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The influence of sensory modality on contextual processing: evidence from temporal and spatial perception.

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When tackling sensory ambiguity, our brains employ diverse strategies to navigate and resolve challenges, such as using contextual information and prior experiences, which are pivotal in shaping our perceptions. Central tendency is a phenomenon where perception gravitates towards the average stimuli encountered in prior experiences, especially within the same sensory modality. An intriguing question arises regarding potentially more reliable prior experiences from a different sensory modality. We investigated this through an estimation task, exploring if perception in one modality can benefit from a more reliable cross-modal prior. Participants estimated temporal or spatial aspects of randomly presented auditory or visual stimuli, each with distinct averages. Our findings from these tasks revealed a bias toward the more reliable modality, emphasizing the role of modality-specific contextual information over central-tendency-based cues.
Moreover, we conducted analyses using various prior models to identify the most fitting model for our experimental data. This analysis underscored the importance of relying on priors from the most reliable modality specific to the task, emphasizing the brain's ability to discern and leverage the most relevant contextual information available from any sensory modality to resolve perceptual ambiguities effectively. In conclusion, our study sheds light on the dynamic interplay between sensory modalities, contextual information, and prior experiences in shaping human perception. This deeper understanding contributes to our broader knowledge of perceptual mechanisms and their implications for real-world tasks and challenges.

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