

## Shit, I can track it in your eyes! Differential pupillary Stroop effects for L1 and L2 taboo words

Prior evidence on bilinguals' emotional involvement in the native language (L1) relative to the second (L2) is mixed. Many studies have shown decreased emotional reactivity in L2 relative to L1 (Iacozza et al., 2017; Jończyk et al., 2016; Puntoni et al., 2009; Toivo & Scheepers, 2019; Wu & Thierry, 2012; Zhang et al., 2023) while some have failed to find differences between L1 and L2 (Ahn & Jiang, 2023; Eilola & Havelka, 2010). The dissimilar results likely relate to differences in bilinguals' language profile (e.g., levels of daily L2 use) as well as to differences in the paradigms and methods used. The present study aimed to replicate Leończyk's (2016) emotional Stroop experiment with taboo words, but this time reaction times measurements in L1 and in L2 were supplemented by concurrent recording of pupillary responses. A group of highly proficient Polish-English bilinguals performed the emotional Stroop task with Polish and English taboo words and neutral control words matched for lexical frequency and length. Half of the participants performed the task in L1 and the other half in L2 (between-subject design). In each language, the stimuli included 20 taboo words (e.g. FUCK) and 20 matched neutral words (e.g. BIKE). Participants were asked to press one of two buttons to indicate the colour of the ink of the presented word (red or green). Response times were significantly longer to taboo words than to neutral words in L1 ( $p=.039$ ), but not in L2 ( $p=.14$ ). However, this difference was not supported by a two-way interaction between Language and Word Type ( $p=.55$ ). The preliminary analysis of baseline-corrected mean pupil dilation data showed a similar pattern as response times, but this time the difference was supported by a significant Language\*Word Type interaction ( $p=.03$ ). Namely, pupil dilation was significantly greater in response to taboo words than to neutral words in L1 ( $p=.015$ ) but not in L2 ( $p=.60$ ). The preliminary analysis of peak latencies tended to show the reverse pattern between languages driven by Word Type effect, but this was not supported by a significant interaction ( $p=.29$ ): peak pupil dilation (maximum pupil size) was reached significantly later for the L2 taboo words relative to the L2 neutral ones ( $p=.043$ ), an effect absent in L1 ( $p=.66$ ). In sum, these results suggest greater sensitivity of pupillometry than behavioural measures to detect differences relating to taboo word processing in bilinguals, which confirm the general trend established in the literature.

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