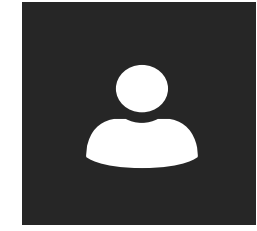


Investigating How the Brain Allocates Attention to Spatially and Temporally Salient Stimuli Across Time



PRESENTER:
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BACKGROUND: Salient stimuli can capture attention. It is unknown how attention resolves the competition when spatial and temporal deviants co-occur. The current study used EEG (electroencephalogram) and a novel oddball popout paradigm to address this gap.

Oddball Popout

- How does the brain process rare stimuli in the context of a goal-directed search task?
- Deviants vary in spatial or temporal salience to investigate



METHODS

1. n = 27 undergraduate students' EEG while performing the oddball popout paradigm
2. Analyzed event-related potentials (ERPs) produced by different arrays
3. Used t-tests to assess differences and significance

RESULTS

- Target array: N2pc to singleton and vMMN to temporal oddball target
- Larger probe positivity (Pp) elicited to the target array compared to the standard
- Probe elicits a larger contralateral P1 compared to the ipsilateral

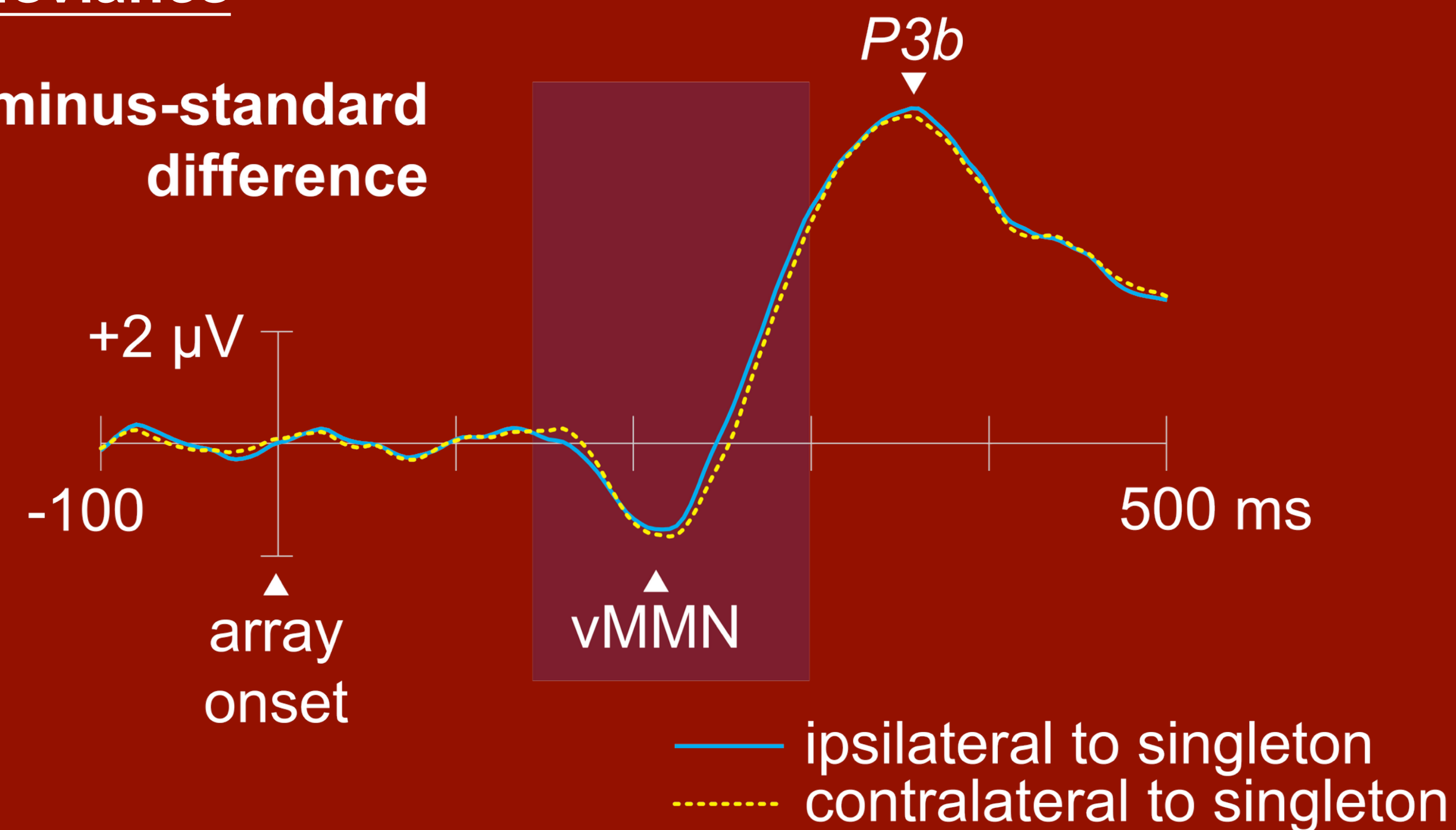
DISCUSSION

- N2pc to the singleton consistent with salience-driven selection theories
- Temporal deviant array was sufficiently rare and deviant to elicit a vMMN
- Larger P1 suggests more processing of stimuli
- Why was the N1 absent on probe target trials?

The brain can pick out two types of salient stimuli simultaneously

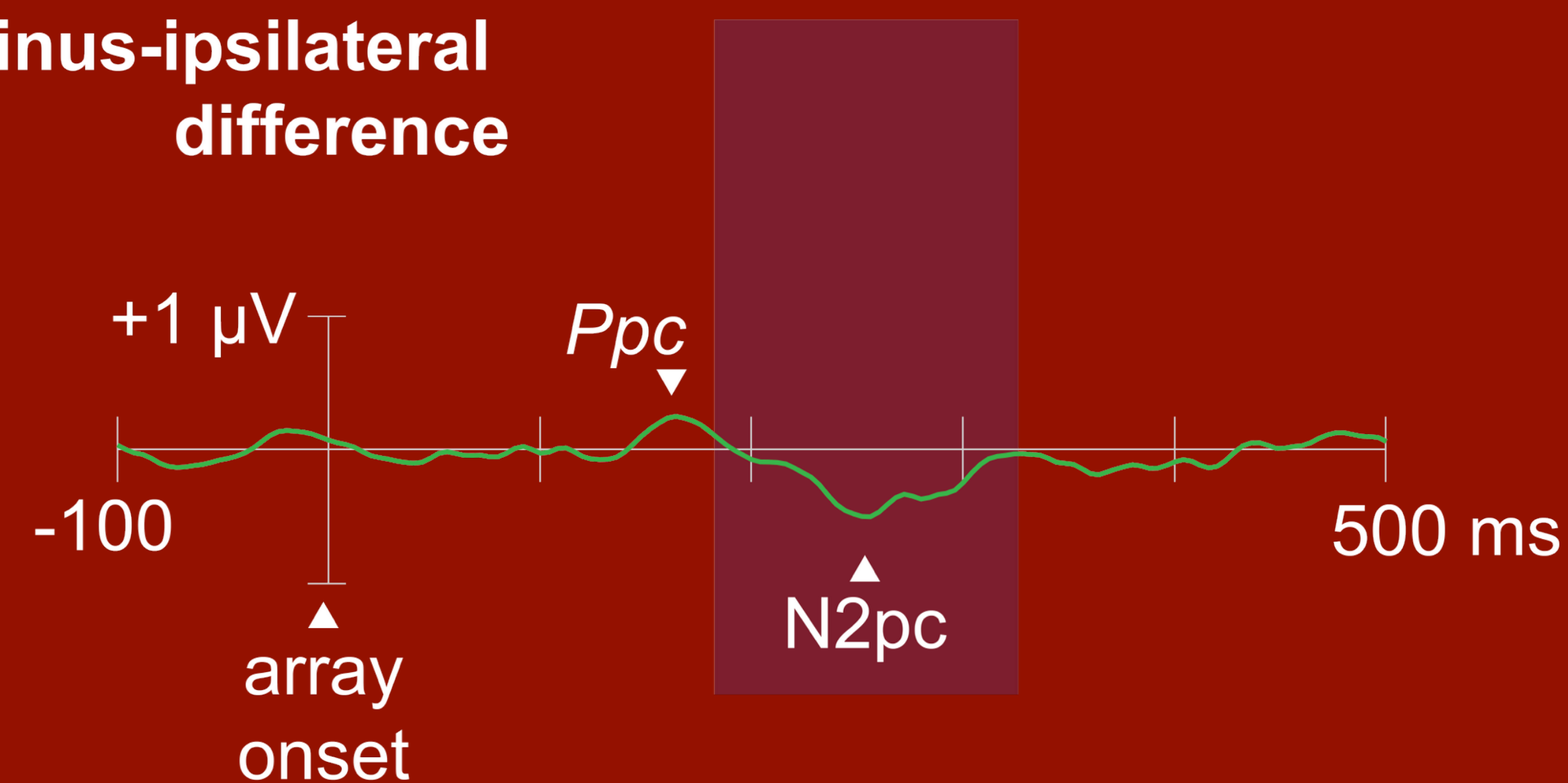
1. Temporal deviance

target-minus-standard difference

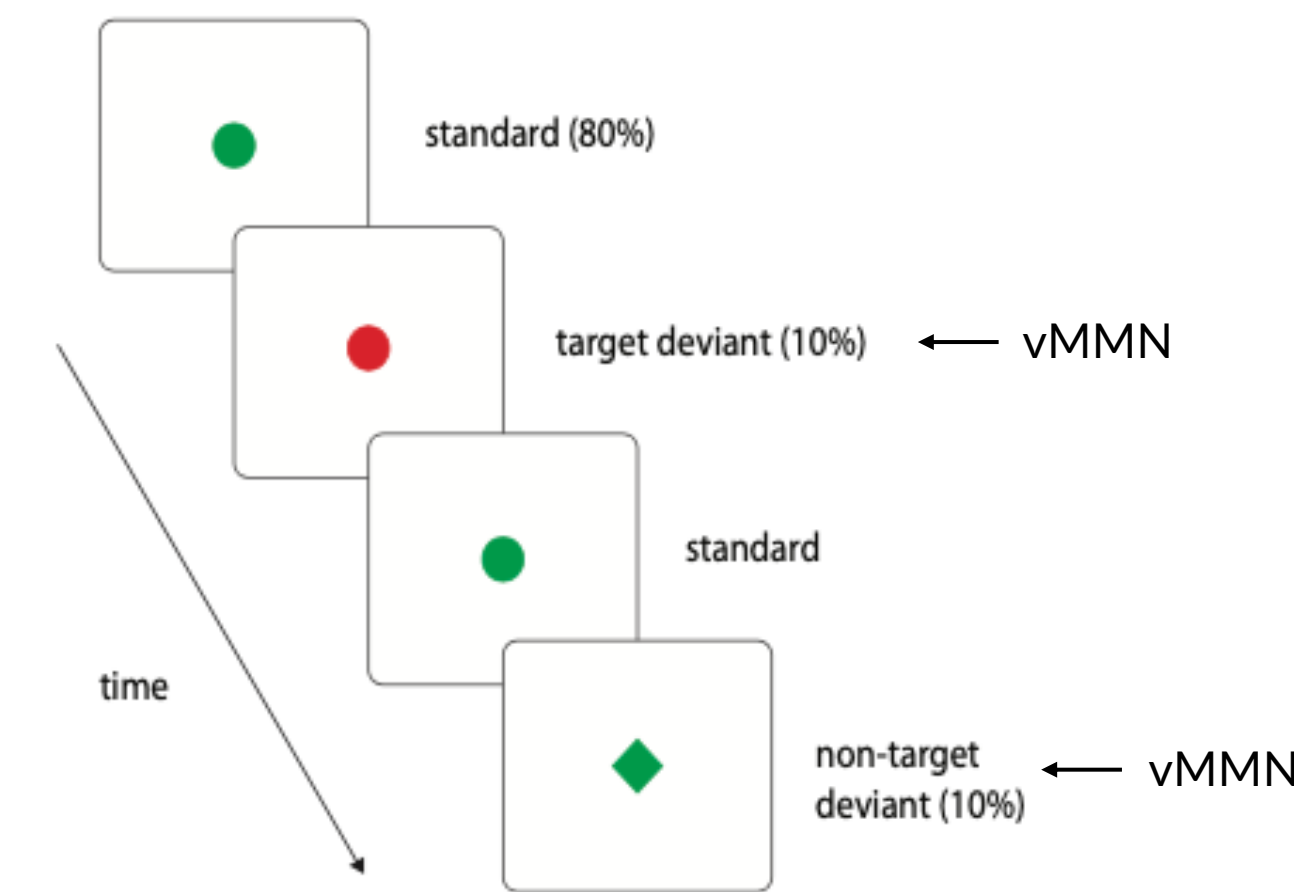


2. Instantaneous salience

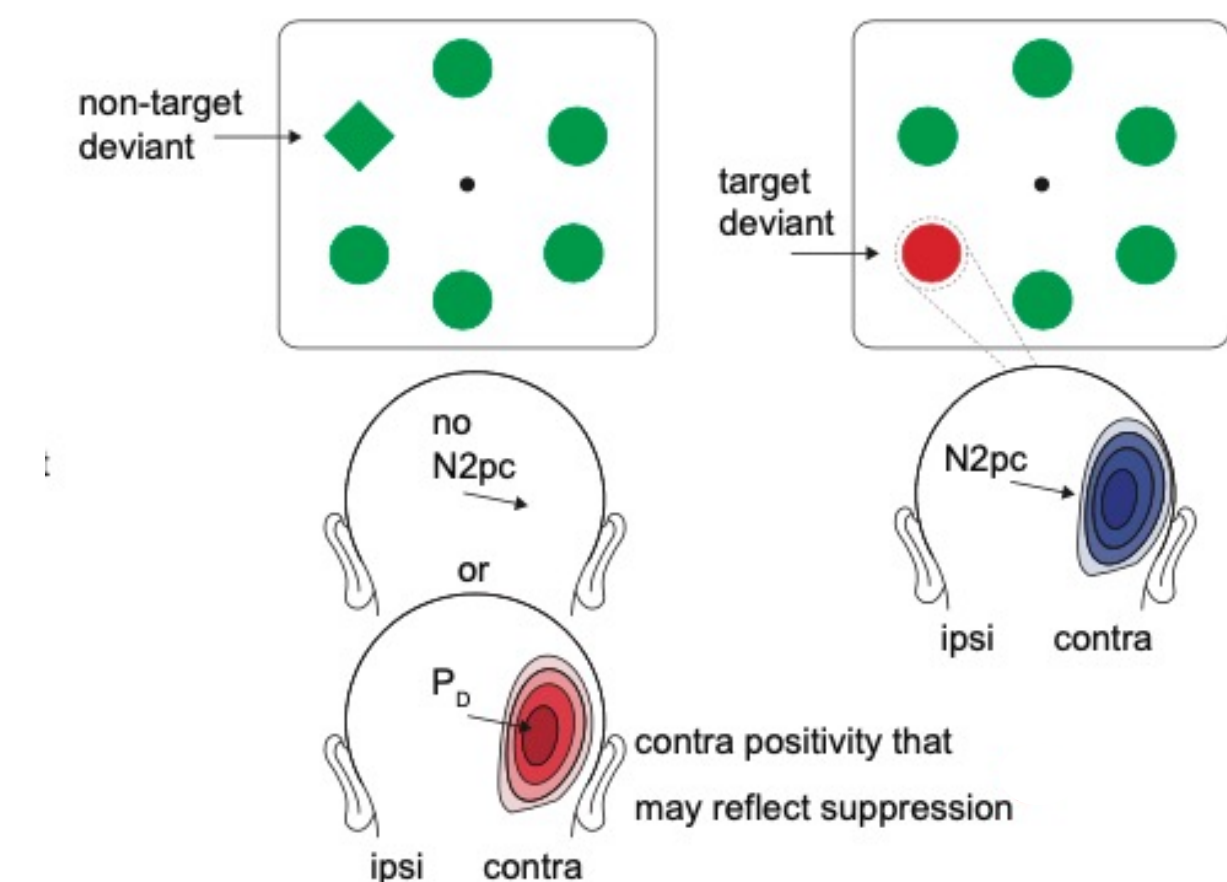
contralateral-minus-ipsilateral difference



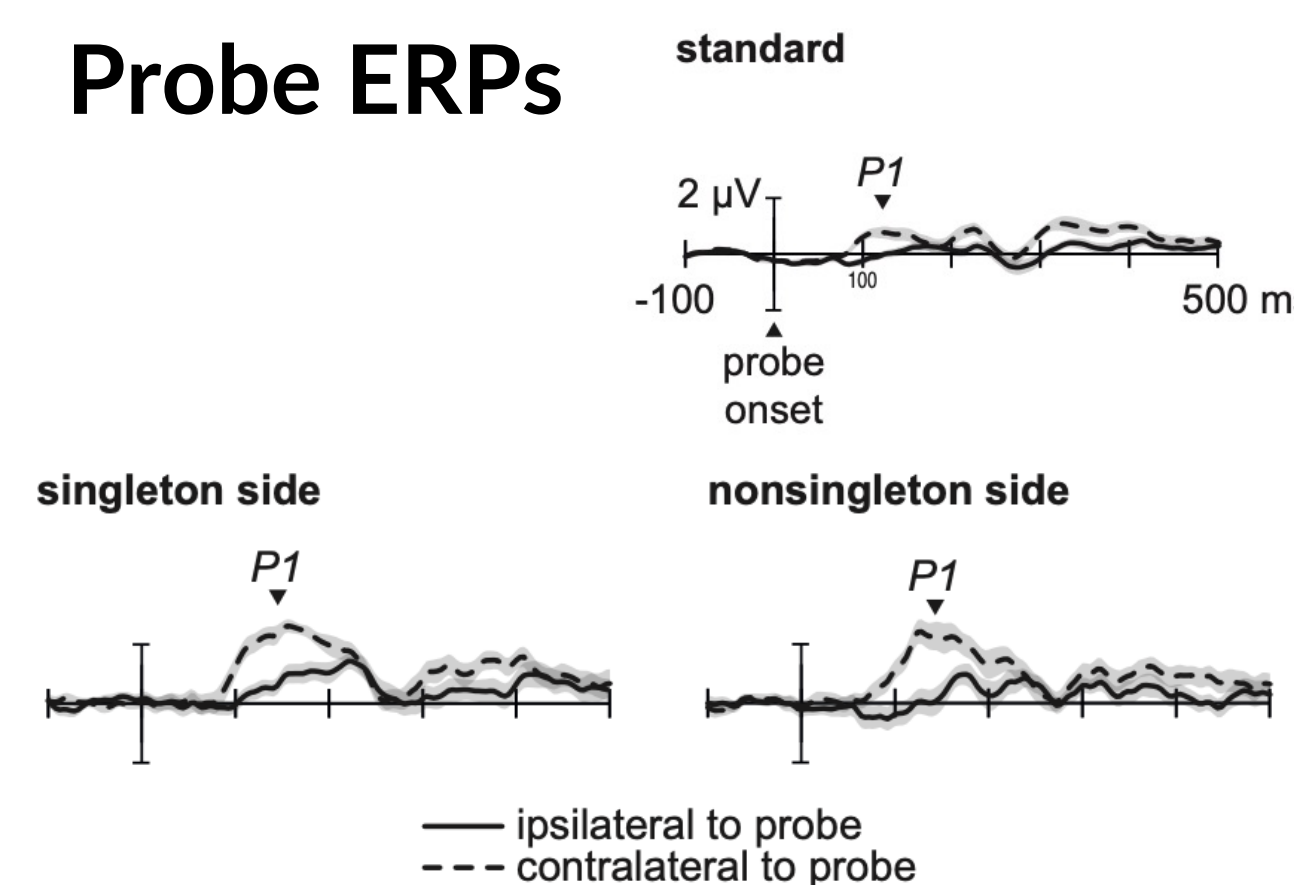
Oddball Paradigm



Visual Search Paradigm



Probe ERPs



REFERENCES

- Comerchero, M.D. & Polich, J. (1999). *Clin Psychophysiol* **110**, 24-30.
- Luck, S. J., Gaspelin, N., Folk, C. L., Remington, R. W., & Theeuwes, J. (2021). *Vis Cogn* **29**, 1-21.
- Luck, S. J. & Hillyard, S. A. (1993). *J. Cogn. Neurosci* **5**, 188-195.
- Theeuwes, J. (2010). *Acta Psychol* **135**, 77-99.
- Treisman, A. & Gormican, S. (1988). *Psychol Rev* **95**, 15-48.

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