Linguistic selection alteration in Huntington's Disease: ecological oral language production reveals evidence through lexical diversity algorithms.

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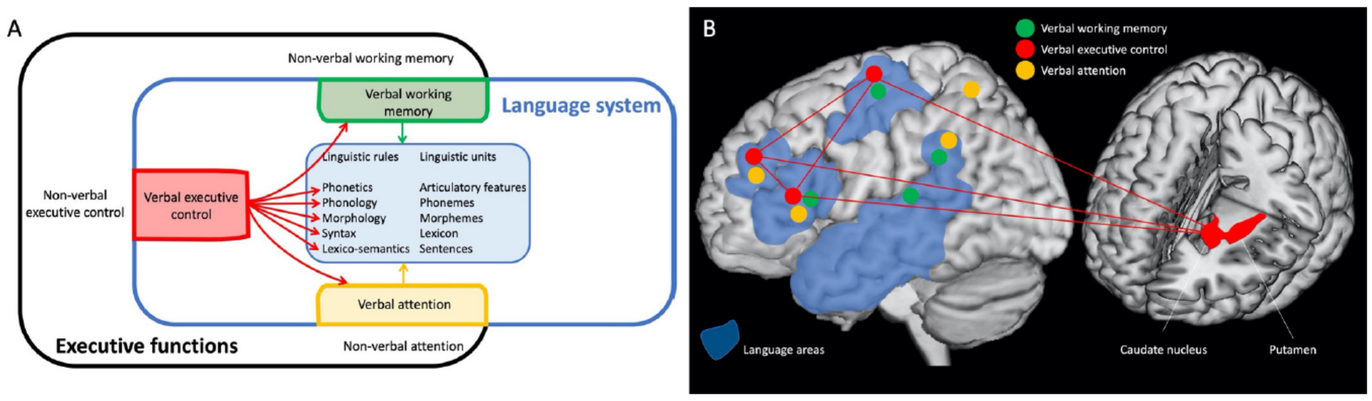
1 Background

Huntington's disease (HD) is a neurodegenerative disease that presents motor, cognitive, and psychiatric alterations. Language is affected from pre-manifest stages, revealing that cognitive decline precedes clinical onset. Morphological and syntactic operations have been reported to be altered in these patients due to sub-cortical damage at the striatum affecting the verbal executive network. However, other linguistic aspects tapping this function have not been addressed.



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2 Objective

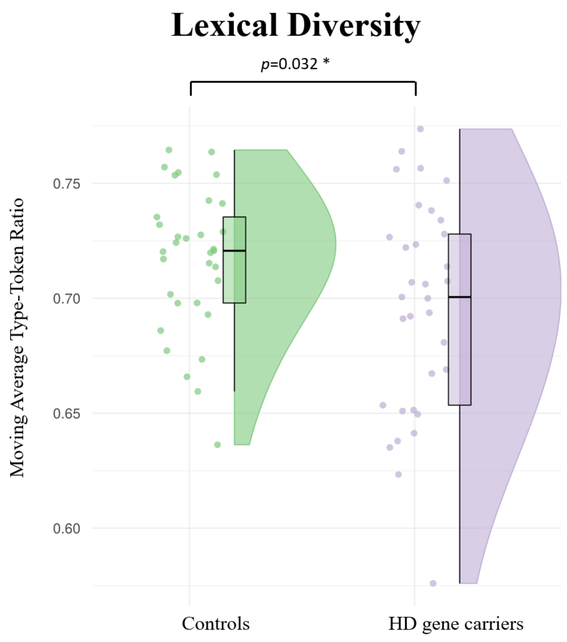
It remains unknown whether alterations in selection processes appear in a transversal mode in the linguistic domain, and not just as isolated grammatical deficits. The aim of this study was to evaluate a lexical selection deficit in HD gene carriers.

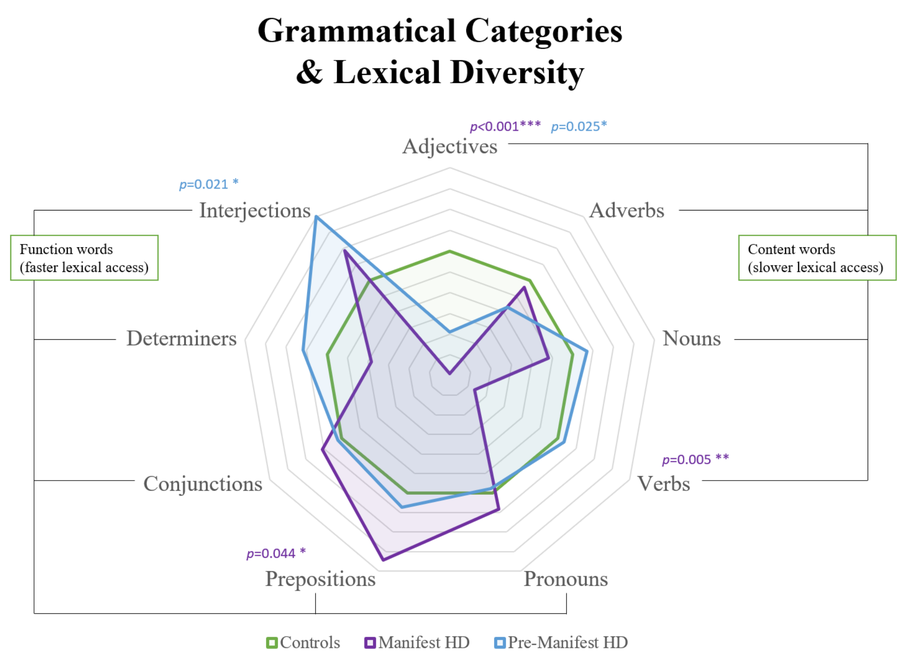
3 Methods

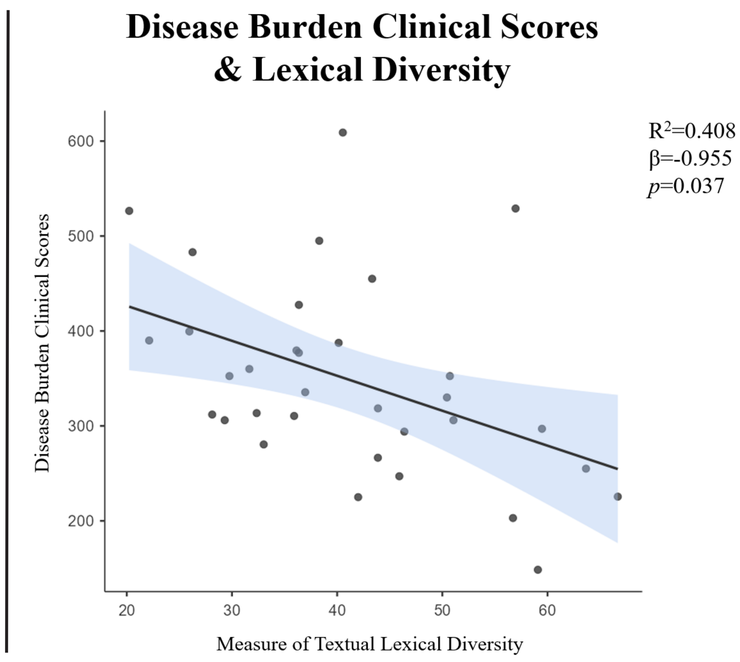
Using a story-telling task, we tested spontaneous speech in a sample of 33 HD gene carriers (17 Manifest, 16 Pre-Manifest) matched in age, gender, and educational background with 33 healthy controls. Computational linguistics methods were deployed to compute lexical diversity by grammatical categories. Lexical diversity was assessed among groups by means of ANOVAs, and for the subset of HD as predictor of disease burden clinical scores through multiple linear regression.

4 Results

HD gene carriers showed a decline in lexical diversity when compared to the control sample over the entire corpus of language production (p= 0.032).
While manifest HD patients revealed a minor diversity in adjectives (p= <0.001) and verbs (p= 0.005), but a higher diversity for prepositions (p= 0.044),
Pre-Manifest HD patients revealed a minor diversity in adjectives (p= 0.025) but a higher diversity for interjections (p= 0.021).
Lexical diversity significantly predicted disease burden of HD gene carriers (β=-0.955, p=0.037).







6 Conclusion

Lexical diversity delineates the linguistic profile in HD from the Pre-Manifest stage, reflecting how striatal damage and disease progression alters language organization in terms of a transversal alteration of the linguistic selection processes.

7 Acknowledgments

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References:
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