Playing with building blocks of creativity help children with autism

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In an attempt to help children with autism learn the building blocks of creativity, researchers at the University of Rochester Medical Center (URMC) tapped a toy box staple for help – legos. By building lego structures in new and unique ways, children with autism spectrum disorders (ASD) learned to use creativity, an important skill that they had seen as very challenging prior to the study.

"In every day life we need to be able to respond to new situations," said Deborah A. Napolitano, Ph.D., BCBA-D., the study's principal investigator and assistant professor of Pediatrics at URMC's Golisano Children's Hospital. "If a child has only a rote set of skills, it's hard to be successful."

Many children with ASD can become frustrated and uncomfortable when asked to break out of repetitive activities and create something new. Using Applied Behavior Analysis (ABA), the science of figuring out how to target and systematically change a specific behavior, the study's researchers succeeded in teaching all six children with ASD in the study to play with legos in a more creative way. The study's findings have been published in the *Journal of Applied Behavioral Analysis*. The children, who had wanted to create the same 24-block lego structure over and over again at the start of the study, began venturing out of their comfort zones to create new structures with different color patterns or that were shaped differently.

Snapping a yellow lego onto a blue one when only red blocks had

touched blue blocks in the previous structure, for instance, was a big step in helping a study participant with ASD cope with new situations encountered in everyday life, such as learning to say hello when someone they know but were not expecting to see greets them.

"We really can teach kids just about anything as long as it's systematic," said Napolitano.

By the end of the study, all six participants succeeded in making changes to every lego structure they worked on. The study's participants were between the ages of 6 and 10 and five of the six had moderate problems with restricted or sameness behavior, according to a behavior scale assessment that each participants' parent or teacher completed. The one-on-one sessions with building blocks took place at the participants' schools in rooms with minimal distractions. Participants' names were changed in the study.

As each child began building with 24 legos, the instructor praised the child with a "good job" from time to time, to get baseline data and decide whether the child seemed inclined to change the color pattern of the legos or the structure of the legos. After acquiring baseline data about the children's preferences (like changing legos' color patterns versus legos' structural patterns) researchers began with the first intervention phase.

The first phase of the study consisted of a set of sessions that took place over several months. An instructor asked a child to build something new at the beginning of each session. If a child seemed confused about what he or she was being asked to do, the instructor modeled how to build something different and then prompted the child to build something different. If a child understood and succeeded in building something new, by experimenting with color patterns or lego structures, he or she was rewarded with a small prize, such as playing with a favored toy.

In the next phase, the instructor asked the children to build something new with wooden blocks, rather than the plastic lego blocks they had grown accustomed to, to see whether they could apply their new skills to a slightly different situation from the one they had learned in. Then the instructor gave the children legos again, but this time they didn't receive teaching sessions and were rewarded only with a "good job" and not a small prize, like in the first phase. The instructor wanted to see whether the children would still experiment with legos. In the last phase, the children were once again rewarded for varying their lego structures.

A few months later, researchers followed up with the children and found that they were all still able to create new structures in varying colors or shapes.

"The study's findings could pave the way for new studies testing interventions that attempt to improve a wide variety of social skills and behaviors among people with ASD," said Napolitano. "With positive reinforcement and teaching sessions, such tasks as engaging in novel conversations, posing new questions and creating new ways to play could be within reach for children with ASD."

Provided by University of Rochester Medical Center

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