

# Irony processing is more cognitively taxing in L2 and more effective in L1: Evidence from event-related potentials

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Uttering „such a talented painter” when looking at a portrait, which is a bunch of scribbles, or saying “such a lousy painter” commenting on a portrait, which looks like a piece of art, are examples of verbal irony. The speaker may use positive valence (talented painter) to express ironic criticism or negative valence (lousy painter) to convey ironic praise. Some research shows that processing ironic statements is more cognitively demanding than comprehending literal ones (Filik et al., 2014; Giora et al., 1998; Giora and Fein, 1999; Shi & Li, 2022). Other research suggests that in some circumstances irony processing may be facilitated when it refers to positive social norms and the context provides sufficient cues (Gibbs, 1986; Kreuz & Link, 2002). However, it remains uncertain whether processing irony is more taxing in bilinguals’ first (L1) and second (L2) language. Previous studies looking at irony processing in L1 and L2 provide inconsistent results. Some evidence suggests that ironic meaning processing is more taxing in L2 than in L1 (Caffarra et al., 2018; Cheang & Pell, 2011; Ellis et al., 2021; Puhacheuskaya & Järvis, 2022), while other suggests similar L1 and L2 irony processing, with high L2 proficiency improving the performance (Bromberek-Dyzman, 2015; Bromberek-Dyzman et al., 2010; Bromberek-Dyzman et al., 2021; Bromberek-Dyzman & Rataj, 2016). Here, we show that bilinguals experience greater cognitive effort when integrating ironic than literal meanings in L2 (but not in L1) and at the same time reveal enhanced reevaluation of ironic than literal statements in L1 (but not in L2). We measured electrophysiological correlates of word processing in sentences conveying praise or criticism that could be taken literally or ironically in highly proficient late Polish-English bilinguals reading for comprehension. We manipulated irony (literal, ironic) and language (L1, L2), while controlling for intention (praise, criticism). We found an interaction between irony and language at the N400 (indexing depth of processing, with greater N400 amplitudes for ironic than literal statements in L2, with no such difference in L1). Further, at the LPP (indexing meaning reevaluation) the same interaction revealed larger LPP amplitudes for ironic than literal meaning in L1, with no such effect in L2. Overall, we found that irony taxes cognitive processes at different stages in L1 and L2. While in L2 irony requires greater processing depth at the earlier (implicit) processing stage (N400), in L1 irony charges the processing at the later (explicit) stage (LPP). These results provide novel evidence showing that expressing intentions ironically is risky and draining in the non-native language and can lead to communicative misunderstandings. Moreover, ironic intentions are more effective when communicated in the native language.

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