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FLASH TALKS SESSION 2

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Development of novel word acquisition paradigm for non-invasive brain stimulation studies

Studies using non-invasive brain stimulation applied to healthy human participants frequently have null results. The reason may be ceiling effects due to insufficient difficulty of an experimental paradigm, rather than the inefficiency of stimulation (Antonenko et al., 2016; Malyutina et al., 2018; Pozdnyakov, 2018). Consequently, effects of non-invasive brain stimulation can be revealed via more challenging tasks, such as a word learning task in the linguistic domain. This paper aims to develop a word learning paradigm sensitive to potential effects of non-invasive brain stimulation. To do so, we have chosen word learning tasks and materials challenging even for healthy participants and validated their difficulty level in a pilot experiment. The paradigm was tailored to brain stimulation parameters commonly used in previous studies: duration of 20 minutes, and measuring performance both during and after stimulation.

We prepared stimuli lists of 80 pseudowords based on our previous study (Stupina, Chrabaszczyk, 2020). We paired pseudowords with 80 semantically unrelated inanimate Russian nouns from the database (Akinina et al., 2014) based on their semantic similarity, length, and gender. We have also developed an explicit word learning paradigm consisting of two phases. The acquisition phase includes passive acquisition, three-alternative-forced choice and recall tasks. The testing phase includes recognition, recall and semantic decision tasks.

We conducted a pilot online experiment to validate the difficulty level of the paradigm. In the testing phase, participants performed reasonably well in recognition (accuracy: $M = 71\%$, $SD = 15\%$, range 50 — 90%) and semantic decision (accuracy: $M = 75\%$, $SD = 10\%$, range 60 — 95%) but not in the recall task (accuracy: $M = 17\%$, $SD = 13\%$, range 0 — 35%). In addition, participants reported a lack of time in the recall task but not in other tasks.

Thus, the paradigm provides a variety of task difficulty levels, with no floor or ceiling effects, and should be sensitive to improvement of performance by brain stimulation. The only change we made to the paradigm based on online validation was extending the response time in the recall task to 10 seconds. The paradigm has proven suitable for brain stimulation experiments and other studies on novel word acquisition.

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Implicit Prosody Hypothesis in reading: Talker-to-listener distance effect in intonation contour

Prosody research provides accumulated evidence that implicit prosody can influence online sentence interpretation. The Implicit Prosody Hypothesis (IPH) suggests that, in reading, a default prosodic contour is projected onto the read phrase not as a translation of written material into acoustic form but rather priming the listeners' interpretation of the message (Fodor, 2002; Breen, 2014).