

Implementing a Phonetically Consistent Treatment Program for /r/ Articulation Disorders Using The Entire World of R™



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How do you feel about /r/?

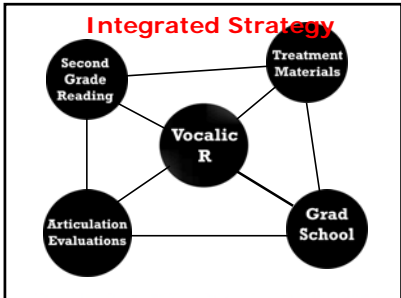
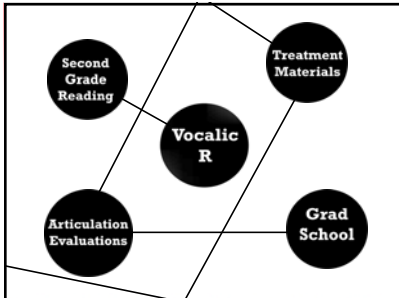


Does your method of /r/ evaluation & treatment:

- Focus heavily on [er] to exclusion of other phonemes?
- Utilize phonetically consistent probe lists for production training?
- Provide measurable progress?
- Consider /r/ in ALL variations?
- Treat only misproduced sounds?

Discussion

The lack of a comprehensive remediation strategy is rooted in a general misunderstanding of the /r/ phoneme, deficiencies in post-graduate education instruction, deficient remediation materials, and most notably-- no generally accepted *effective* method for tackling core /r/ phoneme misarticulation.



Objectives

You will:

- Identify the 8 /r/ controlled vowels.
- Know how to phonetically evaluate and treat the various word positions of the 8 /r/ controlled vowels.
- Be able to write measurable, objective IEP goals for the /r/ phonemes.
- Be able to differentiate between visual and non-visual /r/ controlled vowels.
- Be able to implement at least 3 articulation techniques to elicit the /r/ phoneme.
- Know the benefits of evaluating and treating /r/.

Presentation Overview

- Targeted for intermediate level of knowledge. However, encompass entry-level to experienced clinicians.
- Research review.
- Evaluation procedure.
- Specific treatment strategies.
- Multi-media: Video and Case Studies.

Facts About /r/

- /r/ can be consonantal (e.g. red) or vowel-like (e.g. star).
- Consonantal /r/ and the 11 initial blends are easier to evaluate & treat.
- Vocalic /r/'s are more complex since they are comprised of the vowel + the /r/.

Facts About /r/

- One of the most frequently misproduced sounds.
- One of the later developing phonemes
- Regarded by SLPs as one of the most difficult disorders to correct.

Facts About /r/

- Post-vocalic /r/ is influenced by vowel.
- Production of /r/ changes according to word placement and surrounding sounds, especially vowels which come directly before (e.g. *Archie, Ernie, Erie, airplane*).

The Changing Nature of /r/

The phoneme /r/ in the word "CAR" (/ar/ final) is pronounced differently from the word "FOR" (/or/ final) or the word "BUTTER" (/er/ final).

Figure 1.2 /r/ mouth position, as in CAR

Figure 1.1 /r/ mouth position, as in FOR

However, the final /r/ phoneme in the word "ANCHOR" is pronounced the same as the /r/ phoneme in the word "BUTTER". This is because they are both phonetically /er/ final words despite the spelling differences.

Why is /r/ different than other phonemes?

- No consistent placement as there is for other phonemes (e.g. /t/ or /s/--alveolar ridge).
- /r/ cannot be treated solely by word position, each vocalic /r/ allophone is produced differently.

Categories of /r/

- Prevocalic, Initial, or Consonantal /r/
e.g. *ring, run, race*
- Initial /r/ Blends
e.g. *price, break, straight*
- Vocalic /r/ or r-controlled
e.g. *door, star, skier*
- Medial/final /r/
e.g. *girl, swirl, barrel*

/r/ blends

[pr] pride	[br] brought	[tr] tried
[dr] drain	[fr] frog	[kr] crash
[gr] great	[str] string	[thr] thread
[spr] spring		[shr] shred

Vocalic Variations of /r/

[er] Ernie buttercup feather	[or] Orville corn four	[ar] Archie barn star
[air] Erin ferry fair	[ire] Ireland fire fireman	[ear] Erie cereal deer

32 Types of /r/

Many unique /r/'s to consider!

Treat each of the vocalic/r/ allophones as individual sounds in evaluation and treatment procedures.

Traditional /r/ Therapy

One of the major sources of frustration in the field of speech-language pathology is that /r/ has been evaluated and **treated primarily for its consonantal qualities**, while either ignoring the more complex vocalic /r/ or grouping it into a single category.

Traditional Evaluation & Treatment Method:

**initial /r/
medial /r/
final /r/**

Traditional Approach to /r/--What's Wrong?

- Does not account for each unique /r/ phoneme.
- Some words have recurrent /r/'s.
- Phonetically inconsistent probe lists for production training.
- Probe lists compiled by spelling of word.

Traditional Approach to /r/--What's Wrong?

- Excluded ALL INITIAL VOCALIC /r/'s (i.e. *army, airplane, organize*).
- Does not evaluate or treat the individual vocalic /r/'s, but grouped vocalic /r/ into one category.
- Remediated all students the same.

lor Initial	lor Medial	lor Final
Orville	Award	Snore
Ornament	Export	Adore
Organ	Fork	Core
Orient	Board	Floor
Oriole	Worn	Soar

Phonemic Approach

vs.

Initial	Medial	Final
Ribbon	Barefoot	Car
Run	Buttercup	Fear
Rain	Thorn	Four
Race	Wireless	Butter
Ring	Barn	Software

Traditional Approach

Phonetically Consistent

- Targets only one allophone at a time.
- Repetitive practice of a single allophone.
- Exclude other sounds.

Tenets of Phonetic Consistency

- Targeted practice.
- Only 1 /r/ per word for "pure" practice.
- All of the vocalic /r/'s + initial /r/ blends are represented for each word position.
- Words and images are used as a tool for specific **elicitation techniques**.

Benefits of Phonetic Consistency?

- Only practice specific allophones that correlate to student's misproductions.
- Probe lists are consistent.
- Manner and production for the specific /r/ allophones are repetitively practiced
- Consistent ear training.
- Oral musculature and kinesthetic awareness is increased.

Why focus on one sound & word position at a time?

- Provides consistent practice & repetition.
- Enhances ear training/motor planning.
- Ensures student/SLP knows goal.
- Allows productions of other misproduced /r/ allophones not yet targeted in therapy to generalize.
- Document student progress.

Does a phonetically consistent /r/ approach work?

Phonetically Consistent Approach to /r/ Study

- Conducted in a naturalistic environment (elementary and middle school).
- Practicing SLP's collected the data and administered evaluation and treatment procedures.

Phonetically Consistent Approach to /r/ Study

- 31 Students, 12 Speech Pathologists.
- Ages 6-14 with average time in therapy of 1.66 years.
- Single subject design.
- Two baselines per student.

Phonetically Consistent Approach to /r/ Study

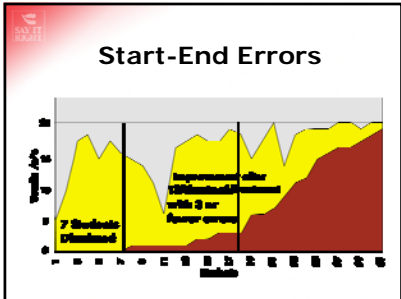
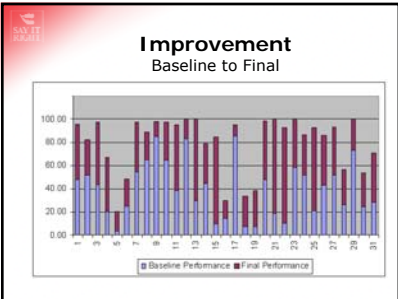
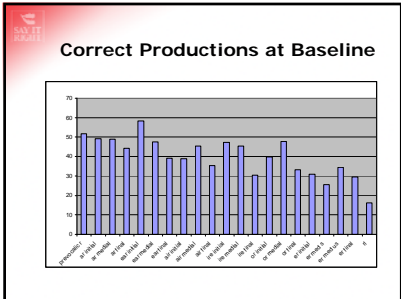
- 6 month period (Jan. - July)
- <15 hours treatment. End 20 hours.
- Method: Single target, until 80% accurate at sentence level 5 consecutive times. Re-test for generalization, then chose new target.

Study Screening

- Very specific – Evaluated single words, phrases, and sentences for 32 different types of /r/.
- Provided correct percentage for each sound and word position. Allowed for easy determination of performance.
- Enabled researcher to logically choose intervention targets.

The Entire World of R™ Advanced Screening for /r/

Student Name	Age	Session	High Point	Session
Target:	Screening 1	Screening 2	Screening 3	Screening 4
Prevalence R Screening				
High Point	Session	High Point	Session	High Point
Word	Position	Word	Position	Word
Correct	Percentage	Correct	Percentage	Correct
AR Screening				
High Point	Session	High Point	Session	High Point
Word	Position	Word	Position	Word
Correct	Percentage	Correct	Percentage	Correct



What does this mean to me?

I just want to treat /r/!

Where do I start?

Start With a Comprehensive Evaluation

- Evaluate ALL vocalic /r/ allophones in ALL word positions to attain a comprehensive understanding of student's individual present level of performance.
- Evaluate prevocalic /r/ (red) and all initial /r/ blends (e.g. bread).

Evaluation Objectives

- Administer **entire** Advanced screening (all /r/ allophones).
- Differentiate correct and incorrect /r/ productions.
- Choose one target.

Why Evaluate All Different Types of /r/?

- To find a starting point for treatment research shows that *almost all students can produce at least 1 type of /r/*. (Curtis & Hardy, 1959; Ristuccia, 2005).
- Pinpoint exactly where to begin therapy according to your student's **individual** needs.

Jacob's Single Word Screening

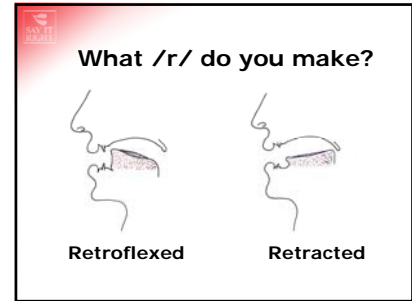
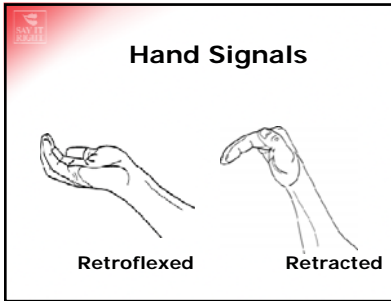
Jacob's Screening Result

Jacob's Results

- Even though many /r/ productions are misproduced, Jacob does have allophones that are correctly produced.
- Ignore errors and focus on using his correctly produced productions to elicit chosen target.

How to Determine Productions of /r/

- Instruct her to say one of the correctly produced /r/ words and ask what her tongue is doing.
- Use her productions to determine her natural production of /r/: **retroflexed or retracted**.



What /r/ do you make?

Who makes a retroflexed /r/?

Who makes a retracted /r/?

Who does both?

Why Establish Natural Production?

- To know which verbal cues and hand signals to use as your starting point.
- To use what the student's tongue does **naturally** to increase kinesthetic awareness of tongue placement.

Evaluating with Dialectal Differences

Tenets of the Phonetically Consistent Approach

- Evaluate all of the vocalic allophones of /r/, prevocalic /r/ and initial /r/ blends.
- Differentiate between correct and incorrect productions.
- Choose target according to student's **individual** needs.
- Only target specific misproduced /r/ allophones.
- Use student's correct productions to elicit incorrect productions.

Plan Remediation

- Choose target based on screening results, noting correct and incorrect productions.
- Apply elicitation techniques based on the specific word position of the target (will vary student to student).
- Consistently focus on chosen target until mastery.
- Use phonetically consistent probe lists for selected target.

Choosing an Intervention Target

Based solely on screening results, choose one sound most likely to correct based on screening → highest correct percentage below 80%.

You don't have to remediate all 21 allophones of /r/!!!!!!

- Target only the misproduced /r/ allophones!
- Only need to remediate if all /r/ allophones were **chronically** misproduced and there was lack of generalization.

Treatment Goal Samples

Sample Goal:
Alex will produce [ar, or, ire, and ear] with 80% accuracy at the sentence level for 5 consecutive sessions.

Sample Working File Goal:
Alex will produce [ar] initial, medial & final word positions with 80% accuracy for 5 consecutive sessions. [ar] final will be the first target followed by [ar] initial.

Review: Evaluation and Target Selection

- Evaluate all variations of /r/.
- Interpret the evaluation results.
- Choose one intervention target by determining allophone with highest chance of improvement.
- Write goals and objectives.

Tips for Working with Students

- Multi-modality--involve many senses.
- Repetition--get as many practice words in as possible.
- Homework are words student can **produce perfectly** in therapy.
- Consistent, consistent, consistent.

Blocked vs. Random Practice (Motor learning theory, Skeitton, 2004)

Traditional Blocked Practice	Random Practice
Isolation	Sentences
Single Words	Isolation
Phrases	Structured Conversation
Sentences	Single Words
Structured Conversation	Phrases
Spontaneous Conversation	Spontaneous Conversation
Maintenance	Single Words
	Maintenance

Visual Teaching Tools

AR + retroflexed

retracted

Isolation

Say Ahhh-RR!

Name: _____ Date: _____

Directions: Watch Alex the doctor or Alex the dentist when they say "ahhh-RR!" to hear what "ahhh-RR!" sounds like. Copy or draw pictures and say "ahhh-RR!" while holding the correct pronunciation. Student gets to color in or "tag" their pronunciation. For an additional challenge, separate words and say "ahhh-RR!" through the mouth of the words for the "ah-RR!" sound.

Isolation

Arrrrrr!

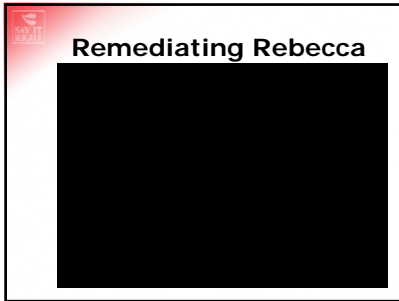
/ar/ Initial Single Words

Name: _____ Date: _____

Directions: Say each word slowly. Make sure to change the "ahh" to "ahrrr". Mark the identification lines as appropriate for correct pronunciation.

arbit	argument
arbitrator	argumentative
arbitration	argumentative
arbitrator	argumentative
arbitrator	argumentative
arbitrator	argumentative

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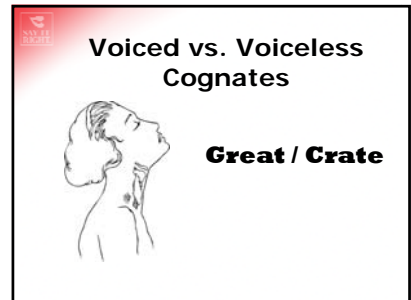
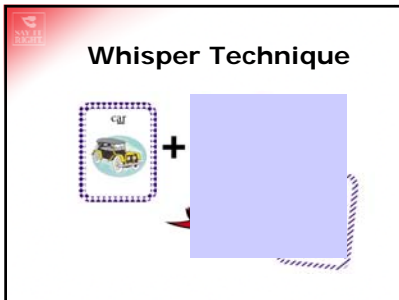
Remediation of (Prevocalic /r/)

- Have student use a mirror so that she can see her own mouth. This is important to eliminate any lip rounding and ensure that the student is producing both the /r/ plus the vowel.

Use Prevocalic /r/ to Elicit ear

- A successfully produced prevocalic /r/ can be used to shape other /r/ variations.

Example: *ear red*
slowly fade out *red*.



How to Evaluate voiced vs. voiceless cognates?

Probe for vocalic/consonantal and consonantal/vocalic combinations for a target allophone. (Elicitation Probe).

orp/orb	por/bor
ort/ord	tor/dor
ors/orz	sor/zor

When to move onto the next sound and/or word position?

- Once a word position for target /r/ is mastered (criterion is 80% for 5 consecutive sessions at sentence level).
- Re-administer advanced screening to choose next intervention target and assess generalization.

Always Review Previously Mastered Sounds

- At the beginning of each therapy session review and practice previously mastered allophones.
- Use sentence or reading level materials.

Ways to Encourage Self-Monitoring & Evaluation

- Remind student each session of his specific goal.
- Marbles in a jar.
- Students check-off correct responses on a data sheet.



Ideas for Getting Multiple Responses

- Use word lists or picture cards.
- Use a tally counter.
- Set a timer and reward for correct productions.
- Have a contest to encourage competition between two or more students or you and the student.

Working with Groups

- Attempt to schedule all /r/ students together.
- Treat each student/allophone separately. Each student will have own treatment plan tailored to their **specific** needs.

Age to Begin Treatment

- Developmental: at 7-8 years old.
- Normative Sequence: when muscles are matured and /r/ controlled vowels are taught in 2nd grade curriculum.
- Complexity Approach: Begin with later developing sounds to achieve generalization in early developing sounds (Morrisette, et al 1996).

Appropriate Homework

- Stage 1: Practicing natural tongue positioning (retroflex vs. retracted /r/) to gain kinesthetic awareness.
- Stage 2: Send home words that the student can consistently produce **perfectly** in therapy.

Homework: Good Practice Times

- In the morning before brushing teeth.
- Before or after homework.
- As soon as they get home from school or right before dinner.
- Before they go to bed at night.
- At the dinner table or use phone if working on transferring /r/ to conversation.
- Have family members help if needed.

Ways to Measure Student Progress:

- Briefly review previously mastered targets to check for retention.
- Use advanced screening tool to collect current data and evaluate direction of therapy.
- Use Daily Data Collection and Daily Tally Sheets to measure progress day to day.

Daily Data Collection

Student Name: _____ MR Date: _____
 MR: _____
 Date: _____ Date of Birth: _____ Working MR Number: _____
 MR Date: _____ Beginning Date: _____

Daily Data Collection Sheet				
Word	Target	Activities	Tally	Accuracy/ Difficult Words

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Reasons for Lack of Progress- Chronic /r/ students

- Traditional approach was taught with lack of target/wrong target.
 - Student taught incorrectly (er red, er run etc.)
 - Student not taught natural tongue positioning.
- Speech has become **effortful**.

Brock

- ### Lack of Success
- Re-administer the Advanced screening to check generalization and choose a **new** target.
 - Review and practice /r/'s that the student can correctly produce.
 - Administer Elicitation Probe for in-depth screening.

- ### Dismissal Criteria
- When students can produce all /r/ allophones with at least 80% mastery at the sentence level.
 - When students, parents, and teachers report it is no longer a problem.
 - When articulation needs can be addressed at home or in the classroom.

- ### Review: Intervention
- Treat only one target until mastered with criterion of 80% at sentence level over 5 consecutive sessions.
 - Re-evaluate/note generalizations.
 - Select new target and treat.
 - Continue until all allophones are correctly produced.
 - Review and reinforce.

Full Day Training

When: Jan 25th, 2008

What: R and Sibilants (s, z, sh, ch, j, zh)

Where: Eastconn, Hampton, CT

Who: Heidi Van Flatern 850-455-0707

Questions?

- ### Case Study #1
- Matthew
 - 10 year-old 5th grader
 - Mispronounces his /r/'s
 - You conduct Advanced screening....

Shelly's Target Considerations using Elicitation Techniques

- Coarticulation within a sound family.
- ear final (0%) + ear initial (100%)
- air final (0%) + air initial (100%)
- or final (0%) + or initial (88%)

Which target do you choose and why?

Probe	EA final	EA initial	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final
100	33	33	0	100	55	22	100	44	0	44	33	33	0	44	0	88	22	0	0	0

Intervention Target = Depends on success using the elicitation techniques

Case Study # 3

- Billy is 11 years old.
- Referred by his teacher because he can't say /r/.
- He loves race cars and trucks, but kids make fun of his speech when he's playing.

Billy's Screening Results

Probe	EA final	EA initial	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final
35	77	33	0	100	100	100	100	44	33	0	11	0	100	11	77	11	11	0	0	0

EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final
88	11	65	100	88	88	100	100	88	88	100	88	88	100	88	88	100	88	88	100	88

Which target do you choose and why?

Probe	EA final	EA initial	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final
35	77	33	0	100	100	100	100	44	33	0	11	0	100	11	77	11	11	0	0	0

EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final	EA final
88	11	65	100	88	88	100	100	88	88	100	88	88	100	88	88	100	88	88	100	88

Billy's Potential Targets

Which are below 80% and above 50%?

- [ar] initial - 77%
- [or] initial - 77%
- [tr] blends - 55%

How to choose if both targets are 77%?

Use Elicitation Probe to determine stimulability of all vocalic-consonantal combinations for a specific word position.

Which Target?

- Probe for cognates for [ar] initial and [or] final.
- [br] and [spr] blends are only 11%; [tr] is only 55%.
- Work on vocalic /r/ first, see if generalization occurs on these isolated blends combinations.

[ar] Probe

Probe all [ar] initial allophones against all possible consonantal combinations

Bilabials (p, b)	
arp	par
abp	par
apb	par
abp	par

Labials (f, v)	
arf	par
arf	par
arf	par
arf	par

Alveolar	
arp	par
arp	par
arp	par
arp	par

[or] Probe

Bilabials (p, b)	
orp	por
orb	por
orb	por
orb	por

Labiodentals (f, v)	
orf	por
orf	por
orf	por
orf	por

Alveolar Stops (t, d)	
ort	por
ort	por
ort	por
ort	por

Which Target to Choose?

- [or] initial only shows one instance of using voiced vs. voiceless cognates.
- [ar] initial probing shows five instances of using voiced vs. voiceless cognates.

Intervention Target = [ar] Initial

Working File Goal

Student will produce [ar] in the initial position with the following phonemes found on the elicitation probe f/v, s/z, sh/j, k/g, and m/n, with 80% accuracy in single words phrases and sentences.

Suggested Treatment

- Voiced exercises- use correct voiced cognates to elicit misproduced words.
 - Use contrast words: arza and arsenic argue and ark
- Practice [ar] initial words until 80% accuracy at the sentence level is achieved.
- Re-screen. Pick new target.

Questions?

Handout

www.sayitright.org/resources

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