

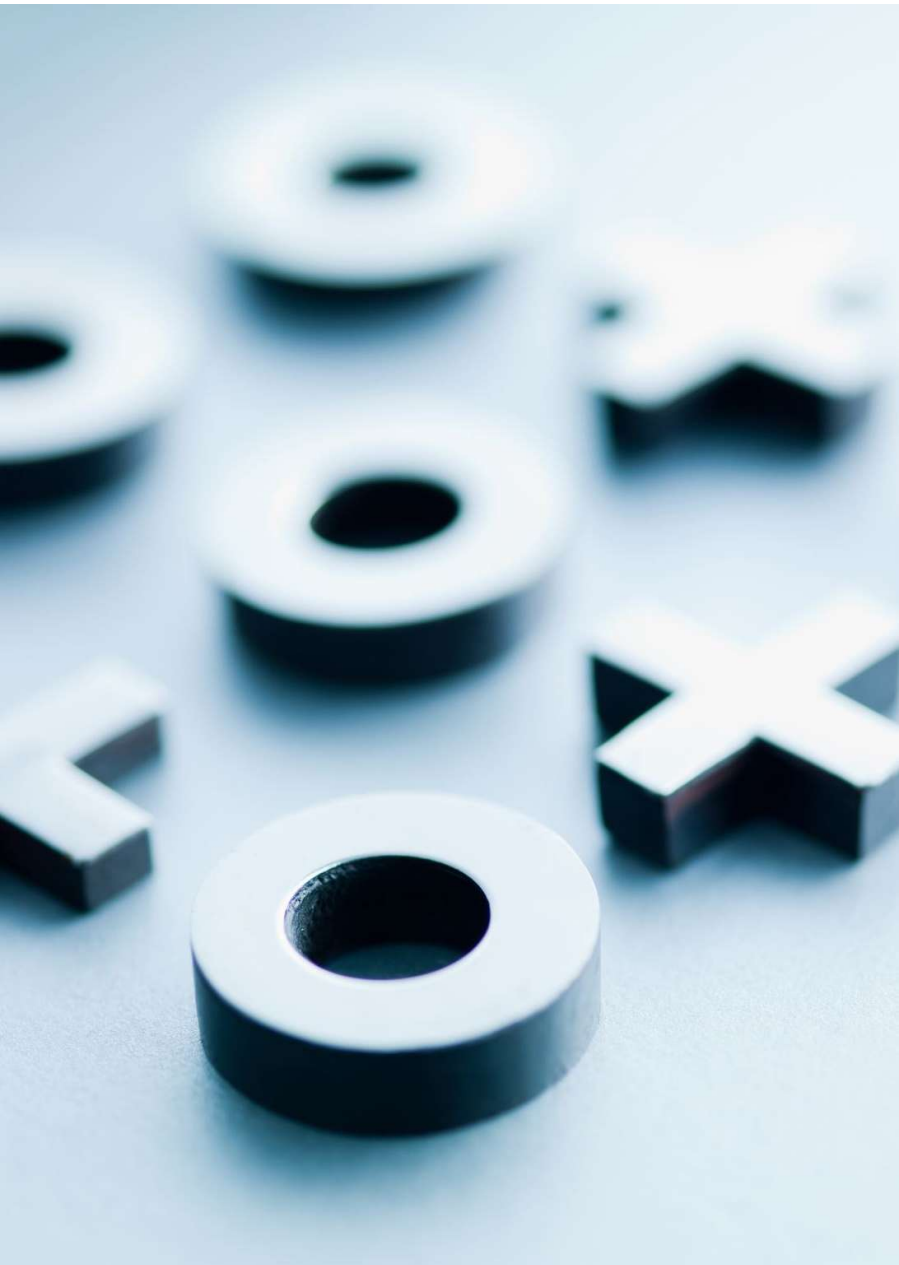
3rd EPATH Summer School
Gent University Hospital
10-07-2026

THERAPEUTIC GOALS AND ACOUSTIC OUTCOMES IN GENDER-AFFIRMING VOICE CARE (GAVC) :

Designing ecologically valid groups,
integrating pertinent acoustical and
physiological measures and assessing
the unstandardized

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M.D. Speech-Language Therapy; Ms.D. Gender studies



THEORETICAL BACKGROUND

Gender-affirming voice care (GAVC) and the
objectives of care

WHAT IS GENDER-AFFIRMING VOICE CARE (GAVC) ?



**Voice AND
communication**

79% of TGDP report vocal dysphoria
= Second source of dysphoria (after the chest)
(Pu et al., 2025)

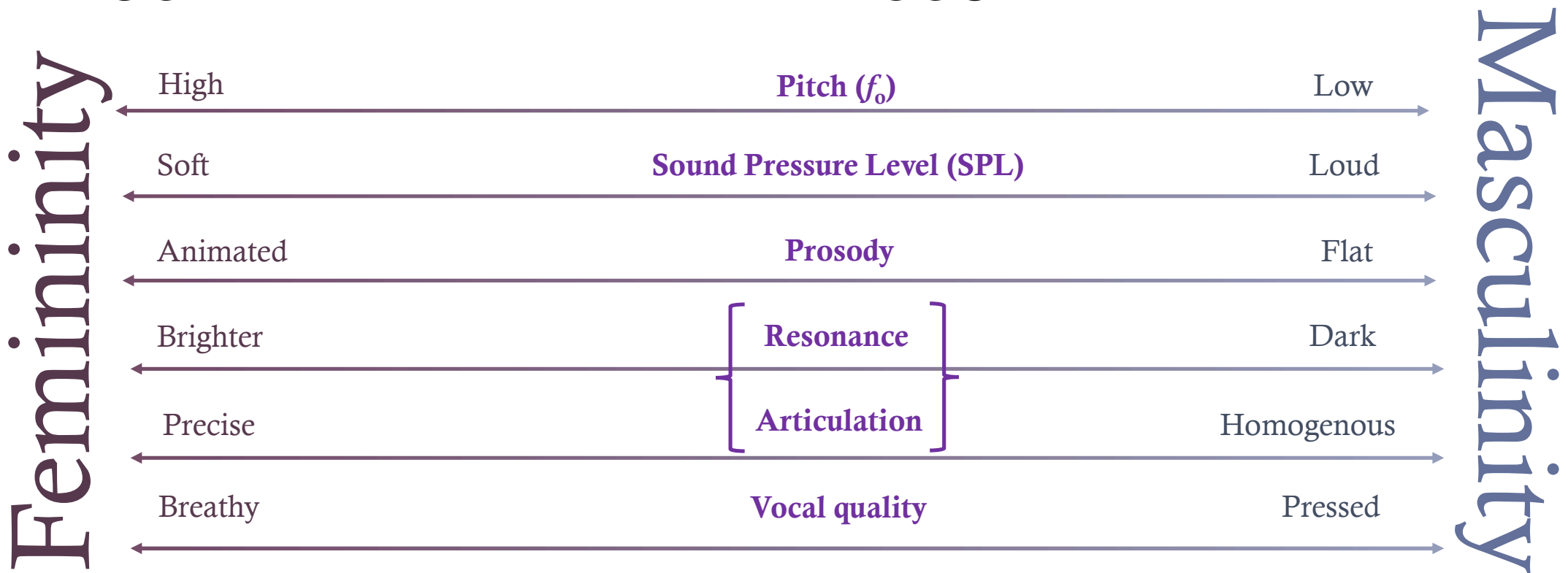
Process



**Trans and gender
diverse people**

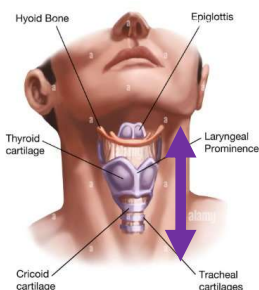
(Leung et al., 2018, 2021; Leyns et al., 2021, 2023; McKenna et al., 2026; Papeleu et al., 2025; Rosi & McGettigan, 2025; Södersten et al., 2024)

VOCAL FEMININITY AND MASCULINITY



(Hosbach-Cannon et al., 2020; Lamesch, 2010; Leung et al., 2018; Leyns, Daelman, et al., 2023; Leyns et al., 2021; Rosi & McGettigan, 2025; Roubeau et al., 2004; Sundberg, 1987; Zhang, 2025)

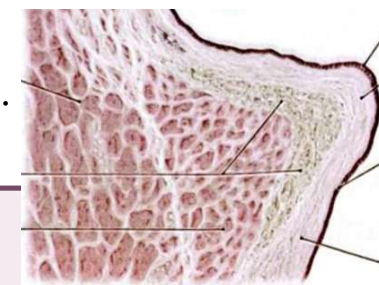
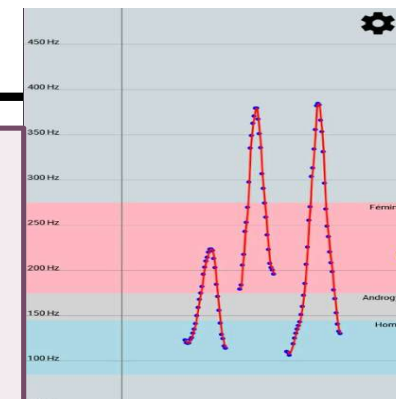
CLINICALLY,



Pitch training:

- Extend range
- In both mechanisms (M1-M2)
- Train endurance and sustainability
- Without inducing strain or unwanted muscle activation
- Depends partially on vocal weight and laryngeal height

e.g.: Below 150Hz for masc., between 150-185 Hz for enby, above 175Hz for fem.
Glissendis in M1, M2 and M1-M2



Laryngeal height (LH) training:

- Differentiate resonance and pitch
- Feel and hear dark and bright resonance /LH
- Feel and master the relation with tongue root position
- Train flexibility and sustainability

e.g.: little girl and father Christmas archetypes
Vary LH on one note

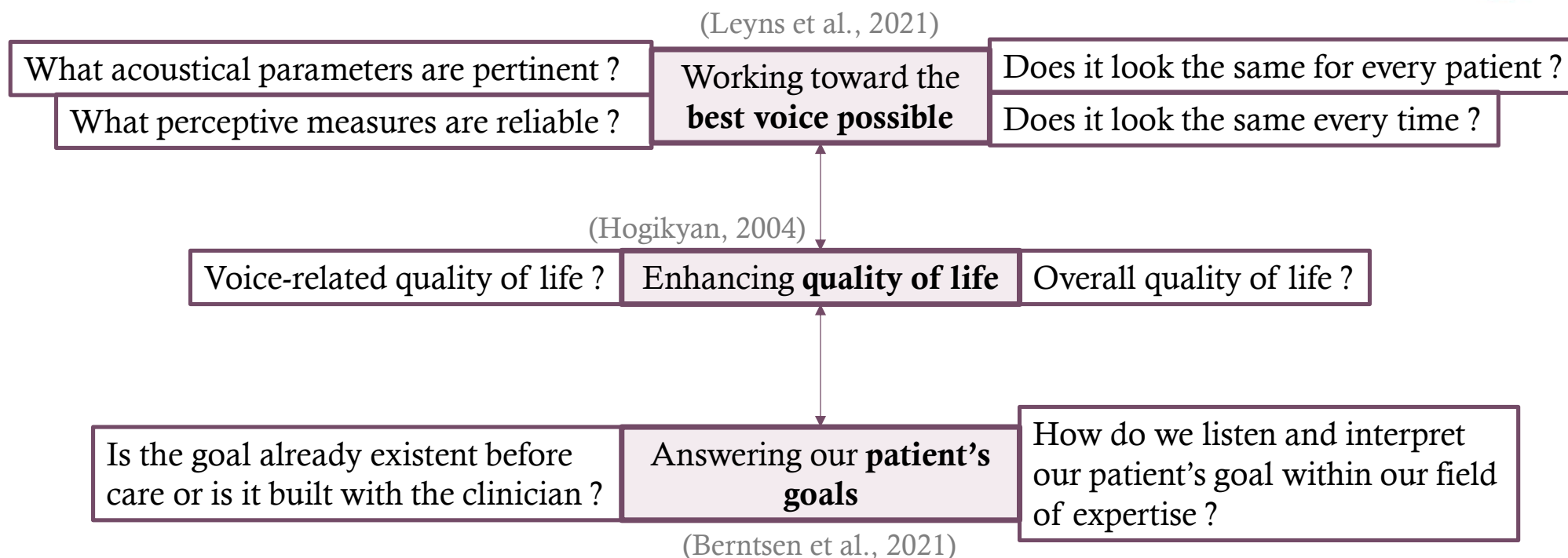
Vocal weight:

- Differentiate SPL and pitch
- Feel the vibratory sensation correlated
- Understanding the link with SPL, mechanisms and voice quality (pressed or breathy)
- Being able to change according to vocal demand and communication situation

e.g.: talking to a sleeping child or screaming to warn
/i, a, u/ with or without buzz feeling

AND others

WHAT IS THE GOAL OF OUR CARE ?



CONFRONTING IT TO REAL LIFE



Ava is a 22 years old belgian **trans woman**. She seeks GAVC to feminize her voice. She is out as a woman in most of her contexts of life (work, friends, artistic activities), but **not with her family**. She still lives with both her parent and with her younger brother. She loves her family deeply but **is afraid that coming out to them could endanger her**. She thinks she could be mistreated or thrown out of her house after telling them and **she doesn't want to risk it right now**.



What can I propose as a voice therapist ?



1. No voice care right now

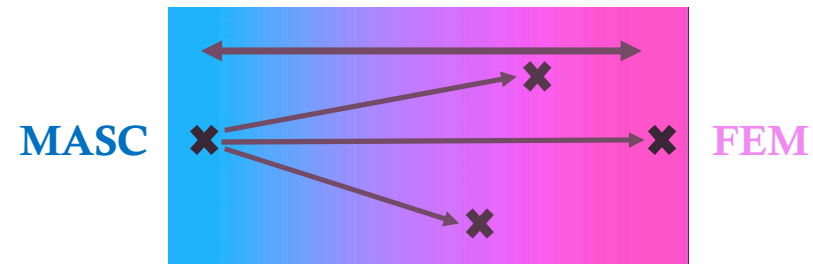
2. GAVC, but **she has to come out** to her family

3. GAVC, while **alternating** between masculinized and feminized vocal motor behaviour

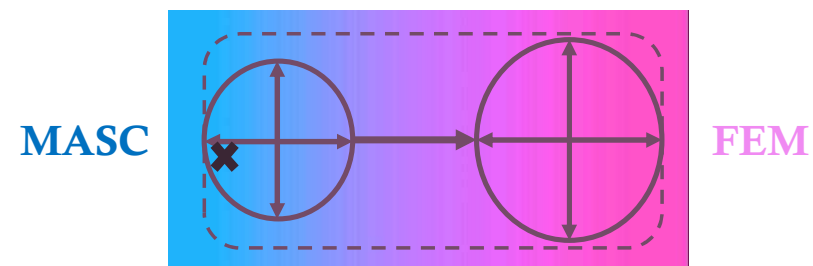
OR...

IN THAT CASE...

Do I want to **get to a set goal** with someone ?



Do I want to give the tools to allow **vocal flexibility** and **evolution perspectives** ?

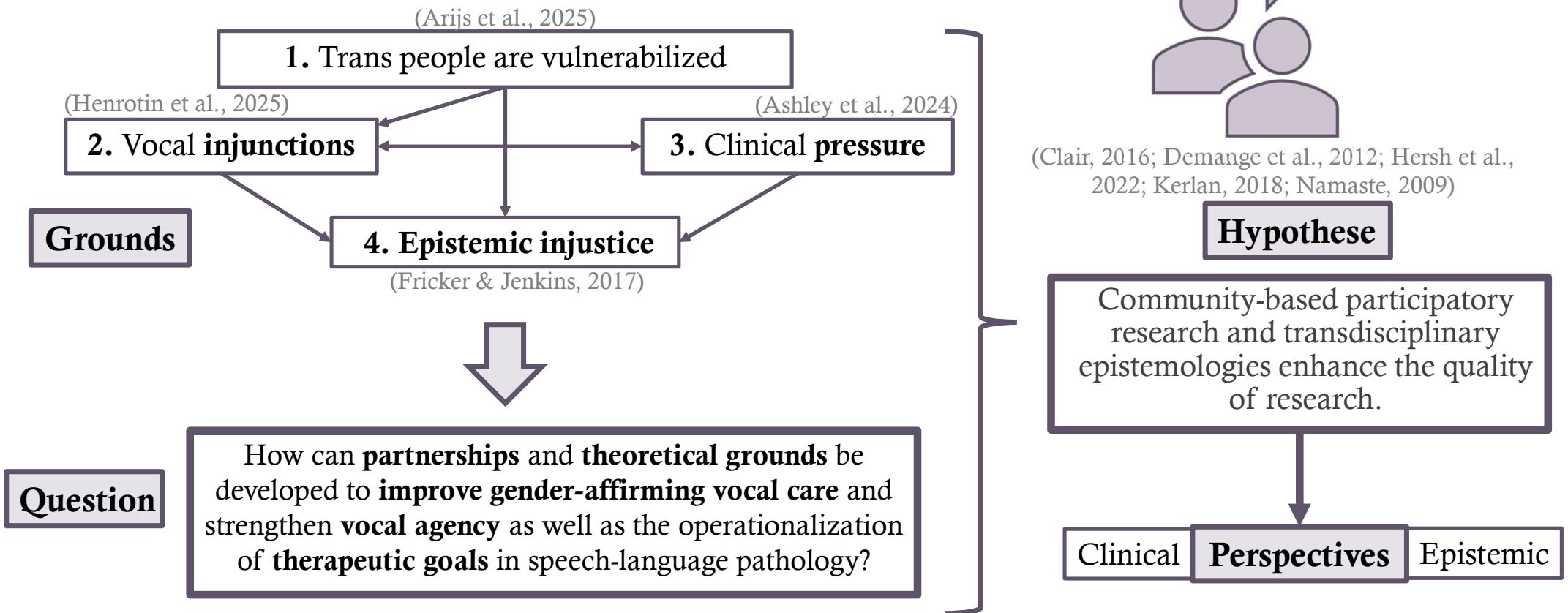


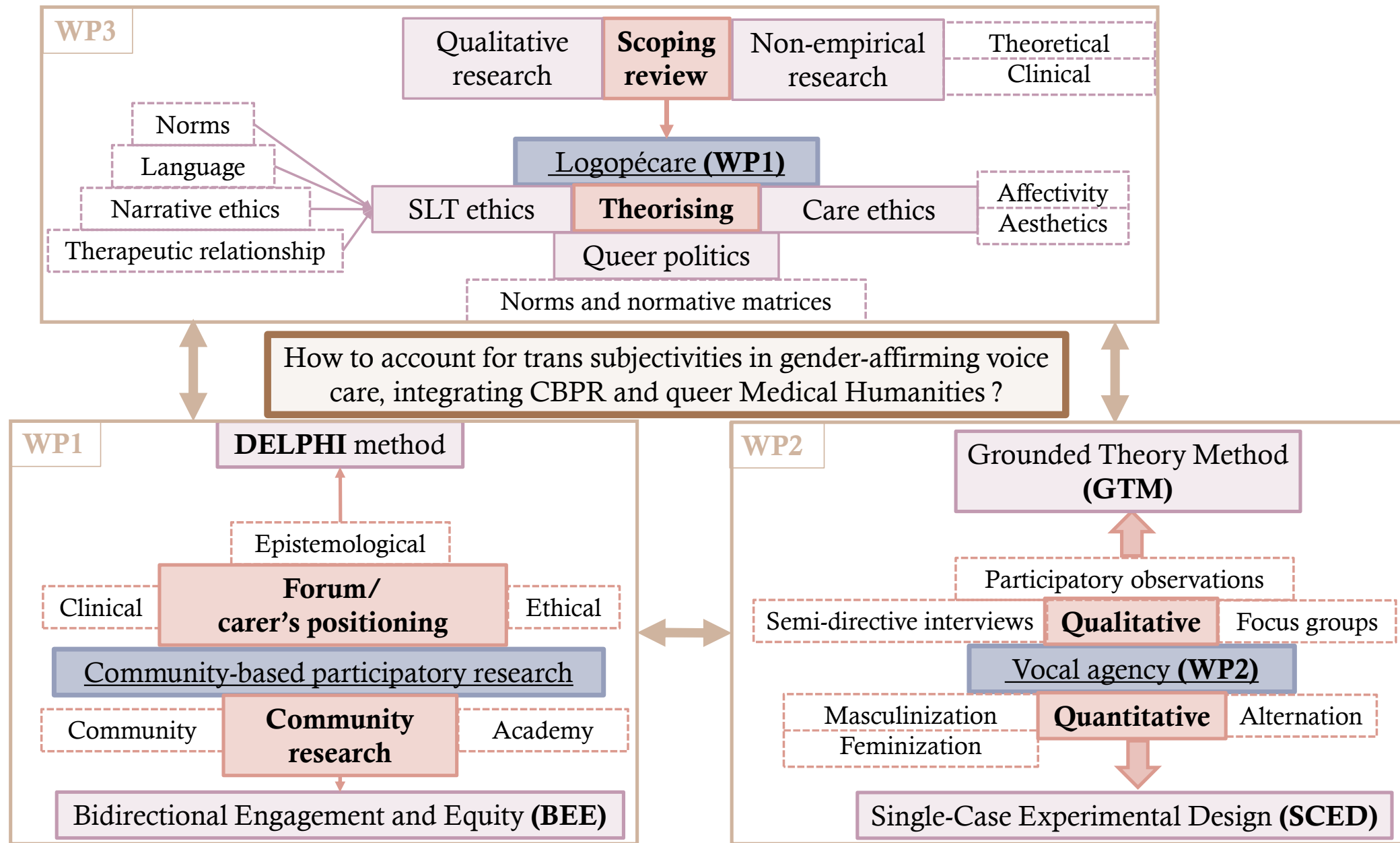


THE PROJECT AND THE QUANTITATIVE STUDY

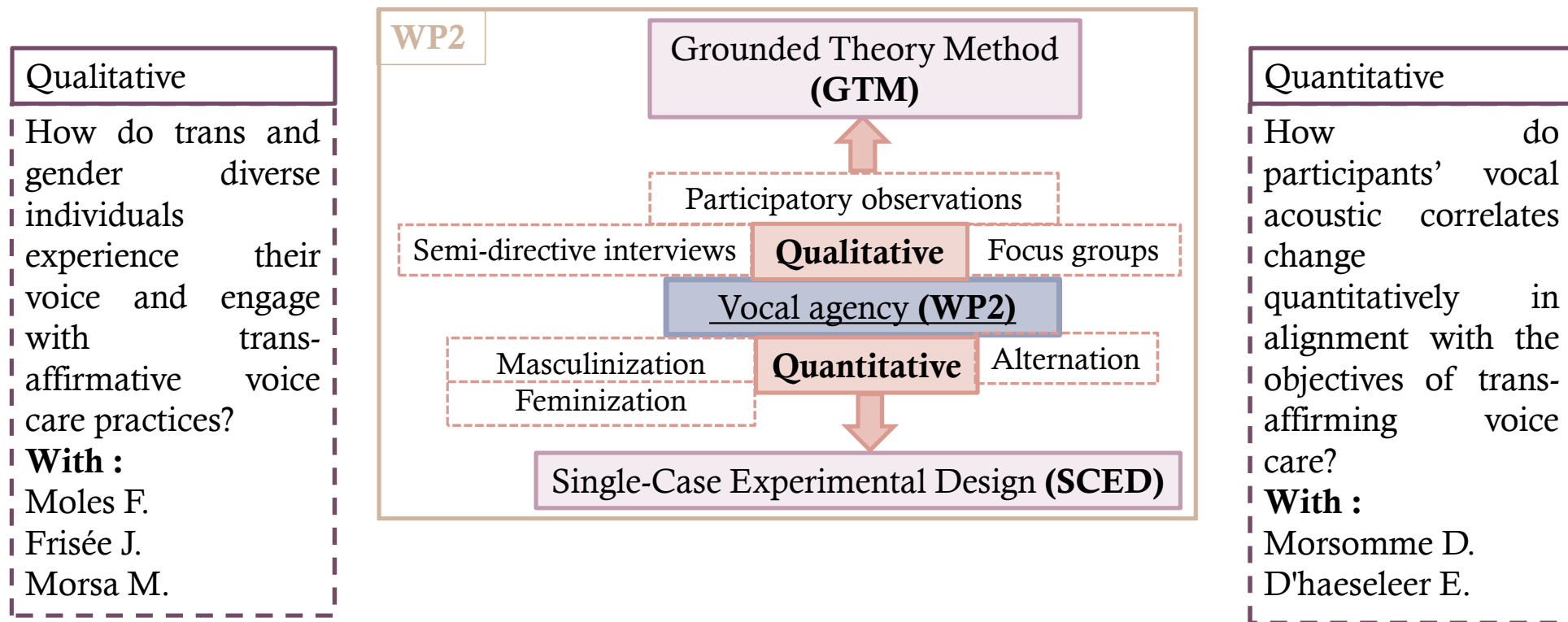
Focus on vocal agency and therapeutic goals
creation-operationalization-evolution

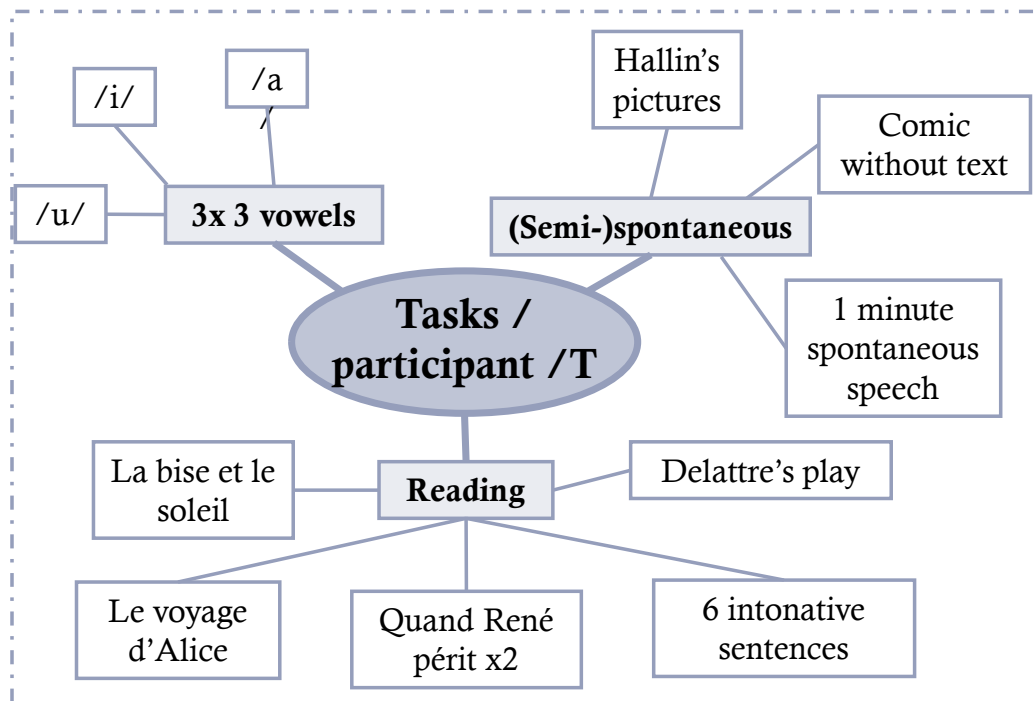
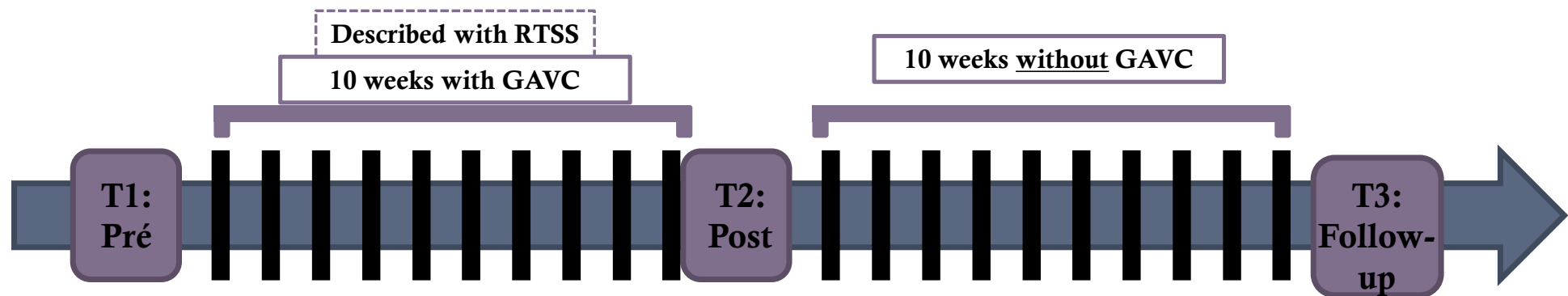
RESEARCH PROBLEMATIZATION





WP2 : VOCAL AGENCY, A MIXED STUDY APPROACH

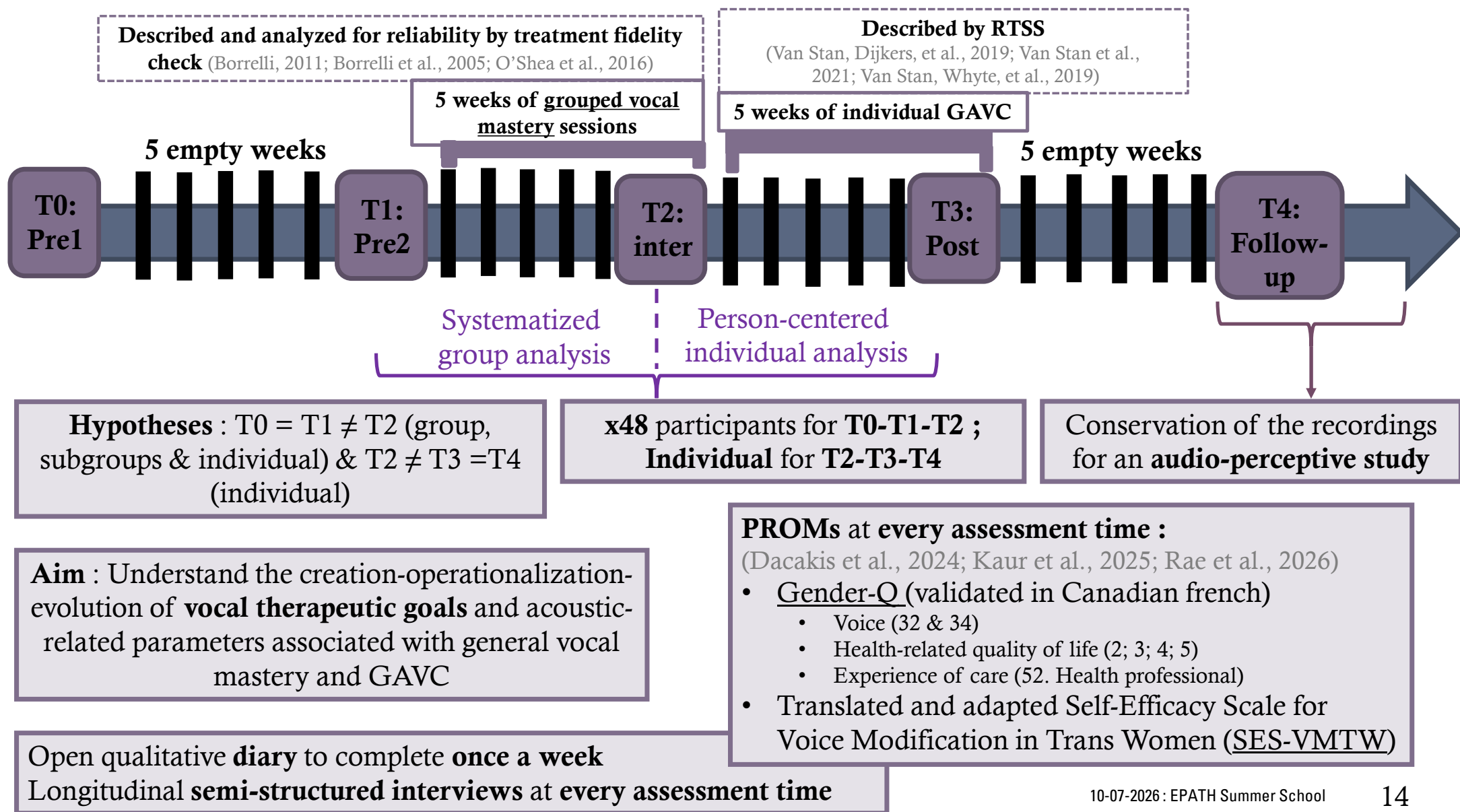




x48 participants		
x16 G1 : Feminization	x16 G2 : Masculinization	x16 G3 : Alternation

Aim : To see if there are differences in the acoustical parameters between F. VMB of G1-G2 & M. VMB of G2-G3

Hypothèse : $T1 \neq T2 = T3$



ACOUSTICAL MEASURES THAT WILL BE INCLUDED

Pitch (in Hz and ST) controlling mechanism :

- f_0 on vowels (a, i, u)
- Speaking fundamental frequency (SFF)
 - Reading
 - Spontaneous

Vocal quality measures:

- Acoustical Vocal Quality Index (AVQI)
- Maximum Phonation Time (MPT)
- Cepstral Peak Prominency (CPP) or Cepstral Peak Prominency Smoothed (CPPS)



Sound Pressure Level (SPL) with calibration :

- Median SPL in vowels and continuous speech

Prosody on 6 intonative sentences and Delattre's play:

- f_0 variation index (Spont.S.)
- SPL variation index (Spont.S.)
- General intonation shift
- Final intonation shift
- Min and max of f_0 and SPL in continuous speech (5th and 95th percentile)

Resonance and articulation :

- Resonance frequency of the 5 first formants (f_{F1-F5}) on vowels (a, i, u)
- Resonance frequency of the 5 first resonance (f_{R1-R5}) on text reading
- Formant spacing or Apparent Vocal tract length on continuous speech
- Vowel articulation index

Voice Range Profile (VRP) :

- First mechanism (M1)
- Second mechanism (M2)
- On the whole ambitus (M0-(M1-M2)-M3)

STILL HANGING

What do you think ?



ACOUSTICAL MEASURES (MAYBE ?)



Vocal weight :

- Closed quotient in electroglottography ?
- Closed quotient calculated acoustically ?
- Ultrasonography ?
- Spectral tilt or slope
- Cepstral Peak Prominency (CPP)
- Dynamic MRI (no)

Estimated subglottic pressure ?



Vocal quality (breathy or pressed) :

- Acoustic breathiness index (ABI) ?
- Spectral tilt or slope
- Cepstral Peak Prominency (CPP)
- H1-H2

Laryngeal height :

- Thyro-Umbrometer (no)
- Laryngoaltimeter (no)
- Ultrasonography ?
- Picture processing ?

Resonance and articulation :

- Resonance bandwidth of the 5 first formants (f_{F1-F5}) on vowels (a, i, u)
- Resonance bandwidth of the 5 first resonance (f_{R1-R5}) on text reading
- Low-High Ratio
- Long-Term Average Spectrum (LTAS)
- Spectral centroid measures

STILL HANGING IN THE STUDY

Timing :

- How many participants ?
- In how many group sessions ?
- Could they begin the research process after some GAVC?
- When to do the auditory-perceptual measures ?

Questionnaire creation :

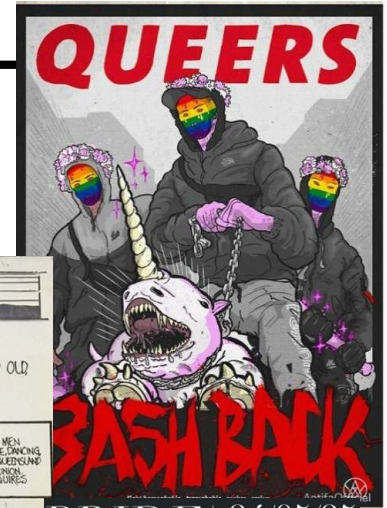
- Based on the SES-VMTW, only supposed to be for trans women
- Add more questionnaire on QoL and V-RQoL ?
- How to evaluate real competency and knowledge in voice mastery ?

Measures :

- A lot
- Mix between acoustical, physiological, PROMs and qualitative
- How to balance accessibility, tolerability and exhaustiveness ?
- How to concretely articulate the different types of data ?
- What proportion of individual and grouped analysis should I do ?

Data collection :

- Represent a huge amount of time
- Not sure yet about the sample size
- How to articulate with the other studies I'll do for the Ph.D. ?
- Should I involve other clinicians and how ? (increasing clinical diversity is a + and a -)
- Collect hormonal information (blood analysis or detailed anamnestic informations ?)



Thank you !

Please, talk to me

Antoine.Henrotin@uliege.be



10-07-2020: ERATIN Summer

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