LETTER

Reply to Nemeth and Janacsek: Children with autism learn to search differently in a large-scale context

Nemeth and Janacsek's (1) letter highlights two findings from our study (2) that seem to be at odds with those from existing studies.

First, they suggest that our finding of autistic children's difficulties with searching in a large-scale environment is due to the demands on global processing compared with searching on a smaller scale (e.g., on a computer screen), for which there are fewer such demands. We wholeheartedly agree with this suggestion. Studies have consistently demonstrated that individuals with autism outperform comparison individuals on small-scale visual search tasks and that this outstanding performance is most likely attributable not to attention-related processes during search but instead to an enhanced visuo-perceptual ability to discriminate between stimuli (targets and distracters) (e.g., ref. 3). As we suggested in our article, such an ability may not confer advantages to search in a large-scale environment because it requires one to take a global "snapshot" of the overall space, to orient oneself within the space, and to remember where one has searched to avoid costly revisits. In fact, we showed that individual differences in autistic children's performance on a local–global processing task and especially on a spatial memory task were significantly predictive of inefficiencies in search. That is, children with autism who showed difficulties in global processing and spatial memory were precisely the ones who were the least effective in their search.

Second, Nemeth and Janacsek (1) suggest that our task "is more visually driven (perceptual learning)" compared with previous studies of children with autism using probabilistic serial reaction time tasks (e.g., ref. 4), which are "equally based on perceptual and motor learning." With this, we disagree. For children to learn effectively within the large-scale environment, they needed to continuously update their position within the space while at the same time recalling which search locations they had visited. Performance on our task is therefore unlikely to be driven primarily by visuo-perceptual skills. Rather, our foraging task is likely to have placed considerable demands on children's learning across a variety of (perceptual, spatial, motor) domains, and we believe it is for this reason that the discrepancy between our findings and those of previous (small-scale) implicit learning studies exists.

Finally, in response to the title of Nemeth and Janacsek's letter ("Are children with autism good or bad learners?") (1), we would like to stress that the children with autism who made up our sample were not "bad learners." In our particular large-scale context, which allowed us to test directly Baron-Cohen's (5) explicit claim about navigation, we found that children with autism needed significantly more trials to learn the probability rule, most likely because they were searching the space in a different way compared with typically developing children. It is precisely this difference that we need to understand to promote well-being and independence of children and adults on the autism spectrum in the long term.

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