

Background

- Very few studies have examined how different reading goals might modulate the mechanisms that underlie the reading process (Just and Carpenter, 1987).
- Models of eye movement behavior during reading (e.g., E-Z Reader: Reichle et al., 1998; SWIFT: Ejnbert et al., 2002) do not provide clear accounts for how reading goals may affect reading behaviour.
- Theories of comprehension suggest that task demands may modulate standards of coherence for comprehension during reading (van den Broek et al., 1995).

Aim

- To examine the effect of reading goals on eye movement behavior during reading, focusing on whether sentence integration (processing of syntactic ambiguity and semantic plausibility) are modulated by reading goals.

Method

Experiment 1

- Examines whether effects of syntactic ambiguity (Frazier and Rayner, 1982) are reduced when scanning for a topic (White et al., 2015) compared to reading for comprehension.
- 2 (task: reading for comprehension, topic scanning) X 2 (syntactic ambiguity: non-ambiguous, ambiguous) within participants and items design.
- 40 participants (native UK speakers).
- Example stimuli, critical region in bold:

Non-ambiguous As the horse fed, the foal that was young and black **stamped into the field.**

Ambiguous As the horse fed the foal that was young and black **stamped into the field.**

Experiment 2

- Compares two different types of rapid reading behaviour (skimming for gist vs scanning for a topic) and examines the effect of reading goals on processing of semantic plausibility (Rayner et al., 2004; Warrington et al., 2019).
- 2 (task: skimming for gist, topic scanning) X 2 (plausibility: plausible, anomalous) within participants and items design.
- 52 participants (native UK speakers).
- Example stimuli, critical region in bold:

Plausible John used a knife to chop the large **carrots** for dinner.

Anomalous John used a pump to inflate the large **carrots** for dinner.

Apparatus

EyeLink 1000 eye tracker (SR Research Ltd.).

Analysis

Analysis was undertaken for the critical regions shown in bold using linear mixed effects models (LMEMs) (Baayen, Davidson, & Bates, 2008).

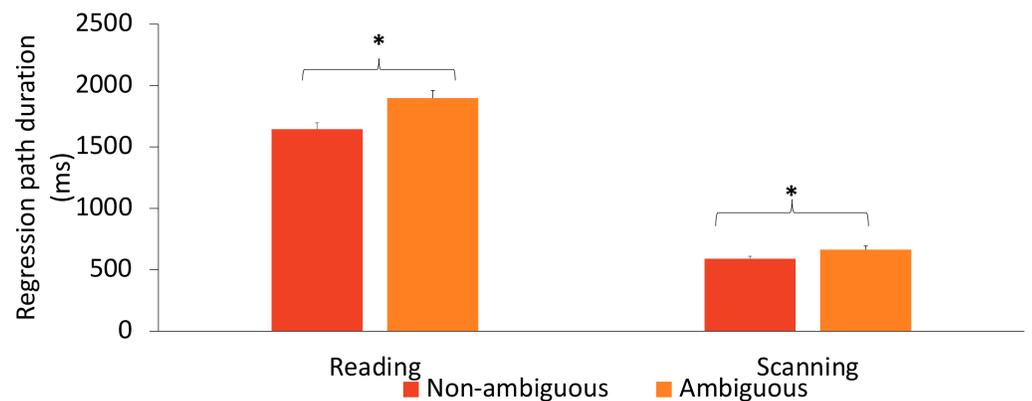
Key measure

Regression path duration.

Results

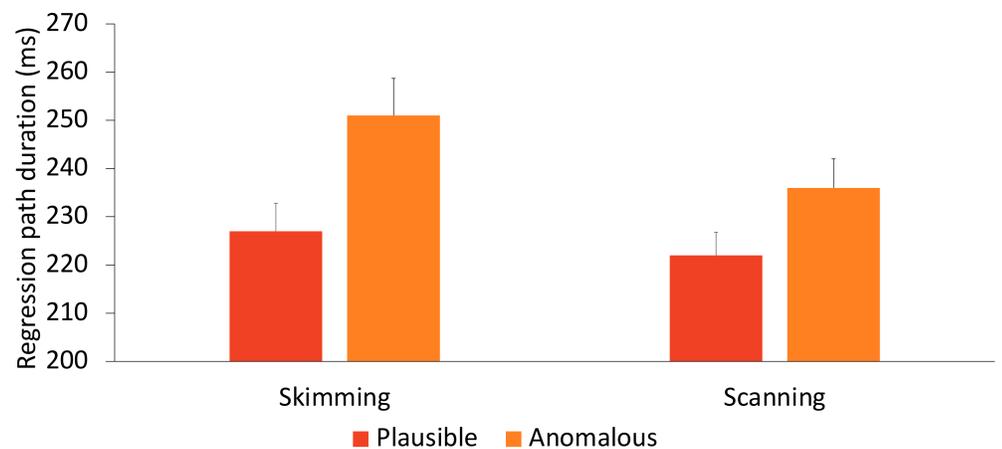
Experiment 1

- Global measures show clear effects of reading task, with longer reading times during reading for comprehension compared to topic scanning.
- Significant interaction between ambiguity and reading task for regression path duration ($t > 1.96$) (raw data).
- Significant effects of ambiguity for both reading goals, indicating that syntactic processing modulated eye movement behaviour for both tasks.
- Larger effects of ambiguity during reading than scanning.



Experiment 2

- Global measures show an effect of reading task in sentence reading time, longer sentence reading time for skimming compared to scanning for a topic.
- Shorter regression path durations for plausible compared to anomalous sentences ($t > 1.96$).
- No significant interaction between task and plausibility.



Conclusions

• Reading goals modulate eye movement behaviour:

- Shorter reading times during topic scanning compared to reading for comprehension (Exp 1), in line with previous work (e.g., Just & Carpenter, 1987).
- Overall shorter sentence reading times during topic scanning compared to skim reading (Exp 2), indicating that different tasks can generate differences in rapid reading behaviour.

• Sentence integration during rapid reading:

- Effects of ambiguity (Exp 1) and plausibility (Exp 2) across reading tasks indicates that sentence comprehension processes can be engaged even during rapid reading in line with Warrington et al. (2019).
- Reading goals can modulate the effects of syntactic ambiguity on rereading behaviour (Exp 1), in line with previous research on effects of question difficulty (Weiss et al., 2018).
- Ultimately models of eye movement behaviour during reading may account for how reading goals modulate underlying mechanisms (e.g., thresholds for sentence integration).

References

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