Do motion and auditory metaphors have unique neural substrates?

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Abstract: It may be that semantic representations of both literally and metaphorically used words extend to neural regions related to their modality. Additionally, it is unclear whether underlying cognitive and neural mechanisms in metaphor and literal sentence processing are distinct, a confusion due to a lack of control over numerous confounding factors in previous research (Schmidt et al., 2010). We presented a highly controlled set of literal and metaphorical sentences ending in words from two modalities, auditory (shriek) and motion (crawl) (Cardillo et al., 2010) to 16 participants. The N400 (a gauge of semantic processing) was calculated based on electroencephalographic recordings at 64 scalp sites. We found an interaction between quadrant of electrode and modality, supporting modulation of neural semantic mechanisms by modality. No other main effects or interactions were found with this highly controlled stimulus set, consistent with the notion that metaphors and literal sentences share similar processing mechanisms.