A Unified Account of Repetition Blindness and the Attentional Blink

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Temporal Parsing w/ Neural Habituation

- Many RSVP tasks produce a transient deficit for a second stimulus following a related or identical first stimulus
- Huber and O’Reilly (2003) proposed that neural habituation (‘synaptic depression’) parses the sequence, reducing interference from recent presentations
- However, this parsing comes at a cost, producing repetition deficits if the second stimulus is a repeat

A Perceptual Account of the Attentional Blink (AB)

- Rusconi and Huber (2018) developed the ‘Perceptual Wink’ model by applying neural habituation to the AB task
- For many AB tasks, both targets belong to the same class of stimuli
  - letters/numbers, upper/lower-case, color, circles, etc.
- Perception of target-defining attribute (e.g. letter detector)
  - lag 1 sparing: letter detector is primed
  - lags 2-4: letter detector is habituated and number detector active
  - repetition blindness for letter detector

Repetition Blindness and the AB

- According to the perceptual wink model, the AB is repetition blindness (RB) for the target-defining attribute
- However, Chun (1997) reported a double dissociation between RB and the AB
  - symbols as distractors weakens AB
  - different colors for repeats eliminates RB
- The wink model can explain this double dissociation (visual RB vs categorical RB)

Bayesian Decision Process for # of Repetitions

- The perceptual wink model is a ‘type’ model and has no knowledge of ‘tokens’
- Solution: Infer # of repeats from STM evidence priors
  - decision process makes specific predictions for patterns of errors
  - these are tested with 6 response options at the end of each trial

References


Conclusions

- The perceptual wink model was augmented with a Bayesian decision process to infer # of repetitions
- Unified model explained dissociations between AB and RB
- Novel predictions confirmed
  - Both AB and RB vary with mapping consistency
  - In midst of AB and RB, people claim there is only one target