**Neural oscillatory processes underlying context binding in visual working memory**

*Qing Yu and Bradley R. Postle*

Working memory tasks typically involve the presentation of one or more to-be-remembered items, then retrieval of the item(s) after a short delay. Although not always explicitly noted, success on these tasks often requires not only the retention of the identity of the to-be-remembered items, but also the retention of each item’s context, such as the location at which each was presented, and/or their order of presentation. Although working memory for item information has been studied extensively in recent years, the neural implementation of binding to context remains poorly understood. In the current study we recorded the electroencephalogram (EEG) while participants performed three types of working memory tasks, each with different context binding demands. Sample presentation was identical on all three trial types: three sinusoidal gratings presented sequentially (500 ms presentation, 500 ms ISI), each at a different location on the screen. After a 2-s delay, a probe stimulus was presented centrally, and participants made a Yes/No recognition judgment. On location-context trials, an arrow superimposed on the probe indicated the location of the sample item against which the probe was to be compared. On order-context trials, a digit superimposed on the probe (“1”, “2”, or “3”) indicated the ordinal position of the item against which the probe was to be compared. On context-irrelevant trials, no cue accompanied the probe, indicating that it was to be compared against all three sample items. Behavioral performance was superior for order-context and for location-context trials than for context-irrelevant trials. EEG results revealed, for both context-binding conditions, elevated alpha-band (8-13 Hz) power at bilateral parietal electrodes and elevated theta-band (4-7 Hz) power at midline frontal electrodes, relative to context-irrelevant trials. These results suggest a general neural mechanism for context binding across different domains in visual working memory.