Diagnosis

- Diagnosis is one of the most important tasks we carry out.
  - Clinical evaluation of the possible disorder.
  - Provides the basis for treatment decisions.
- Diagnosis is sometimes divided into:
  - Evaluation – determine eligibility for services.
  - Assessment – determine goals for intervention.

Screening

- Screening does not provide enough info for a diagnosis; result = pass/fail outcome Failure indicates the need for more testing.
- Informal screening may be as simple as having a conversation with each child and forming a general impression.
- May involve having them name a small set of pictures or repeat a specific set of sounds or words; clinician makes notes about errors.

Screening

- Formal screening may involve formal procedures with standard stimuli, procedures and normative data.
- Phonological screening instruments can be "stand alone" or part of a larger language test
  - HAPP-3 is an unnormed screening form for phonological processes.
  - Word articulation subtest of the TOLD- P (Test of Language Development- Primary) includes norms for preschool children.

Comprehensive Evaluation

- Requires information from several sources:
  - Articulation tests and stimulability measures.
  - Conversational speech sample – more than one context if possible.
  - Hearing screening.
  - Oral-facial examination.
  - Additional language tests (depending on the child).

Initial Impressions

- Possible to be gathering data before the formal evaluation begins.
- Gain an initial impression which might direct specifics of the evaluation.
- Could observe interaction between parent and child in waiting room and can talk to child on the way to the exam room.

Testing "Emerging Phonology"

- Testing very young children or those with significantly delayed speech development may require other approaches.
- Oral facial exam may be difficult to do.
- They may not relate well to pictures.
- They may be quite shy or unwilling to interact with someone new.

Emerging Phonology

- Testing with objects may yield a more meaningful sample than pictures.
- May need to record interactions with caregivers or older siblings.
- Ask caregivers to keep a log of things the child says (with as much detail as possible about how it was produced).

Emerging Phonology

- Paul and Jennings (1992) have proposed an index that looks at the number of different consonants and the types of syllable structures being used.
- Need a sample of spontaneous speech.
- Calculated automatically by CP

Syllable Structural Level (SSL)

Level 1. The word shape is composed of a vowel [ʌ], voiced syllabic consonant [m:], or CV syllable in which the consonant is a glottal stop [ʔo] or a glide [wi].

Level 2. The word shape is composed of a VC [ʌp] or CVC with a single consonant type [kek], or a CV syllable that does not fit the criteria for Level 1. Voicing differences are disregarded.

Level 3. The word shape is composed of syllables with two or more different consonant types, disregarding voicing differences [pɑti]. All word shapes containing clusters are classified as Level 3.

$$SSL = \frac{(\text{Level 1 shapes} * 1) + (\text{Level 2 shapes} * 2) + (\text{Level 3 shapes} * 3)}{\text{Total word shapes}}$$

Perception and Production

- The relationship between the ability to discriminate among speech sounds and produce those same sounds has been much studied.
- For many years we thought it was absolutely crucial that children be able to discriminate before they could produce.
- Discrimination training (ear training) was considered essential to speech therapy.

Perception and Production

- We now know that children with SD of unknown origin don't have general speech discrimination problems.
- They may have problems discriminating sounds that they have trouble producing or they may not (we need to check each sound).

Types of Discrimination

- External Discrimination – being able to detect differences (detecting errors or noticing different but normal sounds) in the speech of someone else.
  - Most children can do this easily for most sounds.
  - May not reflect internal discrimination skills (the ability to detect errors in your own speech).

Types of Discrimination

- Internal Discrimination – some speech delayed children don't seem to be paying attention to their own speech.
  - the /fɪs/ phenomenon.
- This is what we really want to know about, but it is almost impossible to test.

Locke's SP-PT

- The Speech Production- Perception Task.
- Not standardized (i.e., no norms).
- Select 3 sounds: error target, the sound they usually substitute, and a related sound.
- Produce the target word many times with the three sounds.
- See how often they correctly recognize the real word.

Conversational Speech Sampling

- Has the advantage of allowing for analysis of prosody, language, voice, and fluency.
- Will be required since most assessments will need to look at these other areas too.
- Should sample speech in a variety of contexts:
  - **Telling a story, describing pictures, describing favorite activities.**

Conversational Speech Sampling

- After identifying error sounds using an articulation test, you may want to plan materials that will evoke words containing those sounds.
- 10-15 minutes usually results in enough of a sample, but may not be enough for shy children, those under 3;6 or those who are very unintelligible.
- Best to try for at least 90 different words.

The Very Unintelligible Child

- May only be able to understand them using single word tests (where you know what they are trying to say).
- Parents usually report they can understand more than others; research confirms this
  - **They know names of friends, siblings, pets, favorite things, etc. and interact more than others (may also be learning to "translate" error patterns).**

The Very Unintelligible Child

- Single word tests usually result in usable samples (you know the intended targets).
- To improve your chances of knowing the intended targets:
  - **Use specific stimuli (e.g., activity pictures).**
  - **Discuss routine events.**
  - **Gloss (repeat) child's utterances while recording.**

Obtaining a Sample

- Recording conditions
  - Find the quietest environment possible
  - Be aware of noise sources (HVAC, toys that rattle, etc) and try to reduce them
  - Avoid overlapping speech
  - Position yourself to get a clear view of the speaker's face (make sure lighting is adequate)

Obtaining a Sample

- Recording equipment
  - Use the best quality equipment you can get
  - For now, cassette tape recording is fine
  - In the future, you'll want to learn to use digital recording equipment and software
  - Use an external microphone, if possible
  - Maintain a mouth-to-microphone distance of less than 18 inches

Obtaining a Sample

- Be familiar with how the equipment works
  - practice before you use it
- Learn how to adjust the recording level on your equipment
  - tape recorder: record level dial, VU meter
  - laptop: set microphone level thru Control Panel
  - MP3 recorder: look for record level menu
  - microphones may have their own "sensitivity" settings
- At the beginning of the recording session say the speaker's name and the date for future reference

Obtaining a Sample

Maximizing the Sample

- Spontaneous conversation = best
- Be casual about the presence of the recording equipment
- Use a variety of materials and topics to keep the speaker talking
- Make notes about things you see or hear but may not be noticed on the tape
  - – e.g., facial grimaces, fricative distortions

Single Word Articulation Tests

- Very commonly used.
- Examine production of consonants in initial, medial and final position.
- Score each sound (correct/incorrect or indicate omission, substitution (specify sound used) or distortion (may or may not use diacritics).
- Sometimes called "citation-form tests."

Articulation Tests: Advantages

- Easy to give and score (quick to administer).
- Sample all phonemes across three standard word positions (where possible).
- Usually provide standard scores – gives a sense of status relative to normal.

Articulation Tests: Disadvantages

- Performance in single words may not be the same as performance in conversation.
- Limited scope – look only at speech sound production; not other aspects of phonology (rate, intonation, phonological awareness, etc.)
- Don't sample all contexts (e.g., initial /s/ only next to one or two vowels); most tests don't test vowels.

Articulation Tests: Disadvantages

- Phonetic contexts of the sounds vary from word to word.
- Target words vary greatly in complexity.
- Only a single snapshot; tests performance on those sounds in those words on that day.
- Few if any available that are applicable for children under 3;0.
  - Difficult to do since very young children have limited vocabularies and often aren't used to formal testing.

Selecting an Articulation Test

- Test must be appropriate for age of client.
  - Most are standardized for ages 3;0 – 10;0.
- Preferable if you can generate standard scores.
- Preferable if it allows you to easily examine error patterns
  - Possible to do manual or computerized process analysis on any sample.
- Preferable if it samples more common error sounds more frequently.

Administering an Articulation Test

- Usually involves showing a series of pictures and asking the child to name them.
- Each label (target word) evokes a specific target sound.
- Often only focus on one sound per word. e.g., “sun” evokes word-initial /s/

Spontaneous Productions?

- Preferable to get spontaneous productions of the words BUT …
  - Children may not know all the words.
- May need to tell them the word and ask them to repeat it (imitation) BUT …
  - Many children can produce sounds in words more easily when they imitate.
  - May not be the best sample of their speech.

Delayed Imitation

- By telling the child the name of the picture and then asking “what was it called?” we put some time and other words between our production and their production.
  - **A form of delayed imitation**
- Could tell them the name of the picture, go through a few more items and come back to the word and ask “what was this one again?”
  - **A more preferred form of delayed imitation.**

Scoring an Articulation Test

- Count the number of errors on the target sounds (called a raw score).
- Compare the raw score against a table of “norms” to obtain a ‘standard score’ which indicates performance relative to their peers.
- We can’t use the raw score itself because we expect different performance at different ages.

Supplemental Procedures

- Not uncommon for the "target" sound to be correct but have errors on other sounds.
  - e.g., if target is final /m/ in "comb" and child says [tom], the /m/ is correct but there is a t/k substitution.
  - Should transcribe entire word (not just the error); provides additional information about consistency of errors on /k/ .

Supplemental Procedures

- For sounds that are in error, we can sample them in additional contexts (i.e., other words or sentences).
  - Many articulation tests have lists of extra words.
    - e.g. Secord's C-PAC (Clinical Probes of Articulation Consistency).
  - As an SLP, not to mention a college graduate, you should be able to generate lists of words containing target sounds *on demand*.

Supplemental Procedures

- Sample conversational speech and transcribe.
  - Citation form test results by themselves are insufficient.
- Several studies have shown that results on single words are not necessarily the same as in conversation (even for the same target words).

Describing Errors

- Three options available:
  - Two way scoring – correct / incorrect.
  - Five-way scoring – omission, substitution, distortion, addition, correct.
  - BEST is phonetic transcription – more precise and gives more specific information about the error.

Criterion-Referenced Tests

- An alternative to norm-referenced tests.
- No norms = no peer comparison
- Useful for assessment but not for evaluation
- Purpose is to profile a child’s error patterns in terms of
  - error types (S.O.D.A.)
  - error positions (I, M, F)
  - phonological processes

Testing Stimulability

- Examining the capacity to produce sounds that aren't currently being produced correctly (if at all).
- Fairly standard practice to do this as the next step after administering an articulation test.
- Involves asking the child to imitate you (no specific cues given on making the sound).

Stimulability

- No standardized procedure but usually start by asking them to repeat the sound in isolation.
- Typically try 3-5 times; if successful move to higher levels (syllable, word, phrase etc.).
- Continue until you find the level where they can no longer produce it
- Report the highest successful level.

Stimulability

- Has been assumed that sounds that are more stimulable may be mastered more quickly in therapy
  - one basis for selecting targets (not the only one).
- May also indicate which sounds child is "on the verge" of acquiring (may not need therapy for that sound).

Hearing Screening

- Obviously any impairment of hearing has the potential to affect speech acquisition.
  - Middle ear problems have been implicated as a factor in Speech Delay
- Should include taking a brief history, visual inspection of the ear, screening audiometry and screening tympanometry

Language Screening

- Necessary because we know that children with SD of unknown origin often have problems with articulation or phonology AND other aspects of language.
- Many standardized screening tests available
- Can also analyze conversational speech sample.

How much time for Data Collection?

- Given the number of things to do, it is often necessary to spread data collection over several testing sessions.
- Advantage is that it allows you to plan the supplemental testing between sessions.