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# Aging does not impair neural sensitivity to extrafoveal contextual violations

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Objects semantically inconsistent with their surrounding scene typically attract attention (i.e., looked at earlier and for longer) and elicit a fronto-central N400 response, reflecting the cognitive effort to resolve contextual mismatches. Yet, it remains unresolved how much semantic information can be extracted before direct fixation, and whether similar extrafoveal processing mechanisms are preserved in aging.
In this study, eye-tracking and EEG data were simultaneously recorded while younger (N = 22) and healthy older (N = 20) adults studied photographs of indoor scenarios in preparation for a change detection task. Each scene contained a target object that was systematically manipulated regarding its semantic consistency with the background (e.g., a toothbrush vs. a banana in a bathroom). Linear deconvolution was applied to estimate the effect of semantic consistency on fixation-related potentials (FRPs) time-locked to the target fixation, the preceding fixation, all non-target fixations, and scene onset.
Across groups, inconsistent objects were fixated earlier and for longer and elicited stronger N400 responses during the target fixation and the one immediately preceding it, with no semantic effects during non-target fixations. This suggests that semantic conflict is detected in peripheral vision and resolved upon direct fixation. The only age-related difference observed was a widespread reduction in the amplitude of the neural response time-locked to scene onset in older adults, potentially reflecting decreased efficiency in extracting the scene gist.
These findings demonstrate that healthy aging preserves the neural architecture supporting semantic processing in peripheral vision, enabling older adults to extract high-level meaning from complex visual environments.

## If you're submitting a symposium talk, what's the symposium title?

Neural signatures of complex and real-life memories

## If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

No

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