

## **Autism spectrum disorder and related neurodevelopmental disorders.**

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I am very excited to be associated with the Journal of Psychology and Cognition as one of its editors. Of particular interest to me is the area of psychology and cognition as it relates to neurodevelopmental disorders.

We know that approximately 1 in 6 children are diagnosed with a developmental delay or neurodevelopmental disorder, including: intellectual disability, cerebral palsy, seizures, attention deficit/hyperactivity disorder and autism spectrum disorder [1]. Autism spectrum disorder is characterized by significant limitations in social communication skills and the presence of repetitive and restricted behaviors and interests and occurs during the developmental period [2]. ASD is a neurodevelopmental disorder that has a wide ranging clinical presentation of cognitive abilities, language skills, repetitive behavior, and intensity of support needs [3]. Its impact on the individual and his or her family is life-long and can be quite significant. In the past 20 years, we have seen a dramatic increase in the reported prevalence of autism spectrum disorder. In fact, the Center for Disease Control and Prevention (CDC) has reported nearly a 400% increase in prevalence between 1990s and 2014 [4]. In the most recent released report from the Autism and Developmental Disabilities Monitoring (ADDM) sites, the CDC reported findings of 1 in 68 as the rate of prevalence, which was the first time since the CDC started reporting prevalence data from the ADDM network, that the prevalence rate remained constant. Boys continue to be diagnosed with ASD at four times the rate of girls [5]. More research is needed to better understand why the rate of prevalence has been rising over the past several decades and what proportion of this increase is attributable to changes in diagnostic criteria and improvements in identification and what proportion of this rise is actually driven by a real increase in incidence.

The cause of autism spectrum disorder continues to elude scientists. Hundreds of candidate genes have been implicated in its cause [6] but since we know that monozygotic twins do not always develop ASD in 100% of the cases [7,8], there remains more to the emergence of autism that a simple genetic etiology. A more plausible course of exploration for the causes of ASD is looking at

gene X environment interactions [9]. And of course, there is no scientific evidence supporting the now debunked claim that childhood vaccines cause ASD [10,11]. One cannot, however, underestimate the ongoing impacts these misbeliefs continue to have. Parental withholding of critical childhood vaccines such as the measles-mumps-rubella as well as other vaccines has been attributed as the leading cause for the resurgence in the United States of outbreaks of infectious diseases, including pertussis [12] and measles [4].

Other important areas of interest in the area of neurodevelopmental disorders and psychology and cognition include research in the area of interventions to reduce core symptoms and address psychopathology, improve behavioral health, increase adaptive skills as well as cognitive abilities. Exciting work is happening in several areas including: pharmacotherapeutics to improve cognitive functioning in Down syndrome [13] and fragile X syndrome [14], and other educational or behavioral interventions targeting cognitive and behavioral functioning, including but not limited to social skills training [15].

We are looking forward to receiving and reviewing theoretical, review, and empirical manuscripts addressing the pressing issues related to the field of psychology and cognition across the lifespan and ability level.

### **References**

1. Boyle CA, Boulet S, Schieve LA, Cohen RA, Blumberg SJ, et al. Trends in the prevalence of developmental disabilities in US children: 1997–2008. *Pediatrics* 2011; 127: 1034-1042.
2. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders (5th edn)* American Psychiatric Publishing, Arlington, VA 2013.
3. Mehling MH, Tassé MJ. Severity of autism spectrum disorders: Current conceptualization, and transition to DSM-5. *Journal of Autism and Developmental Disorders* 2016; 46: 2000-2016.
4. Center for Disease Control and Prevention. *CDC health advisory: U.S. multi-state measles outbreak, December 2014–January 2015*. US Department of Health and Human Services, CDC, Atlanta, GA 2015.

5. Christensen DL, Baio J, Braun KV, Bilder D, Charles J, et al. Prevalence and characteristics of autism spectrum disorder among children aged 8 years - Autism and developmental disabilities monitoring network, 11 sites, United States, 2012. *Morbidity and Mortality Weekly Report, Surveillance Summary* 2016; 65: 1-23.
6. Chen JA, Penagarikano O, Belgard TG, Swarup V, Geschwind DH. The Emerging Picture of Autism Spectrum Disorder: Genetics and Pathology. *Annual Review of Pathology: Mechanisms of Disease* 2015; 10: 111-144.
7. Hallmayer J, Cleveland S, Torres A, Phillips J, Cohen B, et al. Genetic heritability and shared environmental factors among twin pairs with autism. *Archives of General Psychiatry* 2011; 68: 1095-1102.
8. Rosenberg RE, Law J, Yenokyan G, McGready J, Kaufmann WE, et al. Characteristics and concordance of autism spectrum disorders among 277 twin pairs. *Archives of Pediatrics & Adolescent Medicine* 2009; 163: 907-914.
9. Kim YS, Leventhal BL. Genetic epidemiology and insights into interactive genetic and environmental effects in autism spectrum disorders. *Biological psychiatry* 2015; 77: 66-74.
10. Madsen KM, Hviid A, Vestergaard M, Schendel D, Wohlfahrt J, et al. A population-based study of measles, mumps, and rubella vaccination and autism. *New England Journal of Medicine* 2002; 347: 1477-1482.
11. Uno Y, Uchiyama T, Kurosawa M, Aleksic B, Ozaki N. Early exposure to the combined measles–mumps–rubella vaccine and thimerosal-containing vaccines and risk of autism spectrum disorder. *Vaccine* 2015; 33: 2511-2516.
12. Atwell JE, Otterloo JV, Zipprich J, Winter K, Harriman K, et al. Nonmedical vaccine exemptions and pertussis in California, 2010. *Pediatrics* 2013; 132: 624-630.
13. Costa ACS, Scott-McKean JJ. Prospects for improving brain function in individuals with Down syndrome. *CNS Drugs* 2013; 27: 679-702.
14. Yang JC, Rodriguez A, Royston A, Niu Y, Avar M, et al. Memantine improves attentional processes in Fragile X-associated tremor/ataxia syndrome: Electrophysiological evidence from a randomized controlled trial. *Scientific Reports* 2016; 6.
15. Kaat AJ, Lecavalier L. Group-based social skills treatment: a methodological review. *Research in Autism Spectrum Disorders* 2014; 8: 15-24.

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