Modified Receptive Field & Crowding: Possible early indicators of orthographic knowledge and reading ability?
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Purpose
- How are letter-detector receptive fields (RFs) formed?
- Examining modified RFs and susceptibility to crowding in good and poor readers.
- Do poor readers experience a developmental delay when acquiring modified letter-detector RFs?

In the visual cortex
- RFs are brain areas that receive visual signals¹
- Some become specialized with experience
- Reading modifies some RFs to be sensitive to letters
- First-letter RT elongates leftward¹
- Reduces interference (crowding) of first-letter¹

Crowding
- Related to reading ability²
- Poor readers are more susceptible to crowding “C A T” ok; “CAT” not ok
- Sluggish orienting of spatial attention may result in excessive crowding in poor readers in visual periphery³

What is a Modified Receptive Field (MRF)?

Hypotheses
- MRF depends on reading exposure.
- Poor readers and pre-readers will:
  1. Show no first-letter advantage.
  2. Be more-susceptible to crowding.

Method: Trigram String Task⁴
- Trigrams of letters or shapes
  S D F G H J K *
  □ □ □ □ □ □ 
- Presented in Left or Right Visual Field.
- Participants select the 3 letters or 3 shapes they saw.

Expected Results
- Adult Readers (Control)
- Letters
- Shapes
- Chance-Level

ADULT READERS (CONTROL)
- Letters
- Shapes
- Chance-Level

GOOD READERS
- Letters
- Shapes
- Chance-Level

PRE-READERS AND POOR READERS
- Letters
- Shapes
- Chance-Level

Correlate first-letter-advantage findings with visual attention and spelling ability.
- Show stronger first-letter advantage is related to more-efficient attention, better spelling.

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