

# **New, Controlled Social Intervention for Autism Spectrum Disorder Children Utilizing Proprietary, Artificial Intelligent Software for Pragmatic Growth**

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7/14/22

## Abstract

Autism Spectrum Disorder (ASD) is a neurological disorder that was first described in 1911 by Eugen Bleuler. Originally defined as the most extreme form of schizophrenia, Autism was redefined as a neurodevelopmental disorder in the late 1950s. Today, it is a social and communication disorder with ranging symptoms in poor motor function, speech and social impairment, impulsivity, chronic repetition, extreme sensitivity, anxiety, and depression. It was renamed Autism Spectrum Disorder in later years to facilitate diagnoses of a broader range. ASD can delay pediatric milestones throughout mental and physical growth. Children are typically affected in their social skills with delayed abilities in language, cognition, and learning. Unfortunately, ASD has no clearly defined cause, making it an idiopathic disorder. Even worse, ASD affects one in every forty-four children as of 2018 with the prevalence rate of the disorder nearly tripling in the past two decades. In addition to ASD being an idiopathic mental disorder, there are currently no cures and very few treatment options to alleviate symptoms. As of 2008, 2.3% of eight-year-olds worldwide were diagnosed with ASD. The average age of diagnosis is approximately four years old.

Since there is no known cause for ASD, there is also no diagnostic reason for the treacherous incline in Autism cases. There are many hypotheses as to why, but no confirmed findings. For instance, one belief is that new equipment and diagnosis guidelines have increased ASD's prevalence and that the increase in cases is more of an illusion. Others hypothesize that there is a legitimate increase in Autism cases because of higher parental ages affecting their incidence rate. At the age of forty, pregnancy's incidence rate of infant complications doubles from 0.5% to 1%. Finally, some believe that there is a greater prevalence of the hypothesized Autism-inflicting genes in parents, which is increasing the presence of ASD cases. Either way, all these beliefs are guesses rather than facts, meanwhile, there continues to be an increase in autistic individuals worldwide. With no known cause or cure, ASD will continue to flourish affecting millions of adolescents.

With a growing population of ASD diagnoses among children, there develops a larger need to help the ASD communities. Unfortunately, the world is a more neurotypical-focused setting which can be difficult for those with the disorder. Those affected by Autism display a higher probability of not engaging in social interactions, especially with neurotypical individuals. Familiarity is crucial to an autistic child's comfortability, and changes in social environments can be devastating to them. More importantly, the people themselves drastically affect autistic individuals' comfort and social drive. Those with Autism are very sensitive to the emotions of others. Whether they are outgoing, shy, confident, afraid, happy, or sad, all these emotions can contribute to the neurodiverse person's comfortability. Also, because of the common coinciding symptoms of anxiety, attention-deficit/hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD), and depression, ASD individuals suffer extreme fear with any social interactions, hindering their intersubjectivity, and making it very difficult for these people to operate in a neurotypical setting.

My hypothesis is that through controlled, one-on-one, and small group interactions with real-time, social, and technological intervention, ASD children and adolescents (ages ranging from eight to seventeen) will develop higher social compliance and expand their communication skill sets. Using propriety, bioengineered software, facial expression tracking, and conversation listening will be used to give real-time feedback to the ASD user. The software will help with auditory cues via wireless earbuds to aid the ASD participant. Prompting and engaging will all be auditory notifications used to aid the user. In addition, the software's screen will have the ability to display helpful sequences rather than exclaim them. Finally, the software will also reward users with verbal and visual reinforcement on the screen to help the user's engagement and social compliance. Using the bioengineered software, ASD users will increase their social compliance and communication sets.

Data will be developed through three verbal, neurodiverse groups ranging amongst the Autism spectra: low, middle, and high functioning. A mix of a clinician's diagnosis along with the Childhood Autism Rating Scale (CARS) will be used to determine these groupings. A varied Applied Behavioral Analysis (ABA) Intervention with prompting will be used to properly test the software's abilities. The Yale In-vivo Pragmatic Protocol (YiPP) will be utilized as the communication scale rating. Data will be processed and presented by various clinicians and diagnosticians to ascertain results. The goal is to find the social preferences of autistic children, to further help clinicians and therapists with better, real-time communication intervention, and to give ASD adolescents a verbal communication aid software for them to better convey their thoughts.