Research Spotlight

The Construction Game

Think of a letter (for instance, a capital “E”). If you were instructed to flip the letter upside down, or rotate it 90°, you would likely be able to visualize how the letter would change. Young children, on the other hand, often have difficulty with this task, as they are not yet skilled in using mental rotation. The ability to manipulate an image in one’s head has been shown to correlate with success in fields such as math and science, so it stands to reason that children who master this skill early will be at an advantage in future learning.

The goal of Ashley Taylor’s senior honors thesis, which she is conducting in collaboration with Dr. Sharon Carver, is to examine how working with a partner on a game that requires the use of mental rotation affects an individual child’s ability to employ mental rotation in future tasks. Simply put, does working with a peer help to increase a child’s ability to understand future mental rotation tasks? To examine this topic, Ashley has assigned children to work either individually or with a friend to complete tasks: either commercially-available games that require the use of mental rotation strategies (Trucky 3, Royal Rescue, and Castle Logix) or “building replication” tasks designed to employ the same building skills as the games, but without requiring mental rotation ability. Within these four conditions, 4’s and Kindergartners participated in three brief, 15-minute sessions to practice their skills. Children’s mental rotation abilities were assessed before and after these practice sessions using the Children’s Mental Transformation Task (CMTT). During the CMTT, Ashley shows children an image of two shapes and asks which of the four answer options can be made by putting the two shapes together (See sample below).
Research Spotlight, continued …

The SMART Kids Game

Casey Roark, a graduate student working with Dr. Lori Holt, is investigating how children categorize sounds. This skill is important for listening to speech and deciphering environmental sounds. Quite surprisingly, there is reason to expect that young children may be better at learning sound categories than adults, at least under some circumstances. The “SMART Kids” Game is meant to discover whether children are better at learning categories with or without feedback and to relate these findings to adult learning. To address this, Casey will play five sounds for the child and ask him/her to decide which alien on the screen made each sound. This version of the game has feedback. After the child guesses, the alien associated with the sound category gets a spaceship and the child is told whether the guess was correct or incorrect with a smiley face or a sad face. The time the child takes to guess and the accuracy of the guess are recorded. This study will help us understand how children categorize sounds and whether it differs in any way from that of adults.

The Tracing Game

One of the groups in Dr. Anna Fisher’s Research Methods course is studying the speed-accuracy trade-off – one’s tendency to reduce accuracy when increasing speed, and vice-versa. This phenomenon is documented across all ages, but suspected to be more prominent early in development. In this project, student researchers are using a tracing task, in which children trace three “Snow Friends”, each with different music being played in the background (no music, slow-tempo classical, fast-tempo classical). Children were then allowed to decorate their Snow Friends before taking them home. Children’s tracing speed was measured by the amount of time it took to trace each Snow Friend. The accuracy was measured after the session by calculating the average distance from the trace line at 16 points around each circle. The findings of this project may impact developmental theory and suggest ways in which parents and teachers can provide a better learning environment for children. Songs and music are commonplace in preschools and kindergartens so this study may reveal more knowledge about music’s specific effects on performance, possibly even facilitating the development of new instructions grounded in the advantages of this knowledge.
Research Spotlight, continued …

The Fruit Game

Another group from the Research Methods class is studying theory of mind – one’s ability to understand the beliefs and perspectives of others, such as reading social cues to understand when others are interested or not. This ability is tenuous early in development but rapidly matures around age 4-5. Psychologists often study theory of mind using false-belief tasks, in which the children are asked to predict the beliefs of a doll or other actor. In this study, children predict where a doll will look for her apple, after it has been moved without her knowledge. After the researcher moves the doll’s apple from one lunchbox to another while the doll is looking away, she then asks the child to predict where the doll will try to find her apple. Younger children often fail to understand that their own knowledge of the apple’s new location is not automatically shared with the doll, thus they will direct the doll to the new location – even when they understand that the doll couldn’t see the apple being moved. Older children can typically separate their own knowledge from that of the doll and direct the doll to the correct – prior - location of the apple.

In this project, researchers investigated whether allowing children to hold the doll throughout the experiment would affect their response accuracy, perhaps by helping them identify with the doll’s perspective, rather than thinking about it in abstract terms. They compared the performance of children who got to hold the doll with those who did not. In both cases, after the initial task, a researcher placed the apple in a box with a picture of a banana on it and then asked the child what a friend would think is in the box. Children’s answers to this question will show children’s performance on the initial task relates to teaching techniques for helping children understand the perspectives of others in everyday situations.

The Toy Game

The third Research Methods group is studying gender-related preferences. Even young children are often exposed to factors that influence gender attitudes and expectations by family, peers, and media. In this study, the researchers are investigating whether gender influences a child’s toy preferences. Other research has shown that sometimes children avoid playing with a toy that is depicted being played with by a child of the opposite gender.

In this study, children are shown “The Toy Book.” On each page is a picture of a child of the opposite gender playing with a certain toy and a picture of another toy that is not being played with by anyone. All of the toys shown in the book have been previously rated as gender neutral: a puzzle, crayons, blocks, bubbles, a balloon, modeling clay, a board game, a drum, a sand bucket, and a teddy bear. Researchers tell the child that a character “Frog” needs help picking a gift for a friend and wants to know their favorite toys. After each pair of pictures, children are asked which toy they would prefer. In order to avoid inducing stereotypes, the researchers included a short debriefing at the end reinforcing the fact that any child can play with any kind of toy. The findings may have relevance to the way toys and other products are marketed to children, and the way children are portrayed in the media. The results may show ways to counter gender stereotypes so that all children can explore their options freely.