Research Spotlight

The Reading Game

Professors Anna Fisher and Ken Koedinger are beginning a new line of research on the development of reading. Undergraduate June Walitzer is conducting an initial investigation of how reading comprehension relates to different patterns of eye gaze in beginning and fluent readers. In the reading game, each child is asked to read a short story book displayed on the screen of a laptop computer. If the child is a beginning reader, the researcher helps the child read the story to ensure a positive experience in the study. After reading the book, the child answers several comprehension questions. While the child is reading, the researcher monitors the eye gaze patterns using a portable eye tracker, depicted below. The research team is interested to determine how eye gaze patterns of children who are beginning and fluent readers differ from each other. Specifically, they aim to learn whether beginning readers are more likely than mature readers to shift their gaze between text and illustrations, and whether these frequent gaze shifts are negatively related to children’s comprehension and memory of the stories they read. If we observe this pattern of results, it would suggest that the layout of the books designed for beginning readers can be improved by reducing the competition between text and pictures, in order to enhance children’s reading experience and reading comprehension.

The Learning New Animals Game

When children encounter something new, they can apply their prior knowledge rather than learning from scratch. One way in which children can apply prior knowledge is to categorize the new thing as a member of a known category, and another is to make an inductive inference about the properties that the new thing may share with members of a known category. In this process, they may rely perceptual similarity or on category inclusion rules such as whether a new thing shares a critical feature necessary for category membership. The goal of the present study is to track children’s eye gaze while they make either categorization or inductive inference judgments to investigate whether children are using overall perceptual similarity or a critical feature necessary during these tasks. In the game, children learn two new categories of bugs that vary in overall appearance, but are each defined by their mouth shape: Grassbugs have sharp teeth, whereas Fruitbugs have tube-shaped mouths. Then, children see triads of bugs consisting of a Target bug at the top, and two Alternate Choice bugs at the bottom. The Alternate Choice bugs consisted of a Category Match and a Distractor. On half of the trials, the Category Match was more perceptually similar to the Target than the Distractor, whereas on other trials, this pattern of perceptual similarity was reversed. For each triad, children are asked either which of the two Alternate Choice bugs belong to the same category as the Target, or which of the two Alternate Choice bugs share a novel property (i.e., “Has plaxium blood inside”) with the Target. Researchers predict that children who choose the Category Match on most triads regardless of perceptual similarity will primarily look at just the bugs’ mouths, whereas children who choose the perceptually similar bug on most triads regardless of category membership will look equally at all the bugs’ features. They also hypothesize that high rates of Category Match choices and focusing on the mouth feature will emerge at an earlier age when children are asked to categorize than when they are asked to make inductive inferences about the bugs.