

Frontal midline theta predicts diagnosis style in a medical similarity judgement task

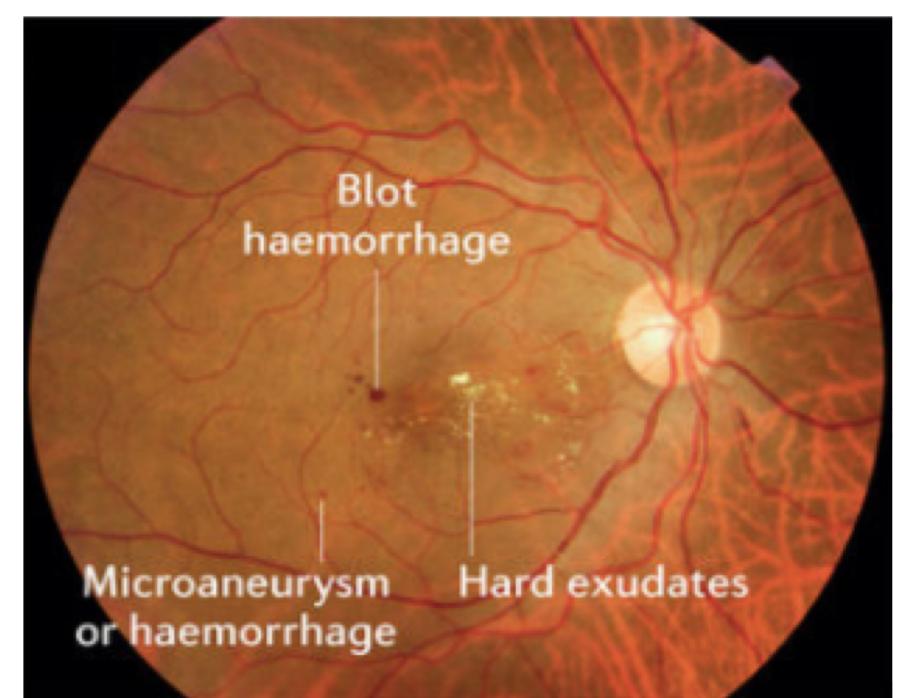
C.D. Hassall¹, M.S. Chia¹, B. Wright³, and O.E. Krigolson¹

Centre for Biomedical Research¹, Division of Medical Sciences³, University of Victoria



INTRODUCTION

- Diabetic retinopathy is diagnosed via the examination of images
- Severity scale: none, mild, moderate, severe proliferative
- Early-career MDs report low confidence in diagnosing diabetic retinopathy (George et al., 2008). Why?

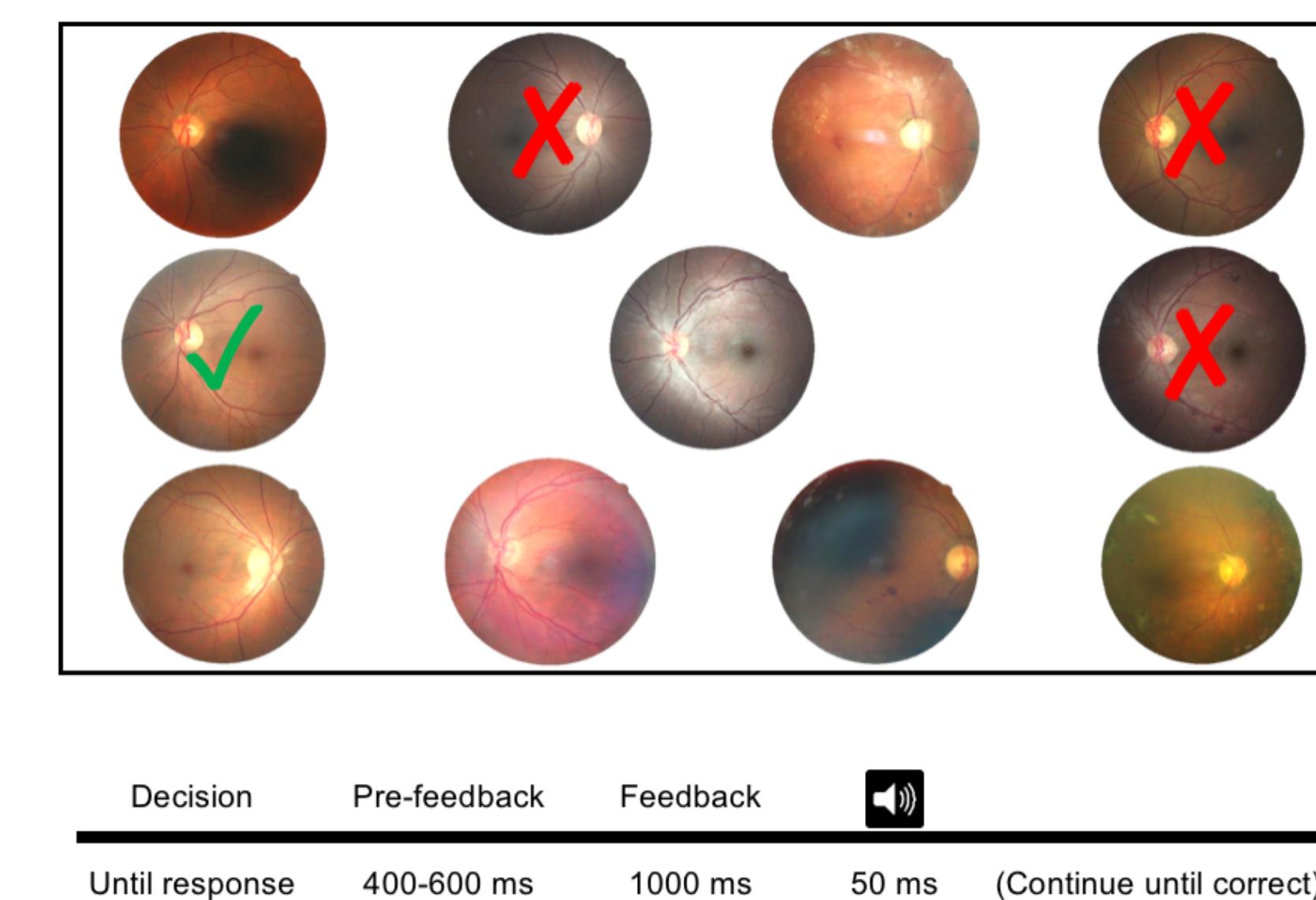


Diabetic retinopathy features.
Adapted from Wong et al., 2017

Rule-based learning (severity scale) \longleftrightarrow Implicit categorization (perceptual space)

METHODS

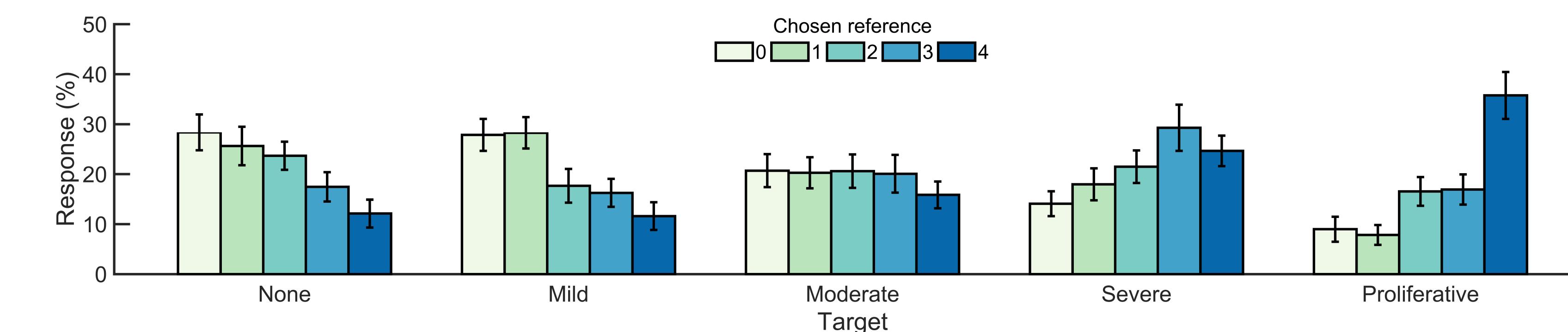
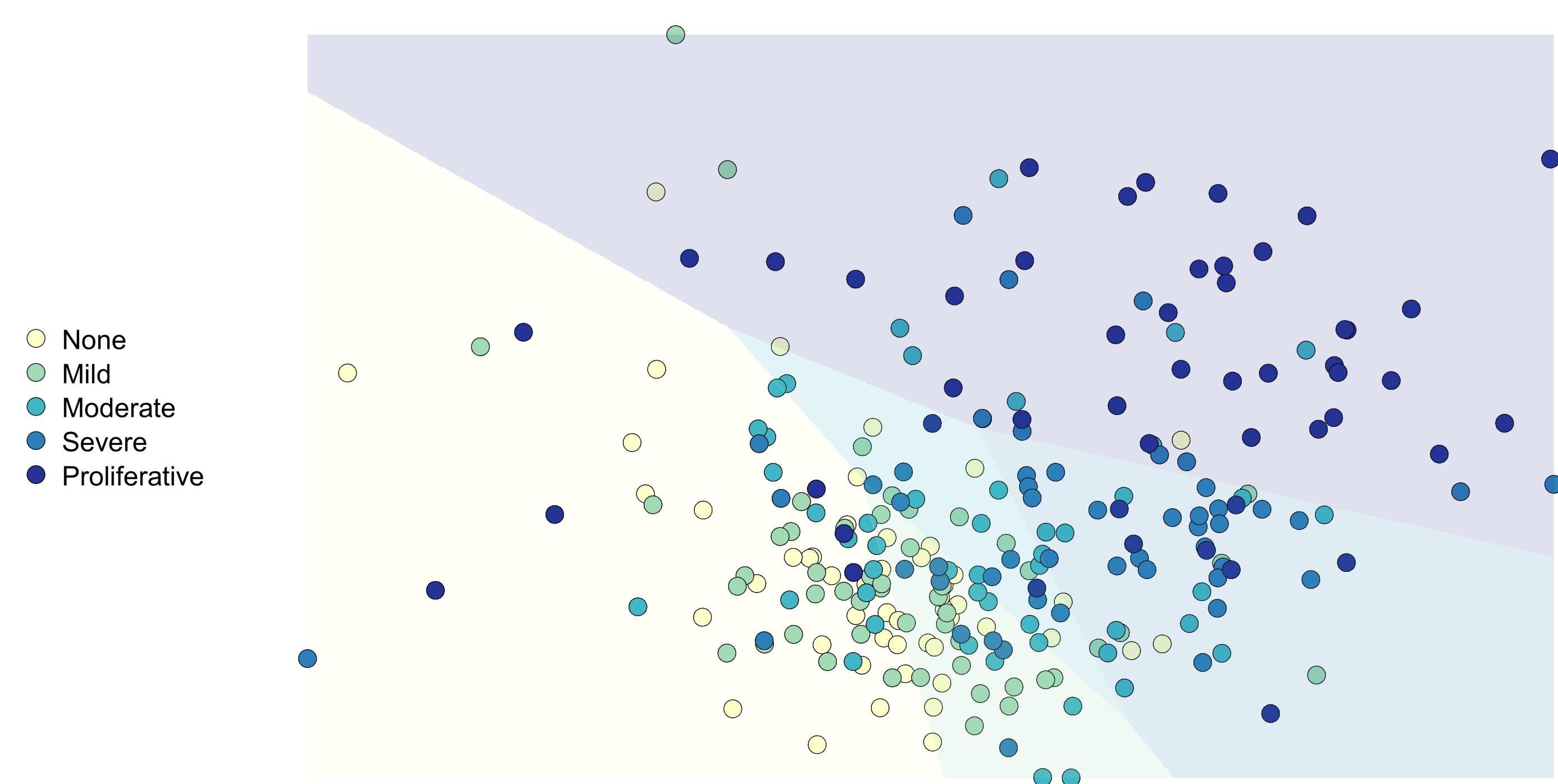
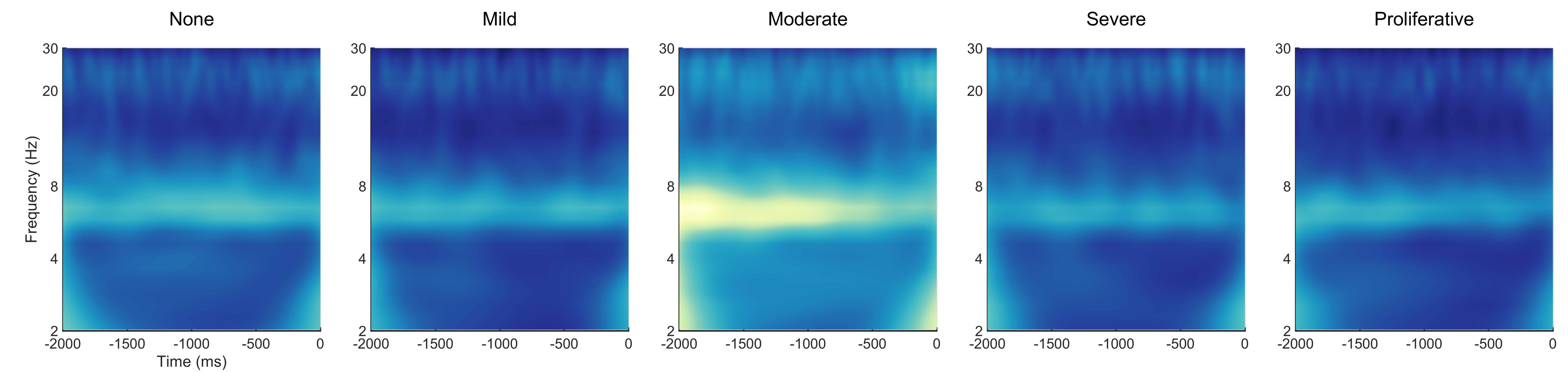
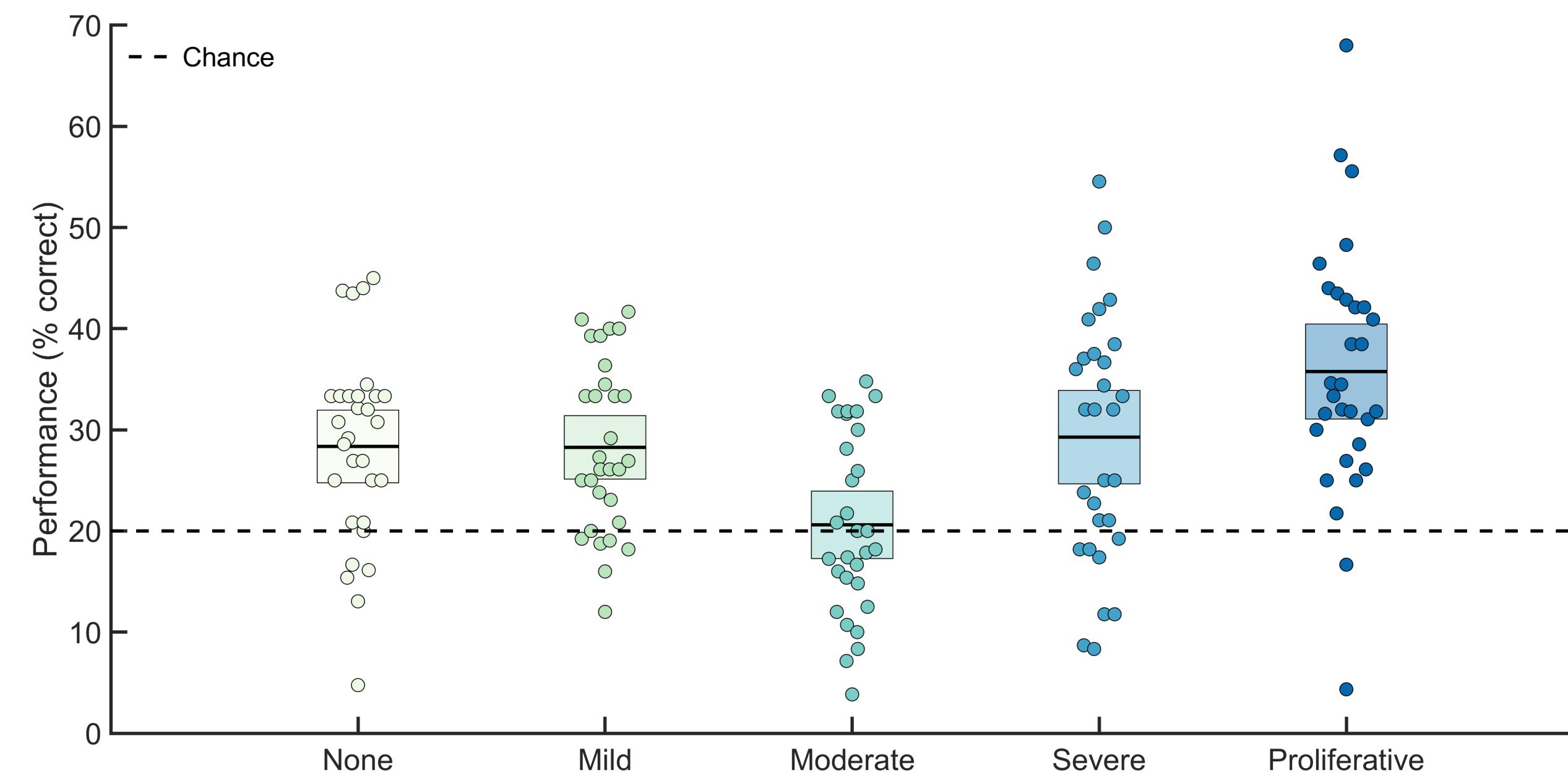
The similarity judgement task



- Accuracy (did the diagnosis match?)
- Triplets (data of the form A is more similar to B than C)
- Frontal midline theta (EEG measure of cognitive control)

N = 31, 8 M, 5 LH, Mean Age: 22.0, 95% CI [19.5, 24.5]

RESULTS



Conclusion

Cavanagh, J. F., & Frank, M. J. (2014). Frontal theta as a mechanism for cognitive control. *Trends in Cognitive Sciences*, 18(8), 414–421.

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Roads, B. D., & Mozer, M. C. (2017). Improving Human-Machine Cooperative Classification Via Cognitive Theories of Similarity. *Cognitive Science*, 41(5), 1394–1411.

Xu, B., Rourke, L., Robinson, J. K., & Tanaka, J. W. (2016). Training Melanoma Detection in Photographs Using the Perceptual Expertise Training Approach. *Applied Cognitive Psychology*, 30(5), 750–756.