

Vaccine and Cognitive Development:  
The MMR Vaccine and the Supposed Effect on Autism Spectrum Disorder  
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### Abstract

Autism Spectrum Disorder is being diagnosed more commonly among children today because of the constant change in parameters of the spectrum. This expansion of the spectrum has come to encompass many children, leading many parents to argue as to why their child is determined to be on the spectrum. Parents will argue that the child seems perfectly fine, or they were before they got any of their vaccines. Theories have developed that vaccines cause ASD (Autism Spectrum Disorder), specifically the Measles-Mumps-Rubella vaccine. Commonly referred to as the MMR vaccine, many parents and homeopathic professionals believe that there is a component in the vaccine causing the child's brain to develop autism. Thimerosal, another ingredient used in various vaccines was also thought to cause autism because it is a mercury based preservative.

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Autism Spectrum Disorder (ASD) can be defined as a group of developmental disorders present in children and adults, all with developmental disabilities and symptoms. I have experience with children in the Autism Spectrum because both of my younger brothers are classified as autistic. While one is high-functioning, the other is moderately-functioning. James was diagnosed with moderately-functioning autism at the age of two, and since has made great advancements in his development mentally and physically. James' physical growth is definitely faster than his cognitive growth, but he has progressed in his speech and understanding. Thanks to his excellent schooling, James has also been able to take his greater understanding of concepts and apply it to his daily life. My mother's herbalist claimed that the Measles, Mumps, and Rubella (MMR) vaccine James received while he was young, mutated in his gut and changed his brain chemistry. Years later when the MMR vaccine cause was ruled out, James got tested and it became apparent that what really caused his autism was Fragile X syndrome. Fragile X syndrome is a gene mutation that occurs when the FMR1 gene expands or increases in length on the X chromosome. Fragile X syndrome can result in behavioral challenges, learning disabilities, various physical characteristics, and many other qualities. While many parents believe that the cause of their child's ASD is the MMR vaccine or some component of vaccines, it is most commonly caused by a genetic element that the parents are unaware of.

In his article, "Measles-Mumps-Rubella Vaccine Does Not Cause Autism", Mellis (2015) states that "polioviruses have maimed and killed humans since at least egyptian

years (p. 838). Mellis' statement indicates the importance of the MMR vaccine in today's society. The MMR vaccine is a very important vaccine for children, as measles can be fatal for children an outbreak of the measles would be catastrophic. We can see proof of the effectiveness of the MMR vaccine through history as we observe its use in society. In 2014, records show that 359 cases of wild polio were documented, and only 52 cases of vaccine-derived polio were documented. In contrast, there were only 25 wild cases of polio reported worldwide, with no reported cases of vaccine-derived poliomyelitis. (Mellis 2015, p. 838). Years before, poliovirus ran rampant globally. There were over 350,000 reported cases of poliovirus annually, providing the impetus for a plan to eradicate the paralytic poliovirus completely. The MMR vaccine has been very successful in the years it has experienced use and has had no previous correlation to ASD since the beginning of its use in the 1930s.

Another theory about the cause of autism in children was the compound thimerosal, often used in some vaccines. Thimerosal is a mercury based preservative and was thought to be one of the causes of autism spectrum disorder, as well as other developmental disorders. Vaccines have been made with thimerosal since the 1930s and it is used to break down ethylmercury and thiosalicylate in the body (Barrett 2005, p. A543). Pharmacokinetics is a division of pharmacology that specifically studies the effect of drugs in living organisms, and as there was little information known about ethylmercury toxicity, Pharmacokinetic based their understanding of ethylmercury on methylmercury, acting under the impression that they shared toxicokinetic profiles. An animal study done soon after relayed the information that they were different based on a couple of factors, raising awareness that it could be a cause for ASD (Barrett 2005, p.

A543). Taylor (2006) researched the topic, and in his article states that “A systematic review of ten epidemiological and two pharmacokinetic papers concluded that the studies did not demonstrate a link between thimerosal containing vaccines and ASD” (p. 513). As the autism spectrum diagnostic criteria changes to encompass more people, more parents are becoming convinced that vaccines are the cause.

Studies have shown that there are significant genetic factors that link autism spectrum disorder to undiagnosed anomalies within the individual's chemical makeup. Taylor (2006) mentions in his article *Vaccines and the epidemiology of autism* that “across the autism spectrum, men are affected more frequently than women” at a ratio of 4:1 (p. 516). This is a significant detail because, according to the 2015 United States census, males only made up 49.2 percent of the population. The change in ASD parameters affects the increase in ASD population as well; however, while the ratio is currently 40-60 autistic individuals in every 10,000 that number is always increasing. It is often found that “children with an older sibling with ASD are more likely to also develop ASD” (Rosenberg 2015, p. 59). There is often a link between the genetic disorders Tuberous Sclerosis and Fragile X syndrome with autism spectrum disorder. The connection has led to more research developments to the possible catalyzation of autism spectrum disorder from the effect of the MMR vaccine on these genetic disorders. This theory that the MMR vaccine only causes ASD when cofactors are present is constantly being researched by many scientists.

As parents are refusing to give their children the necessary vaccines, various outbreaks occur and put children in danger all over the world. An example of this hazard was shown years ago when a controversial article was published in an English journal.

In February of 1998, Andrew Wakefield published a highly biased article in *The Lancet* titled "Ileal-lymphoid nodular hyperplasia, non-specific colitis, and pervasive development disorder in children". In his article, Wakefield reported about 12 children showed signs of ASD and bowel symptoms, and incorrectly associated them with the MMR vaccine (Taylor 2006, p. 513). Wakefield wrote a highly biased paper that held no real scientific evidence. The result of this paper was a decrease in the amount of children receiving the vaccine in the UK, and an outbreak of measles resulted in many children becoming very ill. Parents that refused to vaccinate their children were putting their children, themselves, and everyone they interacted with at serious risks.

Vaccinations are meant to work with the human body to safely develop antibodies that lead to immunity from diseases that are hazardous. In order for a community to be safely protected from a disease, it is necessary to immunize at least 90 percent of the population. Immunizations today are 95 percent successful with the first dose. Those who do not develop full immunity to the illness successfully develop immunity with a second dose (Knopf 2017, p. 1). Vaccines are meant to save lives and protect from life threatening illnesses (Knopf 2017, p. 2). It's not hard to understand the perspective of the parents. They are unsure of why their child was diagnosed with ASD because they have no history of it, and they need something or someone to blame. Parents need to feel that they are not the reason the child developed these disabilities. Wakefield's published work certainly did not do any parents any help; Wakefield convinced parents not to vaccinate their children and many paid the price.

My experience with my brother has opened my eyes to this crisis because I have been able to experience firsthand a child with ASD. It is important for parents who have

children with ASD to understand the genetic factors associated with it, because sometimes it can be reversible. James has fragile x syndrome which is not reversible, but we know how to handle it better than we did previously. As parents become more aware of the factors that go into diagnosing autism spectrum disorder, they can go for more testing to identify the reason behind the ASD. As parents become more aware, they will be more empathetic to these children and adults. It will help them understand the importance of vaccines and their need for; to protect our nation and world as a whole. In addition to this understanding of safety, they will understand there is no direct link between these vaccines and autism spectrum disorder.

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