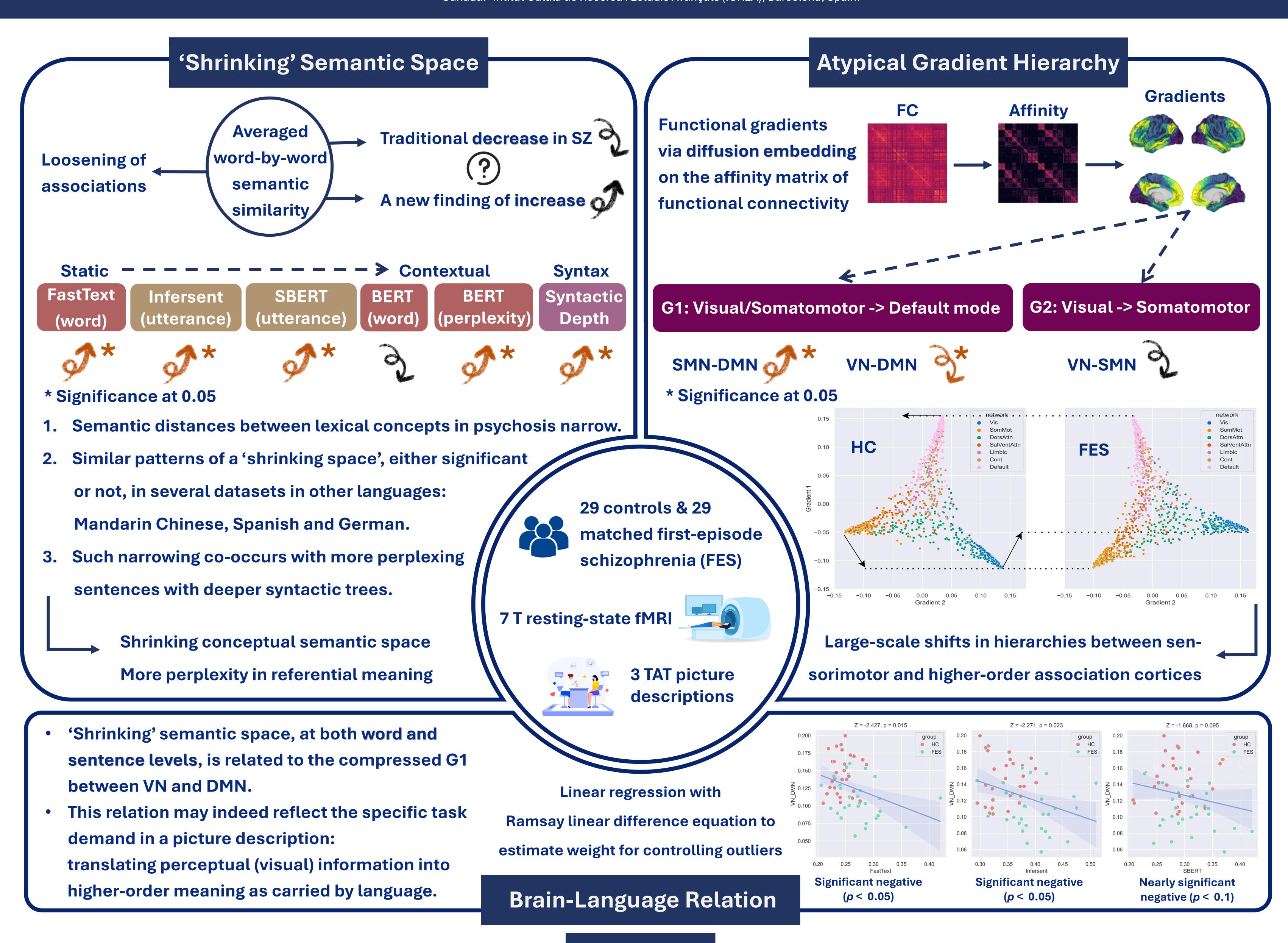
Semantic space contracts in psychosis and

reveals neurofunctional changes in the hierarchical organization of cognition

Rui He^{1,*}, Claudio Palominos Flores¹, Han Zhang¹, María Francisca Alonso-Sánchez², Lena Palaniyappan^{3,4,5}, Wolfram Hinzen^{1,6}

* Correspondence to: Rui He, Universitat Pompeu Fabra, rui.he@upf.edu

¹Department of Translation & Language Sciences, Universitat Pompeu Fabra, Barcelona, Spain. ²CIDCL, Escuela de Fonoaudiología, Universidad de Valparaíso, Valparaíso, Chile. ³Douglas Mental Health University Institute, Department of Psychiatry, McGill University, Montreal, Quebec, Canada. ⁴Department of Medical Biophysics, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Ontario, Canada. ⁵Robarts Research Institute, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Canada. ⁶Intitut Català de Recerca i Estudis Avançats (ICREA), Barcelona, Spain.



Conclusions

These results reveal that the traditional intuition of a 'looser' semantic space is NOT born out by crosslinguistic data using a variety of lexically-oriented language models, while metrics of perplexity at the grammatical level do vindicate this intuition. Alternations of the semantic space may act as a promising read-out of neuropathological changes in the hierarchical organization of cognition in the brain.

References

- 1. Alonso-Sánchez, M. (2023). Progressive changes in descriptive discourse in First Episode Schizophrenia: a longitudinal computational semantics study, *Schizophrenia*.
- 2. He, R. (2023). Navigating the semantic space: Unraveling the structure of meaning in psychosis using different computational language models, *Psychiatry Res*.
- 3. He, R. (2023). Changes in the structure of spontaneous speech predict the disruption of hierarchical brain organization in first-episode psychosis, *bioRxiv*.

Disclosures

LP reports personal fees for serving as chief editor from Canadian Medical Association Journals, speaker/ consultant fee from Janssen Canada and Otsuka Canada, SPMM Course Limited, UK, Canadian Psychiatric Association; book royalties from Oxford University Press; investigator-initiated educational grants from Janssen Canada, Sunovion and Otsuka Canada. Funded by the European Union (GA 101080251 - TRUSTING). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Agency. Neither the European Union nor the granting authority can be held responsible for them.

Affiliations and fundings







