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**First theme choice:** Systems Neuroscience

***Rethinking the McGurk Effect in autism: Hierarchical drift diffusion modeling reveals decision-making differences in autistic and neurotypical children and adolescents***

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**Introduction:** Broken into its simplest components, decision-making comprises three general phases: accumulation of sensory evidence over time, reaching a decision, and initiating a motor action.

**Methods:** Using hierarchical drift diffusion modeling (HDDM) and Bayesian analyses, a dataset from prior research by Stevenson et al. (2014) was reanalyzed in order to elucidate differences in decision-making processes between autistic and neurotypical children and adolescents ages 6-18 years performing a modified McGurk task. Using these methods, we expanded upon prior findings to reveal differences in decision-making processes across both age and diagnostic group.

**Results:** We found that on unisensory trials, autistic children displayed significantly faster rates of evidence accumulation (i.e., drift rate) compared to neurotypical children in response to visual-only stimuli, an effect that was amplified in the younger cohort. However, under multisensory conditions, in children with autism this advantage disappeared, and drift rate was slower than that of the neurotypical groups. Importantly, we observed that the diagnostic group differences in drift rate increased with age. A principal component analysis also revealed an age-dependent relationship between clinical measures of autism and estimates of drift rate. Specifically, for both unisensory and multisensory conditions the Social Responsiveness Scale, 2nd Edition Social Communication Impairment (SRS SCI) subscale was identified as the first principal component. However, while high SRS SCI scores predicted superior unisensory drift rate in younger autistic children and lower unisensory drift rate in older autistic children compared to neurotypical groups, no significant predictive relationship was observed for multisensory trials.

**Discussion:** From this evidence, we propose that accumulation of auditory and visual information slows in older children with autism. Furthermore, we put forward that slowed auditory and visual drift rate in older autistic children is predictive of increased social communication impairments as quantified by standardized clinical measures.

**References, if any:** Stevenson, R. A., Siemann, J. K., Schneider, B. C., Eberly, H. E., Woynaroski, T. G., Camarata, S. M., & Wallace, M. T. (2014). Multisensory temporal integration in autism spectrum disorders. *Journal of Neuroscience*, 34(3), 691-697.

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Drift diffusion modeling, Autism spectrum disorders, Multisensory integration