4-27-2017

Emotion, Text Difficulty, and Purpose for Reading: How Factors Influence Reading Comprehension

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Recommended Citation

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Background

Goal of Project: Examine how emotion, text difficulty, and purpose for reading affect the comprehension of chemistry texts. The factors explored in this study are identified as separate, but constantly influence each other (Bohn-Gettler & Kendeou, 2014). Although research doesn't often account for the effects of multiple variables, real-world learning contexts include how emotion, goals, and text difficulty interact to impact text comprehension.

Emotion: Emotions are important to students' and teachers' productivity (Pekrun & Stephens, 2012), and there appears to be a reciprocal relationship between learning and emotions (Sinatra, Broughton, & Lombardi, 2014). Negative emotions encourage local, analytical processing whereas positive emotions result in processing that is creative, global, and prior knowledge-activating (Affect Infusion Model; Forgas, 2002). Hope and hopelessness have received little attention in research but are prevalent achievement emotions in science classrooms (Pekrun & Stephens, 2012).

Text Difficulty: Text difficulty is an important factor that can limit or enhance understanding of text, but that interact with other variables. For example, high-knowledge readers benefit from more difficult, less-cohesive, texts. Conversely, low-knowledge readers benefit from easier, high-cohesive (O'Reilly & McNamara, 2007). A mismatch between the reader's knowledge and the difficulty level results in lower comprehension.

Purpose for Reading: This study focuses on reading for entertainment versus for study. Reading for entertainment has been shown to hinder comprehension. Conversely, reading for study is increases processing that facilitates comprehension (van den Broek et al., 2001).

Methods

213 undergraduates viewed an emotion-inducing video (hope, hopelessness, or neutral), read a science text about environmental pollution or fossil fuels that was manipulated to be easy or difficult to understand, and were instructed to read the text for either study or for entertainment. After reading, students answered comprehension questions about the text's main ideas, inferences, and unimportant details.
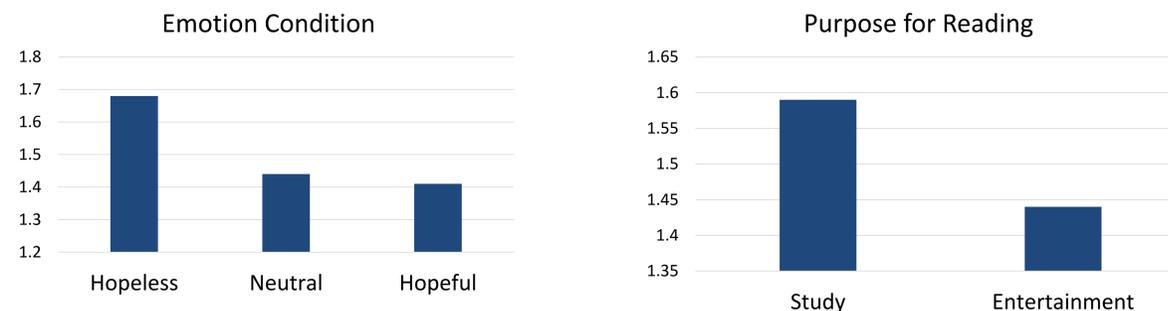
Results

Total Correct Comprehension Questions:
There was a significant main effect of emotion condition on total correct comprehension questions, $F(1, 213) = 2.973$, $p = .05$, such that those in the hopeless condition had the highest comprehension scores. There was also a significant effect for reading purpose on total correct comprehension questions $F(1, 213) = 5.629$, $p = .019$, such that those reading for study had higher scores than those reading for entertainment.

Emotion Condition (Hopeless, Neutral, Hopeful)

Purpose for Reading (Study, Entertainment)
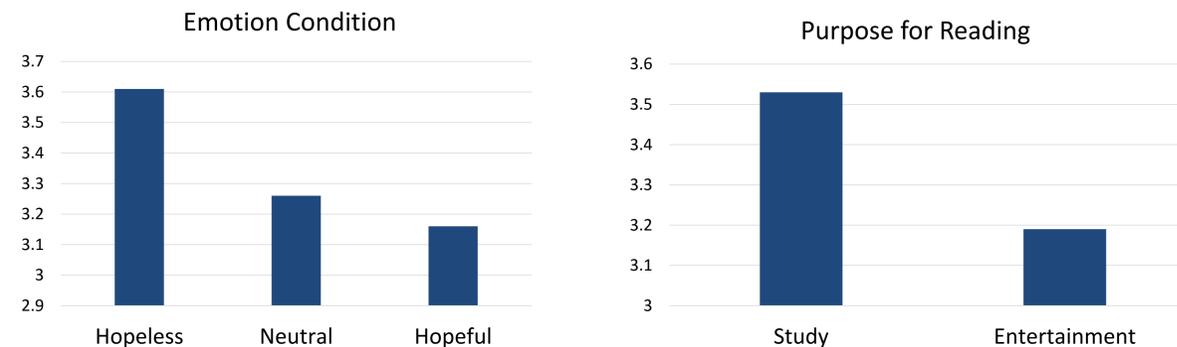
Correct Main Ideas: There was a significant main effect for emotion condition on correct main ideas that mirrors that of the total correct comprehension questions $F(2, 213) = 4.466$, $p = .013$: Those in the hopeless condition had the highest scores. There was also a significant effect for reading purpose that is in line with the total correct findings above $F(2, 213) = 3.876$, $p = .05$: Those reading for study had higher scores than those reading for entertainment.

Emotion Condition (Hopeless, Neutral, Hopeful)

Purpose for Reading (Study, Entertainment)

Correct Inferences: There was a significant main effect for text difficulty on correct inferential comprehension questions $F(1, 213) = 5.584$, $p = .019$, such that easier texts resulted in higher scores than more difficult text.

There was a significant interaction between text difficulty and study condition $F(1, 213) = 4.08$, $p = .04$. When reading easy texts, participants reading for study had higher scores than participants reading for entertainment. There was no significant difference when reading difficult texts.

Text Difficulty and Purpose for Reading (Easy, Difficult) — Study, Entertainment
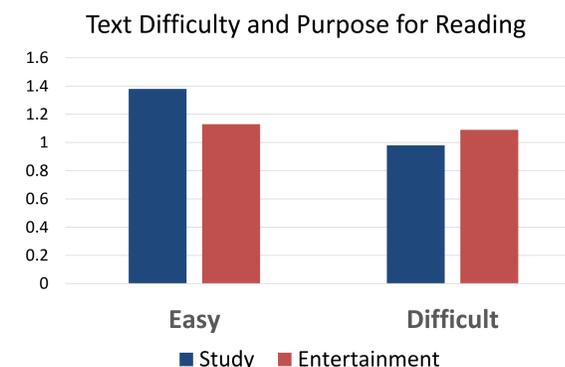
Discussion

The results reveal several findings about the factors that influence reading comprehension. Interestingly, students scored highest both in total correct comprehension questions and in main ideas when they were in the hopeless emotion condition. This could have been caused by a number of factors. One factor could be that participants in the hopeless emotion group experienced mood congruency: The texts about fossil fuels and pollution contained negatively valenced information about the harmful effects of pollution and fuels on the environment. Information tends to be remembered better when it aligns with one's emotional state (Bower, Gilligan, & Monteiro, 1981). It is also possible that the hopeless emotion induction was less effective than the hopeful emotion induction.

The data also support the idea that a student's purpose for reading will change how they comprehend text (van den Broek et al., 2001). In particular, participants instructed to read for study scored higher on comprehension questions than students instructed to read for entertainment. This suggests that the effects of emotion are not as simple as we may think, and that instructors should be clear about the purpose for readings and assignments.

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