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Perception of Events in Stories Guides Eye Movements during Reading: A Working Memory Load Hypothesis



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When people read stories they generate mental representations of the situations described, called situation models (Zwann & Radvansky, 1998). These mental representations are important to organize the dynamic experiences we read about (Zacks, Speer, Swallow, Braver, & Reynolds, 2007). A situation model is a representation of the narrative's situational features: spatial location, temporal information, causality, goals or motivational information, and protagonists and objects (Johnson-Laird, 1982 as cited in Zwann & Radvansky, 1998). Situation models are organized by events (Kurby & Zacks, 2008; Zacks et al., 2007, as cited in Swets & Kurby, 2015), or "segment of time at a given location that is conceived by an observer to have a beginning and an end" (Zacks & Tversky, 2001).

Readers tend to update their current situation model when situational dimensions change so that the current event model is representative of the current state of affairs (Gernsbacher, 1990; Zacks et al., 2007; Zwann & Radvansky, 1998). For example, when a narrative states, "a few days later," it indicates a change in the temporal dimension of the text. In addition to this moment-to-moment updating, readers segment their situation models into separate events when these situational changes occur.

The perception of an event boundary likely has a number of behavioral and cognitive consequences (Zacks et al., 2007). This updating may cause a working memory load as processing increases to incorporate that new information. Zwann, Magliano, and Grasser (1995) found that reading time slowed for sentences with shifts in situational dimensions. Given these findings, Swets and Kurby (2015) investigated the role of event structure's effects on eye movements during reading. Swets and Kurby (2015) found that reading time was slower for event boundaries according to measures of overall reading time, first pass, and first

fixation. Additionally, regressions back to previous clauses were significantly more likely to land on event boundaries. In alignment with a working memory load hypothesis, those with lower working memory capacity slowed down more at event boundaries whereas those with higher capacity did not. This suggests that segmentation does cause a load on working memory.

The goal of the current study was to directly test the working memory load hypothesis. In contrast to Swets and Kurby (2015), working memory load was experimentally manipulated by asking participants to maintain a verbal working memory load or a spatial load while they read (Fincher-Kiefer, 2001). The current study hypothesized that maintaining a working memory load would increase the effects of segmentation on reading behavior measured by eye movements. Undergraduate students read four texts while their eye movements were tracked, similar to Swets and Kurby (2015). Each student was randomly assigned to have a spatial load, verbal load, or no working memory load. After reading the assigned texts, participants completed three working memory span tasks to assess working memory capacity.

Means for our dependent measures show how some trends replicate Swets and Kurby (2015), yet the means do not support the working memory hypothesis. However, data collection is incomplete, and as such final conclusions need to be withheld until collection is finished.