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The effects of conceptual and perceptual difficulty on processing and engagement in text during reading and learning.

Abstract, ECEM 2017

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Abstract

To investigate how conceptual and perceptual difficulty affects reading and learning, three eye-tracking experiments were conducted. Subtle low-pass filtering was used as the perceptual difficulty manipulation, learning was measured after 25 minutes, and working memory capacity (WMC) was assessed. When comparing the perceptually difficult text with the control condition, appropriate conceptual difficulty resulted in a shift from shorter to longer total reading times on words (Experiment 1), high conceptual difficulty resulted in shorter total reading times during the entire text (Experiment 2), and low conceptual difficulty resulted in longer total reading times during the entire text (Experiment 3). This suggests that conceptual difficulty interacts with perceptual difficulty and affects processing. Learning outcomes were unaffected by the perceptual manipulation in all experiments, but WMC predicted learning outcomes in Experiment 1, agreeing with previous research. In Experiment 2, participants with lower WMC performed significantly worse compared to participants with higher WMC for the perceptually difficult text only, with longer first fixation durations also observed. This suggests that the high cognitive load from the perceptual and conceptual difficulties was too large to counteract. In Experiment 3, WMC did not predict learning outcomes, likely because the conceptual difficulty of the text was inappropriately low.