Originally Printed:
The Autism NewsLink, Fall 2004



education

# Memory Strategy Use in Autism

*by Kerry Wells, York University*

> *Our lab has found that children with autism can in fact be trained to use memory strategies.*

Memory affects nearly every aspect of our lives. Most of life's tasks rely on information that we have memorized. It is not a singular concept as the term suggests, but actually consists of a variety of different and often independent skills. For example, one's ability to recall past birthday parties is a different skill from the ability to recognize a person whom you have previously met. Both of these skills however, are considered a type of memory.

Children and adults with autism often have deficiencies in some aspects of memory ability, but strengths in other areas. Ben Shalom (2003) notes that most of the literature has shown that individuals with autism demonstrate intact memory performance in the areas of rote memory and the recall of facts. In contrast, impaired performance has often been seen in the areas of source memory and memory for the sequence of events.

Another memory-related difficulty in autism is the inability to use strategies to improve recall (Bebko & Ricciuti, 2000), a critical skill needed for development of an individual's knowledge base. When someone tells us a phone number, we might repeat the number frequently to ourselves, a strategy that greatly increases the likelihood of recalling the number later. Research headed by Dr. James Bebko at York University has focused on trying to understand how individuals with autism use memory strategies, and how this skill can be further developed.

Most people are active when they process new information, which in turn, helps them to remember new data. In contrast, individuals with autism are more passive when confronted with new information, further exaggerating their memory deficiencies and giving the appearance of a deficiency in areas of memory that are actually intact (Bebko & Ricciuti, 2000). *If children with autism were more active when processing new information, all of their memory skills could be greatly improved, even in areas that may be more difficult for them.*

In typically developing children, strategy use emerges in the early school years (Rhee, 2000). However, like any newly emerging skill, the strategies are not used with great efficiency. The child, although producing memory strategies, may not actually be increasing their recall, or may be doing so only marginally, likely due to the high amount of cognitive effort required. As we age and develop, our strategy use becomes more sophisticated and automatic. Linguistic development is especially important because most strategies are language based. By the ages of seven or eight, typically developing children become much more adept at strategy use, and the skill becomes more efficient, providing greater facilitation of recall (Rhee, 2000).

One of the earliest strategies to emerge in young children is called *cumulative rehearsal*, cited in the telephone number example, where items to be recalled are repeated over and over in the correct order (Bebko, 2004). More sophisticated strategies that develop later include the categorization of items to be recalled, and the use of other mnemonics.

Children with autism, however, fail to develop strategy utilization in the same manner as typically developing children. For several years researchers had believed that children with autism simply failed to use memory strategies of any kind. However, they were rarely directly studied (Bebko & Ricciuti, 2000). Our research indicates that children with autism do develop the ability to use memory strategies. Despite this, the percentage of children with autism who use memory strategies is much lower than what is expected from their cognitive level (Bebko, 2004). In other words, when compared to a group of children that do not have autism, but have the same level of verbal and cognitive maturity, there are significantly fewer researchers among children with autism.

Strategy use may be delayed by several years in children with autism, and may emerge even later in those individuals with cognitive impairments as well as autism. *This delay has serious implications for their cognitive development, which may be further impaired because of the late emergence of this skill.* As noted by researchers Woody-Dorning and Miller, "the development of strategies is a main cause of memory development" (p. 543, 2001).

Recently we have explored the effectiveness of memory strategy training in children with autism, seeking to teach young children with autism how to use cumulative rehearsal, which was discussed earlier. This relatively simple strategy is useful in a number of situations. Since it is one of the first strategies to emerge in typically developing children, teaching it is developmentally appropriate, and may be used as a stepping stone to the development of other strategies. Rehearsal could quite easily be taught in a classroom setting.

Our lab has found that children with autism can in fact be trained to use memory strategies (Bebko 2004). Most importantly, *when these children are trained, the strategy is successful in enhancing their recall.* We have found that it is also important not only to teach the children the strategy itself, but also why they are learning this new technique and where else it might be used (Bebko, 2004; Rhee, 2000). These additional pieces are needed because of

**For more information on Dr. Bebko's memory studies or any of his other projects, or if you would like information on participating in a project, contact the Bebko lab at bebkolab@yorku.ca or at 416-736-2100 Ext. 20706.**

the lack of planning and awareness of mental processes in children with autism. In addition, Bebko and Ricciuti (2000) found that the memory performance of children with autism is increased when maximum control of the learning environment is given to the child. This means letting the child process the material at his/her own pace, rather than presenting material at a predetermined rate. It is also well documented that external supports such as visual schedules, cues and reminders may be beneficial to these children.

Although teaching a memory strategy to children with autism may be a relatively simple task, they do seem to have problems maintaining this skill and generalizing its use to other contexts (Bebko, 2004). It is important to modify one's teaching techniques to maintain and generalize the strategy. We have found that it is necessary to have several different training sessions—up to four or more—in which the child is taught strategy use, for children to be likely to retain the strategy at a follow-up session later.

We have also found that contrived situations such as delivering messages, or using commercial games that emphasize particular types of memory strategies, are generally more popular with the participants than simply attempting to recall a series of pictures.

Studies from the Bebko lab have repeatedly demonstrated that children with autism can be taught valuable memory skills. Improvement of memory strategies can lead to improvements in many areas including school activities and learning various routines that can have a lasting effect for the child.

Bebko, J.M. & Ricciuti, C. (2000). Executive functioning and strategy use in children with autism. *Autism, 4,* 299-320.
Bebko, J.M. (2004). IMFAR poster presentation.
Ben Shalom, D. (2003). Memory in autism: Review and Synthesis. *Cortex 39,* 1129-1138.
Rhee, T. (2000). The memory-metamemory connection in children with autism. Unpublished Master's Thesis, York University: Toronto, Ontario, Canada.
Woody-Dorning, J. & Miller, P.H. (2001). Children's individual differences in capacity: Effects on strategy production and utilization. *British Journal of Developmental Psychology, 19,* 543-557.