal**?



Teaching in context of a preferred activity makes speech work fun.

This is not just desirable - **it is critical** for early speech learners.

It also aligns with typical speech-learning experiences.

Video

Vocal target: shorten duration 2-4 syllable combos
VB target: echoics, tacts, intraverbals

Data: from echoic and tact probes and NLT

Instruction period dates _____

Instructed skills

Targets ↓	Mand	Imit	Tact	IV	MTS	Echoic	LR
bread	Prevent access to bread, but give jar of PLB and tell to make sandwich	Untwist twist tie and say <i>Do it like this + Open it</i>	Hold up <i>What's this?</i>	(Next: when Tact M'd) <i>We need some</i> —	<i>Get one of these:</i> (Hold up own bread slice)	n/a	<i>Get the sack of bread</i>
Data:							
p7butter	(M'd)	Unscrew model jar & show <i>Open it like this</i>	Hold up <i>What's this?</i>	n/a	<i>This jar's empty; go get one from the cupboard</i> (Hold up sample)	"peaLNuh" (make sure he says the /n/ here)	n/a
Data:							
plate	<i>What do you need now?</i>	n/a	n/a	n/a	<i>Which plate matches this one?</i>	T models "pway" Next: "pwate"	<i>Get a plate</i>
Data:							
knife (plastic)	n/a (not tar yet)	Model how to dip into jar & scoop Next tar: Model how to spread PB	n/a	n/a	<i>Get another 1 of these, please.</i>	T models "nah" Next: "nai"	n/a
Data:							

Instruction period dates _____

Instructed skills

Targets ↓	Mand	Imit	Tact	IV	MTS	Echoic	LR
bread	"Bwed"	Untwists tie	"Bwed"	(Next: when Tact M'd) (T: We need some...) "BWED"	(T: Get one of these) Gets a slice of bread from bag	n/a	Gets the sack of bread when asked
Data:							
p7butter	(M'd)	Unscrews jar	"PeaLNuh"	n/a	(T: Get one of these) Gets jar of PB	"peaLNuh" (make sure he says the /n/ here)	n/a
Data:							
plate	"pway"	n/a	n/a	n/a	T: Which plate matches this one? Points/gets matching plate	"Pway"	Gets a plate when asked
Data:							
knife (plastic)	n/a (not tar yet)	Dips knife into jar & scoops out some PB	n/a	n/a	Get another 1 of these, please. Picks up matching knife from utensil bin	"Nah"	n/a
Data:							

No response to echoic model
Inconsistent response to echoic model
Inaccurate response to echoic model
Poor echoic transfer

Target

Increased vocalizations in general

Target

A vocal response to *every* echoic model

Target

A point-to-point matching vocal response to every echoic model

Target

Correct vocal response to non-echoic verbal stimuli; fade echoic prompts

Echoic transfer

Antecedent stimulus

Tact trial

“What’s this?”

Echoic prompt



This response informs the
topography of the next
echoic prompt

Response

p i t s ə

p i t - ə

p i - - ə

p - - - ə

Mand-Tact

Criterion for reinforcing:
Is it intelligible?

Echoic

Criterion for reinforcing:
Is it precise?

Select targets from:

- current available sounds
(voc BL, *EESA*)
- syllable skills (*SAS*)
- reinforce on rich schedule if intelligible
- ok to give echoic prompts if higher skill acquired echoically, but must S+ lots of 1st attempts, if intelligible
- Continue echoic work

Select targets from:

- shell requirements to support vocal mands-tacts
(write on echoic-to-mand card)
- *EESA* and *SAS* information
- embed into other activities most of the time
- ok to do “runs” of 10, 20, 30 echoic trials as isolated practice if not aversive to child, but deliver S+ on CRF to shape

Example - Core Vocabulary

Toys	Food	Animals	Clothes	Vehicles	Household		School
ball	apple	bear	button	airplane	bag (sack)	ladder	backpack
balloon	banana	bird	coat	bicycle (bike)	Bandaids	lamp (light)	board
blocks	bread	bug	dress	boat	bathtub	laundry	book
book	broccoli	butterfly	hat	bus	bed	microwave	computer
bubbles	butter	cat	jacket	car	blanket	napkin	crayons
doll	cake	chicken	pajamas	helicopter	bowl	oven	flag
drum	candy	cow	pants	motorcycle	box	pillow	glue
movie, video	carrot	dinosaur	scarf	tractor	brush (comb)	plate	letters
music	cereal	dog	shirt	train	camera	radio	lunchbox
Play-doh	cheese	duck	shoes	truck	chair	refrigerator	marker
puppet	chicken nuggets	elephant	shorts	wagon	clock	rope	numbers
puzzle	chips	fish	socks		closet	shelf	paint
swing	cookie	frog	swim suit		computer	shower	paper
Teddy bear	corn	giraffe	underwear		couch	sink	pencil
	cracker	horse	zipper		couch (sofa)	soap	scissors
	drink (noun)	lion			cup	spoon	tape
	egg	monkey			desk	stove	
	fries	pig			door	straw	
	grapes	rabbit			drawer	table	
	hamburger	sheep			dresser	telephone	

Example - Vocal VB Skills Checklist

	Vocal?				Vocal?			
	M	T	IV		M	T	IV	
				Toys				Food
1	☒			ball		☒		apple
2				balloon				banana
3				blocks				bread
4			☒	book				broccoli
5				bubbles				butter
6				doll				cake
7				drum	☒	☒		candy
8	☒			movie, video				carrot
9				music				cereal
10				Play-doh				cheese
11				puppet				chik nuggts
12	☒			puzzle				chips
13				swing				cookie
14				Teddy bear				corn
15					☒			cracker
16								drink (noun)
17								egg

Contact

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