

## Phonetic Therapy

- A phonetic approach also goes by several other names:
  - Motor approach.
  - Traditional approach.
  - Articulation approach.
  - Sensorimotor approach.

## Phonetic Therapy

- Applied to phonetic errors.
- May also be appropriate in some cases with phonemic problems.
  - Child may be quite stimulable for the error in a particular context but not in others.
  - Child may need some "motor practice" to establish the sound.
  - In these cases, not all of the steps in a phonetic approach may be necessary.

## Goal-Attack Strategies

- With only a few sounds to work on, the order we work on them probably doesn't make much difference.
- With multiple errors we need a strategy for how to organize the targets.
  - Applies to both phonetic and phonemic approaches.

## Goal-Attack Strategies

- Three possible ways to "attack the goals".
  1. Vertical strategy – work on one target sound at a time until the child masters it, then start the next target sound.
  2. Horizontal strategy – also called a multiple sound approach. Work on several target sounds all at the same time. As each sound is mastered, add in another target sound (if any).

## Goal-Attack Strategies

- 3. Cyclical strategy – also called a "cycles" approach.
  - Work on each target sound by itself for a specific period of time (e.g., 3-4 sessions).
  - Regardless of progress, switch to next target sound for the same amount of time, then switch to next target sound etc.
  - Once all target sounds have been worked on, a "cycle" is complete.
  - Check progress and start cycle again (drop out any target sounds that have been "mastered").

## Therapy Sequence (Overview)

1. Sensory-perceptual training – also called auditory training or ear training.
2. Production of the sound in isolation.
  - Teaching the child to produce the sound.
3. Production in nonsense syllables.
4. Production in words.
5. Production in structured phrases / sentences.
6. Production in spontaneous speech.

## Therapy Sequence (Overview)

- To move from one level to the next, we set some criterion for "mastery".
- Most clinicians use 80-90% correct for all levels except spontaneous speech.
- Research suggests that once accuracy reaches at least 50% in spontaneous speech, progress should continue to mastery without much additional help.

## 1. Sensory-Perceptual Training

- Also called auditory training or ear training.
- Only needed if discrimination is a problem.
  - Prior to the 1970s we did this for every child on every error sound.
- Teaching child to hear the difference between the target sound and what they usually use in its place (don't worry about producing it).
- Several steps (clinicians don't always use every step).

## Identification

- Want child to be able to recognize the target sound in isolation.
- Have child practice listening to the sound by itself and compare it against other similar and dissimilar sounds.
- May need simple labels (metaphors) for the sounds for very young children.
- May need to begin by contrasting the sound against a very different sound (acoustically or productively very different).

## Isolation

- Child's goal is to be able identify when the target sound is used.
- Sound is produced in a variety of word positions and in a variety of material (words, phrases, sentences, narrative).
  - Child indicates (e.g., by raising a finger) whenever the sound is heard.

## Stimulation

- Child hears and tries to identify the sound produced in a wide variety of contexts and forms.
- Practice with different speakers, different rates, different volumes, different types of material.
- This step is frequently omitted (difficult to organize the material).

## Discrimination

- Also called error detection.
- Child hears the target sound contrasted with the error they usually make in a variety of contexts.
- Child is required to say whether the target sound is correct or incorrect.
- Second stage where child is asked to identify errors in their own speech.

## Special Considerations

- Younger children may have difficulty with identifying where a sound is in the word.
  - This is a "phonological awareness" task (a type of metalinguistic task).
  - Must be able to appreciate that words consist of smaller units (sounds) that can be separated.
  - Most preschool children have trouble with this.

## Self-Monitoring

- During the early phases of phonetic therapy, we need to help the child need pay attention to their own productions (self-monitor).
- They need to be able to judge the correctness of their productions.

## Is Auditory Training Sufficient?

- It has been suggested that for some children simply training them to hear the sounds may result in correct production.
- No solid evidence either way.
- Certainly would only apply in those situation where discrimination is a problem.

## 2. Production in isolation

- Trying to teach the child the specific physical movements required to produce the sound by itself.
- Several techniques available to do this.
- In most cases you should be able to get a few good productions within 5-10 minutes.
- If not, switch to another target sound to avoid having the child become frustrated.

## Production in isolation

1. Always try imitation - simplest technique is to ask the child to listen to you and "try to do what you do"
  - Continuant sounds (fricatives, liquids, glides, nasals) can be prolonged to heighten awareness (hear and feel it more).
  - With stops, you must model in a syllable

## Production in isolation

- 2. Phonetic placement – tell the child specifically where to put the articulators and what to do with them to make the sound.
- 3. Sound modification – also called sound shaping.
  - Take a similar sound and show the child how to modify it so that it becomes the target sound.

## Production in isolation

- 4. Symbolic noise – a variant of sound shaping
  - Elicit the target consonant as symbolic noise (hiss, growl, machine noise, etc.) and then modify context and mechanics of production so that it is produced as speech

## Is Production in Isolation Necessary?

- Certain phonetic contexts have been shown to make it easier to produce certain sounds (for some children).
- Almost always real words.
- Called 'facilitating contexts'.
- May explain why some children can produce the sound in only some contexts but not others.

## 3. Production in Nonsense Syllables

- Allows you to help establish accuracy of production of consonant-vowel combinations (CV, VC, CVC).
- This step is frequently skipped; move directly to real words to make the process more meaningful.
- May be a very necessary step for some children (real words may trigger old habits).

## Production in Nonsense Syllables

- Does not have to be strictly imitation though it often starts with that.
- Can create "abstract" or nonsense shapes or drawings to use to represent each syllable.
- Could use colored blocks or create shapes with building blocks for each syllable.

## 4. Production in Words

- Actually includes several levels of complexity (not all words are equal!) that you may need to work through in sequence.
- Words with fewer syllables usually easier.
- Prevocalic position tends to be easier than postvocalic which may be easier than intervocalic.
- Open syllables easier than closed syllables.

## Production in Words

- Sounds are usually easier to produce in stressed syllables than unstressed syllables.
- Certain sound combinations may be easier due to coarticulatory effects (recall facilitating contexts).
- Very familiar words may be easier than less familiar ones (but may be more difficult for some because of "habit-strength").

## 5. Structured Phrases / Sentences

- Not always possible to go straight from words to spontaneous speech.
- Create a "carrier phrase" to practice a series of words in (e.g., "I see a \_\_\_\_\_").
- Playing "go fish" can be helpful here "Do you have a \_\_\_\_\_?" (or other games that require frequent use of phrase like that).

## 6. Spontaneous Speech

- The ultimate goal is to have fully correct production in everyday conversation.
- Probably need specific time for this to at least measure production accuracy.
- Self-monitoring can be very difficult at this level.

## Carryover

- A big issue in therapy.
- Not uncommon to see mostly correct productions in the clinic room but the errors return in other settings.
- May need to plan conversations in other places.
- Setting up a home program often helpful (ask parents / older siblings to monitor speech).
- May be done by a speech assistant.

## Dismissal and Review Criteria

- Recall 50% correct in conversation is a common goal.
- Could dismiss after all target sounds reach this level or better.
- Ultimate progress needs to be checked.
- Schedule a review for 3-6 months after dismissal.

## A note on Minimal Pairs

- Usually thought of as a "phonemic" procedure (to demonstrate linguistic function).
- But it has other uses:
  - Testing discrimination.
  - Testing if production contrast is maintained.
  - May help establish production skills, especially if new sound is contrasted with error (learn to contrast the placements or motor movements).

## General Context Considerations

- Consider vowel on either side of the target.
  - Front vs. back; rounded vs. unrounded.
- Consider syllable structure.
  - CV less complex than CVC or CCVC.
- Consider features of surrounding consonants.
  - Same place? Same manner?
- Error pattern of the child.
  - E.g., if child usually substitutes /t/ for the target, avoid words that contain /t/ elsewhere.

## Oral Motor Exercises

- Probably shouldn't be a major part of any speech sound therapy.
- May be useful to increase awareness of the articulators (only need brief work).
- Because they involve non-speech activities, they are unlikely to have any direct effect on speech.
  - Will not likely increase strength or coordination for speech.

## Oral Motor Exercises

- These are normally justified four ways:
- 1. May help speech by breaking it down into smaller steps – NO. We don't learn motor activities that way. We learn motor movements by practicing the entire movement.

## Oral Motor Exercises

- 2. These may help increase strength of the speech organs. NO. Two problems:
  - a. Not necessary. Speech normally only requires less than 20% of our strength capacity.
  - b. Strengthening requires many repetitions against resistance. Exercises being advocated don't involve resistance and never involve enough repetitions to be useful.

## Oral Motor Exercises

- 3. These may improve the connections between the nerves and muscles. NO.
- Research has shown that the only way to improve how the nervous system interacts with the muscles is to practice RELEVANT behaviors. Need to practice speech to improve connections for speech.

## Oral Motor Exercises

- 4. But doesn't speech develop from earlier non-speech behaviors? NO. Despite what would seem obvious, research has shown that the brain organizes the movements for speech in very different ways than for nonspeech movements. There are common structures but that's all.

## /s/ and /z/

- Among the most common error targets.
  - Considered later developing.
  - Complex production - have to maintain narrow constriction and precise airflow.
  - Place critical – too far forward and it can be confused with the dental fricatives /θ, ð/.
- Cross-sectional norms say we shouldn't work on this until about age 8 years but intelligibility concerns may dictate otherwise.

## /s/ and /z/

- Only distinguishing feature = voicing.
- Possible to produce 2 different ways; both sound correct
  - Apico-alveolar = tongue-tip up.
  - Predorsal -alveolar = tongue-tip down.
  - Constriction still at alveolar ridge and air flows down center of tongue.
  - Lateral edges (sides) of tongue seal off back teeth.

## /s/ and /z/

- Among the most frequent sounds in English.
- Occur in all word positions.
  - /z/ more common word-finally.
  - Many cluster combinations possible.
- Serve broad morphophonemic function.
  - Plurals, possessives, 3rd person singular.
  - Frequent contractions of "to be" (is, are).

## Misarticulations of /s/ and /z/

- May arise from any one of several sources:
  - High frequency hearing losses.
  - Minor structural problems like missing incisor teeth or new dentures (usually can adjust).
  - Tongue thrust: tongue tends to sit too far forward and move forward during swallowing (still a controversial diagnosis).

## Misarticulations of /s/ and /z/

- Several error patterns seen:
  - Interdental: substitution of /θ, ð/.
  - Addental or dentalized: tongue too far forward.
  - Lateralization: air escapes out sides of tongue.
  - Palatalization: tongue too far back.
  - Strident or whistled production.
  - Stopping: substitution of /t,d/.
  - Nasal emission: some air escapes through nose.

## Misarticulations of /s/ and /z/

- Very common error sounds.
- One of the most common residual errors in adults (may be more common in females).
- Majority of adult errors are dentalizations or interdental substitutions.
  - Lateralization less common but more likely to call attention to itself.

## Remediation of /s/ and /z/

- Phonetic placement: describe how to make the sound (visual aids may be helpful).
  - If one way to make it doesn't work, try the other.
- Sound shaping: modify nearby sounds /ʃ, ʒ, θ, ð/ or homorganic stops /t,d/.

## Remediation of /s/ and /z/

- Lateral /s, z/ difficult to correct; ignore developmental norms here (work on early).
  - Tongue-tip down pattern may help.
  - Try directing air through a straw.
- May need to increase awareness of the sides of the tongue.
  - Tongue rolling exercises.
  - Brushing sides of tongue with ice.

## Nasal Emission on /s/ and /z/

- Only appropriate to work on if it is certain that there is no structural problem.
  - Must be confirmed by an intra-nasal exam (usually performed by otolaryngologist).
- If nasal emission is limited to /s, z/ it is more likely due to a learned problem with velopharyngeal closure.

## Which to do first? /s/ or /z/

- Most clinicians start with /s/.
  - One less feature to worry about.
- Some advantages to starting with /z/.
  - Less air pressure needed for voiced forms.
  - Voicing covers minor inconsistencies which may make it easier establish a pattern.
  - Don't have to stop voicing during the transition to and from surrounding vowels.

## Coarticulation with /s/ and /z/

- Front vowels may help with anterior tongue placement (unrounded lips reduce overall constriction at front of mouth).
- Lack of lip rounding in front vowels may also help avoid substitution of /ʃ/.
- /s/ and /z/ are sometimes easier to produce in postvocalic position.

## Rhotic Sounds

- Typically see errors on all three forms /r, ɹ, ɻ/.
- Usually regarded as later developing sounds – both Sander (1975) and Smit et al (1992) say they are not mastered by 90% of children till age 8.
- Hodson and others actually say we should work on these with preschoolers (it is quite possible to evoke good productions in 4 year-olds).
- Tongue growth is most rapid between 5 ½ and 7 years, an argument for not working on it during this period.

## Rhotic Sounds

- No single "correct" tongue position though speakers tend to use either retroflex or bunched tongue shape.
- Normal consonant form /r/ may be almost voiceless or fricative-like after /t, k, f/.
- Normal vocalic forms /ɹ, ɻ/ also variable in articulation (many possible shapes).

## Rhotic Sounds

- Very frequently used in English.
- Consonant form /r/ occurs in many pre- and postvocalic clusters.
- Vocalic and postvocalic forms subject to normal loss of /r/ -coloring in several dialects (New England, AAVE, Southern).
  - Prevocalic /r/ usually not different across dialects.

## Coarticulation and Rhotics

- No particular vowel context appears to help with the rhotics .
  - Central vowels may help "retroflex" production.
  - Back vowels may help "bunched" production.
- Consonant /r/ may be easier in prevocalic clusters (e.g., following /t/).

## Misarticulation of the Rhotics

- Substitution errors common in young children
  - /w, l, j/ used in place of consonant form
  - /o, ə, u/ used in place of vocalic forms
- Distortions = derhotacization.
  - This error more likely with older children and/or adults
  - One of the more common residual errors (may be more common in males)

## Remediation of Rhotic Errors

- Vocalic forms may be easier to start with because they are continuants.
- Avoid prolonging consonantal /r/ when you model it and when they produce it.
  - Child may focus in on duration as important cue rather than /r/-like resonance.
  - Result may be substitution of bunched /ɜ:/ for retroflex /r/

## Remediation of Rhotic Errors

- Phonetic placement – retroflexed production often easier to explain.
  - Point tongue tip just behind alveolar ridge but don't touch it.
- Discourage too much lip rounding if error is w/r.
- Mouth should be mostly closed; hard to keep tongue dorsum down if mouth is wide open.

## Remediation of Rhotic Errors

- Bunched /ɜ:/ can be achieved by having child put tongue in position for /d/ and drop tongue-tip down (leaving sides in contact with upper molars).
  - Have child produce /dɜ:/.

## Remediation of Rhotic Errors

- Sound Shaping – possible to shape from prevocalic “light” /r/ by dropping tongue-tip and then curling it back (producing voicing throughout).

## Other Error Targets: /k,g/

- Frequent developmental error = k→t , g→d.
- Common error in delayed speech (fronting).
- May see use of velar fricatives or uvular stops occasionally.
- Both occur in all word positions and clusters.
  - /g/ more common word-initially.

## Remediation of /k,g/

- Phonetic placement – describe raising of the back of the tongue (visuals may help).
- Tactile cue may be helpful – touch finger where chin meets neck.
- Manipulation – use tongue depressor to hold down front of tongue.
- Sound shaping – from /a/.

## Other Error Targets: /f,v/

- One of the earliest fricatives = /f/ , but /v/ can be quite late developing.
- Reason for difference not clear.
  - Both equally frequent in the language.
  - /v/ doesn't occur in as many different words (many instances of /əv/, /hæv/ and /gɪv/).
  - /v/ much more common in postvocalic position (closed syllables).

## Other Error Targets: /f,v/

- Typical errors = f→p, v→b, or use bilabial fricatives.
- Phonetic placement – have child “bite-down” lightly on lower lip and blow.
- Can use feather or small scrap of paper to show them airflow.
- Sound shaping – create closure for /p/ and physically push lower lip toward teeth and release closure.

## Other Error Targets: /l/

- Common errors = l→w, l→j (Gliding or Liquid Simplification).
- Occasionally see l→r (more common in Spanish).
- Vocalization (postvocalic only).
- Distortions: velarized or may sound like fricative
- /l/ = high frequency in English.
- Two forms that vary by position.
  - Light /l/ = prevocalic.
  - Dark /l/ = postvocalic; sounds closer to /ɹ/ or /ɹ̥/ .

## Remediation of /l/

- Phonetic placement: describe tongue placement at alveolar ridge.
- May need to use 'spread lips' to avoid /w/ error.
- Sound shaping: can move from /d, n, i/.

## A Word about Mirrors

- Many clinicians use mirrors to assist the child in finding the correct placement.
- This can be helpful but for some children it only creates confusion.
  - We don't usually learn speech this way.
  - Reversal of position and movement may be confusing.
  - Be prepared to put the mirror away if it isn't helping.

## Consonant Clusters

- Many possible in English (many other languages don't allow them).
  - May be up to 4 elements (/streŋkθs/).
- Frequent source of errors developmentally; may be three stages in acquisition
  - omit one element.
  - substitute for one element.
  - Fully correct.

## Remediation of Clusters

- Epenthesis (insertion of schwa) between the two elements may aid transition between the two consonants.
- Pausing between the two elements may heighten awareness.
- Prolong the first element, then add second element quickly.

## Remediation of Clusters

- Intervocalic clusters often are part of separate syllables.
  - Sometimes called "ambisyllabic" because syllable boundaries uncertain.
  - Use pause between and slowly reduce the length of the pause.
- Possible to shape all clusters this same way.
  - May be helpful to use props and physically bring them closer together.