Sentence versus Paragraph Processing:
Linear and relational knowledge structure measures

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Background
• Current fixation-related fMRI acquisition requires sentence-level presentation (Hsu et al., 2019). How do sentence-level outcomes align with those at the paragraph level? (See our other IWALS 2019 eye-tracking with fMRI poster)
• In a behavioral study (Follmer et al., 2018) we compared sentence vs. paragraph reading comprehension outcomes after reading the expository text and also Knowledge Structure differences.

Participants & Materials
• Volunteers read a 307-word expository text on global positioning satellites (GPS) sentence-by-sentence (n=50) or as a paragraph (n=100) and then completed a term generation task (e.g., for primacy and recency), a comprehension test (10-MC items, and a vertical sorting task (v-sort as network Knowledge Structure, KS).
• Descriptive measures here include correlations among these measures and also sentence and paragraph group-averaged network forms.

Conclusion
• Crossing sentence boundaries allows integrative knowledge structure to arise, whereas sentence-by-sentence reading tended to engender a knowledge structure that was more discrete as well as more accurate for text propositions coming toward the end of the text.
• Sentence and paragraph participants’ sorting task networks were quite alike (77% link overlap)
• A Google Ngram network derived from the American English corpus (2008) shows that several multiword clusters (MWCs) that occur in the crowd also surfaced in the GPS lesson text (33% & 39%) and in the participants’ sorting tasks (54% & 48%)

Ngram, GPS text, and post-reading V-sort Pathfinder Networks

Results
• For the sentence-by-sentence condition, recency of term order was correlated with comprehension, in contrast,
• For the paragraph condition, there was a significant correlation between comprehension and KS network form.
• Analysis of networks indicates that paragraph presentation engendered a more relational KS relative to sentence-by-sentence presentation (see the networks on the right side above).

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