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behavioural and brain data about action verb processing

If and how the brain areas responsible for primary modalities such as vision, audition, somatosensation and motor execution are involved in concept formation and language processing has been a matter of debate for quite some time in - and still is. The theoretical frame is grounded cognition. In the phases I and II of the SFB991 our group further explored the processing of action verbs in different experimental setups using language processing and motor execution interaction paradigms. Behavioural and neurophysiological data point at a substantial overlap of neuronal engagement for language processing and movement execution.

Behaviourally, prolongation of reaction times emerges when short SOAs between language stimulus and response cue ( $\approx 150$  ms) are implemented thus suggesting interference mechanisms. On the other hand facilitation effects are observed for longer SOAs of about 400 ms.

Interaction processes also appear in the modulation of 20-Hz beta-frequency range neuronal oscillations. Decreased beta suppression appears to be a correlate of overlapping cortical activation induced by the semantic congruency between a linguistic stimulus and the response effector.

Some effects are only present in high-performing subjects, which points at a further role of attentional processes. We conclude that conceptual language processing recruits primary processing areas (here: motor), however the amount depends on task details such as stimulus timing and cognitive requirements.