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ERP correlates of working memory for sound and picture Locations

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Abstract Previous studies conducted in our lab provided evidence that object locations of sounds and pictures are maintained by a common mechanism. This suggests that working memory for spatial locations is not separated according to input modality. Additionally, it is known that in visual short-term memory, location and object information are maintained by different processes. Taken together, this suggests that the distinction between location and object processing should also be valid for auditory memory. We conducted an ERP slow wave study to investigate to what extend this dissociation holds true for both pictures and sounds. In our experiment, we varied both, modality (sounds vs. pictures) and task type (object vs. location memory). Subjects studied either sounds or pictures presented at different locations. The study phase was followed by a cue which indicated what information to maintain during the retention interval. Subjects either needed to maintain object identity or object location to carry out an old/new decision in the following test. They were instructed to actively maintain the relevant information during the retention interval. ERP slow waves recorded during maintenance differed both by task type and modality, suggesting information-specific processing. We discuss the ERP results with respect to a model of domain-specific processing in a network structured along the anterior–posterior dimension of the brain.

Keywords Working memory · Object locations · ERP slow waves

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