

## Quantitative and qualitative verbal fluency assessment in primary progressive aphasia

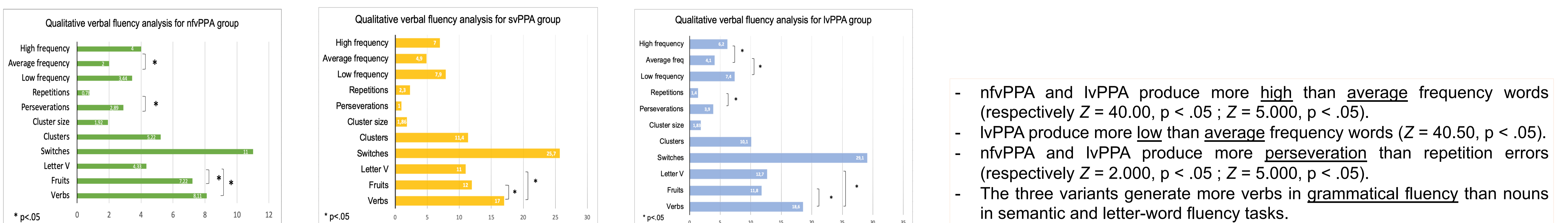
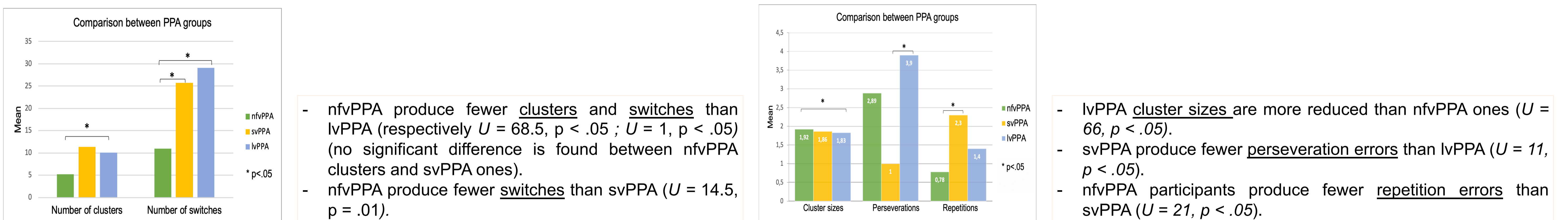
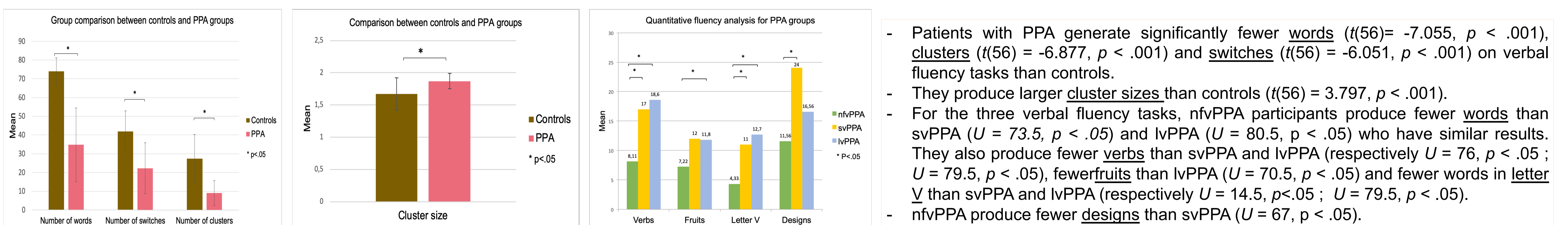
### Overview and aim

Verbal fluency, which is decreased in primary progressive aphasia (PPA)<sup>[1]</sup>, involves several cognitive processes, such as language and executive functions. In this study, we aimed to investigate this impairment, with a quantitative (number of words generated), usually carried out, but also with a qualitative (clustering, switching, word-frequency and perseveration/repetition errors) verbal fluency analysis, for the three variants of PPA (non-fluent/agrammatic (nfvPPA), semantic (svPPA), and logopenic (lvPPA)). We also added a design fluency task. With this comprehensive assessment, we aimed to highlight the nature of the fluency impairment and contribute to differential diagnosis.

### Methods

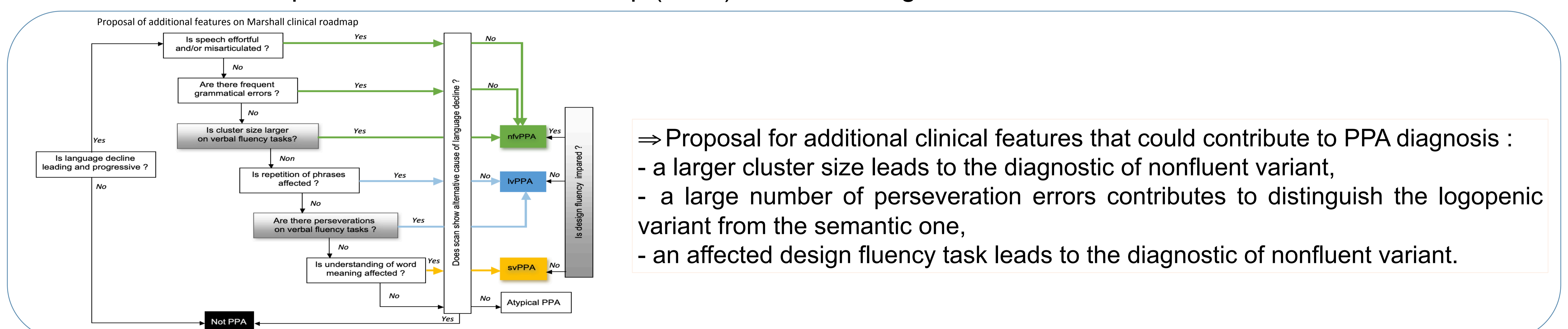
We recruited 29 participants who met the current criteria for PPA (9 nfvPPA, 10 svPPA, 10 lvPPA) and 29 healthy controls, matched for age, gender and education. Participants underwent a verbal (grammatical, semantic and phonemic (GREMOTs)) and design (RFFT) fluency assessment.

### Results



### Discussion and conclusions

These findings fit well with Gorno-Tempini et al. (2011)<sup>[1]</sup>, who describe a verbal fluency deficit in PPA, and with Troyer's<sup>[2]</sup> model of verbal fluency (1997), in which clustering is associated with the semantic system and supported by temporal lobe, whereas switching is associated with executive functioning and related to frontal lobe, which is relatively spared in svPPA but impaired in nfvPPA. For this variant, the design fluency deficit confirms an executive impairment. The better production of verbs for grammatical fluency could provide additional information concerning the relative preservation of verb lexical treatment in PPA, unlike some other neurodegenerative diseases. Qualitative analysis of verbal fluency provides additional information and should contribute to classification of PPA. Additional clinical features could underpin Marshall clinical roadmap (2018)<sup>[3]</sup> for PPA diagnosis.



### References

[1] Gorno-Tempini, M.L., Hillis, A.E., Weintraub, S., Kertesz, A., Mendez, M., Cappa, S.F., ... Grossman, M. (2011). Classification of primary progressive aphasia and its variants. *Neurology*, 76(11), 1006-1014.  
 [2] Troyer, A. K., Moscovitch, M., & Winocur, G. (1997). Clustering and switching as two components of verbal fluency: Evidence from younger and older healthy adults. *Neuropsychology*, 11(1), 138-146.  
 [3] Marshall Marshall, C. R., Hardy, C. J. D., Volkmer, A., Russell, L. L., Bond, R. L., Fletcher, P.D., ... Warren, J. D. (2018). Primary progressive aphasia: a clinical approach. *Journal of Neurology*, 265(6), 1474-1490.