

# Perceptual-auditory and acoustic analysis of the voice of wind instrumentalists pre and post musical rehearsal

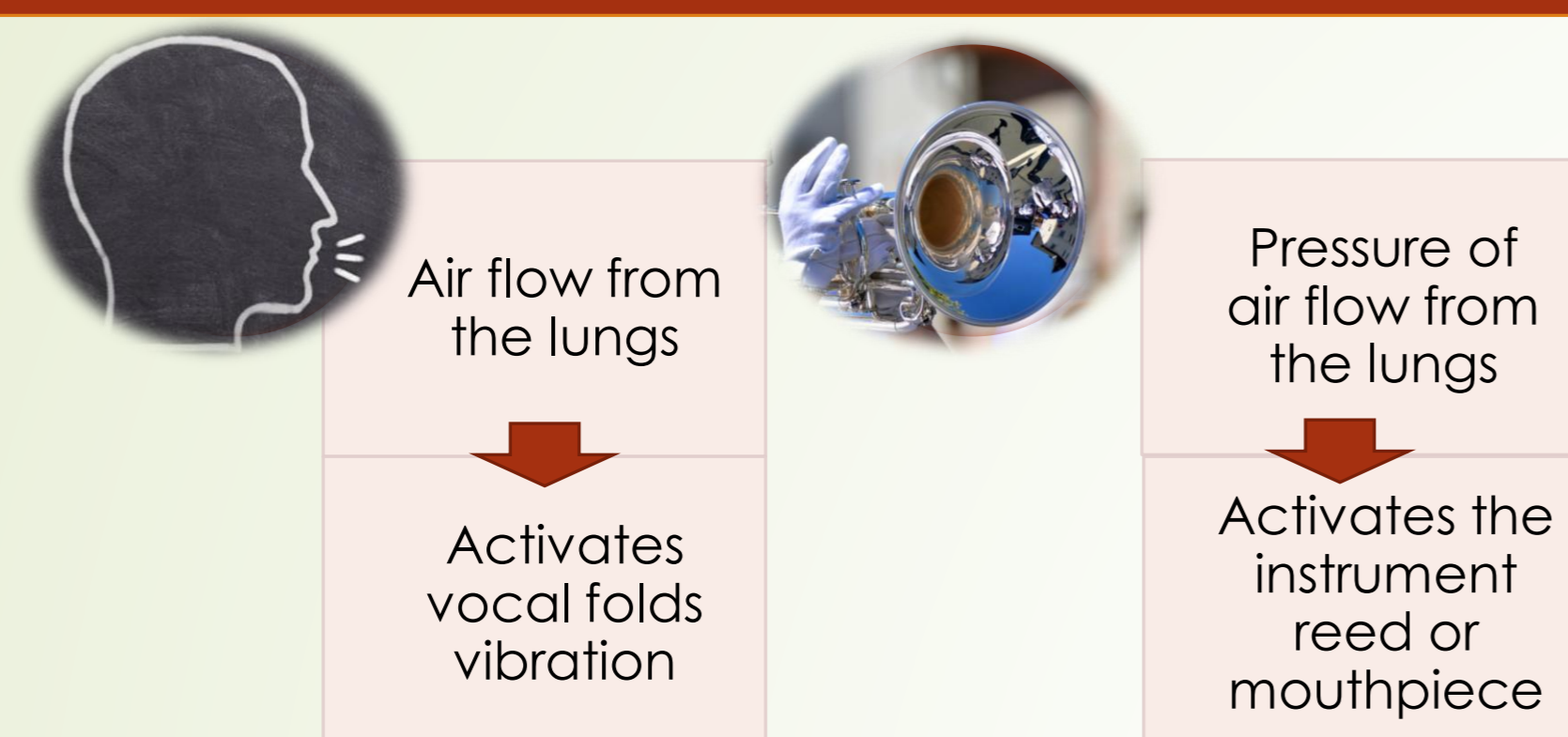
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## INTRODUCTION

The mechanical act of playing a wind instrument use muscles of the head and neck, as when speaking or singing<sup>3</sup>.

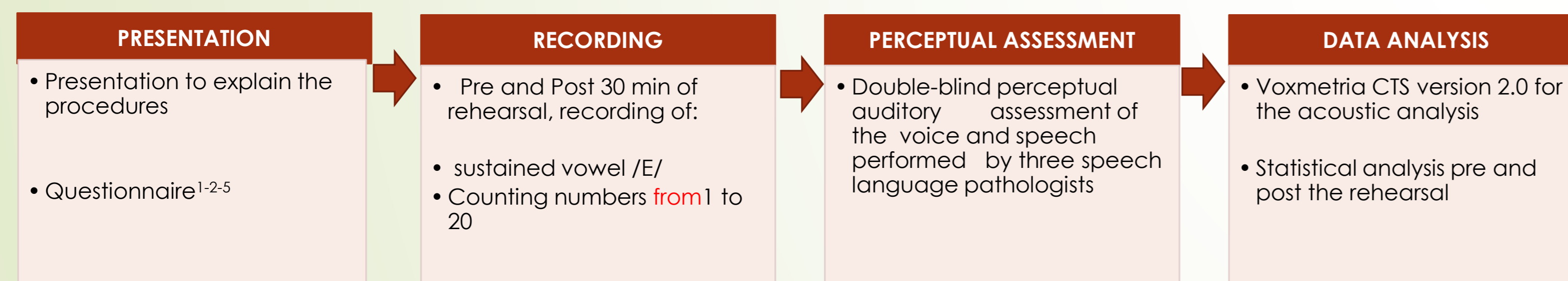
### SOUND PRODUCTION: voice and instrument



## PURPOSE

To analyze the wind instrumentalist's voice and continuous speech pre and post rehearsal

## METHODS



- ❖ Approved by the ethics committee under the protocol number 0576/04
- ❖ Double-blind observational analytical study
- ❖ 23 male, professional wind instrumentalists from the Musical Band of the Military Police of the State of São Paulo (Brazil), with at least 5 years of professional experience
- ❖ Aged between 18 and 50 years old, non-professional voice users, good health and no vocal complaints

## REFERENCES

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## RESULTS AND DISCUSSION

TABLE 1 - Perceptual auditory evaluation of the best vocal emission, in instrumentalists pre and post the rehearsal

EVALUATOR	BEST VOCAL EMISSION						P-value
	Pre		Post		No difference		
	N	%	N	%	N	%	
1	9	13.04	11	15.94	3	4.35	
2	6	8.69	11	15.94	6	8.69	
3	4	5.80	15	21.74	4	5.80	
<b>TOTAL</b>	<b>19</b>	<b>27.53</b>	<b>37</b>	<b>53.62</b>	<b>13</b>	<b>18.84</b>	<b>0.035*</b>

- ✓ ♦ Kruskal-Wallis test
- ✓ Best pre vs best post p = 0.046
- ✓ Best pre vs equal p > 0.556
- ✓ Best post vs equal p = 0.011\*
- ✓ Mann-Whitney test

TABLE 2 - Perceptive auditory evaluation of the best continuous speech sample, pre and post the rehearsal

EVALUATOR	BEST CONTINUOUS SPEECH SAMPLE						P-value
	Pre		Post		No difference		
	N	%	N	%	N	%	
1	8	11.59	10	14.49	5	7.25	
2	5	7.25	14	20.29	4	5.80	
3	8	11.59	8	11.59	7	10.13	
<b>TOTAL</b>	<b>21</b>	<b>30.43</b>	<b>32</b>	<b>46.37</b>	<b>16</b>	<b>23.18</b>	<b>0.295</b>

♦ Kruskal-Wallis test

TABLE 3 - The acoustic measures average and p-values pre and post rehearsal (maximum phonation time - MPT in seconds, average, mode and standard deviation of the fundamental frequency - F<sub>0</sub> in Hz, glottal to noise excitation ratio (GNE) in dB, jitter and shimmer in percentage.

ACOUSTIC PARAMETER	AVERAGE		P-value
	Pre	Post	
MPT	19.78	19.95	0.782
F <sub>0</sub> average	117.45	121.52	0.055
F <sub>0</sub> mode	117.41	121.95	0.028*
F <sub>0</sub> DP	0.7	0.74	0.552
GNE	0.79	0.85	0.021*
Jitter	0.25	0.17	0.322
Shimmer	6.46	6.37	0.891

♦ T-Student Test

\* Statistically significant

- ❖ The acoustic outcome when playing a wind instrumental is similar to the acoustic outcome of a resonance voice<sup>6-7</sup>
- ❖ The compressed voice has many harmonics and it is similar to the sound produced by the instrumentalists

## CONCLUSIONS

POSITIVE VOCAL IMPACT POST REHEARSAL

observed in the sustained vowel

POSSIBLE VOCAL WARM-UP

Higher f<sub>0</sub> – higher pitch

Further therapeutic studies that aim to determine how the vocal tract impedance can improve the constriction of vocal and the vocal quality should be performed<sup>8</sup>