



**GHENT
UNIVERSITY**

SPEECH MANAGEMENT FOR CHILDREN WITH A CLEFT LIP AND PALATE: STATE-OF-THE-ART

Webinar 3

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CONTENT

1. Active versus passive speech errors

2. Speech intervention approaches
 - 2.1. Motor-phonetic approach
 - 2.2. Linguistic-phonological approach
 - 2.3. Combined phonetic-phonological treatment
 - 2.4. What approach should we use?
 - 2.5. What sounds should we treat first?

ACTIVE AND PASSIVE SPEECH ERRORS

Active speech disorders

Maladaptive articulatory placements

Learned by the child (“compensation”)

Changes regarding the place of articulation

E.g., glottal stops, backing to a palatal/velar place

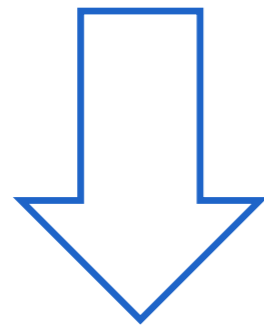
Passive speech disorders

Caused by abnormal structure

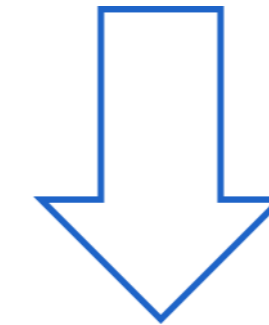
Changes regarding the manner of articulation

Often consequent to VPI

E.g., hypernasality, nasal emission/nasal turbulence, weak or nasalized productions

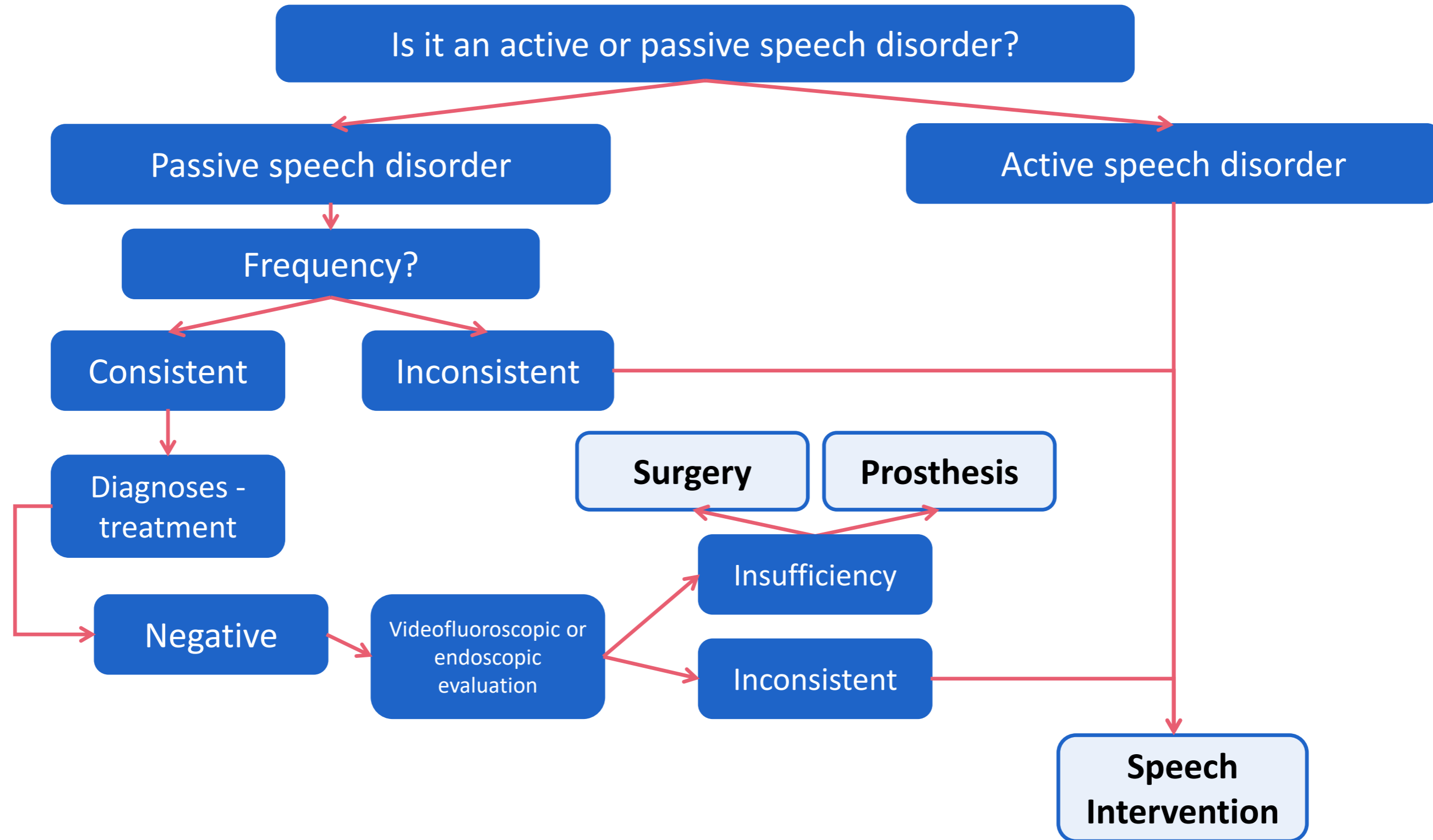


Speech intervention

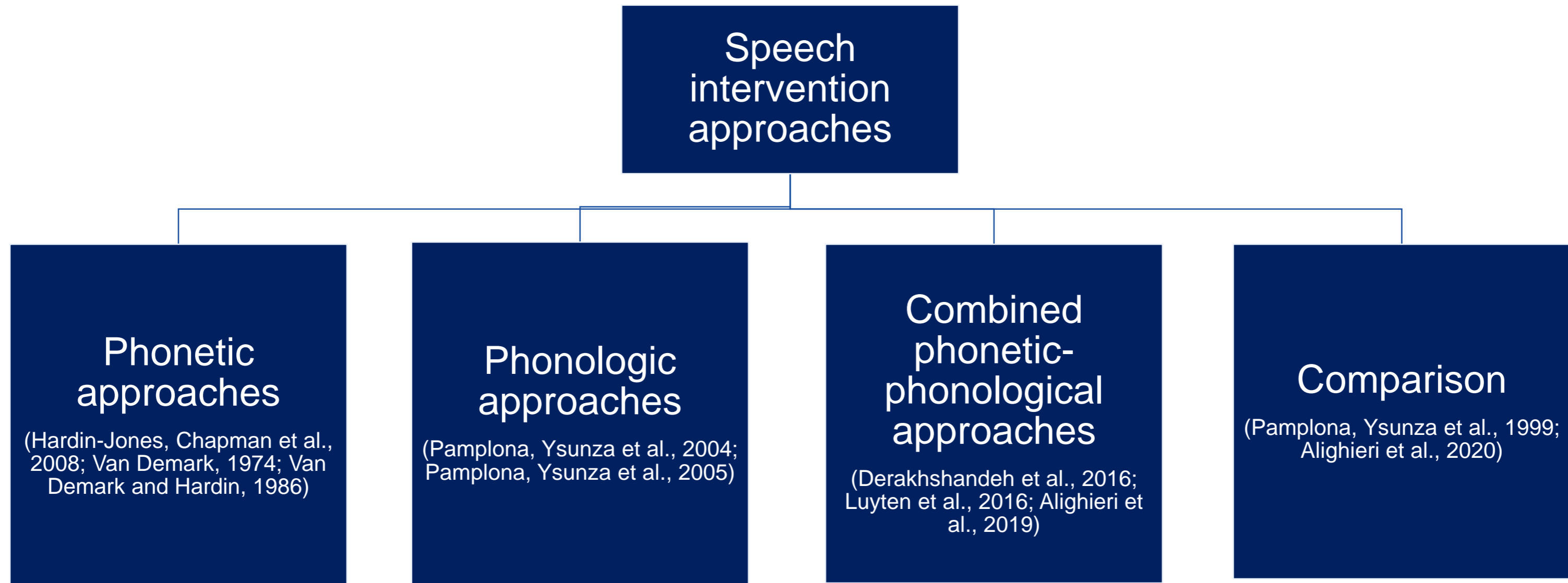


Surgical intervention

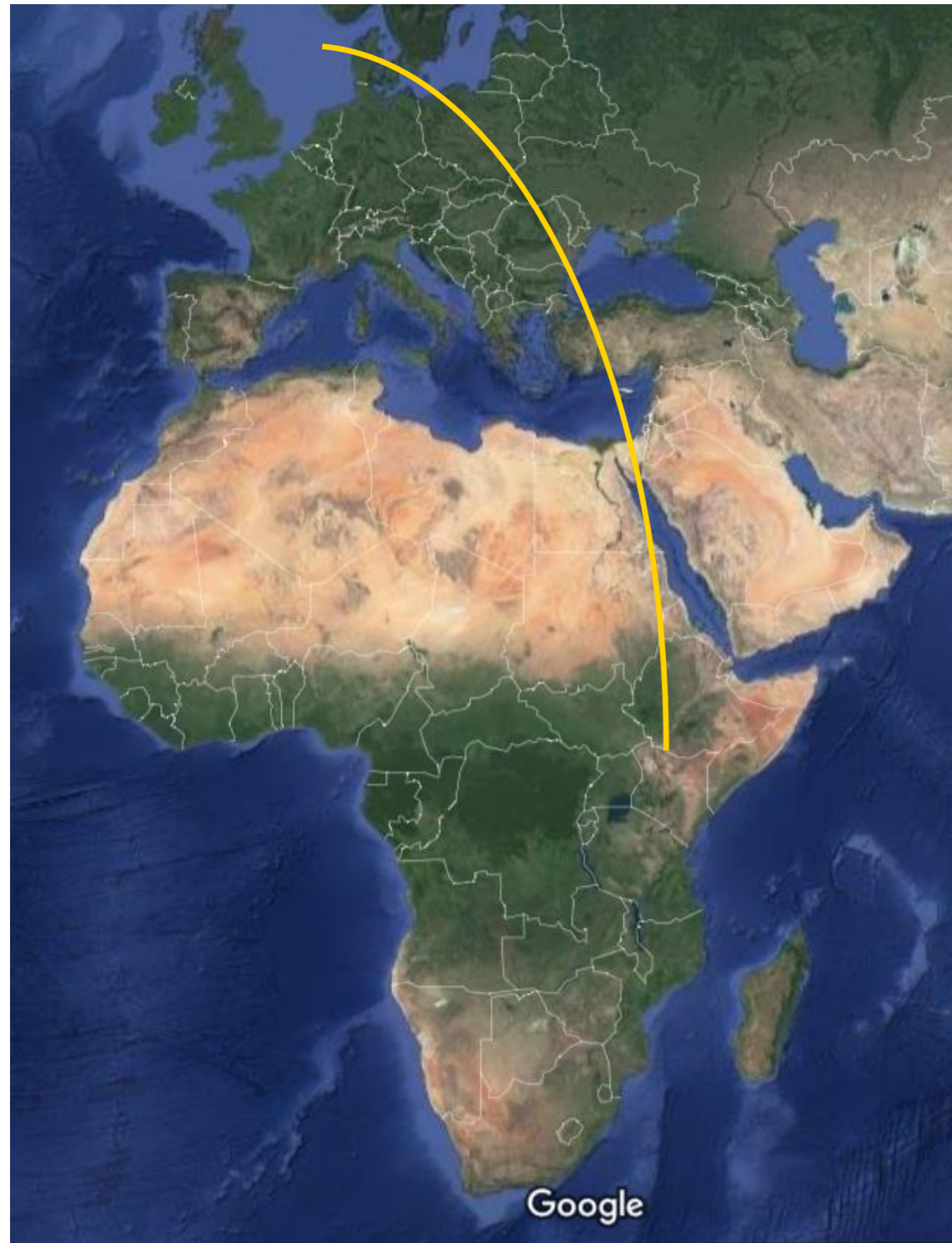
ACTIVE AND PASSIVE SPEECH ERRORS



LIMITED EVIDENCE FOR SPEECH INTERVENTION



OUR EXPERIENCE IN COUNTRIES WITH LIMITED ACCESS TO SPEECH THERAPY: UGANDA



- ❖ 43.252.996 million inhabitants
- ❖ 0.37 per 1000 Uganda (Dreise et al. 2010) vs. ± 1 per 1000 Western countries



- ❖ Limited access to hospital
 - 0.037-0.005/100.000 (WHO, 2016)
- ❖ Limited availability SLPs
 - 0.016/100.000 (Mulwafu et al., 2017)

COMPREHENSIVE REHABILITATION SERVICES UGANDA (CORSU)



CASE 1

- ❖ Ugandan boy, aged 4, born with a bilateral cleft lip and palate
- ❖ One-stage early lipplasty and palatoplasty (<6 months)
- ❖ No history of speech therapy

Perceptual speech assessment revealed:

- ❖ Glottal productions of the /p/ and /b/
- ❖ Palatalisation of the /t/
- ❖ Mild hypernasality

Approach to intervention?

MOTOR-PHONETIC APPROACH (VAN RIPER, 1978)



Isolation – syllable – word – sentence – text – spontaneous speech

Individual approach!

STEP 1: IDENTIFICATION

Patient needs to learn the sound features

- ❖ Visual, tactile and auditory **feedback**
- ❖ SLP is model for correct production
- ❖ Sound features
 - Placement: correct placement of articulators?
 - Manner: is air flowing in the right way?
 - Voice: is phonation occurring?



STEP 2: DISCRIMINATION

Patient listens to own speech

- ❖ Give the patient **time to identify** the error
- ❖ Auditory training
- ❖ Feedback
- ❖ **Listen** to the sound (wrong or right?)

The speech therapist is a guide!

STEP 3: VARIATION & CORRECTION

Patient listens to own speech

- ❖ Progressive approximation
- ❖ Auditory stimulation/imitation
- ❖ Phonetic placement
- ❖ Modification from other sounds



**Focus on the correct
production, not on the
error!**

EXAMPLE 2: /P/ IN ISOLATION



STEP 4: STABILIZATION & TRANSFER

Possible techniques

- ❖ Increased/decreased duration of sound production
- ❖ Speaking and writing
- ❖ Intensity (louder/softer)
- ❖ Reminders in daily life!



INTRODUCING THE NEXT PHASE?

- ❖ Individual approach
- ❖ When the child is able to produce the target sound correctly in **90%** of the cases with **minimal cues** from the therapist



TREATMENT OF GLOTTAL STOPS?

Identification & discrimination:

- ❖ “Throat sound” vs. “Mouth sound”
- ❖ Use mirror for articulatory placement
 - ❖ Back of tongue is up for the /k/ and /g/

Variation & correction

- ❖ /h/ before the pressure consonant
 - ❖ /hhhhhhhk/
 - ❖ /hhhhhhhg/



“Throat sound” vs. “Mouth sound”

www.leadersproject.org

CASE 2

- ❖ Girl, aged 8 years, born with a cleft palate
- ❖ One-stage early lipplasty and palatoplasty (<6 months)
- ❖ No history of speech therapy

Perceptual speech assessment revealed:

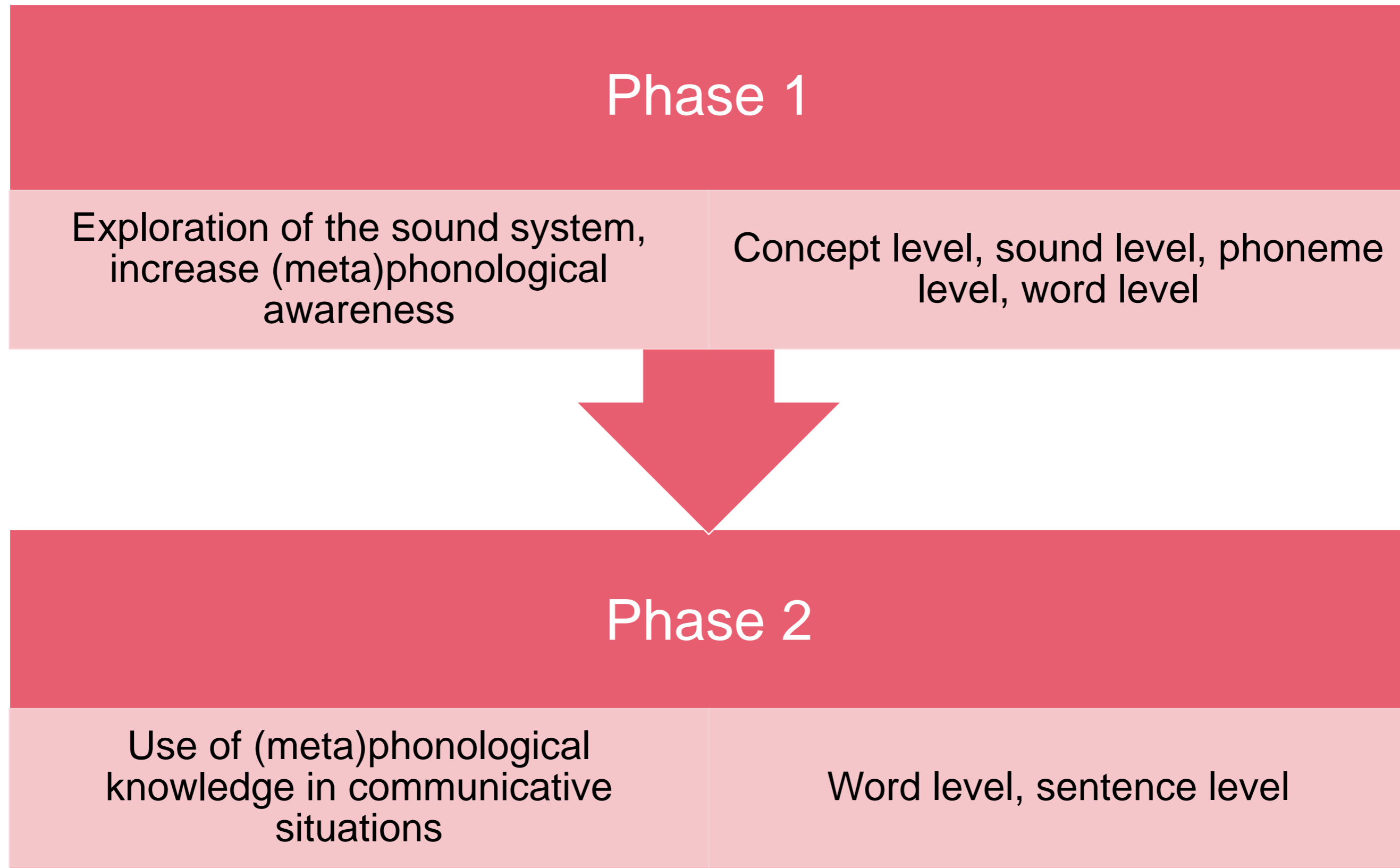
- ❖ Substitution of all fricative sounds by active nasal fricatives

Approach to intervention?

LINGUISTIC-METAPHONOLOGICAL APPROACH

- ❖ Phonetic disorder → Phonological disorder (Chapman, 1993)
- ❖ Organization and representation of the sound system
- ❖ Higher speech processes
- ❖ Knowledge and perception of a sound
- ❖ E.g., Metaphon (Howell & Dean, 1994; Alighieri et al., 2020), use of minimal pairs

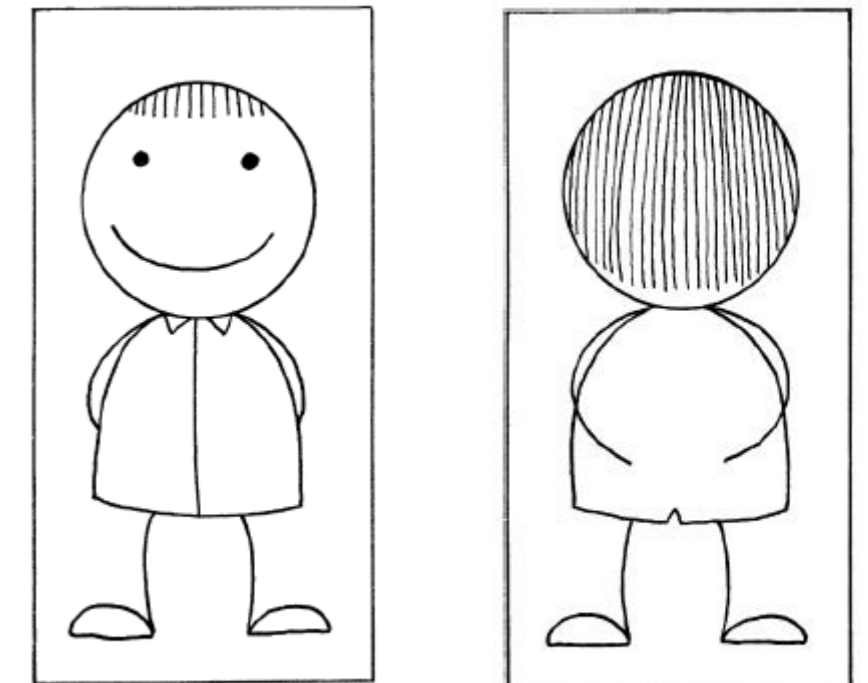
METAPHONOLOGICAL APPROACHES (HOWELL & DEAN, 1994)



METAPHONOLOGICAL APPROACHES (HOWELL & DEAN, 1994; ALIGHIERI ET AL., 2020)

Phase 1: Concept level

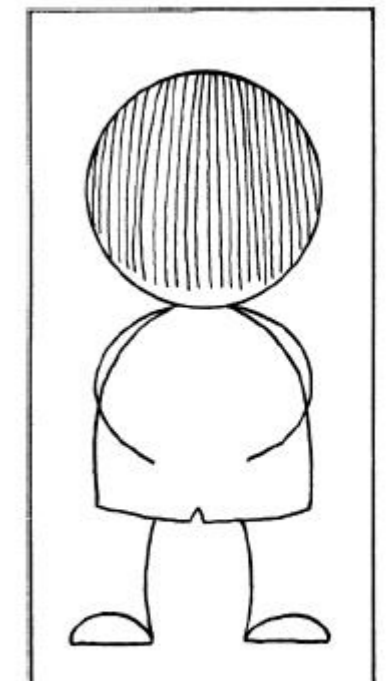
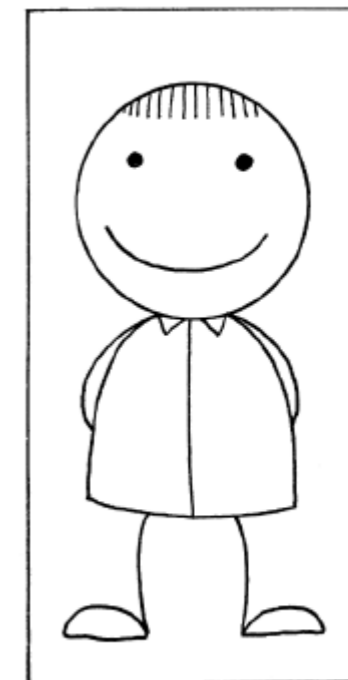
- ❖ Shared understanding of concepts
- ❖ Child-friendly vocabulary to talk about sound classes
- ❖ **No (speech) sounds involved!**
- ❖ E.g., backing: mister front – mister back



METAPHONOLOGICAL APPROACHES (HOWELL & DEAN, 1994; ALIGHIERI ET AL., 2020)

Phase 1: Sound level

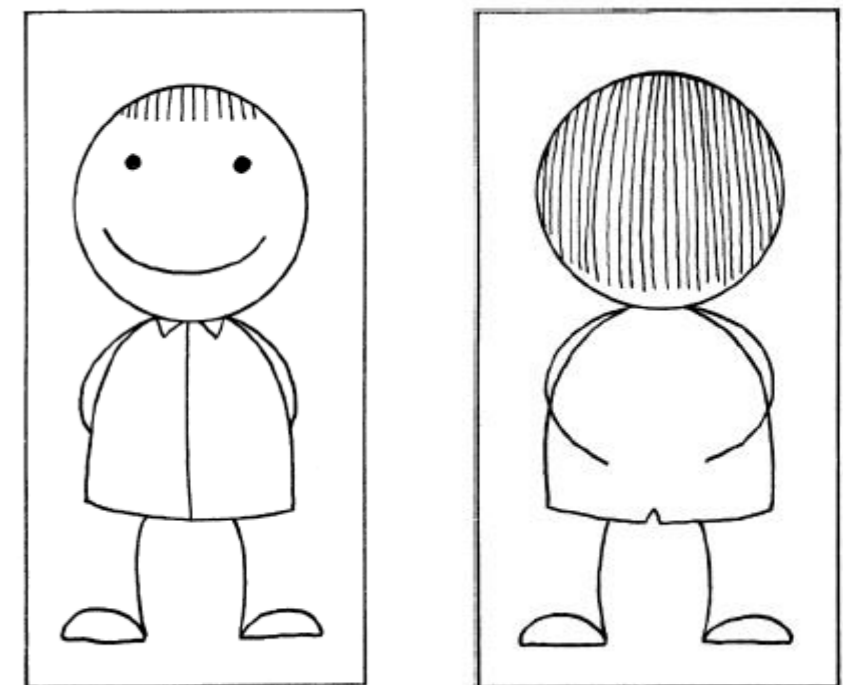
- ❖ Transfer of this vocabulary to **non-speech sounds**
- ❖ Musical instruments, sounds made by toys
- ❖ E.g., backing: is the sound made in the **front** or in the **back**?



METAPHONOLOGICAL APPROACHES (HOWELL & DEAN, 1994; ALIGHIERI ET AL., 2020)

Phase 1: Phoneme level

- ❖ Manipulation of **speech sounds**
- ❖ Produce sounds that vary along the dimension in question
- ❖ Three parts:
 1. SLP produces sounds
 2. Child points at correct reference image



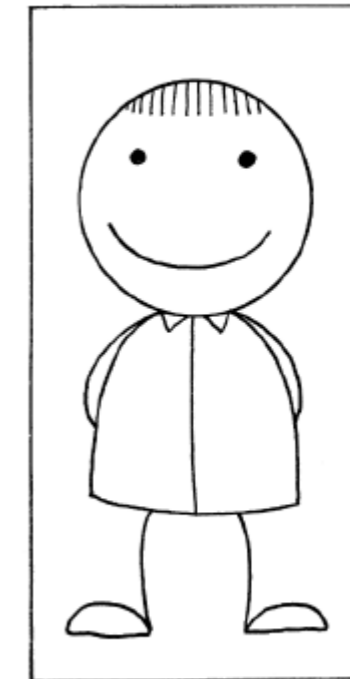
METAPHONOLOGICAL APPROACHES (HOWELL & DEAN, 1994; ALIGHIERI ET AL., 2020)

Phase 1: Word level

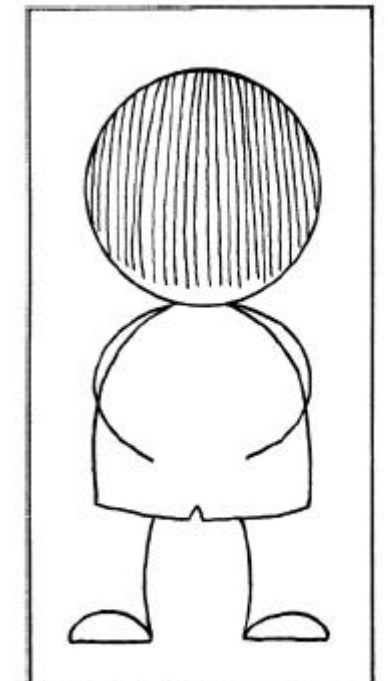
- ❖ Child is listener (not an actor)
- ❖ Stimulated to produce (non-speech)sounds
- ❖ Minimal pairs



tea



key



ADJUSTMENTS FOR CLEFT SPEECH CHARACTERISTICS (ALIGHIERI ET AL., 2020)

- ❖ Original Metaphon approach: feedback on success or failure using minimal pairs
- ❖ Often: no minimal pairs available for cleft speech characteristics

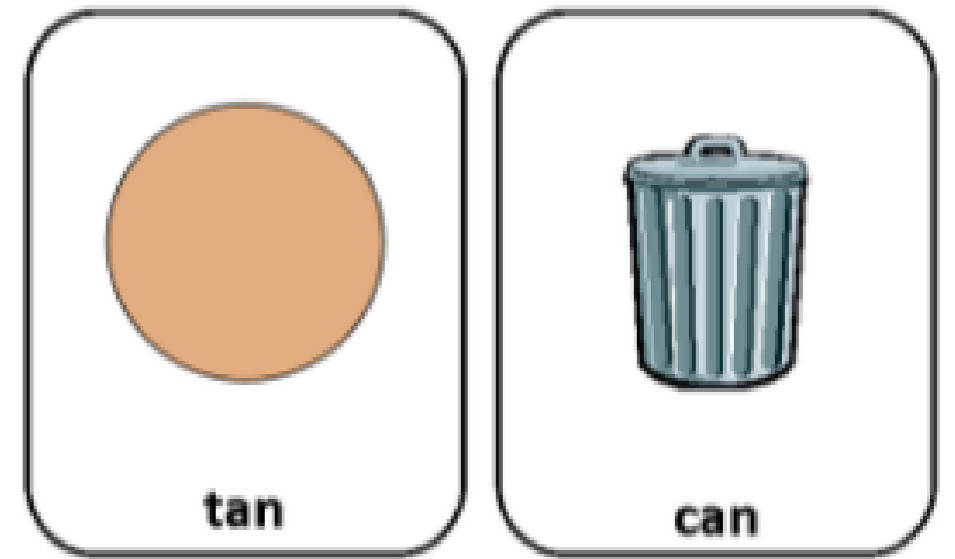


- ❖ Nonsense minimal pairs
- ❖ Active nasal fricatives: contrast between devoiced/voiced fricatives (e.g., “sue” and “zoo” (Alighieri et al., 2020))

METAPHONOLOGICAL APPROACHES (HOWELL & DEAN, 1994; ALIGHIERI ET AL., 2020)

Phase 2: Word level

- ❖ Active participation of the child (actor and listener)
- ❖ Structured treatment task
- ❖ Bunch of cards – “secret” message



Correct? “How did I know that I needed to point at this picture?”

Wrong? “I hear mister front, but wasn’t it supposed to be mister back?”

COMBINED PHONETIC-PHONOLOGICAL TREATMENT

- ❖ Combination of phonetic and phonological principles
- ❖ E.g., Van Riper (1979) and minimal pairs/reference pictures
- ❖ Phonological principles to learn **differences between the target consonants**
- ❖ Evidence? (*Derakhshandeh et al., 2016; Luyten et al., 2016; Alighieri et al., 2019*)

PHONETIC ELEMENTS IN THERAPY



PHONOLOGICAL ELEMENTS IN THERAPY



WHAT APPROACH SHOULD WE USE?

- ❖ Individual approach based on assessment of articulation
- ❖ Older patients (>12 years) → Phonetic approach (Van Riper, 1978)
- ❖ Younger patients (<12 years)
 - ❖ Problem of **placement** → phonetic approach
 - ❖ Problems with **distinctive features** of the sounds, several **errors in one class** of sounds
→ (combined phonetic-)phonological approach

WHAT SOUNDS SHOULD WE TREAT FIRST?

(KUMMER ET AL., 2014)

- ❖ Speech understandability and acceptability
- ❖ Normal speech development
- ❖ Anterior sounds > posterior sounds
- ❖ Voiceless sounds > voiced sounds

STRENGTHS AND WEAKNESSES OF THE APPROACHES

Motor-Phonetic approach

Often easy to understand given the visual, auditory, and tactile feedback

Can be used in older patients

Linguistic-Phonological approach

Easier generalization

Multiple sounds at a time - time efficient

Motor-Phonetic approach

One sound at a time

Generalization

Linguistic-Phonological approach

Less appropriate for older patients

Difficult to grasp for some children

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