LETTER

Are children with autism good or bad learners?

In a recent study, Pellicano et al. (1) found that children with autism showed decreased performance on a visual search/learning task. These findings apparently contradict earlier results, which found intact or "outstanding" visual search skills (2) or sequence learning skills (3) in autism. This contradiction can be connected to the nature of the tasks used in these studies and can be divided into two separate and distinct questions.

First, regarding the differences in earlier visual search (2) and in Pellicano et al. (1), the studies differ in the "visual" settings: earlier studies used computer screens, whereas Pellicano et al. used a large-scale search task, which has more true-to-life settings. According to Happé and Frith (4), autistic children have attentional preference for local over global context. Therefore, in the large-scale search task, global processing of the stimuli is much more difficult for them compared with the small-scale search. Because children with autism have difficulties with global processing, the performance decrement is more present in this experimental setting.

Second, Pellicano et al. (1) contrasted their study and sequence learning studies to those of Brown et al.* and Nemeth et al. (3). The two latter studies used a probabilistic serial reaction time (SRT) task, which is a four-choice reaction time task containing a hidden repeating sequence that the subject comes to implicitly predict and learn. These studies found intact probabilistic sequence learning in autism. Moreover, Nemeth et al. (3) showed that the consolidation of this fundamental learning mechanism is also intact in autism. How could Pellicano et al. have found impaired probabilistic learning in contrast to Brown et al. and Nemeth et al.? On a functional level the Pellicano task is more visually driven (perceptual learning) in contrast to the probabilistic SRT, which is equally based on perceptual and motor learning. This difference between tasks is also present on a neuroanatomical level, in that the medial temporal lobe (MTL) structures are involved in Pellicano's task (1), whereas the SRT task is connected to the striatum and the cerebellum (5).

In sum, skills connected to the striatum and cerebellum are preserved in autism compared with MTL structure-related functions and frontal lobe structure-related functions. In addition, large-scale search tasks are more impaired in autism in contrast to small-scale search tasks because of the differences in global vs. local processing. These questions draw attention to the fact that the nature of the task is highly important in the understanding of the cognitive neuroscience of autism. It can play a critical role in designing and developing more effective diagnostic methods and therapy in autism.

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