

An investigation to examine the effectiveness of semi-occluded vocal tract exercises in enhancing self-efficacy and motivation of female adolescent singers: an embedded sequential mixed methods design

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Rationale

- During adolescence, the vocal mechanism goes through a period of growth (Hamdan *et al.*, 2012)
- Breathiness, roughness, decreased range (Abitbol and Abitbol, 2014)
- Some singers can exhibit distress during the female adolescent voice change process (Sweet, 2015; Sweet, 2018)

Solutions?

- Davids and LaTour (2021) recommended semi-occluded vocal tract exercises
- Manternach, Sweet and Clark, (2023) = straw phonation improved vocal quality and increased feelings of competence among female adolescent singers.



Aims

To ascertain whether SOVTEs can enhance the self-efficacy and motivation of female adolescent singers within my practice

To develop my academic ability

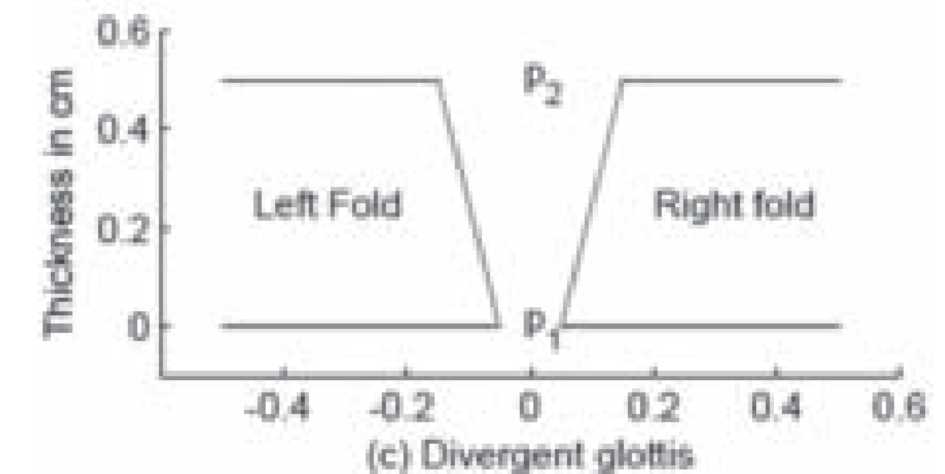
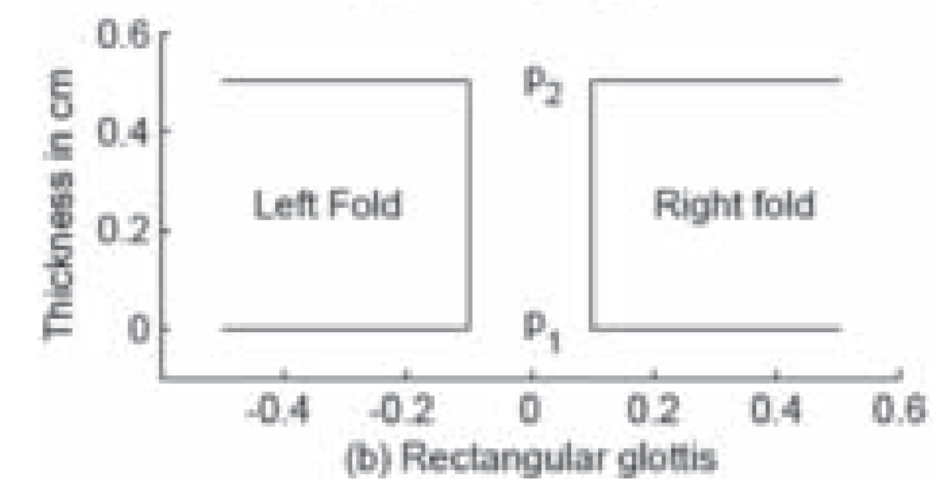
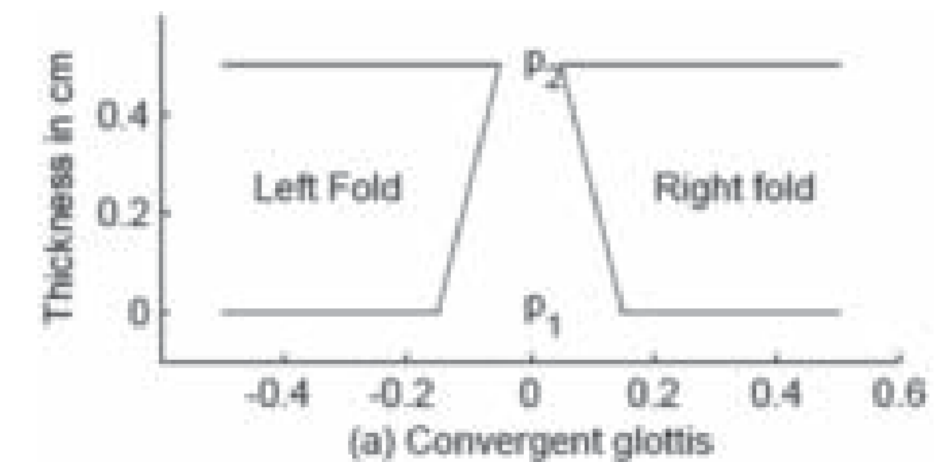
Literature review

Benefit to SOVTEs: Vocal ease

- SOVTEs can change the shape of the vocal tract (Titze *et al.*, 2021)
- Reduce contact pressure of the vocal folds (Zhang *et al.*, 2021)
- Self-reported ease following SOVTEs (Fantini *et al.*, 2017; Manternach, Sweet and Clark, 2023; Devadas, Vinod and Maruthy, 2022; Manternach, Kotsonis and Mann, 2022)

Benefit to SOVTEs: Vocal quality

- SOVTEs can change the position of the vocal folds (Titze *et al.*, 2013)
- Leading to more efficient vocal fold vibration (Titze, 2018)
- improve vocal quality (Manternach, Maxfield and Manternach, 2021; Manternach, Sweet and Clark, 2023; Nam *et al.*, 2019; Ramos and Gama, 2017)



Impact on self-efficacy and motivation

- **Mastery experiences** (Bandura, 1997)
- **Positive physiological and affective (emotional) states** (Bandura, 1997; MacAfee and Comeau, 2020; Maddux and Kleiman, 2016)
- **Motivation** – task difficulty (Virkkula, 2020)

Methodology

An embedded mixed methods sequential design (Creswell, 2008)

Phase 1
Qualitative

Phase 2
Quantitative

Phase 2
Qualitative

4- week SOVTE protocol

Phase 1

Sample

3 singing teachers
with a minimum
20 years experience

Methods

Semi-structured
interviews

Phase 2: 4-week SOVTE protocol

Sample

20 female adolescent singers from my practice.

Mean age of *14.4* (*SD=1.3*).

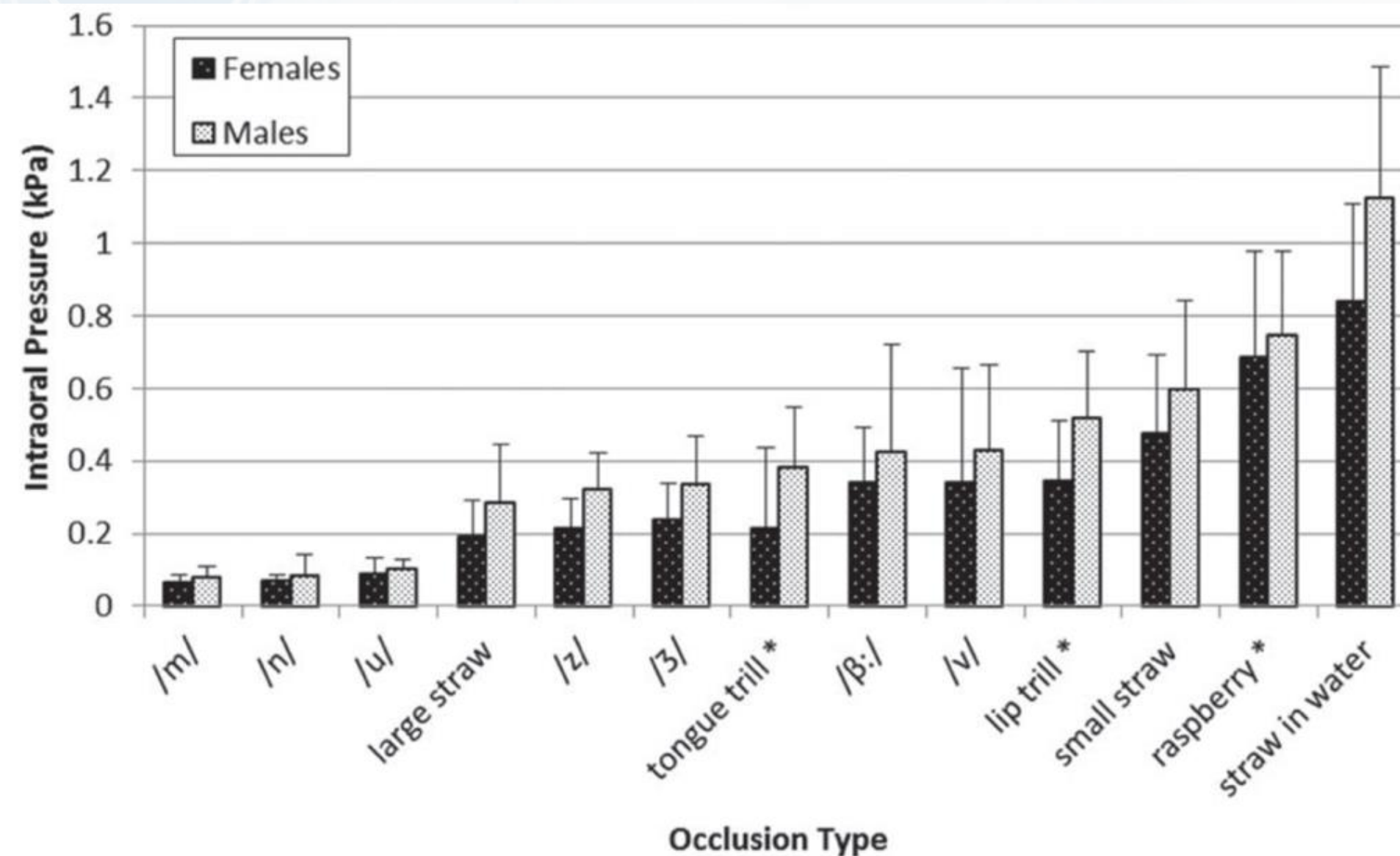
Methods

Surveys

- Singing Voice Function Self-Efficacy Scale (Lã *et al.*, 2023) and Fisher's (2014) Singing Self-Efficacy survey
- The Student Work Preference Inventory (Amabile *et al.*, 1994)

Semi-structured interviews

SOVTE

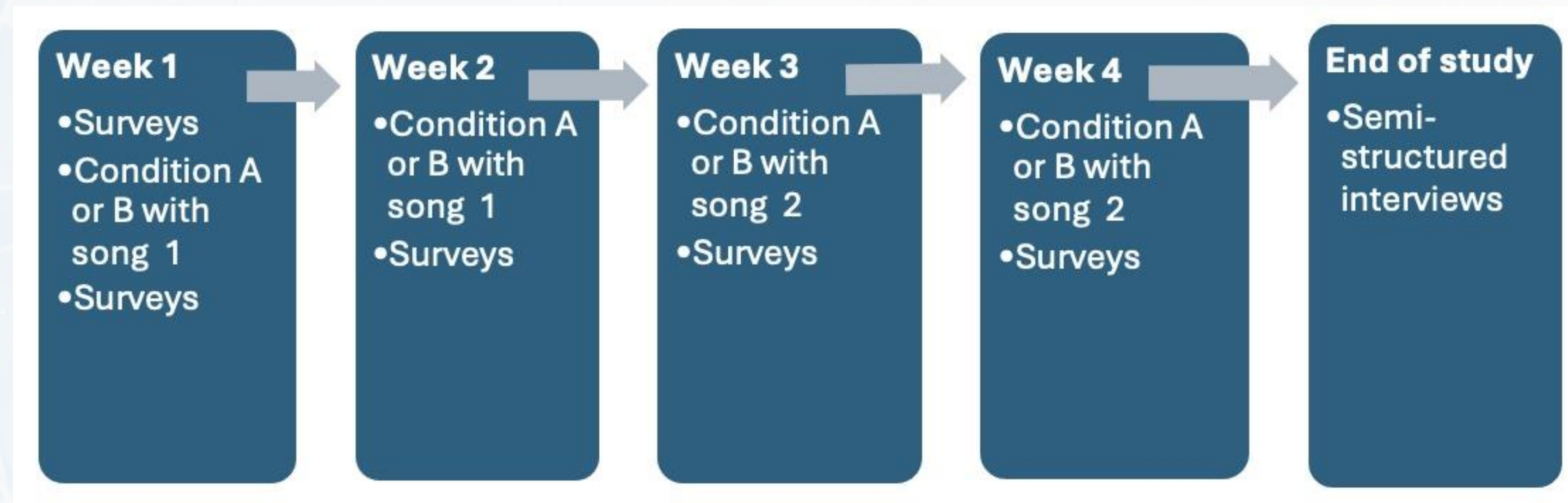


intraoral pressure for a range of SOVTEs (Maxfield et al., 2015).

Along the x-axis shows the different SOVTEs used, and the y-axis shows the intraoral pressure of each exercise for males and females.

- SOVTEs can result in difficulty (Manternach and Daughtery, 2019; Mills *et al.*, 2018)
- Metal drinking straw measuring 21.5cm x 0.6cm

4- week straw phonation protocol



Phase 2 procedure. Condition A = SOVTE. Condition B = singing the song without the SOVTE

Ethics

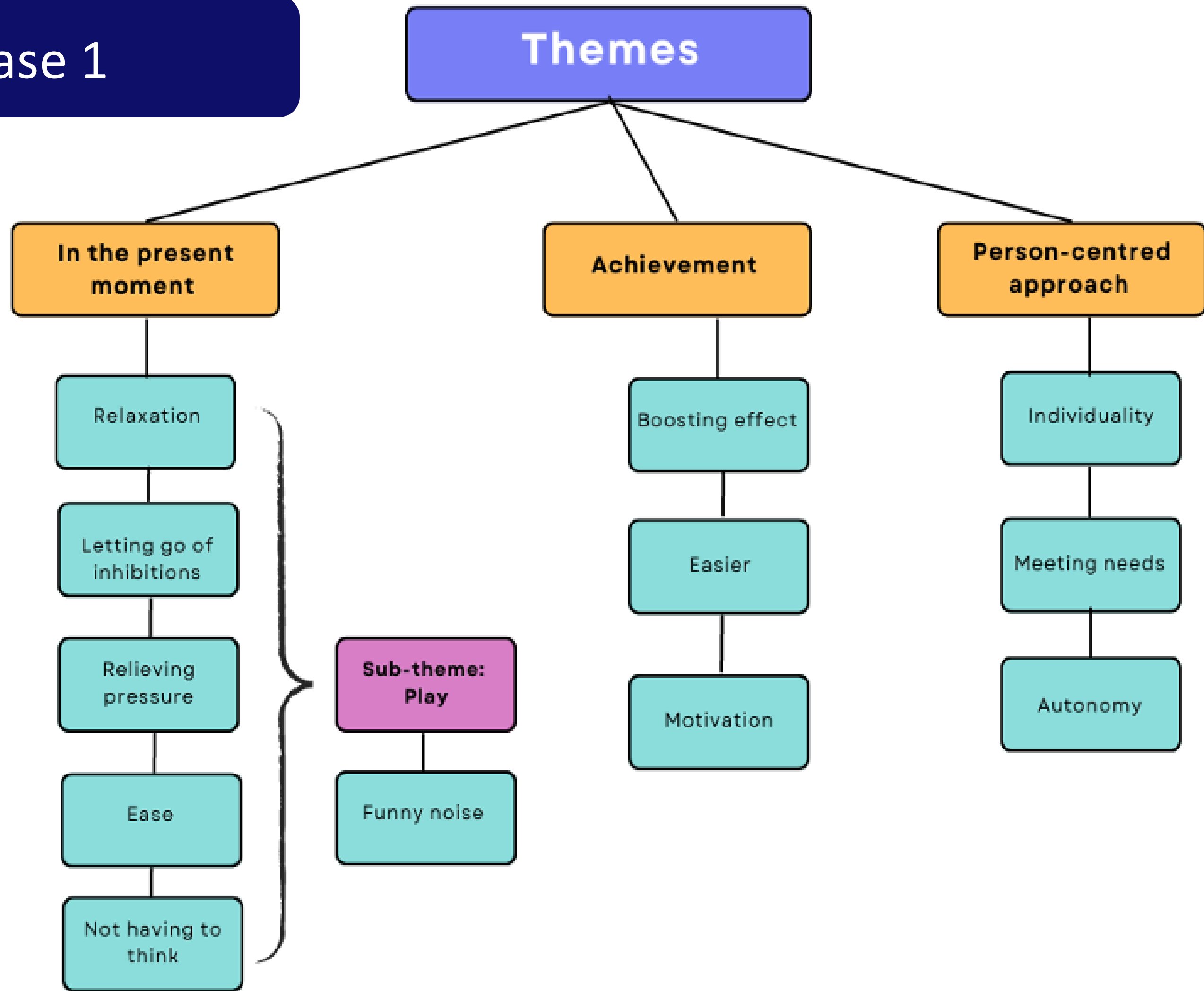
Position of power

- Participants were given autonomy in the research process
- Adolescent participants, along with their parents signed off on taking part in the study (NSPCC, 2024)
- Repertoire was own choice

I am not a healthcare professional

- Keltz and McHenry (2022) – risks if SOVTEs are not taught correctly
- Followed instructions (Bhatt *et al.*, 2023)
- Refer to a healthcare professional if required

Findings: Phase 1



In the present moment

'CHILL'

'to let of inhibitions '

'TO LET GO OF TENSION'

'switch their brain off'

- Mindfulness can predict self-efficacy (Fan and Cui, 2024)
- Relaxation can positively affect motivation (Mariani et al., 2019)

Sub-theme: play

‘PLAYING WITH SOUNDS TO
HELP THEM ACHIEVE
THINGS’

‘it’s a funny sound, it’s not singing’

- Playfulness can enhance the self-efficacy (Lee, Joung and Jeon, 2023)
- Motivation and competence (Heimann and Roepstorff, 2018)

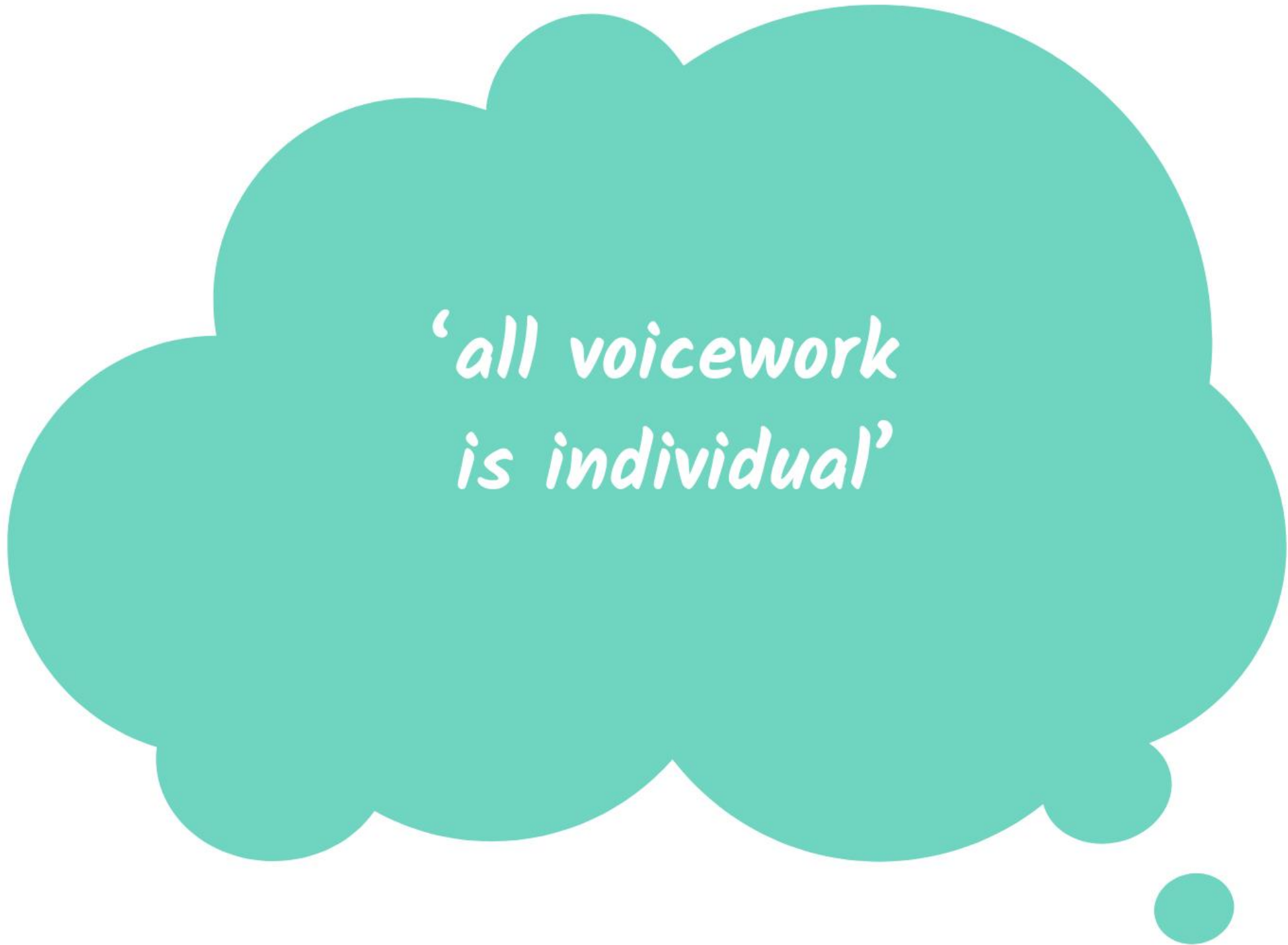
Achievement

'because it [the SOVTE] makes it [singing] easier'

'achieving a bit of a goal'

- reduced task difficulty can enhance self-efficacy and motivation (McPherson *et al.*, 2015; Virkkula, 2020)

Person-centred approach



*'all voicework
is individual'*

- Person-centred approach can impact on self-efficacy (Andishehjoo, 2020) and motivation Løvoll, Bentzen and Säfvenbom, 2020)
- Meeting a singer's needs may influence on motivation (Fletcher, Davidson and Krause, 2023)

Quantitative results: Self-Efficacy

Mean self-efficacy and paired t-test results					
	Mean self-efficacy	N	Standard deviation	t-value	p-value
A: SOVTE	133.10	20	16.23	1.31	0.10
B: No SOVTE	129.72	20	14.24		

Mean self-efficacy scores for each independent variable showed a growth in self-efficacy following straw phonation ($m=129.72$; 133.10)

Statistically insignificant growth ($p=0.10$) for statistical significance $p=0.05$ or less)

Quantitative results: Self-efficacy

Further paired t-tests					
	Mean self-efficacy	Sample size (N)	Standard deviation (SD)	t-value	p-value
Pre-test	122.30	20	13.90	-4.1	0.001
Post-test	135.70	20	18.58		
Pre-test	122.30	20	13.90	-3.6	0.001
Condition A: SOVTE mean	133.10	20	16.20		

Statistically significant growth ($p=0.001$) between pre and post-test and between pre-test and mean SOVTE condition

Statistical significance ($p=0.05$ or less)

Quantitative results: Motivation

Mean motivation and paired t-test results					
	Mean motivation	N	Standard deviation	t-value	p-value
A: SOVTE	84.20	20	9.40	-0.078	0.46
B: No SOVTE	84.10	20	8.86		

Mean motivation scores for each independent variable showed a growth in motivation

following straw phonation (m=84.10; 84.20), statistically insignificant (p=0.46)

For statistical significance p=0.05 or less)

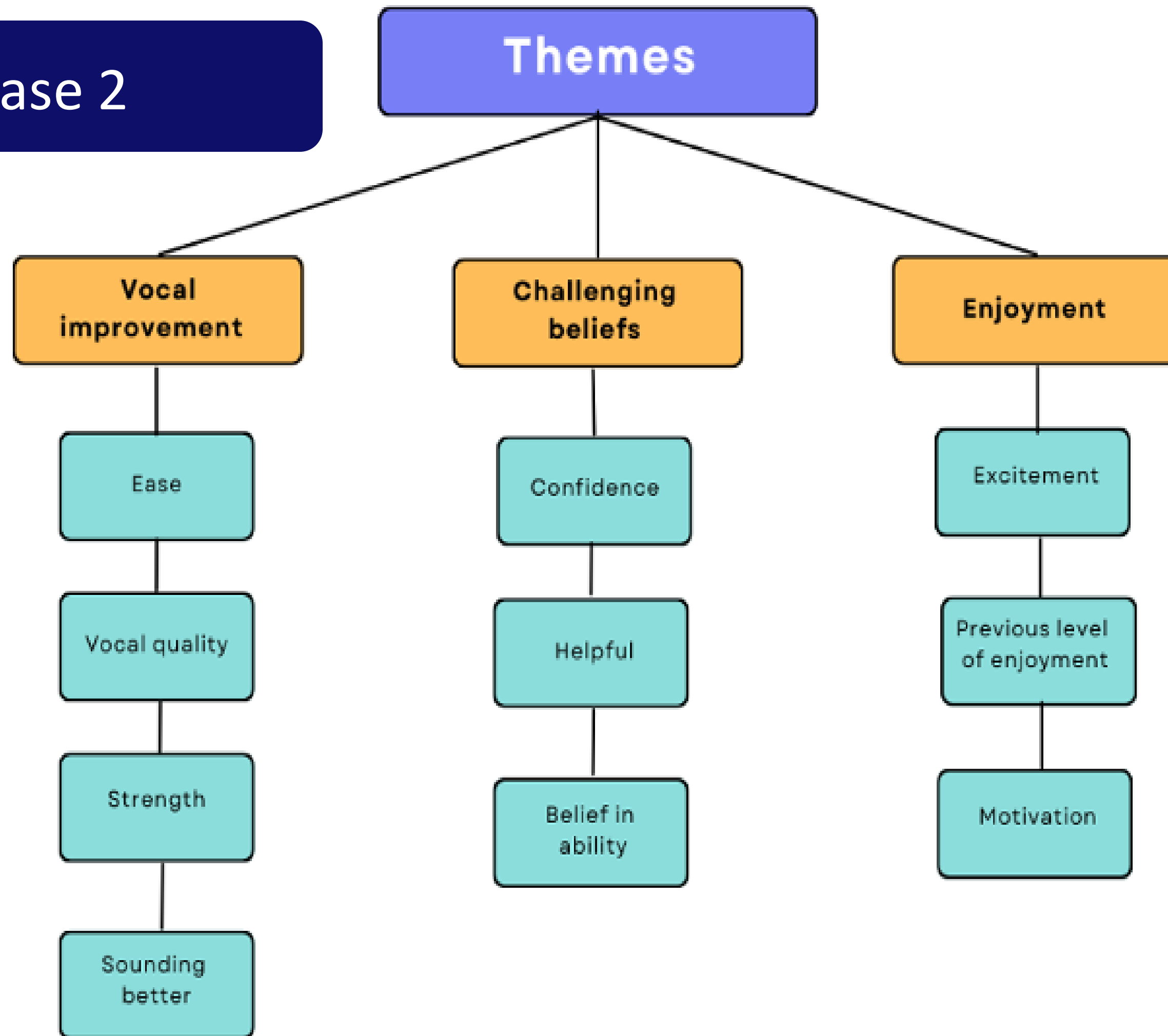
Quantitative results: Motivation

Further paired t-test results					
	Mean motivation	N	Standard deviation	t-value	p-value
Pre-test	83.20	20	10.65	1.18	0.25
Post-test	85.73	20	8.84		
Pre-test	83.20	20	10.65	-0.61	0.27
SOVTE mean	84.20	20	9.40		

Statistically insignificant growth ($p=0.25$; $p=0.27$) between pre and post-test and between pre-test and mean SOVTE condition

Statistical significance ($p=0.05$ or less)

Findings: Phase 2



Vocal improvement

‘STRONGER’

‘easier’

‘it just sounds better’

‘a lot clearer’

- Improvements in vocal quality (Manjunatha, Nayak and Bhatt, 2022; Portillo *et al.*, 2018; Nam *et al.*, 2019; Manternach, Kotsonis and Mann, 2022; Ramos and Gama, 2017)

Challenging beliefs

'helped me know that I could do it...that I was capable'

'I CAN SING WELL'

'I think I'm a lot more...confident in what I can sing'

- Increased sense of competence (Manternach, Sweet and Clark, 2023)

Enjoyment

‘MORE...EXCITING’

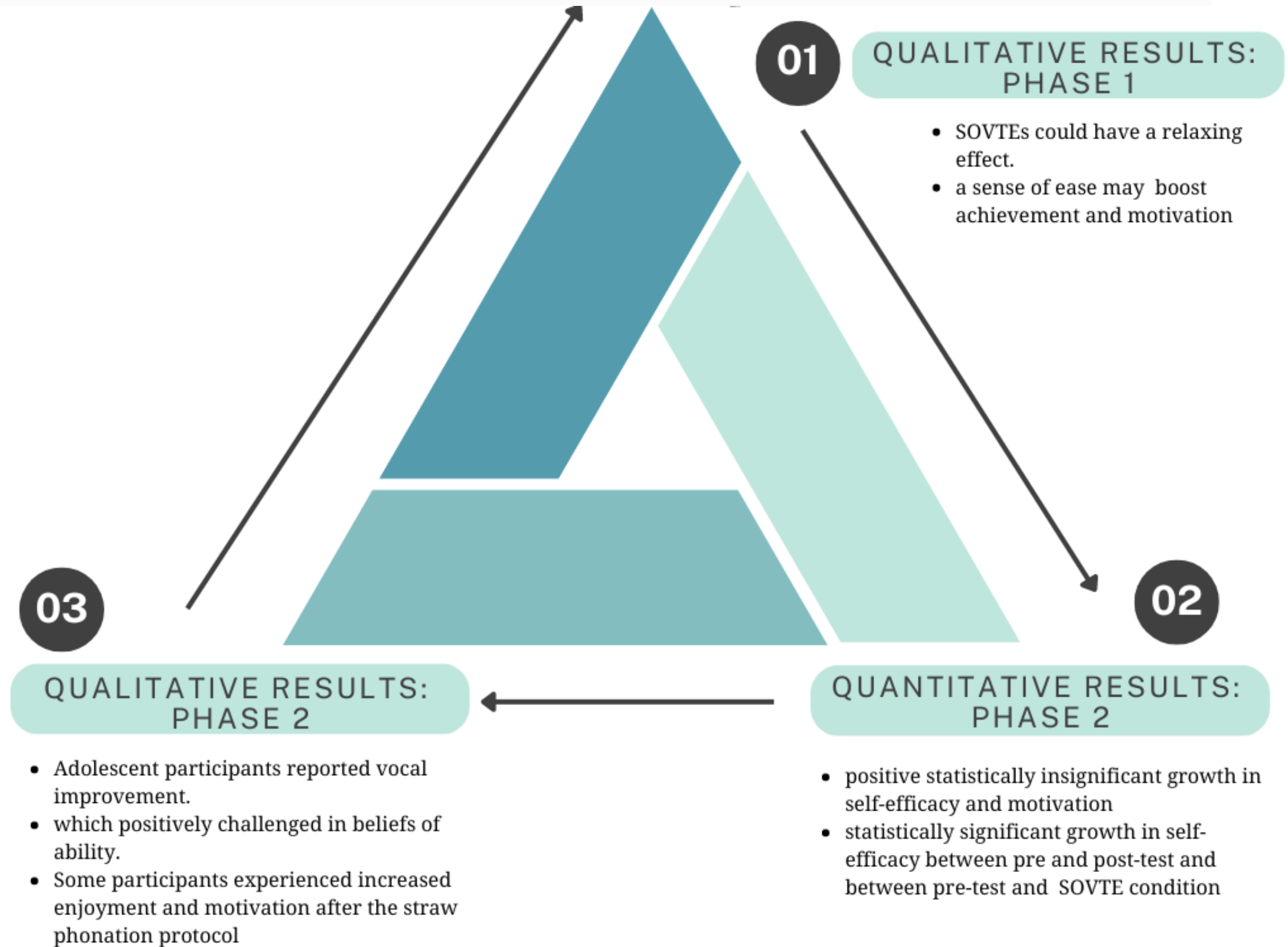
‘enjoy it [singing] more ’

‘It really motivates you to get better and better and better’

- Enjoyment predictor of motivation
(Kulakow and Raufelder, 2020; Kramer *et al.*, 2024)

Conclusion

Aim: To ascertain whether SOVTEs can enhance the self-efficacy and motivation of female adolescent singers within my practice



Limitations

- Sample size too small
- Correlation does not equate to causation (Meyer and Scherer, 2023)

Recommendations

Straw phonation could be used to:

- Enhance confidence and enjoyment in singing
- Help singers increase their singing self-efficacy

Personal reflections

“it is my deep conviction that if you love your topic, have endless curiosity...and believe in its importance, it will inevitably be a powerfully rewarding journey.”

(Dweck and Yeager, 2019, p.2)

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