

Reduced ERP amplitudes for animal stimuli in the absence of conscious awareness

Weina Zhu^{1,2,3,4}, Jan Drewes⁴, Karl Gegenfurtner³

¹School of Information Science, Yunnan University ²Kunming Institute of Zoology, Chinese Academy of Sciences, China.

³Department of Psychology, Giessen University, Germany. ⁴CIMeC, Trento University, Italy

Contact: zhuweina.cn@gmail.com



Introduction

Background: (1) Categorical information from natural scenes can be quickly and easily extracted; (2) Animal stimuli deviate from non-animal stimuli around 150ms after stimulus onset (ERPs, Thorpe, Fize et al. 1996)

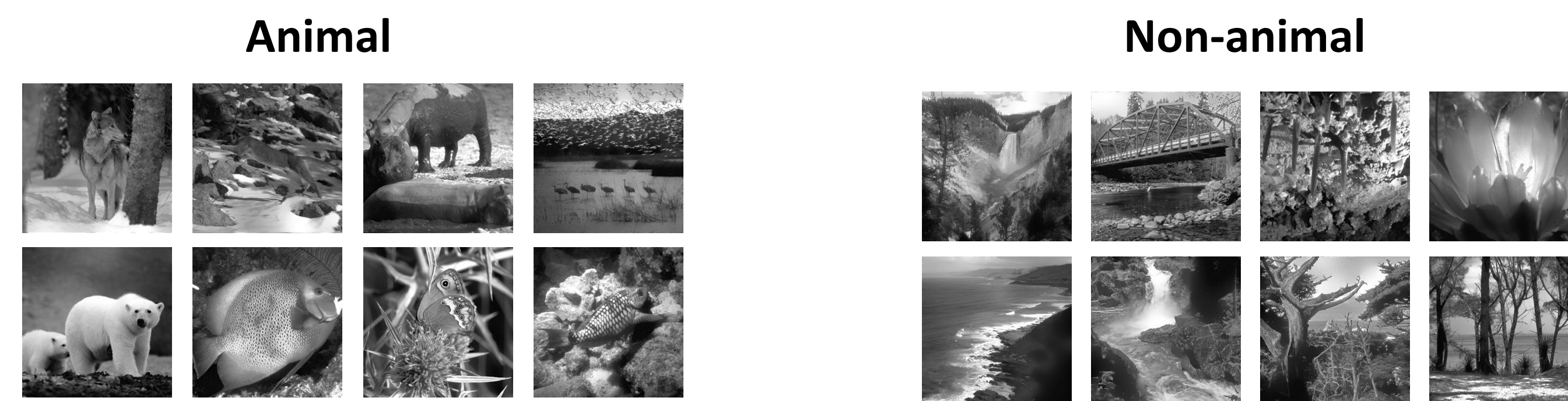
Question:

- (1) Does this remarkable capability function in the absence of awareness?
- (2) Are there any differences between animal and non-animal in the suppressed condition? (Are animals special?)

Methods

Stimuli: 300 animal and 300 non-animal images (in experiment 1, 2) or vehicle images (experiment 3) selected from the Corel image library. Gray scaled images equalized in luminance and contrast...

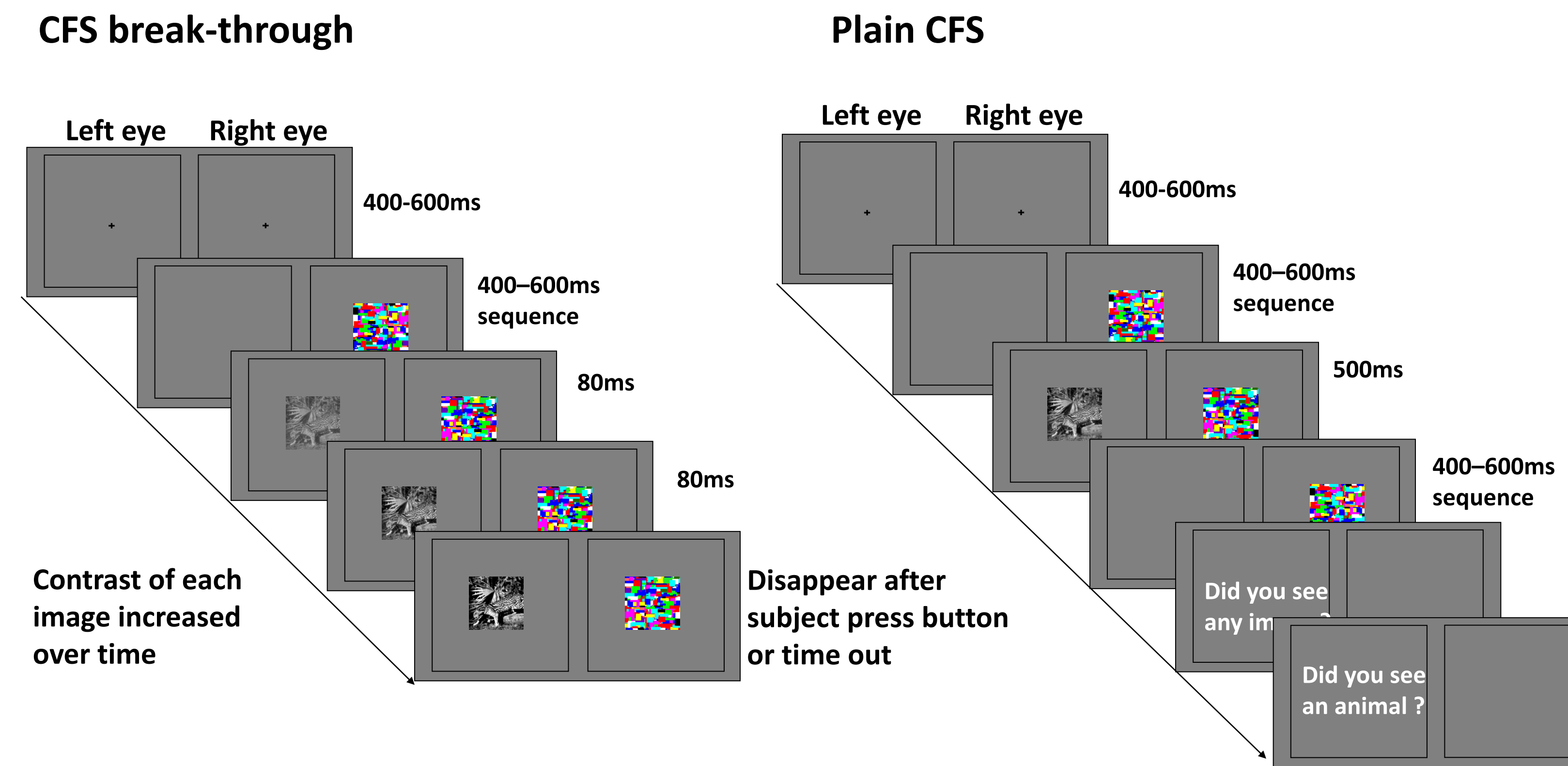
Experiment 1, 2



Experiment 3

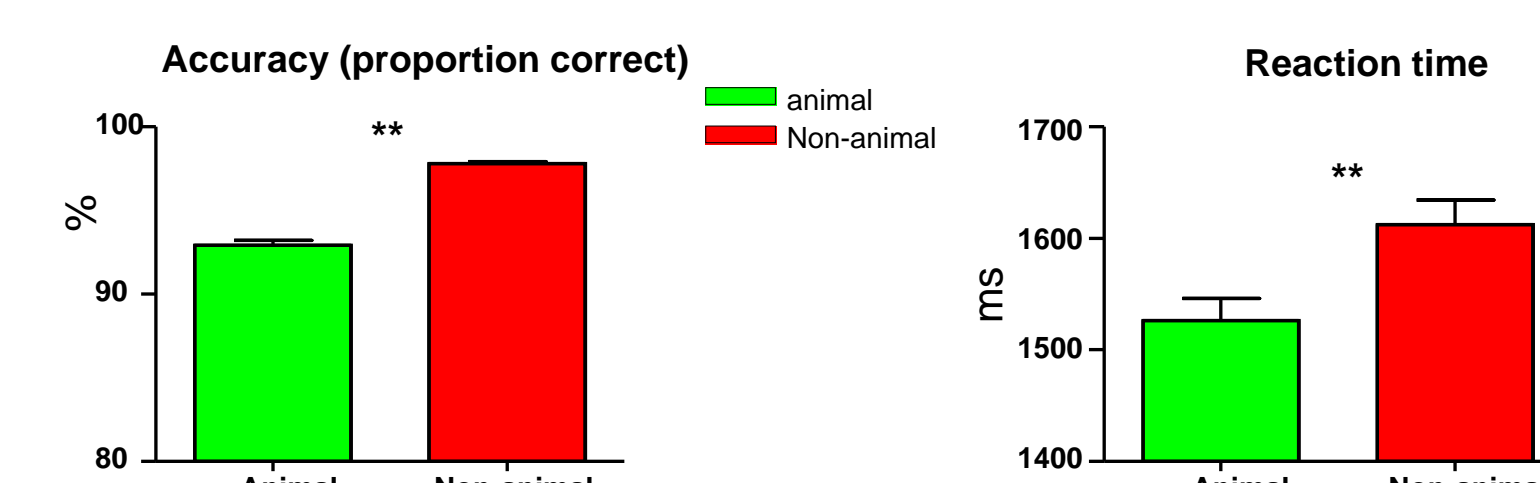


Paradigm: CFS (continuous flash suppression) break-through (experiment 1) and plain CFS paradigm (experiment 2,3, EEG) were used.



Results

Experiment 1

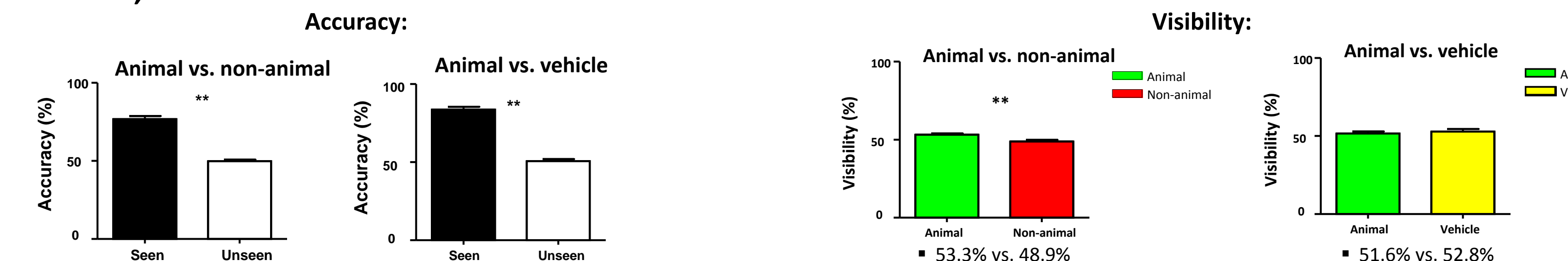


Both animal and non-animal images had very high accuracy (93% vs. 98%).

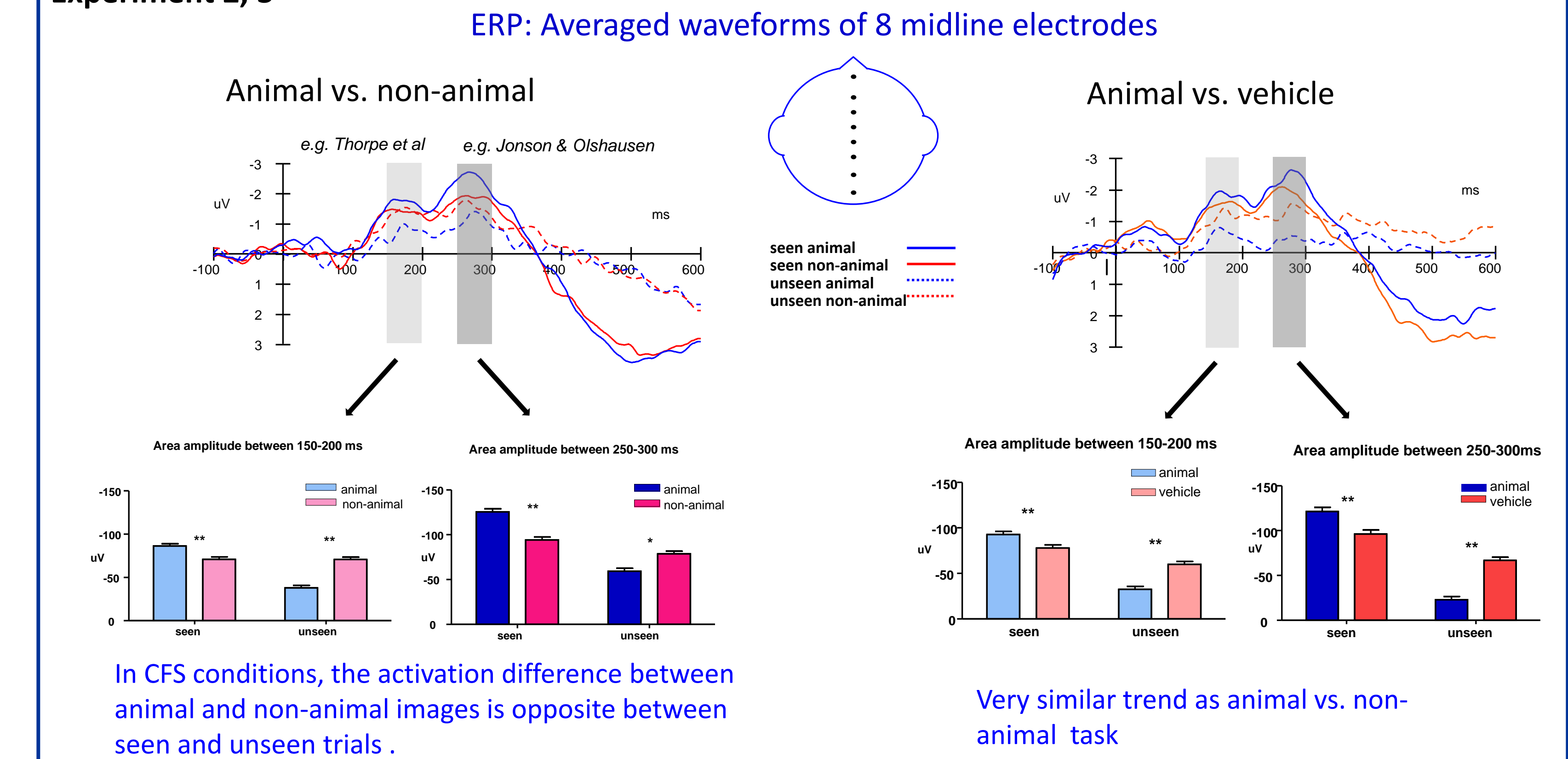
Animal images had shorter reaction time than non-animal images (1526ms vs. 1613ms).

Conclusion: Animal images are faster to overcome the depression of the mask than non-animal images.

Experiment 2, 3



Experiment 2, 3



Conclusion

- Even in the “unseen” trials, the brain responds differently to animal and non-animal/vehicle images
- The rapid processing of animal images is different between conscious and unconscious conditions.
- (yes! Animals are special)

A possible explanation would be the existence of a "special channel" for rapid animal detection, which would be affected by the CFS masking in a different way than general scene processing

References

- Thorpe, S., D. Fize, et al. (1996). "Speed of processing in the human visual system." *Nature* 381(6582): 520-522.
- Tsuchiya, N. and C. Koch (2005). "Continuous flash suppression reduces negative afterimages." *Nat Neurosci* 8(8): 1096-1101.
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