UPDATE: Treating Articulation & Phonological Disorders in the Schools

Texas Region 10 Education Service Center
February 10, 2023

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Disclosure

Dr. Harris receives no financial or non-financial benefit by discussing any products or programs during this workshop.

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Handouts

See HANDOUT:
- *Title of Handout in Your Packet*

1. *Response (Data) Sheet*
2. *Technique for Correction of /r/*
3. *Shaping Procedure for Lisp*
4. *Treating Glottal Replacement*
5. *Intrusive /h/*
6. *Vowel Quadrilateral*

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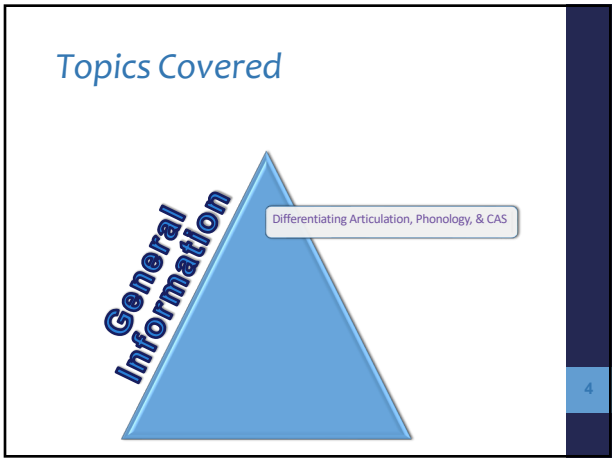
Topics Covered
General Information
Differentiating Articulation, Phonology, & CAS
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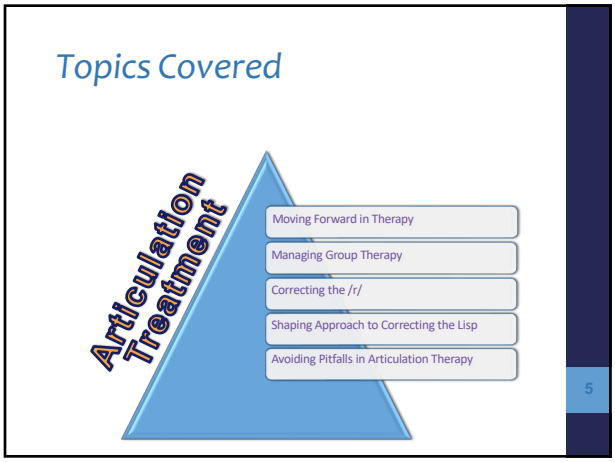
Topics Covered
Articulation Treatment
Moving Forward in Therapy
Managing Group Therapy
Correcting the /r/
Shaping Approach to Correcting the Lisp
Avoiding Pitfalls in Articulation Therapy
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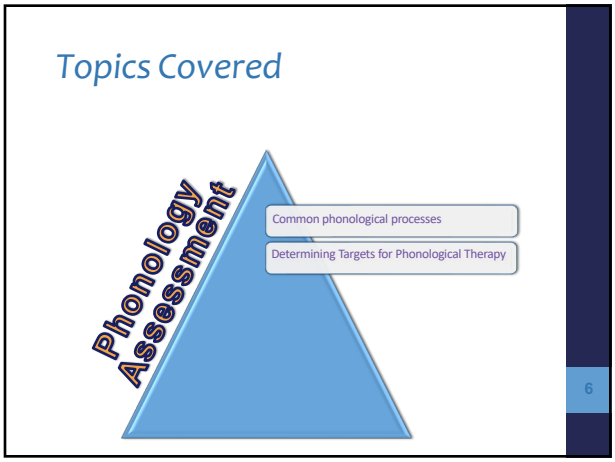
Topics Covered
Phonology Assessment
Common phonological processes
Determining Targets for Phonological Therapy
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Topics Covered

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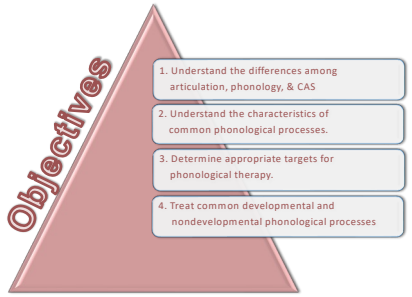
Learner Outcomes



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And now…

Let's have some fun!

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General Information

Differentiating an Articulation, Phonology, and Childhood Apraxia of Speech

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Speech Sound Disorders

Articulation

- Characterized by typically **predictable errors** that are usually developmental in nature.
- **Intelligibility** is mildly to moderately affected, based on the number of errors.
- Treatment is most successful is when it treats **individual phonemes**.

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Speech Sound Disorders

Phonology

- Characterized by **patterns** of speech sound disorders.
- **Intelligibility** is moderately to severely affected with multiple sounds affected.
- Treatment is most successful when it **treats patterns** of errors rather than specific speech sounds.

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Speech Sound Disorders
Childhood Apraxia of Speech

- The three speech characteristics *most useful* in differentiating a child with CAS from other children with severe speech sound disorders without CAS:
  - **Inconsistent errors** on consonants and vowels in repeated productions of syllables, words, and phrases.
  - **Vowel** deviations
  - **Prosodic** differences (intonation, stress, loudness). Coarticulation is affected by unusual transitions between between sounds and syllables.

These 3 are considered **DIFFERENTIALLY DIAGNOSTIC.**

All 3 characteristics (triad) do not need to be present to make a diagnosis of CAS since it **not a syndrome**. It is a **symptom cluster**, meaning that they are related.

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Speech Sound Disorders
Childhood Apraxia of Speech

- Other commonly reported clinical signs of CAS include:
  - Phoneme sequencing
  - Groping for sounds
  - Drooling
  - Limited consonants and vowels in the phonetic repertoire
    - May be difficult to diagnosis definitively
    - Trial therapy may be required to confirm a CAS diagnosis
  - Difficulty imitating oral (nonspeech) movements
  - Difficulty imitating sounds and words
- These speech behaviors are not differentially diagnostic because children with other diagnoses may exhibit them.

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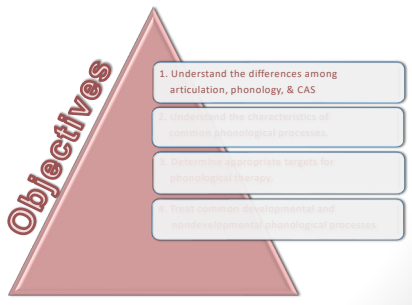
Learner Outcomes



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Articulation

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Articulation Treatment

How to Know When to Move Forward in Therapy

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Articulation Treatment

Collecting Data

- Data collected on every response.
- Determine when to move to next step.
  - 80% accuracy
  - 20 consecutive correct responses
- You can still use 80% accuracy on the IEP.
- Use circles and diagonals to mark data.
- Let child see data sheet.

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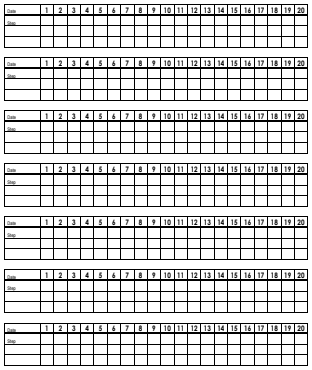
Child: _____ Phoneme/Goal: _____

Key: **X** = Correct with social and token reinforcement; / = Correct with social reinforcement only; **O** = Incorrect

Recommended Artic Reinforcement Schedule: *Isolation & Syllables* – 100% social & 100% token; *Words, Phrases, Sentences*: 100% social & 50% token reinforcement; *Conversation*: 50% social & 10% token.



See HANDOUT:
- Response (Data) Sheet

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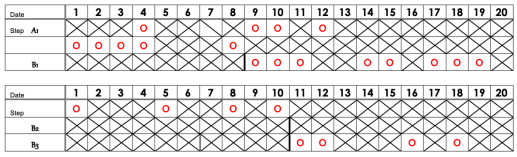
Child: *Johnny Example One* Phoneme/Goal: _____

Key: **X** = Correct with social and token reinforcement; / = Correct with social reinforcement only; **O** = Incorrect

Recommended Artic Reinforcement Schedule: *Isolation & Syllables* – 100% social & 100% token; *Words, Phrases, Sentences*: 100% social & 50% token reinforcement; *Conversation*: 50% social & 10% token.



- **A** = isolation; **B** = syllables **1** = initial **2** = final **3** = medial
- Johnny met criterion in isolation and in the initial and final positions of syllables. [Note: Isolation = 81%; Initial syllables = 79%].
- In the medial position of syllables, Johnny achieved three consecutive correct responses at his best.

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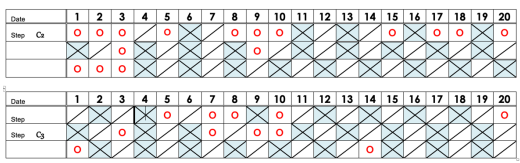
Child: *Sally Example Two* Phoneme/Goal: _____

Key: **X** = Correct with social and token reinforcement; / = Correct with social reinforcement only; **O** = Incorrect

Recommended Artic Reinforcement Schedule: *Isolation & Syllables* – 100% social & 100% token; *Words, Phrases, Sentences*: 100% social & 50% token reinforcement; *Conversation*: 50% social & 10% token.



- **C** = words; **D** = phrases; **E** = sent. **1** = initial **2** = final **3** = medial
- Sally met criterion in final position of single words in a picture naming task. [Note that percentage of accuracy = 73%].
- In the medial position of single words, Sally achieved 12 consecutive responses at her best (see bottom row).

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Articulation Treatment
Managing Group Therapy

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Articulation Treatment
Managing Group Therapy

- Most SLPs use games to occupy a child's attention in a group setting or reward the kids for doing well.
- The result is very few responses.

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Articulation Treatment
Managing Group Therapy

- CHALLENGE: Work in random order.
- Get no more than 3 responses from one child before moving to the next.
- **Kids** stay alert and motivated.
- **SLPs** stay alert and motivated.

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Articulation Treatment
Managing Group Therapy

- If the session is getting stale or kids are getting bored, *change activities*.
- Replace games with strong social reinforcement.
- Great reinforcers include *Chipper Chat*, *Token Towers*, stickers, and stamps.

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Articulation Treatment
Managing Group Therapy

From Super Duper Publications (www.superduperinc.com)

Item #CC23 (ORIGINAL - $49.95)

#CC99 (HOLIDAY - $64.95)

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Articulation Treatment
Managing Group Therapy

From Super Duper Publications (www.superduperinc.com)

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Articulation Treatment

Correcting the /r/

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Articulation Treatment

Correcting the /r/ - *Stability Zones*

The key to establishing the /r/ is teach the child to establish the **stability zones**.

This is where the *posterior lateral margins* of the tongue make contact with the upper molars.

If the stability zones are not maintained, the /r/ will never be produced correctly.

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Articulation Treatment

Correcting the /r/ - *Stability Zones*

To help the child understand the stability zones, use your **index fingers** to touch the child's cheeks where the upper molars are.

Tell the child to make sure the sides of the tongue touch his back teeth where you are touching.

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Articulation Treatment

Correcting the /r/ - *Stability Zones*

1. Close front teeth.
2. **Bite down on the posterior lateral margins AT THE SAME TIME.**
3. Relax. Repeat.
4. Now **open the front teeth about ½"**.
5. Make sure upper molars are still pressing on the lateral margins.

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Articulation Treatment

Teaching the consonantal /r/

1. With the stability zones intact, slightly **lower the jaw** a small amount.
2. Have child **point the tongue tip behind him**, lifting it up and back so you can see under the tongue.
3. Practice this **without speech** until the child can create this movement repeatedly.

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Articulation Treatment

Teaching the consonantal /r/

4. Now add speech. Have child say "rah." Move from the stability zones to the /ɑ/ by simply unrolling the tongue. Remind him not drop the tongue until **after** the /r/ is produced.
5. After /rɑ/ is consistent, continue with CV syllables and follow the normal progression to words & phrases.

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Articulation Treatment
Teaching the consonantal /r/

The child must do all three movements correctly before the /r/ can be produced correctly:

- **Bite lateral margins**
- **Open teeth slightly**
- **Curl tongue tip back**

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Articulation Treatment
Teaching the vocalic /r/

1. For the vocalic /r/, the tongue starts out on the floor of the mouth for the production of /ɑ/.
2. Then lift the lateral margins up to the stability zones and lift the tongue tip up and back. Notice that this is the **reverse order** that was used for the consonantal /r/.

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Articulation Treatment
Teaching the vocalic /r/

3. When producing /ɑɝ/ (as in *car*), have the child say /ɑ/ and then glide into the /ɝ/. Stretch the /ɑ/ if necessary.

   Show the child how you make the the sound.

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Articulation Treatment
Teaching the vocalic /r/

- You try it. Say /ɑ/ and then /ɝ/ and notice how the posterior tongue moves up and the lateral margins touch the molars. You can feel when the **stability zones are intact**.
- Now go from /ɝ/ to /ɑ/ and notice how the tongue falls and you **lose contact** with the stability zones.

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Articulation Treatment
Teaching the vocalic /r/

4. If child says /ɔ/ or /ɑ/ instead of /ɑɝ/, let him know that the back of the tongue fell down. → Don't be tricked by rising inflection.
5. Touch the cheeks again to remind him where the tongue dorsum should go.

See HANDOUT:
• *Technique for Correction of /r/.*

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Articulation Treatment
Teaching the consonantal or vocalic /r/

So, what do you do when your student learning /r/ starts making it nasal?

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Oral and Nasal Listener

Ann Kummer, Ph.D.,
Super Duper Publications

Allows both child and SLP to monitor nasality at the same time.

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Oral and Nasal Listener

Ann Kummer, Ph.D.,
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Item #: ONL22

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Articulation Treatment

Shaping Approach to Correcting the Frontal or Lateral Lisp

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Articulation Treatment
Shaping Approach to Treating the Lisp

- Tongue tip UP.
- Tongue tip DOWN.

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Articulation Treatment
Shaping Approach to Treating the Lisp

- Tongue tip UP should be the first approach to consider.
- Shape the /s/ from the /t/.

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Articulation Treatment
Shaping Approach to Treating the Lisp

- [t]
- [t^{h}]
- [t^{hh}]
- [t^{hhh}]
- [t^{hhhh}]
- [t^{hhhhh}]
- [t^{hhhhhh}]

Noisy T

- [tssssss]
- [ssssss]
- [sssss]
- [ssss]
- [sss]
- [ss]
- [s]

Squeaky T

See HANDOUT:
• *Shaping Procedure for the Lateral and Frontal Lisp*

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Articulation Treatment
Shaping Approach to Treating the Lisp

- Use this method of teaching tongue tip **UP** does not work.
- Smile to get lip spreading. The tongue will flatten naturally.
- Lips should have NO tension.
- Do **NOT** allow the tongue blade to elevate.

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Articulation Treatment
Shaping Approach to Treating the Lisp

1. Instruct the child to say /t/ several times so he becomes familiar with the movement pattern. Use a **straw** to amplify the sound. McDonalds or Panera straw
2. Ask the child to "blow more air" through the /t/ in order to produce a long or "stretchy" (aspirated) /t/.

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Articulation Treatment
Shaping Approach to Treating the Lisp

3. Rehearse the /t^h/ constantly.
4. Begin to shape the /t^h/ into /ts/.
5. **Do NOT** ask the child to produce /ts/.
6. A good /ts/ will result if the child focuses on the oral position for /t/.
7. If not successful, try switching to /ʧ/.

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Articulation Treatment
Shaping Approach to Treating the Lisp

IMPORTANT RULE

The Stretchy /t/ will only work if the child can produce a /t/ correctly.

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Articulation Treatment
Shaping Approach to Treating the Lisp

SUCCESS VS. FAILURE

1. The tongue should be positioned behind the anterior teeth at the **papilla**.
2. The airstream should be midline.

Both of these characteristics must be noted for the production to be considered correct.

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Articulation Treatment
Shaping Approach to Treating the Lisp

Be aware that the Stretchy /t/ does not work for all kids. Use the following guidelines to make decisions about changing directions:

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Articulation Treatment
Shaping Approach to Treating the Lisp

- If your child with either the frontal or lateral lisp **CAN** produce a /ts/ or /ʧ/ correctly by using the Stretchy /t/ approach, he is **ready to move on** to the Key Sound level.
- The Target Sound is the /ts/, followed by Words, Phrases, Sentences, etc.

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Articulation Treatment
Shaping Approach to Treating the Lisp

- If he **CANNOT** produce the /ts/ or /ʧ/ correctly using the Stretchy /t/ without resorting to the frontal or lateral lisp, then you will need to **change techniques**.

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Articulation Treatment
Shaping Approach to Treating the Lisp

- If he **CAN** produce a good /t/ or /ʧ/ production at any point, but **CANNOT maintain** the production, then he is **NOT ready to move on** to the establishment of /ts/ as the target sound.
- Just stay at the /t/ level until he achieves more success.

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Articulation Treatment

Shaping Approach to Treating the Lisp

- If he **PROTRUDES THE TONGUE** during production of /t/, and if he also does so on /d/, /n/, and /l/, then this is a clear indication of a **more pervasive oral-motor delay**.
- Jaw instability and low tone should be suspected.

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Articulation Treatment

Avoiding Common Pitfalls

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Articulation Treatment

Correcting production of /f/

- In normal conversational speech, the lower teeth just touch the inside surface of the lower lip. The upper teeth do not **bite** lower lip.
- Encourage the child to just touch the lower lip to the upper teeth.

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Articulation Treatment
Correcting production of /θ/

- The /θ/ is just a **tongue sound.** A child who has been producing the f/θ error is likely to use the lower lip with the tongue.
- Be careful not to allow **lower lip assist**. It is not a normal production and it will slow the diadochokinetic rates during connected speech.

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Articulation Treatment
Correcting production of alveolars

- As we just discussed with the frontal lisp, the child should never be told to put the tongue right behind the teeth. The tongue should be at the **papilla**, or "the spot."
- This reduces the chances of the child developing a **therapy-induced intradental lisp**.

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Articulation Treatment
Working at the phrase level

- If a child produces a target word after a **pause**, the result is production at the word level, not the phrase level.
- The pause typically occurs because the child is concentrating so hard on the target sound that he ends up pausing, so continuous speech is needed.

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Articulation Treatment
Working at the phrase level

- **Example:** Billy is working on initial /k/ in phrases. He says, *Paul* ⏸ *can run*.
- This response should not be counted as correct because Billy produced /k/ correctly, but it wasn't in a phrase. It was simply a production of a single word.

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Articulation Treatment
Working with closed teeth

- When teaching sounds that require mandibular closure, don't just instruct the child to "*close your teeth*," tell him to "*close your front teeth*."
- This will reduce the chance that the child will clench his teeth.
- Look/feel for contraction of the masseter muscle.

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Phonology

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Phonological Assessment

Common Phonological Processes

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Common Phonological Processes

1. Prevocalic Voicing
2. Postvocalic Devoicing
3. Final Consonant Deletion
4. Velar Fronting
5. Palatal Fronting
6. Consonant Harmony (Assimilation)
7. Weak Syllable Deletion
8. Cluster Reduction (Simplification)
9. Gliding of Liquids
10. Stopping and Stridency Deletion

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Common Processes

Prevocalic Voicing [PVV] [IV]

- A word-initial voiceless consonant is replaced by a voiced consonant.
- Most commonly occurs on plosives. PVV rarely occurs on other phonemes.

- /kʌp/ (*cup*) → /gʌp/

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Common Processes
Postvocalic Devoicing [PVD] [FD]

- A word-final voiced consonant is replaced by a voiceless consonant.
- This usually occurs on plosives, but can occur on affricates.
- Very rare on fricatives.
- **CAUTION**: When PVD is produced by AA children, it is considered dialectal and should not be targeted.

- /rɛd/ (red) → /rɛt/

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Common Processes
Final Consonant Deletion (FCD)

- A final consonant (or entire cluster) is omitted from the word.
- This is one of the most common phonological processes observed in children.

- /dɔg/ (*dog*) → /dɔ/
- /bʌs/ (*bus*) → /bʌ/
- /mæsk/ (*mask*) → /mæ/

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Common Processes
Velar Fronting (VF)

- A velar phoneme /k/ or /g/ is replaced by an alveolar.
- It is **not** VF if a velars to a palatal. /bæk/ → /bætʃ/
- When /ŋ/ is replaced by final /n/, as in /tɔkɪŋ/ (*talking*) becoming /tɔkɪn/, it is usually regional and is not targeted in therapy.

- /kom/ (*comb*) → /tom/
- /gɛs/ (*guess*) → /dɛt/
- /bæk/ (*back*) → /bæt/

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Common Processes
Palatal Fronting (PF)

- A palatal phoneme /ʃ/, /ʒ/, /ʧ/, /ʤ/ is replaced by an alveolar.

- /ʃu/ (*shoe*) → /su/ or /tu/
- /ʤʌmp/ (*jump*) → /dʌmp/
- /ʧen/ (*chain*) → /ten/
- /bæʧ/ (*batch*) → /bæt/

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Common Processes
Consonant Harmony [CH] (Assimilation)

- One phoneme is influenced by another.
- The harmony can be determined by direction (progressive or regressive) or place of articulation (labial, alveolar, alveolar).
- Determine if you are observing FR, BK, or CH

- /tɔk/ (*talk*) → /tɔt/ Progressive alveolar assim.
- /kɑit/ (*kite*) → /tɑit/ Regressive alveolar assim.
- /kɑp/ (*cop*) → /pɑp/ /mɑp/ Regressive Labial assim.

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Common Processes
Consonant Harmony [CH] (Assimilation)

- Differentiate *Fronting* or *Backing* from *Assimilation* by examining velars & alveolars to determine a pattern.

- /kɑr/ (*car*) → /tɑ/ **VF**
- /ʧɛr/ (*chair*) → /tɛ/ **PF**
- /tæp/ (*tap*) → /kæp/ **BK**

Notice how Fronting & Backing occur in ***isolation*** since there is no phoneme influencing another.

This child is NOT exhibiting CH.

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Common Processes
Consonant Harmony [CH] (Assimilation)

- CH can be examined if there are phonemes that can influence others.

- *Cat* produced as [tæt] — Final /t/ influences /k/ — **RA**
- *Cup* produced as [kʌk] — Initial /k/ influences /p/ — **PA**
- *Suit* produced as [tut] — Final /t/ influences /s/ — **RA**

Here the Fronting and Backing **do not** occur in isolation, but **only** in the environment of another consonant.

This child IS exhibiting CH.

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Common Processes
Weak Syllable Deletion [WSD] [USD]

- A weak or unstressed syllable is deleted.
- This only applies to words with more than one syllable.

- /ʌlon/ (*alone*) → /won/ — /ʌ/ deleted
- /tɛləfon/ (*telephone*) → /tɛfon/ — /lə/ deleted

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Common Processes
Cluster Reduction [CR] [CS]

- A consonant cluster is reduced by at least one element.

- /stɛp/ (*step*) → /sɛp/ or /tɛp/
- /splæʃ/ (*splash*) → /plæʃ/ or /pæʃ/
- /slip/ (*sleep*) → /ip/ is ICD, not CR

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Common Processes
Liquid Simplification

Gliding of Liquids [GL]

- Liquids are replaced by glides.

- /læmp/ (*lamp*) → /wæmp/ or /jæmp/
- /rʌn/ (*run*) → /wʌn/

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Common Processes
Liquid Simplification

Vocalization [VOC] or Vowelization [VOW]

- A word-final liquid is ***replaced*** by a vowel.

- /kɑr/ (*car*) → /kɔ/
- /brʌðə/ (*brother*) → /bwʌdʊ/
- /æpl/ (*apple*) → /æpo/

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Common Processes
Liquid Simplification

Vocalization [VOC] or Vowelization [VOW]

- If the final liquid is ***omitted*** and is NOT replaced by a new vowel, it is FCD.

- /bɔl/ (*ball*) → /bɔ/
- /kɑr/ (*car*) → /kɑ/

These are FCD (not VOC) because the **original vowel was maintained.**

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Common Processes
Stopping [ST] & Stridency Deletion [STR]

STOPPING

- A fricative or affricate is replaced by a ***plosive***.

- /sʌn/ (*sun*) → /tʌn/
- /ʧɔk/ (*chalk*) → /tɔk/; /kɔk/

STRIDENCY DELETION

- A fricative or affricate is replaced by a ***plosive…***
- …or **/θ/** *or* **/ð/**.
- …or is is ***omitted.***

- /sʌn/ (*sun*) → /tʌn/
- /sʌn/ (*sun*) → /θʌn/
- /sʌn/ (*sun*) → /ʌn/

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Common Processes
Nondevelopmental Processes

- Initial Consonant Deletion [ICD]
  - /læmp/ (*lamp*) → /æmp/
- Backing [BK]
  - /tɑɜ/ (*tar*) → /kɑɜ/

Already discussed when differentiating FR and BK from Consonant Harmony.

- Glottal Replacement [GR]
  - /wægn̩/ (*wagon*) → wæˀn̩
  - /mɛsi/ (*messy*) → mɛˀi

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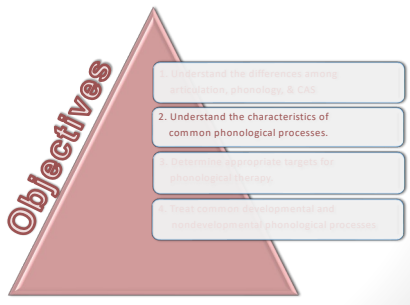
Learner Outcomes



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Phonological Assessment
Determining Need for Therapy

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Phonological Assessment
Determining Need for Therapy

- A child should qualify for therapy for speech sound disorders based on three criteria:
  - 1.5 standard deviations below the mean
  - Overall intelligibility
  - Documented adverse effect
- A child may qualify if scores are above 1.5 standard deviations if you can document:
  - Adverse effect
  - Sufficient unintelligibility

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Phonological Assessment
Determining Need for Therapy

- Keep in mind that nondevelopmental processes are not counted in the normative data.
- If a nondevelopmental process occurs five or more times, it is significant and may help you make a decision about eligibility.

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Phonological Assessment
Determining Need for Therapy

- A child qualifies for services whether the dx is Artic, Phono, or CAS
- Use ICD 10 Code: F80.1 for all.
- ***Articulation*** or ***phonology*** only pertains to materials, & methods.
- A severe phonological child may later be treated as artic, as he improves and the eligibility category won't change.

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Phonological Assessment
Determining Targets for Therapy

86

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Phonological Assessment
Determining Targets for Therapy

- Phonological treatment should always start with nondevelopmental process.
  - Initial Consonant Deletion
  - Backing
  - Glottal Replacement
- We start here for two reasons:
  - Typically-developing children don't produce these processes and they **don't self-correct** easily.
  - **Intelligibility** is significantly impaired.

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Phonological Assessment
Determining Targets for Therapy

- Initial Consonant Deletion
  - Most meaning in the initial consonants
  - FCD does not impair intelligibility as badly.
- Backing
  - All alveolars and palatals are reduced to /k/ & /g/.
  - With the majority of phonemes being backed, intelligibility is reduced significantly.
- Glottal Replacement
  - Affects plosives, fricatives, and affricates.
  - All may be reduced to a glottal stop.

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Phonological Assessment
Determining Targets for Therapy

- If there are no nondevelopmental processes that are productive (occurs 5+ times), the priority should be placed on the earliest suppressing processes.
  - Weak Syllable Deletion
  - Prevocalic Voicing
  - Final Consonant Deletion
  - Velar Fronting
  - Stopping/Stridency Deletion

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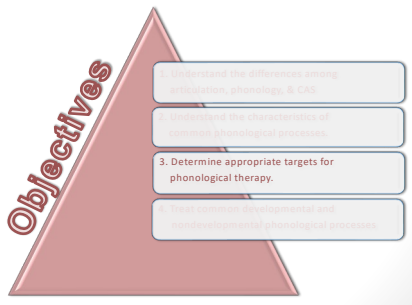
Learner Outcomes



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Phonological Treatment

Treating Nondevelopmental Phonological Processes

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Nondevelopmental Processes

1. Initial Consonant Deletion
2. Backing
3. Glottal Replacement

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Initial Consonant Deletion

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Phonological Treatment
Initial Consonant Deletion [ICD]

- Help the child hear the difference between words with initial consonants and those without initial consonants.
- Remember to start with a recognition task before production.

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Phonological Treatment
Initial Consonant Deletion [ICD]

Minimal Oppositions → Minimal pairs

Error	Target	Target	Target
• eight	wait		
• itch	witch		

Maximal Oppositions

• eat	meat	seat	
• in	pin	chin	
• at	cat	sat	chat
• each	peach	reach	teach

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Phonological Treatment
Initial Consonant Deletion [ICD]

- Come up with as many minimal pairs as you can and make picture cards for each. There may be some available commercially.
- Place a minimal pair in front of the child and have him put a token over the word you say.
- *Exaggerate final consonant at first*.

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Phonological Treatment
Initial Consonant Deletion [ICD]

- Come up with as many minimal pairs as you can.
- Place a minimal pair in front of the child and have him put a token over the word you say.
- *Exaggerate initial consonant at first.*
- Then move to production of single words.

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Phonological Treatment
Initial Consonant Deletion [ICD]

- in pin
  - SLP → Put a token in the cup under picture of pin.
  - SLP → *Where do you want me to look for the circle?*
  - Child → *IN*
  - SLP → *OK, I'll look under "in." It's not under "in."*
  - SLP → *Where else should I look?*
  - Child → *IN*
  - SLP → *It's not under "in." Do you mean "**P**in?"*
  - SLP → Help child say word again.
  - SLP → *Try it again. Where should I look for the circle?*
  - Child → *PIN*
  - SLP → *Let's see. There it is! Great job putting the sound at the beginning of the word.*

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Phonological Treatment
Initial Consonant Deletion [ICD]

- When the child is consistent with single word production, move to production of the target word in short sentences.
- Use the minimal pair cards to have the child produce two sentences with carrier phrases.

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Phonological Treatment
Initial Consonant Deletion [ICD]

- I see eight.
- I see age.
- I see all.
- I see up.
- I see gate.
- I see cage.
- I see fall
- I see cup.
- I want at.
- I want ice.
- I want eel.
- I want oil.
- I want mat.
- I want mice.
- I want seal.
- I want soil.

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Backing

101

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Phonological Treatment
Backing [BK]

- As stated earlier, all alveolars and palatals are reduced to /k/ & /g/, so intelligibility is impaired dramatically.
- Since /t/ and /d/ will correct this process, treating BK as artic only will work well.

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Glottal Replacement

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Phonological Treatment

Glottal Replacement [GR]

- Unlike ICD and BK, *Glottal Replacement* is insertion of a non-standard English sound, making its impact on intelligibility significant.

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Example:

Glottal Replacement occurs on /k/

105

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Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Fully Whispered /a/

[^{hhhhhh}aaaaaa]

106

106

Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Fully Whispered /a/ with overlaid velar

[^{hhhhhh}aaa**k**^{hhhhhh}aaaaaa]

107

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Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Voicing introduced *after* vowel onset.

[^{hhhhhh}aa**k**^{hhhhhh}aaaaaa]

108

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Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Voicing introduced *at* vowel onset.

[^{hhhhhh}aaa**k**^{hhhhhh}aaaaaa]

109

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Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Aspiration decreased following /k/

[^{hhhhhh}aaa**k**^{hhh}aaaaaa]

110

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Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Normal duration of /k/ release for medial position

[^{hhhhhh}aaa**k**^{h}aaaaaa]

111

111

Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Normal duration of /k/ release for medial position

[^{hhhhhh}aaak^{h}a]

(blue = normal syllable)

112

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Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Decreased duration of carrier aspiration

[^{hh}ak^{h}a]

113

113

Phonological Treatment
Glottal Replacement [GR] - /k/ Example

Normal /k/ production in the initial position

[k^{h}a]

114

114

Example:

Glottal Replacement occurs on /s/

115

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Phonological Treatment

Glottal Replacement [GR] - **/s/ Example**

Fully Whispered /a/

[^{hhhhhh}aaaaaa]

116

116

Phonological Treatment

Glottal Replacement [GR] - **/s/ Example**

Fully Whispered /a/ with overlaid velar

[^{hhhhhh}aaa**s**^{hhhhhh}aaaaaa]

Unlike correcting the /k/, which needs aspiration since it is a plosive, the /s/ is already a continuant, so we are simply forcing breathiness. This is not considered aspiration since the target sound is already strident.

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Phonological Treatment
Glottal Replacement [GR] - /s/ Example

Voicing introduced *after* vowel onset.

[hhhhhhaashhhhhhaaaaaa]

118

118

Phonological Treatment
Glottal Replacement [GR] - /s/ Example

Voicing introduced *at* vowel onset.

[hhhhhhaaashhhhhhaaaaaa]

119

119

Phonological Treatment
Glottal Replacement [GR] - /s/ Example

Aspiration decreased following /s/

[hhhhhhaaashhhaaaaaa]

120

120

Phonological Treatment
Glottal Replacement [GR] - /s/ Example

Normal duration of /s/ release for medial position

[hhhhhhaaasaaaaaa]

121

121

Phonological Treatment
Glottal Replacement [GR] - /s/ Example

Normal duration of /s/ release for medial position

[hhhhhhaaasa]

(purple= normal syllable)

122

122

Phonological Treatment
Glottal Replacement [GR] - /s/ Example

Decreased duration of carrier aspiration

[hhasa]

123

123

Phonological Treatment

Glottal Replacement [GR] - /s/ Example

Normal /s/ production in the initial position

[sa]

See HANDOUT:
- *Treating Glottal Replacement*

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Phonological Treatment

Treating Common Developmental Phonological Processes

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Common Phonological Processes

1. Prevocalic Voicing
2. Postvocalic Devoicing
3. Final Consonant Deletion
4. Velar Fronting
5. Palatal Fronting
6. Consonant Harmony (Assimilation)
7. Weak Syllable Deletion
8. Cluster Reduction (Simplification)
9. Gliding of Liquids
10. Stopping and Stridency Deletion

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Prevocalic Voicing
Initial Voicing

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Phonological Treatment
Prevocalic Voicing [PVV] [IV]

- PVV is an early-suppressing process (3 yrs. of age) and should be targeted early if it is still productive (30% usage).
- Before working on production, the child needs to hear the difference between words with initial voiced and voiceless consonants with minimal pairs.
- Recognition task, not production!

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Phonological Treatment
Prevocalic Voicing [PVV] [IV]

Error	Target	Error	Target
bore	pour	beach	peach
dip	tip	door	tore
girl	curl	goat	coat
van	fan	vat	fat

When the child can recognize the difference between these words, try implementing the **Intrusive /h/** before using Minimal Pairs.

See HANDOUT:
- Intrusive /h/

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Phonological Treatment
Prevocalic Voicing [PVV] [IV]

Child says *doe* for *toe*.

- **Intrusive /h/.** Child should turn on speech motor during transition.
  - /p/ + *ham* = *Pam* /p/ + *hole* = *pole*
  - /t/ + *hawk* = *talk* /t/ + *hoe* = *toe* /tʰʰʰʰʰho/
  - /k/ + *hat* = *cat* /k/ + *home* = *comb*
  - /s/ + *hand* = *sand* /s/ + *hay* = *say* ssssʰʰʰʰʰhay
  - /f/ + *heat* = *feet* /f/ + *harm* = *farm*
  - /ʃ/ + *hot* = *shot* /ʃ/ + *hair* = *share*
  - /θ/ + *horn* = *thorn* /θ/ + *hum* = *thumb*
  - /ʧ/ + *hat* = *chat* /ʧ/ + *hair* = *chair*

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Postvocalic Devoicing
Final Devoicing

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Phonological Treatment
Postvocalic Devoicing [PVD]

- As with PVV above:
  - Early-suppressing
  - Help child hear the difference
  - Use minimal pairs in a recognition task only.

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Phonological Treatment
Postvocalic Devoicing [PVD]

Error	Target	Error	Target
cup	cub	cop	cob
beet	bead	pat	pad
back	bag	pick	pig
rice	rise	bus	buzz
H	age	batch	badge

Remember: This phonological process should not be targeted if it is suspected that a dialectal difference accounts for the child's productions, such as AA.

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Phonological Treatment
Postvocalic Devoicing [PVD]

- When the child is consistent with the identification task, start production of single words.
- Use the token activity we discussed for PVV, placing the token in one cup.
- Place the two cards of a minimal pair on each of the cups.

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Phonological Treatment
Postvocalic Devoicing [PVD]

- cup cub
  - SLP → Put a token in the cup under picture of cub.
  - SLP → *Where do you want me to look for the circle?*
  - Child → *CUP*
  - SLP → *OK, I'll look under "cup." It's not under "cup."*
  - SLP → *Where else should I look?*
  - Child → *CUP* No schwa!
  - SLP → *It's not under "cup." Do you mean "cuB?"*
  - SLP → Help child say word again.
  - SLP → *Try it again. Where should I look for the circle?*
  - Child → *CUB*
  - SLP → *Let's see. There it is! Great job putting the sound at the end of the word.*

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Final Consonant Deletion

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Phonological Treatment

Final Consonant Deletion [FCD]

- As with PVV & PVD above:
  - Early-suppressing
  - Help child hear the difference
  - Use minimal pairs in a recognition task only.

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Phonological Treatment

Final Consonant Deletion [FCD]

Minimal Oppositions

Error	Target	Target	Target
bay	bait		
bee	beak		

Maximal Oppositions

bow	boat	bone	
so	soap	soak	
cow	couch	cows	count
my	mine	mice	might

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Phonological Treatment
Final Consonant Deletion [FCD]

- When the child is consistent with the identification task, start production of single words.
- Continue with the cup task that was described for Postvocalic Devoicing.

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Phonological Treatment
Final Consonant Deletion [FCD]

- cow couch
  - SLP → Put a token in the cup under picture of couch.
  - SLP → *Where do you want me to look for the circle?*
  - Child → *COW*
  - SLP → *OK, I'll look under "cow." Hmm, it's not there. Oh, you mean "couCH"*

This activity can be expanded if you decide to use Multiple Oppositions.

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Phonological Treatment
Final Consonant Deletion [FCD]

- When the child is consistent with single word production, move to production of the target word in short sentences.
- Use the minimal pair cards to have the child produce two sentences with carrier phrases.

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Phonological Treatment
Final Consonant Deletion [FCD]

- bay is here. bake is here.
- bow is here. bone is here.

- cow on floor . couch on floor.
- sew on floor. soap on floor.

Remember: Don't allow a **glottal stop** to replace a final consonant

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Velar Fronting

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Phonological Treatment
Velar Fronting [VF]

- Elicit /k/ and add /h/-initial word.
  - /k/ + *hall* = *call*
  - /k/ + *home* = *comb*
  - /k/ + *huff* = *cuff*

When trying to elicit "call", the child will typically produce "tall" or "k-tall."

- Gradually shorten aspiration until target is reached.
- Remember to implement the **Intrusive /h/** **before** using Minimal Pairs.

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Phonological Treatment
Velar Fronting [VF]

Minimal Oppositions

Error	Target	Target
• cab	tab	
• go	dough	

Maximal Oppositions

• care	tear	dare
• coat	tote	dote
• go	toe	dough

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Palatal Fronting

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Phonological Treatment
Palatal Fronting [PF]

- Elicit /ʧ/ and add /h/-initial word.
  - /ʧ/ + *hat* = *chat*
  - /ʧ/ + *hair* = *chair*
  - /ʧ/ + *hum* = *chum*

When trying to elicit "chat", this child will probably say produce "tat" or "ch-tat."

- Blend the /ʧ/ and /h/-initial word with aspiration of the /ʧ/ and slightly prolonged /h/.
- Gradually shorten aspiration until target is reached.

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Phonological Treatment
Palatal Fronting [PF]

Minimal Oppositions

Error	Target	Target
• chalk	talk	
• Jeep	deep	

Maximal Oppositions

• chip	tip	dip
• chime	time	dime
• Gym	Tim	dim

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Consonant Harmony
Consonant Assimilation

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Phonological Treatment
Consonant Harmony [CH] (Assimilation)

- Once you have definitively identified Consonant Harmony (op. VF, PF, BK), the question then is ***"Now what do I do?"***
- While this is considered a common process, it is not one that is typically treated.
- CH usually resolves once other processes have been remediated.

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Weak Syllable Deletion
Unstressed Syllable Deletion

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Phonological Treatment
Weak Syllable Deletion [WSD] [USD]

- **TROCHAIC STRESS:** A **stressed syllable** is followed by a weak syllable. / U [Trochees]
  - ***Bu**nny* [bʌ]
  - ***Mo**mmy* [mɑ]
- **IAMBIC STRESS:** A **stressed syllable** is preceded by a weak syllable. U / [Iambs]
  - *A**lone*** [non]
  - *A**wake*** [wek]

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Phonological Treatment
Weak Syllable Deletion [WSD] [USD]

- **SPONDAIC STRESS:** Both syllables are stressed. U U [Spondees]
  - *Football*
  - *Baseball*
  - *Mayday*
  - *Heartbreak*
  - *Doorway*
  - *Sunshine*
  - *Cowboy*
  - *Mushroom*

This is just for your information. We don't target spondees since there is no unstressed syllable.

2 other stress patterns appear in English, but are not appropriate to teach young children:

Dactylic / U U *alphabet*
Anapestic U U / *contradict*

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Phonological Treatment

Weak Syllable Deletion [WSD] [USD]

- WSD is one of the earliest suppressing processes (typically by age 3).
- Since it represents very immature speech development, it should be targeted very early.
- Stick with **bisyllabic targets** since very young children typically don't use 3-syllable words.

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Phonological Treatment

Weak Syllable Deletion [WSD] [USD]

- Start with target words that have **iambic stress** because they are easier to teach. [U /] ***alone, awake***
- Your success comes from targeting words that **end with a stressed syllable**.
- Then move to target words with **Trochaic stress**. [/ U] ***bu**nny, **mo**mmy*

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Cluster Reduction
Cluster Simplification

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Phonological Treatment
Cluster Reduction [CR] [CS]

- The easiest way to target CR is by teaching **/s/ clusters** since /l/ and /r/ may not have developed yet.
- Start with easier clusters; then plosives.
  - /sm/, /sn/, /sw/ Notice continuous airflow
  - /sp/, /st/, /sk/

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Phonological Treatment
Cluster Reduction [CR] [CS]

- Teaching **/l/ clusters** can be a challenge. The idea is to produce two phonemes at the same time.
- If the cluster elements are taught separately, a **schwa will usually be inserted**, resulting in **EPENTHESIS**.
  - /bəlu/ for "blue"
  - /kəlæp/ for "clap"

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Phonological Treatment
Cluster Reduction [CR] [CS]

- The tongue tip should start out with the placement for the /l/.
- The tongue stays at the papilla when producing the 1st element of the cluster.

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Phonological Treatment
Cluster Reduction [CR] [CS]

- The /kl/, /pl/, and /fl/ (and the cognates) are all produced with the tongue already in place.
- The /sl/ cluster should be delayed until the child can produce the other /l/ clusters. This is classified as an /s/ cluster, not an /l/ cluster because of the tongue is elevated after the /s/.

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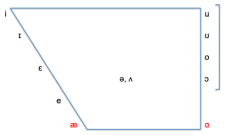
Phonological Treatment
Cluster Reduction [CR] [CS]

- There must be significant mandibular opening or the /l/ will likely be deleted.
- The mandibular opening is encouraged by the use of low vowels /æ/ and /ɑ/.



See HANDOUT:
• *Vowel Quadrilateral*

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Gliding of Liquids

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Phonological Treatment
Gliding of Liquids [GL]

- GL is often just **treated as artic** since the only two phonemes that need to be targeted are /l/ and /r/.
- **Correction of /r/** was discussed earlier in the Articulation Treatment section, so it will not be addressed here.

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Phonological Treatment
Gliding of Liquids [GL]

- **Initial /l/** should be taught with a very light touch of the tongue.
- The mandible should be somewhat open, but naturally. Even when pairing /l/ with a low vowel, the jaw should never be lower than a relaxed /ɑ/.
- Do not allow the tongue to protrude beyond the teeth.

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Phonological Treatment
Gliding of Liquids [GL]

- After the initial /l/ is consistent, move to the **medial position**.
- **Avoid the final /l/**, as it is often omitted as part of regional or colloquial speech. The final /l/ is extremely difficult to teach and it usually comes is spontaneously after the initial and medial positions are learned.

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Stopping
Stridency Deletion

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Phonological Treatment
Stopping [ST]; Stridency Deletion [STR]

- Typical situation
  - SLP → Say "*sun.*"
    - Child → "*tun*"
  - SLP → *Say* /ssssss/
    - Child → /ssssss/
  - SLP → *Great. Now say* "*sssssssun.*"
    - Child → "*sssssstun*"
- Start with what the child has in is repertoire: **/s/ clusters.**

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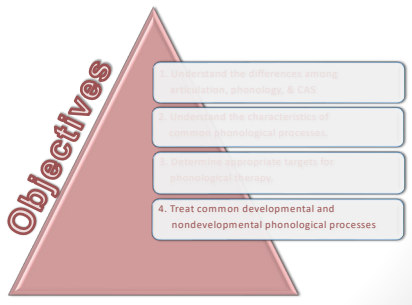
Learner Outcomes



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Thank you!

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