

The role of confidence in decision-making

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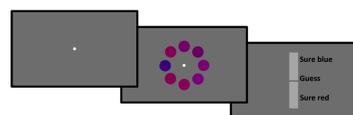
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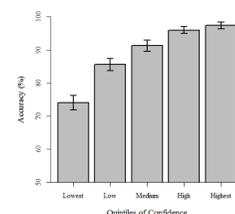
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Background

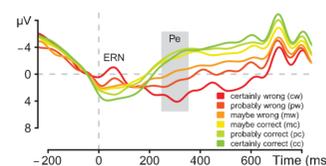
“How confident are you that your decision is correct?”



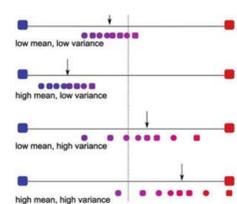
Typically, **decision confidence** closely tracks accuracy. This close association makes it hard to isolate the effect of confidence on **decision making**.



It has been suggested that the **detection of errors (ERN)** and **decision confidence (Pe)** are associated with different neural correlates¹.

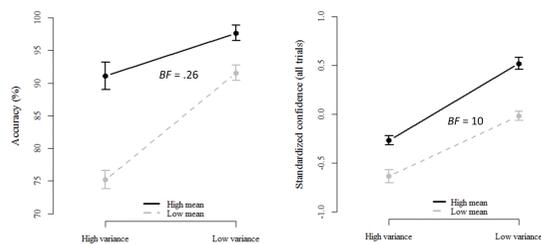


On the behavioral level, recent work on decision making, has documented that both mean evidence and **evidence variability** affect performance².



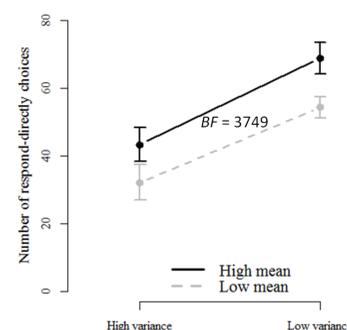
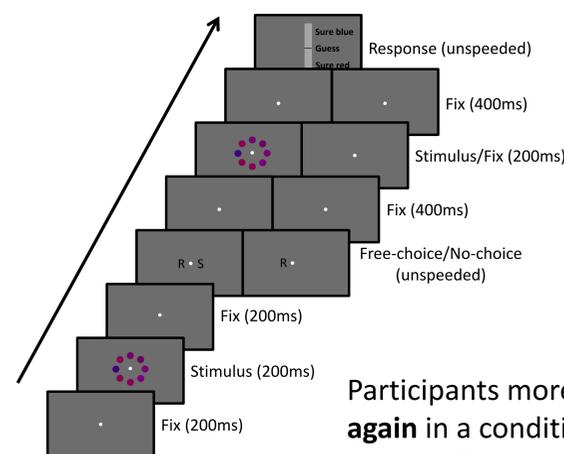
Decisions can be hard because the *mean* is close the decision boundary, or because there is high *variability* in the stimulus.

Crucially, **evidence variability** influences confidence more than it affects performance. Thus, it is possible to create two conditions (low-low and high-high) with **identical accuracy**, but **different subjective confidence**.

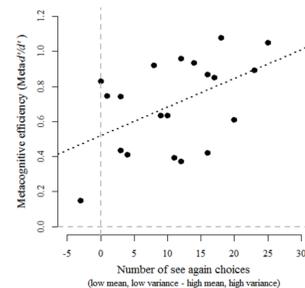


This dissociation allows to examine the role of confidence in decision making!

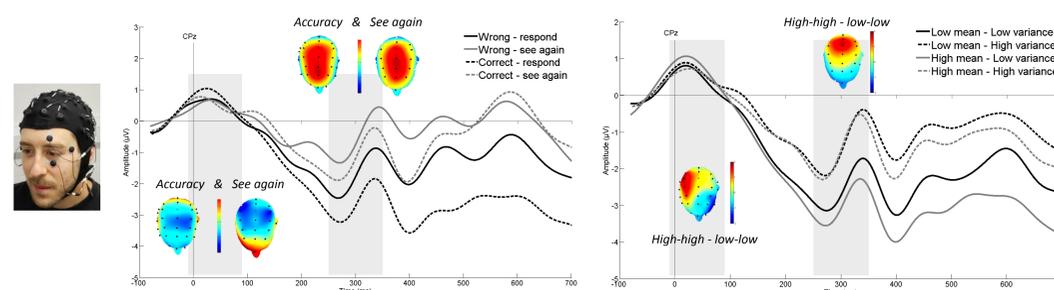
Confidence predicts “see again” choices



Participants more frequently ask to **see a stimulus again** in a condition associated with low compared to high confidence, despite identical accuracy in both.



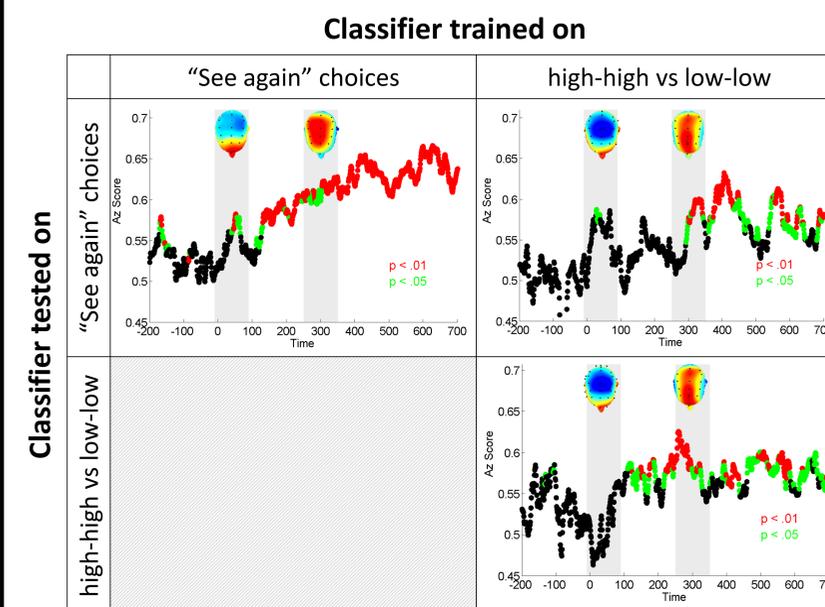
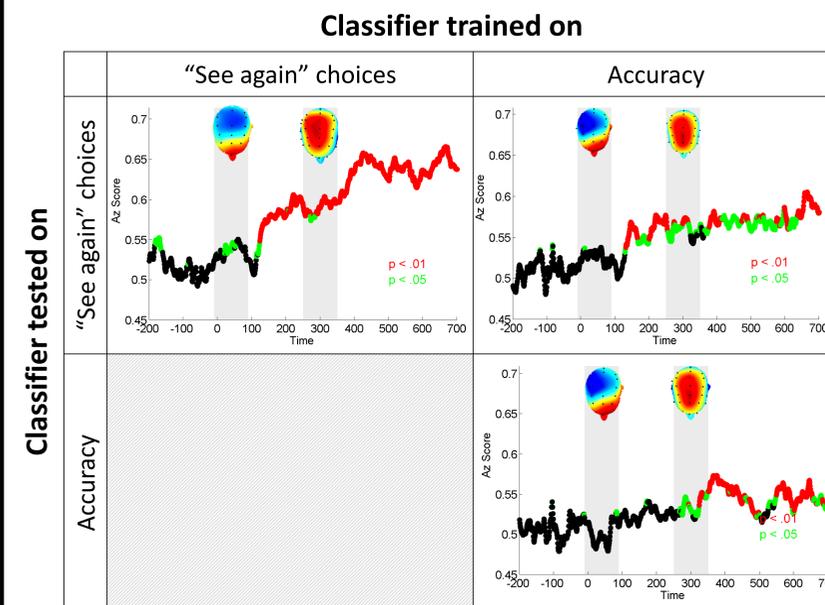
People with high **metacognitive capacity** (Meta-*d'/d'*) are more susceptible to this effect. This rules out that it reflects a lack of introspective accuracy. Rather, it seems to be a **fundamental property** of decision making.



Discussion

Decision confidence plays a crucial role in the decision whether or not to sample more information before making a response. These decisions can be decoded by a classifier trained on accuracy/condition late in time (+ 250ms), consistent with the time-course of the Pe, but not early in time, during the time-period of the ERN (-10 to 90ms). Our results suggest that **metacognition** (i.e., confidence) might play a more important role in **adaptive behavior** than commonly assumed³.

Predicting “see again” choices



References

¹ Boldt, A., & Yeung, N. (2015). *J. Neurosci*
² de Gardelle, V., & Summerfield, C. (2011). *PNAS*
³ Desender, K., Van Opstal, F., Van den Bussche, E., (2014). *Psychol. Sci*