

A vibrotactile rhythmic priming for processing language

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Rhythmic priming tasks have been largely applied to investigate the possibility to transfer benefits from short-term exposures to musical rhythms across domains, including language (Cason et al., 2015; Fiveash et al., 2020). Moreover, the rhythmic priming effect was found to occur across sensory modalities, such as auditory to visual (Fotidzis et al., 2018) and visual to auditory (Gould et al., 2018). However, very few studies investigated the cross-modal influence of vestibular, tactile, and sensorimotor (VTS; Provasi et al., 2014) inputs. Surprisingly, although the core involvement of sensorimotor processing is accounted for in nowadays models of rhythm perception (Fiveash et al., 2021; Nayak et al., 2022), the potentiality of VTS sensory modality is significantly underestimated in the field. Based on previous research on the role of VTS rhythmic abilities in language acquisition (Russo et al., 2024), this Study tests for the first time to our knowledge the benefit of processing language when primed by a matching, short-term VTS rhythmic exposure. Infants were presented with a rhythmic prime via a vibrotactile system for music perception (Russo et al., 2024); then, VTS rhythmic primes were followed by matching or mismatching linguistic sequences via auditory modality. Changes in pupil diameter were collected in a gaze-triggered paradigm as index of cognitive effort (Calignano et al., 2023). Data were modeled via generalized, linear mixed models and model comparison was performed to maximize statistical robustness while accounting for inter-individual variability (Nieuwenhuis et al., 2012). Preliminary results on 16 participants (M age: 340 days, SD:117) point toward potential cross-domain and cross-sensory effects of VTS rhythm on language. Findings are discussed within current frameworks on rhythm in language (i.e., Temporal Sampling Framework, Goswami, 2011; Processing Rhythm In Speech and Music framework, Fiveash et al., 2021) with promising impacts for screening, training, and educational practices.