

Speech Changes Following Temporal Resection

Krohn, V., Descamps, M., Lefrançois, S., Boucher, O., Nguyen, K, Rouleau, I. & Montembeault, M.

INTRODUCTION

Due to advances in microsurgical techniques, **insular and/or temporal resections** have been increasingly employed for **epilepsy control**^{1, 2, 3}.

Resections for epilepsy control results in **cognitive impairments** in multiple domains like emotion recognition and memory^{4, 5}.

An important impairment that is overlooked by research is that of **language deficiency** (i.e., speech rate, pitch, etc.)

The few studies on the impact of this epilepsy treatment on language have focused on qualitative evaluations or specific cognitive tasks.

Thus far, no study has used an **ecological task of spontaneous speech**, which would allow for a more representative evaluation of language in these patients.

In our study, we used an approach of **connected speech** to investigate the impact of temporal and insular resections on epileptic patients.

We hypothesize that patients with right temporal resections will exhibit more pronounced changes in expressive prosody, whereas those with left temporal lobectomies will display more significant alterations in motor aspects of speech.

CONCLUSIONS

- Both **experimental groups** had a **lower phonation time** than the controls, speaking less words and less syllables.
- While both **experimental groups** presented a **greater percentage of pauses** in their speech, thereby demonstrating an impairment in their language.
- While there is no significant difference between groups in speech rate, there was a difference in articulation rate. **This indicates that while they seem to exhibit normal speech patterns, when removing hesitations and pauses, we can see that these patients speak at a much faster rate.**
- Lastly, there was no significant difference across pitch range used by the patients vs. the controls.

Taken together, our results align partially with the hypotheses:

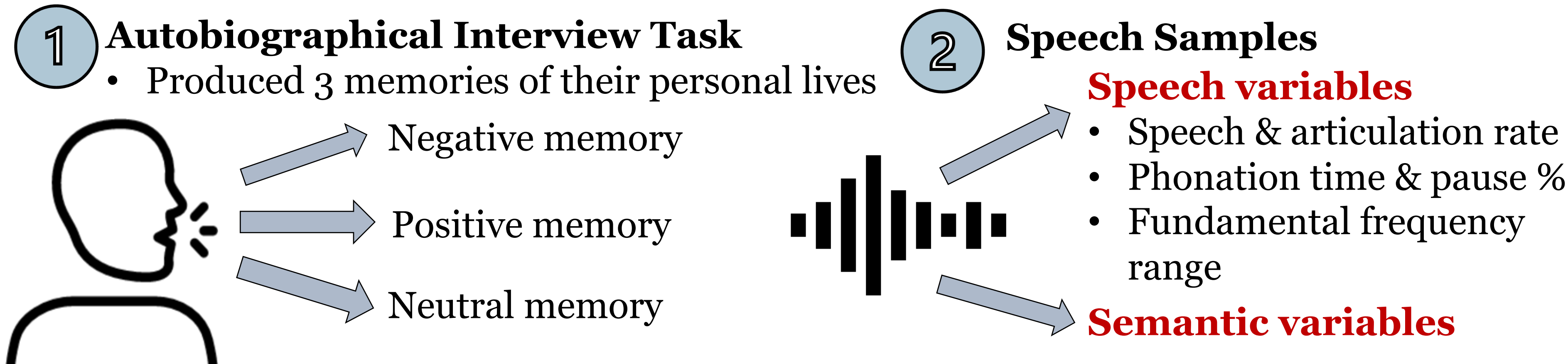
Although our results do not support the role of right vs. left dominant resections, our findings demonstrate that temporal and/or insular lobotomies are extremely detrimental to the patients, as they affect their speech in multiple ways.

METHODS

Participants: Recruited at the CHUM

Group	N	Mean Age (yrs)	Sex		Resection Type			Resection Location
			Male	Female	Temporal	Insular	Temporal-Insular	
Control	9	38.6	4	5	n/a	n/a	n/a	n/a
Right Resection	11	39.3	2	9	6	1	4	Right Hemisphere
Left Resection	12	37.9	5	7	9	2	1	Left Hemisphere

Procedure:



REFERENCES

- T. Kaido, T. Otsuki, H. Nakama, Y. Kaneko, Y. Kubota, K. Sugai, et al. Complex behavioral automatism arising from insular cortex Epilepsy Behav., 8 (2006), pp. 315-319.
- R. Malak, A. Bouthillier, L. Carmant, P. Cossette, N. Giard, J.M. Saint-Hilaire, et al. Microsurgery of epileptic foci in the insular region J. Neurosurg., 110 (2009), pp. 1153-1163.
- M. von Lehe, J. Wellmer, H. Urbach, J. Schramm, C.E. Elger, H. Clusmann. Insular lesionectomy for refractory epilepsy: management and outcome Brain, 123 (2009), pp. 1048-1056.
- Boucher O., Rouleau I., Lassonde M., Lepore F., Bouthillier A., Nguyen D.K. Social information processing following resection of the insular cortex. Neuropsychologia. 2015;71:1-10. doi: 10.1016/j.neuropsychologia.2015.03.008.
- Descamps, M., Boucher, O., Nguyen, D. K., & Rouleau, I. (2021). Emotional Autobiographical Memory Associated with Insular Resection in Epileptic Patients: A Comparison with Temporal Lobe Resection. Brain sciences, 11(10), 1316. <https://doi.org/10.3390/brainsci11101316>



RESULTS

