Persistent Articulation Distortions: From Shaping to Carryover

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To: Maureen Sweeney, Barb Nathanson and NSSLA

THANK YOU

A little about myself

- MA/PhD NU
- CF /first job NU
- Dissertation affect of lesions to the one of the nuclei of CN IX on swallowing in cats
- Private practice
  - Speech of those with hearing loss
  - CI
  - Articulation disorders, apraxia
- Clinical Faculty since last fall
  - Caseload of school-age persistent articulation distortions

Persistent Articulation Distortion

- Why are these distortions resistant to therapy?
  - Why are they not stimulable?
  - When they are stimulable, why is it so difficult to move to the next level?
  - Even when they progress to the next level, why is it so easy to slip into the old error production?

Disclaimer and Acclaimer

- **Disclaimer**
  - Based on my experience as a clinician
  - Many methods work, but sometimes it takes guts to stick it out with this population

- **"Acclaimer"**
  - Pam Marshalla
  - https://pammarshalla.com/

Clinical presentation

- If you are an experienced speech pathologist, I hope this reinforces what you know
- For the beginner and in-between, I hope that you will learn a few principles in treating distortions and points that will make you a more acute observer in
  - What you hear in a distortion
  - The physiology behind the distortion you hear
  - The target you choose to extinguish a habitual motor pattern
  - The type of model you present
  - The kind of cue to give
  - The kind of feedback to give

A few notes

- Hold questions about the presentation until the end

- From 8:30-8:45 there will be a 15 minute question and answer period

- A few of the second year graduate students will attend mid-session after their class ends.

Agenda

- Selecting a target production
- Pharyngeal "R"
- Facilitative Word
- Coarticulation
- Shaping
- Feedback and Cues
- Motor Practice and Carryover

Selecting a Target Production

From speech sounds to motor patterns

o American Speech Correction Association (1925)
o ASHA (1947)
o Treatment by Speech sounds vs. Distortions across sounds
o Distortion = variations in a motor system = motor patterns

Motor patterns

- A coordinated set of movements involving both voluntary and reflexive actions such as standing, walking, or speaking. Typically, the initiation and cessation of such acts are voluntary but once initiated, the movements continue _without conscious control._

- Ingrained chunked pattern

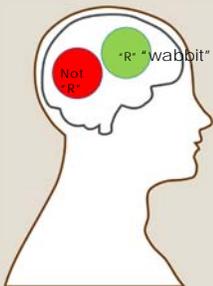- Instead of speech sounds such as /s/, think of the brain and motor patterns

- The brain

The brain is a sorter

"R" "wabbit"

Not "R"

"rabbit"

- Sorting vs. Teaching a sound
- Refining the system to increase accuracy of sorting

The closer the distortion to the target,
the harder it is for the brain to distinguish the two

◦ When the distortion is so close there is no overlap

◦ *"I wish it were a substitution because at least the brain would have two
established linguistic categories instead of two vague error and target groups"*
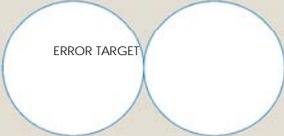
ERROR TARGET

If the brain is a sorter, why not keep the two
as far away as possible?

Which one would you choose?

ERROR TARGET

CHOICES:
Either make the error further away from
target
OR
Move the target further away from the
error

**Move the Target Further Away from
Error**

The brain is a sorter

ERROR

TARGET

What if we moved the target past <u>what is commonly accepted?</u>

(ERROR)   (CUSTOMARY PRODUCTION TARGET)   (TARGET) →
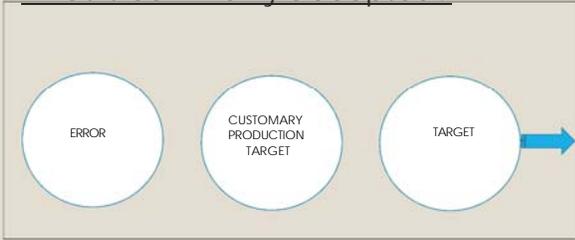
Selecting a target production: not just any motor pattern

Why not select a pattern that is effective in *extintinguishing the old pattern?*

what **if** why **not**

Principle: Make the target as far away from the error as possible to extinguish the error pattern

o **Select a target that is NOT the ultimate target that you are shooting for in carryover**

o **The over-correction will settle into the naturally correct target in conversational speech as they drift back toward the original error placement**

o **Different from shaping to correct production**

o **Changes short term goal to X "spot" in the oral cavity or pharynx, which is not correct production**
    o **Fronted production of palatal /tʃ/**

o **Never go near the old pattern during shaping**

How can you tell if you are extinguishing the old error pattern?

When the new errors are variations close to the new "playground" and never go back to the old "playground."

"Forget about the "R", just say anything in the back."

Distortions as old error patterns

- For the purposes of this talk, I will use the "R" distortion as an example for the application of principles.
- "R" will encompass all forms of / `,a /.
- We will assume that you have tried to teach the retroflex, bunched, and back "R". However, the distortion is still persistent.

New target: Pharyngeal "R"

Tip/Retroflex vs Bunched/Back"R"

Two Ways to Produce /r/

Retroflex   Bunched

back   tip

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Tip/Retroflex vs Bunched/Back/Retracted "R"

- What gives the back R an advantage, is that the Back R configuration keeps the tongue closer to its resting and speech position

- As such, the Back R can be used in speech that is lightning fast.
  The Tip R, on the other hand, draws the tongue tip away from its neutral position and into the back of the oral cavity and slows down speech

  Both "R"s are acceptable, unless the "R" does not sound like an "R"

Successful R Therapy
Pam Marshalla
2015 by Pam Marshalla
"The Back R" p19

The target and distortion: Creating two distinct speech sounds for the brain

- The closer the distortion, the harder is is for the brain to distinguish

- The target "R" is made in a similar place in the oral cavity as the distorted "R"

- The brain needs a bigger distinction

- What about going further back into the pharynx to make the "R"?

Pharyngeal "R": Posterior "Back R"

*1.Base of tongue retraction **

1. Elevation of back lateral margins of the tongue

2. Lowering of the mid-back of the tongue

4. Tensing of the mid-back of the tongue

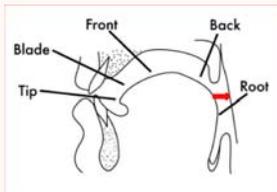We have many different short-term goals as opposed to working on one speech sound

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1. Tongue root retraction into pharynx – "'gugugug' stay in the back"

Watch for tongue tip and tongue retraction

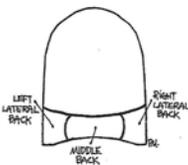## 2. Elevate the back lateral margins of tongue- superglue "ee"

Fig. 1.2. Back of the Tongue: The back of the tongue is comprised of three parts: the middle back and two lateral back sections.

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"The Back R" p18

Lateral view of back lateral elevation of the tongue

Back Front

HIGH BACK LATERAL MARGIN

VELUM
PALATE
TONGUE
INCISOR
BL

Fig. 1.4. Lateral View of the Back R Position: A true lateral view shows high elevation of the back-lateral margins.

Successful R Therapy
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"The Back R" p19

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3. Lower the middle of the tongue – superglue "ee" and say "guh"

Fig. 1.3. Aerial View of Back R Position: Note that the lateral margins of the tongue are stabilized, the tip is retracted and the middle section tenses.

TIP RETRACTION
STABILIZATION
TENSION
STABILIZATION
BL

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4. Only the mid-back tongue tenses.
Tensing the entire tongue prohibits correct shaping

Fig. 1.5. Posterior View of the Back R Position: The posterior view shows that the lateral back sections are stabilized in a high position and that the middle tenses but does not touch the palates.

UPPER MOLAR
LOWER MOLAR
RESONANCE CHAMBER
HIGH LATERAL STABILITY
TENSION
TONGUE
BL

If you tense the entire tongue, you will not have flexibility to shape tongue into proper configuration

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Why the cue "tense" can make things worse:

Fig. 2. Tongue position for the correct Back R. Notice that the back lateral margins are high and stable and that the middle back is tense.

Fig. 2.1. Tongue position for the distorted Back R. Notice that the middle back is very high and the lateral back margins are low and lax.

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"The Back R"

Facilitative Contexts:

Why not work on the one best word until you stabilize the target sound?

If you haven't established the sound in a facilitative context, there is no reason to move onto to other vowels, no matter how long it takes

It takes guts to take the time to extinguish a persistent motor pattern and learn a new motor pattern

KEEP CALM AND LET OTHERS DO THE WORK

Facilitative contexts: Back tongue consonants

/kɡŋ/

/j/

Pam Marshalla MA, CCC-SLP
The Frontal Lisp, The Lateral Lisp, The Distorted "R"
ORAL MOTOR TECHNIQUES
Innovative Concepts, Seattle WA,

Facilitative contexts for "R"

What initial blend?

GR

Which vowels would be facilitative for back tongue lateralization?

FRONT ——————— BACK
HIGH

beat — i   u — boot
bit — ɪ   ʊ — book
bate — e   Bert   o — boat
            ɝ
            ʌ again
bet — ɛ butter ə   ɔ — bought
                but
bat — æ   ɑ — bomb

LOW

■ FIGURE 2.8   English vowels, identified by

Facilitative vowel

What following vowel?

GRA

What else?

GRAINY GRAVY

How will we present the model?

COARTICULATION: A gold mine of information to the brain

In order to process more information we need to slow it down for the brain.

Slow it down so your client can process
Slow down production of your client so that you can hear it better to give accurate feedback
When you are coming from a /g/, there is more coarticulatory information

Let's practice
Slowing down coarticulation vs vowel nuclei /gɹ-e-e-e-eni/
Slowing down coarticulation vs target /grrrrrreni/
Slowing down coarticulation vs rest of word /greeeennniiii/

The slow down challenge:

g rrrrr eeeeee nnnnnn iiiii   ……

Shaping: Putting It All Together

Develop the client's ear while you are teaching production

When introducing a new step, incorporating discrimination of productions with and without the new feature when possible.

Shaping: Putting It All Together- Warm-up

1. *Base of tongue retraction – "gugugug"*
2. Elevation of back lateral margins of the tongue – "superglue 'ee'"
3. Lowering of the mid-back of the tongue – "superglue + /i, ɪ, ɛ, e, æ, ʌ/
4. Tensing of the mid-back of the tongue

Shaping Pharyngeal "R": Putting it all together

1. Gug-gug-gugug
2. "ee" - Gugugugug – "ee" - garainy
3. Garainy (front vs back demonstration)
4. Grainy
5. Geraineegeraineeger
6. Gerainbow
7. Erainbow – "baby er"
8. Erainboot erraincoat
9. Gugugug- gerand, gerandma, gerandpa, grandcat, grandfish

Two other ways to distort all "R"s

1. Base of tongue retraction
2. Elevation of back lateral margins of the tongue
3. Lowering of the middle of the tongue
4. Only the mid-tongue tenses, tensing the entire tongue prohibits correct shaping
5. *Positioning "R" before voicing*
6. *Holding "R" to flavor the following vowel*

You hear an "R" somewhere but not the whole time?

The "R" is too late
◦ **The tongue needs to be in the "R" position before vocalizing initial "R"**

The "R" is not held
◦ **The tongue need to be in the "R" position throughout the word** ◦ **Much easier to do with back or retracted "R"**
◦ **Say "grilling, gleeful, murdering**

Hearing shades of "R" - timing

"R" is too late: /goɹeni/ "gorany" vs /gɹeni/ "grainy"

"R" is dropped: dropped vs "grainy"

Practice

Hearing shades of "R": Oral cavity vs Pharyngeal "R"

+**When** you don't hear a strong back "R" originating in the pharynx, practice "gugugug"

+**"Say** it in your throat, in the back"

+**Use** client's terminology

Hearing shades of "R" – Elevated vs Dropped sides of tongue

When the sound is made in the back and is slightly derhoticized, it's time to elevate the sides of the back tongue.
Superglue "ee"

Principles: Shaping

1. Have a definable, unmovable, fixed target in your head
2. Hear gradations and intimately know the physiology of the gradations
3. (Intimately know the physiology of your own production of the target sound)
4. Know the ways you can distort an "R"
5. Make sure your model isolates what you are targeting
6. Cues are determined by the feedback that elicits change
7. Feedback

FEE CK N CUES

FEEDBACK

- Without feedback, the client could have stayed home and said words on his own in
  front of the TV.
- Without feedback, the brain is unable to improve sorting
  - Did that one go in the correct pile?
- Without feedback, the brain does not have information to modify output
  - Relying on the "faulty" feedback loop and motor system alone of the client

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SORTING FEEDBACK TO SHADES OF GRAY

- Sorting feedback: yes vs no
- Programming feedback: 99.9%, don't let go of the "ee"

- How do know when it's 99.9% vs 100%?
- Most important feedback for sorting- "I'm not sure so I'm going to say no – it's a 99.99%"

LISTEN Tel OUR DX

FEEDBACK

§ Explain your body language to the client to save time

TYPES OF SPECIFIC FEEDBACK (PROGRAMMING)

- Forget the "R", just stay in the back
- Leave the tongue in the "R" position during the entire word
- Don't go there, stay in your playground.
- Relax.
- Superglue "ee"
- Get your tongue in the "R", before you say the word
- Say "gugugugug" while supergluing the "ee"
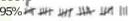- Most important feedback: I'm not sure why, but that was not 100%

TAKING DATA DURING SHAPING
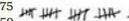
- Measurable behavior: (hope)
  - Gugugug produced in the pharynx
  - 100% 95% 75% 50% 0%
- In the beginning, call out the percentage and have student tally the ratings
  100%
  95% ~~JHT~~ ~~JHT~~ ~~JHT~~ ~~JHT~~ |||
  75
  50 ~~JHT~~ ~~JHT~~ ~~JHT~~ ~~JHT~~ ~~JHT~~ |||
  0%
- Have the student figure out how they would like to organize their percentages and
  tally marks
- Tallying gives ownership to the client by active instead of passive participation

Cues = Feedback

Model -> Feedback -> Cues

Motor Practice and Carryover

Motor practice vs generalization to other context

- Using one word with the best facilitative context only
- The brain can judge and compare with greater accuracy if the stimulus does not change
- 200-300 repetitions/40 minutes
- Keep focused on your goal

How to keep client focused

- Pacing
- Tallying
- Reward for tally marks
- Challenge to break the record
- ("Buy-in") – intent, trust- honesty

How do I know when to leave the one facilitative word?

- 100% correct, 30-100 times in a row, depending on stability of motor system
- Errors never are made in the old location and are variations of the new location.
  - This is the surest sign that the old motor pattern is extinguishing and occurs first
- Self-monitoring and then self-correction

5 activities that incorporate motor practice

- Tallying to throw a ball
- 100% wild throw
- Tallying to break a record
- Dealing out a deck of cards, then playing speed or war
- Games to come up with categories with single facilitative word
- Grainy-Cubs, Grainy-Indians (by league or divisions)
- Conversing in single facilitative word

Scaffolding to establish motor stability: Taking one word to carryover

- Use one word until your "R" target is 100% correct 50 times in a row.
  - "Gravy" or "grainy"
- Gradually increase from 1 time to 5 times per breath

Build on the one word to secure motor stability and start carryover skills

+Add another syllable: Grain-bow, grain-boot

+Add fluency and increased rate: Grainy-day, week, month

+Add word finding: –Cubs, White Sox…; IL, WA, WI…; (Pick a topic of interest to the other person)

+Add intonation: Yes-No question, agreement,

+Add feelings: frustration, disbelief

+Have a conversation with one word: grainy? Grainy! Grainy (sarcasm – "right")

From shaping to carryover

Start carryover on day 1
- Laying down foundation of the new motor pattern
- Not linear or sequential
- Backwards from carryover to shaping

Because often when carry over doesn't happen, you need to go back to the beginning

1. Did you select an appropriate target?
2. Were the fundamentals of the target motor speech pattern at 100% accuracy?
1. Did you give feedback that allowed the brain to sort 99.9 % vs 100% accurate productions?
1. 80% accuracy

1. Did you choose a target that took into consideration how the production will deteriorate in conversational speech?

- Address or periodically check conversational rates during motor practice by rapidly repeating target 3-5 times in one breath stream to observe how the sound breaks down in conversational speech.

- 100% correct fundamentals of motor speech pattern before leaving the facilitative word

- Work up to conversational rates during motor practice

With persistent motor patterns, moving in the smallest step possible is the only way to move forward

- "Gravy isn't what I like to eat at Thanksgiving."

- "At Thanksgiving, do you like to eat gravy."

- "I never said that I didn't like gravy at Thanksgiving."

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2. Were the fundamentals of the target motor speech pattern at 100% accuracy?

1. Does the tongue retract for all productions?

2. Are the back sides of the tongue elevated?

3. Is the mid back of the tongue lowered and tensed?

IF NOT, AT WHAT POINT DOES THE PRODUCTION DETERIORATE?

3. Did you give feedback that allowed the brain to sort 99.9 % vs 100% accurate productions?

1. Maybe I need to go back to a 100% accuracy level and focus on 99.99 vs 100% accurate productions

2. Take the responsibility and the blame

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4. Goal: "with 80% accuracy"?

20% Inaccuracy

80% Accuracy

CARRYOVER EXCERCISE: Awareness of when "R"s occur in speech

- Count and tally every "R" you say in a conversation by holding a finger up and saying a number after each "R" you say
- Model:
  - "I will hold up a fingerrr and count outloud afterrr everrry "RRR" that I say until I hit 10. If is miss one, I have to starrrt all overrr again. If you catch it and not me, I have to go to 15 instead of 10. Remember to speak slowly so you don't miss any."Now it's your turn."
- Every "R" is counted regardless of correctness. This is an exercise for the brain to become aware of "R"s in conversational speech.

CARRY OVER EXERCISE: Awareness of Correct Productions

- Count and tally *correct* productions in a conversation by holding a finger up and counting outloud or tallying points.
  - For every "R" that you catch: 1 point
  - For every "R" that is 100% correct: 2 points
- Model:
  - "I will hold up the number of points for every "R" you say.
  - A 100% correct "R" will be worth 2 points"
  - Hold up finger(s) that correspond to the number of points or use body language established with client (wide eyes and sitting straightening body)

CARRYOVER EXERCISE: *Awareness* of self-correction

- Level 1
  - Count and tally 100% accurate productions and self-corrections
  - One point for a 100% accurate production and 1-5 points for a self-correction, depending on how difficult it is to achieve
- **Level 2**
  - One point for a 100% accurate production
  - Minus 5 points without a self-correction
  - Start all over without a self-correction
- **Level 3**
  - Same as level 2 and go to 100 in a ROW
- **Level 4**
  - Same as level 3 and add loads
    - Language
    - Motor activities

CARRYOVER TO THE FINISH LINE

When even 300 in a row is not a problem, add loads to the conversation

- Language load
  - Answering inferential questions using complex sentences
  - Asking inferential questions of the clinician
- Preferred topic load
  - Explaining what you can win or the character's powers in Mario Kart Motor load
  - Explaining the rules of a game
- Motor load
  - Conversation while walking, throwing a ball in a orderly fashion to wild throws
- Custom loads
  - Sometimes reading is an easier level than conversational rate sentences with meaning and emotion

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Summary

+ Selecting a target production

+ Pharyngeal "R"

+ Facilitative Word

+ Coarticulation

+ Shaping

+ Feedback and Cues

+ Motor Practice and Carryover

THE END I HOPE YOU ENJO
Thank
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