



## Investigating Factors of Aphasia Recovery

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### **Introduction**

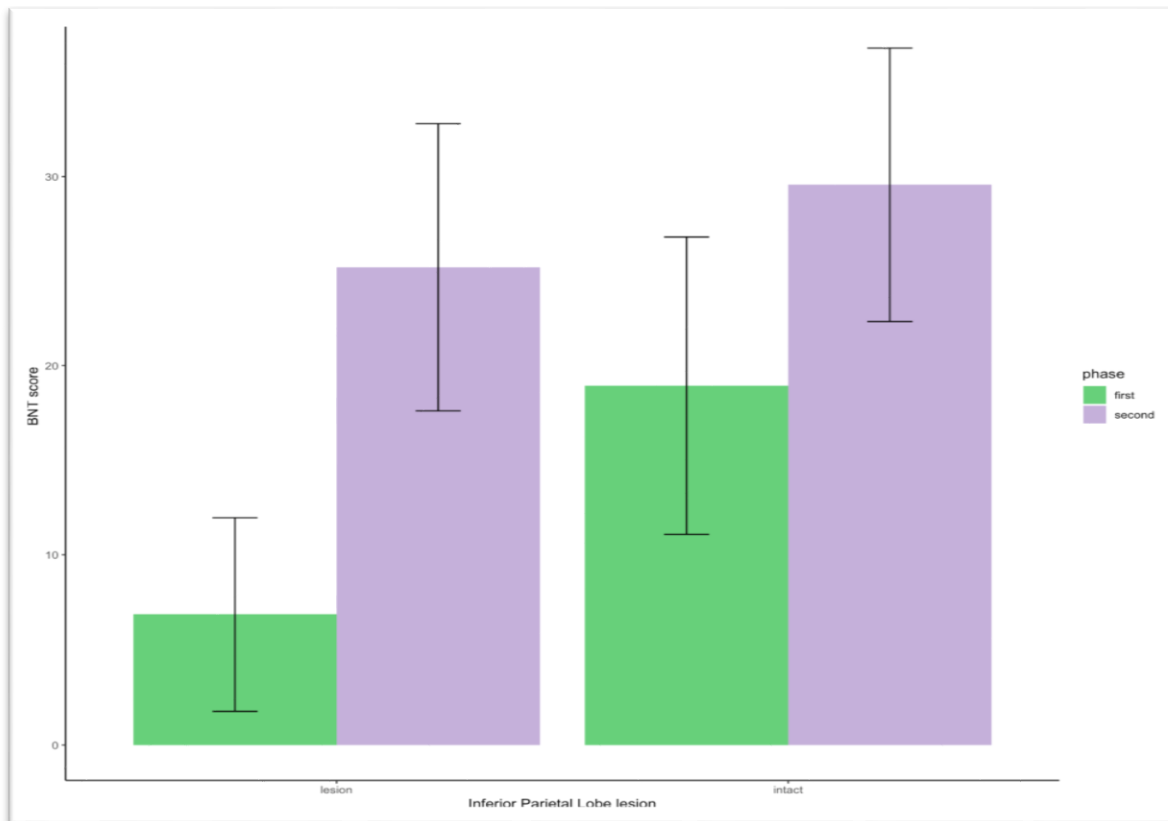
Even though most studies support the notion that there is a degree of language improvement with advancing time even in untreated aphasic patients (Lazar & Antonello, 2008), the specifics of the association between recovery of particular language indices and possible predicting factors, such as demographic or lesion variables, are yet to be fully elucidated. In the present study we attempt to investigate such relationships focusing on three language domains: speech output, comprehension and naming.

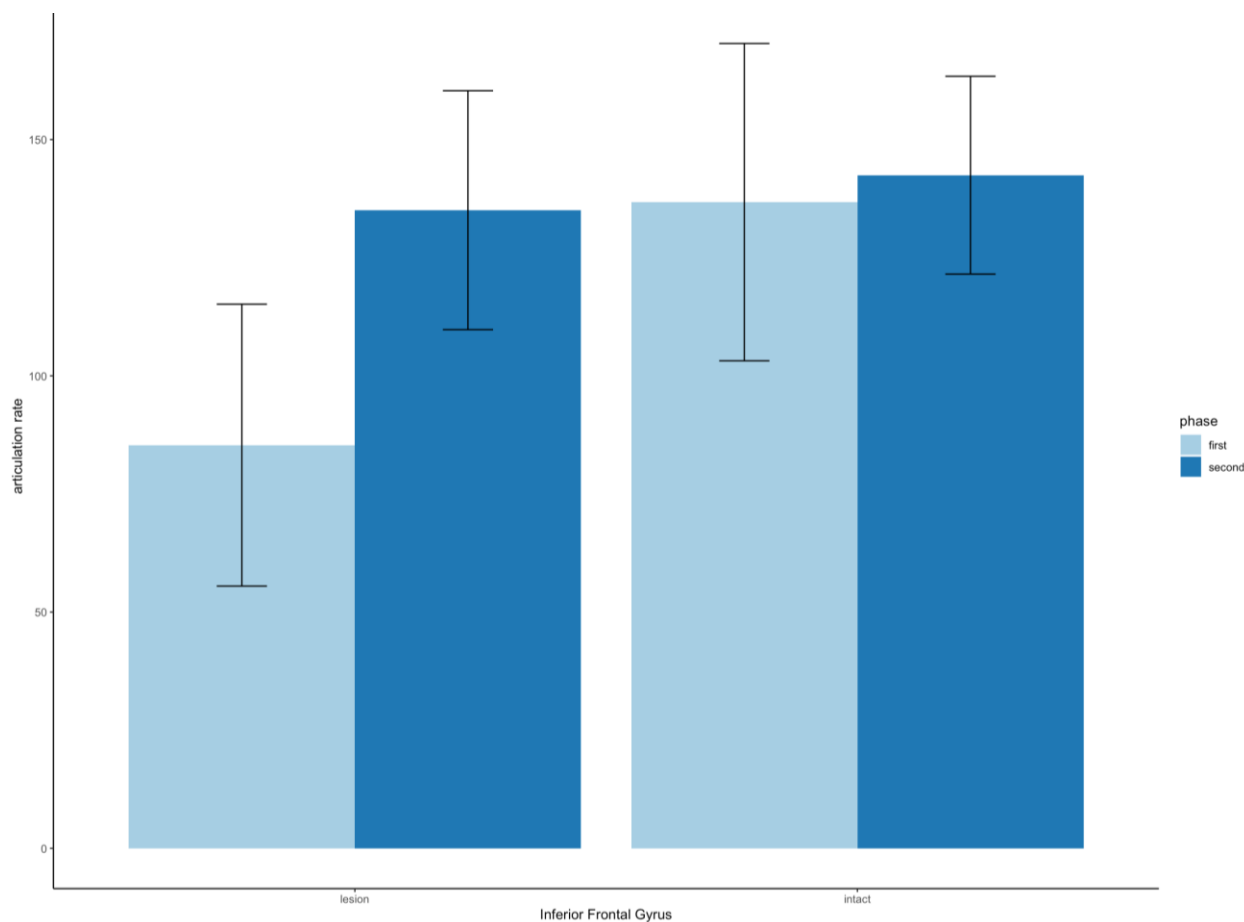
### **Methods**

Forty-one patients (13 women), with acquired aphasia due to a left single stroke, 23-84 old (mean:56,8; SD: 14,79) with 6-18 years of formal schooling (mean: 11,43, SD: 3,63) were recruited. All participants were right-handed and native Greek speakers. CT and/or MRI scans were obtained for each patient and lesion sites were identified and coded by two independent neuroradiologists for 16 predetermined left hemisphere areas (Kasselimis et al., 2017). The total number of lesioned areas served as an index of lesion extent (lesion score). The patients were assessed in two testing times by a neuropsychologist. Mean time post onset for the first examination was 18.68 days and for the second was 305.53 days. To assess language deficits, we used the Boston Diagnostic Aphasia Examination – Short Form (BDAE-SF), and the Boston Naming Test (BNT). Articulation rate and speech rate were calculated based on a speech sample elicited from the Cookie Theft Picture for BDAE-SF, for each patient.

## Results

The BNT score and specific BDAE-SF subscales, that is the three auditory comprehension subscales (words, commands, complex material), as well as speech and articulation rate were included in the analyses. Comparison between the two times of testing using paired-samples t-test showed that mean performance was significantly higher for all measures in the second examination. Regression models revealed that score differences between testing times were not shown to be generally affected by lesion extent, age of onset, and years of formal schooling, with one exception: age seemed to be a marginally significant predictor for improvement of comprehension of commands scores (having an inverse association with performance). We then selected four specific lesion loci (inferior frontal, superior and middle temporal gyri, as well as the inferior parietal lobule) and tried to investigate whether lesion in these areas may have an effect on performance separately for the first and second examination phase, by implementing mixed effects models. Interestingly, there was a significant effect of frontal, temporal and parietal lesions on performance in the acute/subacute, but not in the chronic phase.





## Conclusions

Although overall improvement of several language indices was evident in our patients, our findings do not provide a clear-cut answer with regard to demographic or lesion factors that may have contributed to the recovery of such language functions. Notably, particular lesion loci seemed to affect performance in the acute/subacute but not in the chronic phase. In conclusion, we argue that lesions affecting specific cortices of the perisylvian language network may be of greater importance in the early stages of aphasia, rather than in the chronic phase.

## References

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