Reconsidering visual dominance

Visual stimuli typically override non-visual stimuli during multisensory perception. Such “visual dominance” effects might stem from inhibition across sensory systems. Using both behavioral responses and event-related brain potentials (ERPs), this study investigated whether visual stimuli also dominate olfactory input. Participants performed a categorization task with congruent and incongruent odor-picture pairings and a delayed auditory response target that informed about categorization modality (olfactory vs visual). For congruent pairings, accuracy was better for visual decisions. However, for incongruent pairings, RTs were faster for olfactory decisions. Incongruent olfactory stimuli thus interfere more with visual decisions than vice versa. This olfactory dominance effect over visual perception was reflected in incongruent auditory target ERPs in terms of a late “slow wave” ERP effect that was more pronounced and had a longer latency during visual vs olfactory decisions, reflecting additional categorization costs for incongruent visual stimuli. In sum, both behavioral and ERP effects suggest a higher level of interference from incongruent olfactory, compared to visual, input. These findings suggest that asymmetric inhibition across sensory systems is a fruitful way of studying sensory dominance, and that olfactory stimuli can dominate visual stimuli, refuting the general notion of “visual dominance.”