Inhibition Supports Lexical Selection: An ERP Study

Zeshu Shao[1], Ardi Roelofs[2], Daniel J. Acheson[1, 2], & Antje S. Meyer[1, 2]

1. Max Planck Institute for Psycholinguistics, Nijmegen, the Netherlands.
2. Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, the Netherlands

Max Planck Institute for Psycholinguistics

Donders Institute for Brain, Cognition and Behaviour

Introduction

- Lexical selection refers to the retrieval of a word representation from the mental lexicon. The time window is about 200 - 275 ms in picture naming. [1]
- During lexical selection, related lexical representations are activated. Inhibition may be involved to suppress the competing responses. [2]
- N2 component: second negative peak, fronto-centrally distributed, associated with inhibition mechanism. [3]
- Name agreement: the degree to which participants agree on the name of the picture. [4]

Research Question

Is inhibition more involved when lexical selection is more competitive, i.e. in naming pictures with low name agreement (low NA) compared to pictures with high name agreement (high NA)?

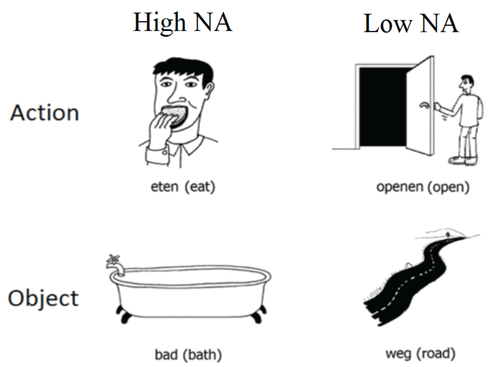
Method

Participant 25 native Dutch speakers (8 males).

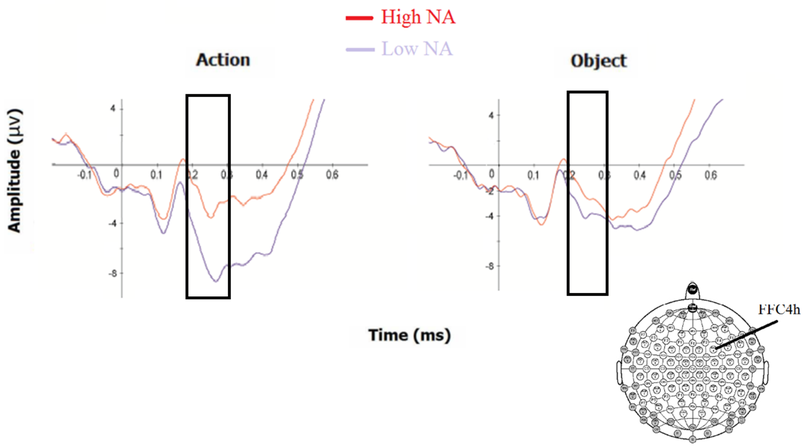
Task Object and action naming.

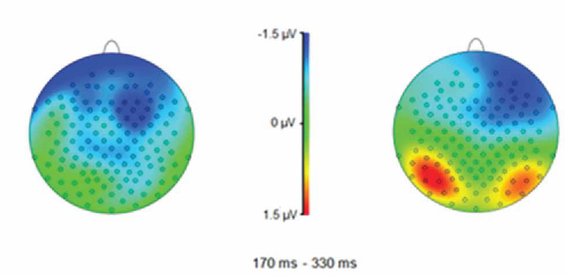
Participants were familiarized with pictures and names before testing. Blocked design.

Materials 40 High NA vs. 40 Low NA



Results





- An N2 effect for name agreement (i.e. N2 amplitude was larger in low NA condition than in high NA condition), for action naming, $p < .01$, and for object naming, $p < .05$. But no difference between action and object naming.

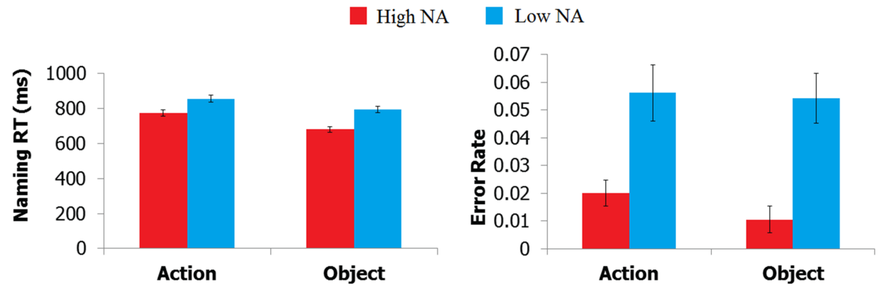
- An N2 effect for name agreement in the time window for lexical selection: peaking at 250 ms.

EEG Recording

128 chanels, acticap. Sample rate: 512 Hz.

Epoch: -200 – 700 ms. Time locked to picture onset.

Baseline corrected: -200-0 ms.



- A main effect of name agreement on RT, $p < .001$.
- A main effect of naming type on RT, $p < .001$.
- A significant interaction between name agreement and naming type on RT, $p < .01$.

Conclusions

- Shorter naming RTs for pictures with high NA than low NA.
- A larger N2 amplitude for pictures with low NA than high NA.
- Name agreement effect occured at lexical selection level.
- Inhibition is more strongly involved when lexical access is more competitive.

References

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More information: Zeshu.Shao@mpi.nl