Research Spotlight

The Classroom Game

The purpose of this study by Dr. Anna Fisher and graduate student Karrie Godwin is to investigate how children allocate their attention in learning environments. We are particularly interested in examining how physical features of the environment (e.g., toys, posters, artwork, etc.) can contribute to or hinder children’s ability to attend to the content of a lesson. We are also examining whether children’s ability to effectively distribute their attention has consequences for learning new content. In this study, a researcher is teaching kindergartners a series of mini-lessons in a small group format. For half of the lessons, the physical environment includes items that are typically found in early childhood classrooms that may be potential sources of distraction (e.g., posters, artwork, manipulatives, etc.). For the remaining lessons, the physical environment only includes visual aids and materials directly relevant to the lesson. Each lesson lasts approximately 10 to 15 minutes. During each lesson, the children listen to a short story as a group. Then, each child answers questions about the content of the story. For example, after a story about plants, the child might be asked to circle which of four pictures was shown in the book.

The Listening Game

In this study by Dr. Erik Thiessen and graduate student Lucy Erikson, researchers are investigating how young children discover words in fluent speech, which lacks reliable pauses between words. One cue that may help children segment speech is its statistical structure. For instance, syllables within words tend to have a higher probability of co-occurrence than syllables that span word boundaries (e.g., the syllables in ‘pre-tty’ and ‘ba-by’ occur together more frequently than the syllables between those two words, ‘ty-ba’). Prior research with artificial languages stripped of all other cues to word-identity has demonstrated that both infants and adults are sensitive to this cue. Furthermore, this learning often happens after brief, passive exposure periods and without participants’ conscious awareness of learning. However, in studies where participants are asked to do a secondary task while listening to the speech, performance is disrupted. This finding suggests that attention is necessary for learning, but the specific role attention plays in the process is not yet known. In the present research, researchers are interested in exploring how performance on a task of sustained attention (the Moving Eyes Game) is related to performance on this word segmentation task. In the Listening Game, children listen to an audio recording of a speech stream while using a coloring app on an iPad. Before listening to the language, children were introduced to a stuffed dog and told they would be listening to a pretend language spoken by dogs. After the exposure phase, they are presented with sets of two words and asked which word sounded more like a word they heard in the dog language while playing on the iPad. All of the words they hear are syllable combinations that were present in the stream, but within each pair one of the words is characterized by higher statistical coherence than the other (i.e., the syllables predicted each other 100% of the time compared to 33% of the time).
Research Spotlight, continued

Research Methods Class Studies

Students in Professor Anna Fisher’s Developmental Research Methods class will start the semester with a lab entitled the **The Remember What and Where Game** (see below). Later in the semester, students will work in groups to conduct a study of their own design, which will be approved both by their teacher and by Dr. Carver.

**The Remember What and Where Game**

The Research Methods students will work in pairs and small groups to conduct a study of spatial working memory capacity. *Working memory* refers to our ability to hold in mind information intended for immediate use, such as dialing a phone number someone just told you. *Spatial working memory* refers to the ability to remember locations of objects in space, such as remembering locations of landmarks on a map.

Information stored in working memory is forgotten relatively quickly unless we make a special effort to retain it, for instance by repeating it several times. The amount of transient information one can hold in mind increases with development. For instance, a 2-year-old may not be able to remember a sequence of three random instructions (for example: touch your nose, clap 3 times, and shake your head), but a kindergartner should be generally able to do so.

In the **Remember What and Where Game**, students in the Developmental Research Methods class will investigate the age-related increase in spatial working memory capacity. In this task, each child will see a 4-by-3 grid with 1 to 6 objects placed in random locations on the grid (see example below). The child studies the target grid for 30 seconds and then is asked to recreate the position of each object on another grid. The correct locations are marked on the testing grid in grey, but the child must remember which object belongs where.

![Example grid](image)

Each child will play the **Remember What and Where Game** twice within one session, once with familiar objects (as in the example above) and once with novel nonsense objects that can’t be easily labeled with words. This contrast allows the students to test the hypothesis that children use a mixture of visual and verbal encoding strategies on this task. Verbal encoding strategies (such as saying to oneself ‘car goes here’) should be difficult when unfamiliar objects for which the child does not have a name are used in the game; therefore, the students expect the game to be more challenging to children of all ages with novel objects rather than familiar objects.