

The electrophysiology of voluntary and cued language switching

Nora Kennis¹, Xiaochen Zheng¹, Angela de Bruin² & Vitória Piai^{1,3}

¹ Radboud University, Donders Institute for Brain, Cognition and Behaviour, Nijmegen, The Netherlands

² Department of Psychology, University of York, York, UK

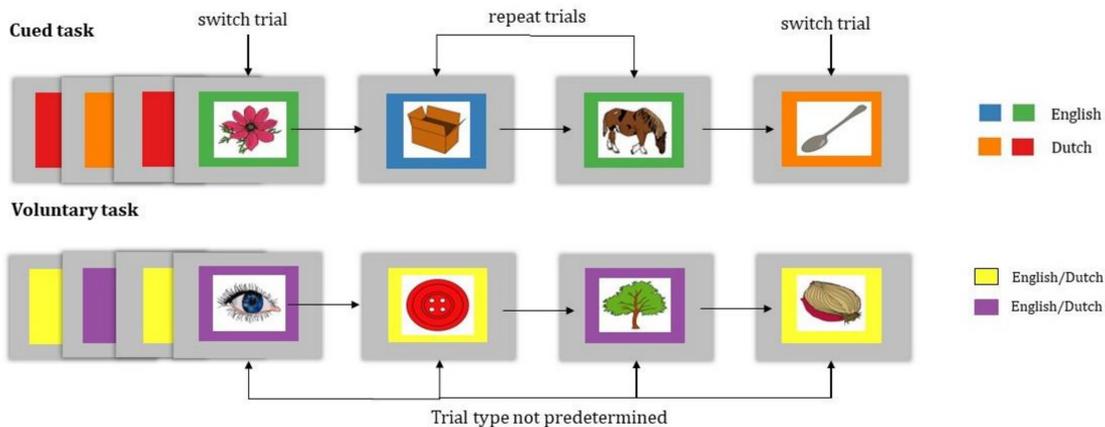
³ Radboudumc, Donders Institute for Brain, Cognition and Behaviour, Department of Medical Psychology, Nijmegen, The Netherlands

INTRODUCTION

- We commonly investigate multilingual language control processes using cued picture naming paradigms. However, language switching in daily life can also occur freely when interlocutors share multiple languages, a process which is rarely studied using electrophysiology.
- Cued language switching tasks often show slower responses on switch trials than non-switch trials¹, a phenomenon known as the *switching cost*.
- Voluntary language switching could be behaviourally and electrophysiologically easier than cued switching, as less top-down control of the non-target language may be necessary when speakers are free to choose their language², but behavioural evidence is mixed^{3,4,5}.
- This study investigates the electrophysiological switch effects in voluntary compared to cued language switching.

METHODS

PARADIGM

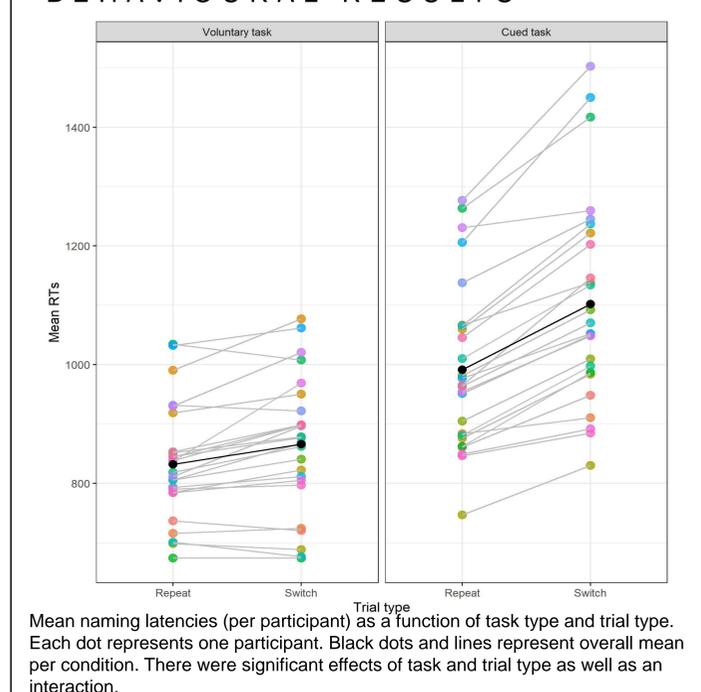


TASK

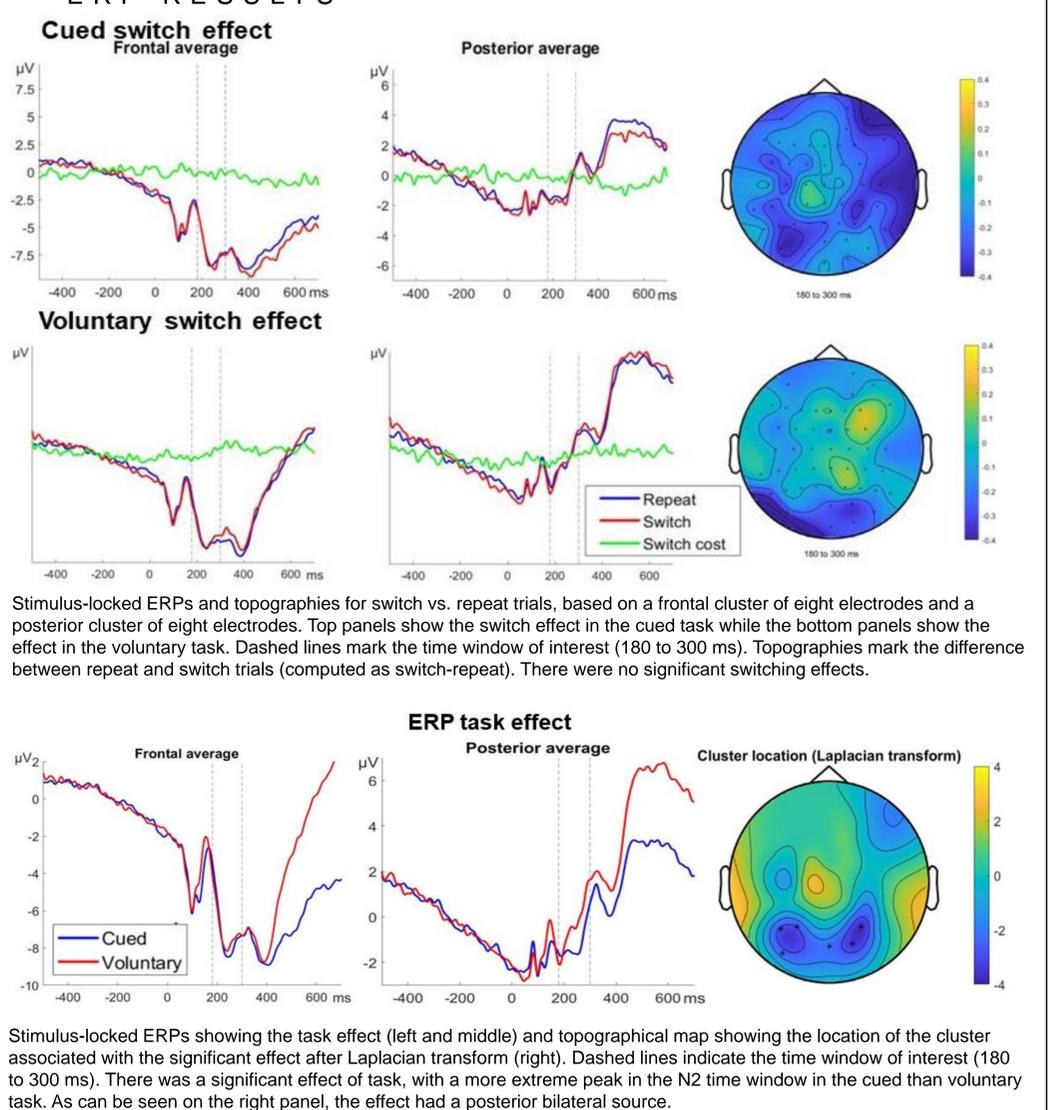
- 25 Dutch-English late bilinguals performed two bilingual picture-naming tasks: switching between languages was cued in one and voluntary in the other.
- 240 trials per task.
- Stimuli from MultiPic database⁶
- Behavioural analysis using LMEM with 2*2 design
- EEG analysis using cluster-based permutation tests.

RESULTS

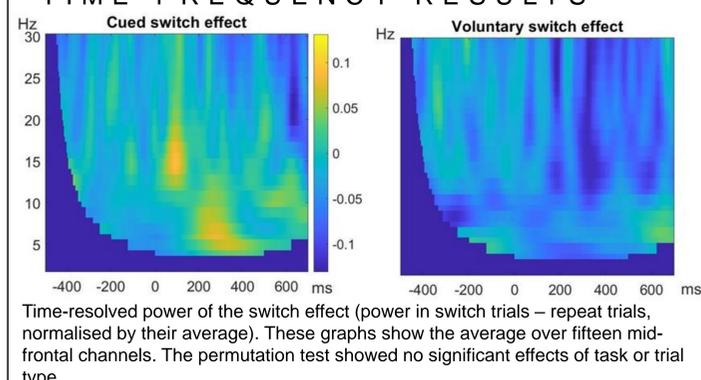
BEHAVIOURAL RESULTS



ERP RESULTS



TIME-FREQUENCY RESULTS



CONCLUSIONS

- Behavioural results show a smaller voluntary than cued switching cost, meaning freely switching between languages seems to be easier than switching on cue.
- We found no EEG switch effects.
- Can neural switching costs be mapped onto behavioural switching costs at all? Effect sizes of neural switching effects may be altered by small design and population changes while behavioural effects remain robust.

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- ³ de Bruin, A., Samuel, A. G., & Duñabeitia, J. A. (2018). Voluntary language switching: When and why do bilinguals switch between their languages? *Journal of Memory and Language*, 103, 28–43. <https://doi.org/10.1016/J.JML.2018.07.005>
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