Brain potentials reveal reduced sensitivity to negative content during second language production

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Accumulating electrophysiological evidence points to reduced sensitivity to negative language content when bilinguals operate in their second language. The available evidence, however, is limited to language comprehension. Here, we tested the production of negative and neutral words in Polish (L1)-English (L2) bilinguals in three EEG experiments (N = 35 per experiment) that manipulated emotional cueing (Experiment 1 and 2) and presentation modality (Experiment 3). In Experiment 1 (neutral context), white or black circles indicated whether participants should read aloud (shadow) or translate a subsequently presented word. N400 amplitudes were selectively reduced for negative L2 words regardless of task, indexing an attenuation of emotional response to L2 words at the stage of lexico-semantic access. In Experiment 2 (emotional context), we used black or white emojis, either sad or neutral, as cues. The previous interaction between word valence and language of operation vanished, but late positive potential (LPP) amplitudes elicited by negative words were larger for translation from L2-to-L1 (i.e., production in Polish) than from L1-to-L2 (i.e., production in English), indexing greater re-evaluation of negative words at the stage of L1 word production. Finally, in Experiment 3 we used the same design as in Experiment 2, with the exception that this time participants were exposed to spoken rather than written words. We found a robust reduction of the N400 amplitudes for negative L2 words regardless of task, replicating the results from Experiment 1. LPP increased for negative as compared to neutral words when participants translated them from L2-to-L1 or simply repeated them aloud in L2. Together, our findings parallel the existing comprehension research showing reduced sensitivity to negative language content when operating in the second language; and, critically, extend the available evidence to language production. As such, we provide first insights into the neural dynamics of production of written and spoken emotional words in bilinguals, shedding light on naturally occurring emotional communication in a bilingual context.

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