
| RESEARCH ARTICLE

Autism Spectrum Disorder: The State of Play

Fadoua Kadiri

Doctoral student, Faculty of Letters, Languages and Arts, Ibn Tofail University, Morocco

Corresponding Author: Fadoua Kadiri, **E-mail:** fadoua.kadiri@uit.ac.ma

| ABSTRACT

This review paper traces the evolution of autism since its simultaneous discovery back in the forties, by Leo Kanner and Hans Asperger, until the present day. Many disciplines, ranging from psychoanalysis to behaviorism, struggled to understand autism and provide a map to navigate it but ended up with only fragments of this multifaceted disorder. Even the Diagnostic and Statistical Manual of Mental Disorders (DSM) kept changing autism's categorization from infantile psychosis to behavioral disorder and, recently, to neuro-developmental disorder. Today, autism's rapid strides toward the realm of neuroscience are blurring all the frontiers between the aforementioned disciplines, transcending the black-white dichotomy and establishing a new grey area.

| KEYWORDS

Autism, ASD, disability, neurodiversity

| ARTICLE INFORMATION

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1. Introduction

What is autism? Is it a lifelong disability, a different form of cognition, or both and more?¹ In reality, all these questions carry some sort of truth about the condition, and future progress is expected to throw more light on it.

The United Nations started recently referring to autism, or what is known now as an autism spectrum disorder (ASD), as a condition "mainly characterized by its unique social interactions, non-standard ways of learning, keen interests in specific subjects, inclination to routines, challenges in typical communications and particular ways of processing sensory information."²

However, many experts and even writers define autism as a constellation of anomalies affecting a myriad of areas such as "motor functioning, balance, the physical sense of where your own body is and inner consciousness."³ While other authorities in the field of psychiatry still believe that autism is an impairment affecting notably social behavior and communication and characterized by repetitive, invariant activities. This set of deficiencies is usually used as a benchmark against which the severity of the condition is measured, and autism red flags are identified.

This situation might be explained by the fact that autism spectrum disorder has been, since its discovery in the forties, and still, very elusive amid the lack of conclusive evidence about what causes it.

¹ Silberman, S. (2015). *Neurotribes: The legacy of autism and the future of neurodiversity*. Penguin.

² World Autism Awareness Day 2 April, retrieved on September 09, 2021, from the United Nations website:

<https://www.un.org/en/observances/autism-day/background#:~:text=The%20United%20Nations%20General%20Assembly,an%20integral%20part%20of%20society.>

³ Solomon, A. (2012). *Far from the tree: Parents, children and the search for identity*. Simon and Schuster.P. 222

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2. The psychoanalytical cradle of autism

2.1. Leo Kanner

The early definition of autism as a cluster of deficits draws mainly on the findings of Kanner (1943), who asserted that children brought to him were displaying an acute form of “autistic aloneness” and decided to call the condition “early infantile autism”.

Leo Kanner, a child psychiatrist who is believed to be the discoverer of autism, maintained that autistic children have the tendency to shun any kind of social interaction, favoring the perpetuation of “sameness instead” in many aspects of their lives and “literalness” in their verbal communication. Kanner, who affirmed that these kids presented conspicuous limitations in numerous aspects, did not fail to mention that his subjects boasted good cognitive intelligence and exceptional memory and even excelled when tested with the Seguin form board⁴.

While trying to understand the newly-discovered condition, Kanner relied mainly on clinical observations, classical testing, and parents’ testimonies. He refused to diagnose adults, believing that autism was exclusive to children, “so keen was he to establish the new field of child psychiatry” (Baron-Cohen, 2015, p. 1330).

In his attempt to explain the emotional quotient of his autistic subjects, the scientist came up with a controversial theory in which he openly laid the blame of the autistic children’s solitariness on toxic parenting, professing that the domestic climate in which they were living lacked affection and was as cold as a refrigerator⁵ (Kanner, 1949). In some instances, these speculations led to removing these children from their family environment and placing them in specialized institutions as a form of cure.

2.2. Hans Asperger

Roughly around the same time, Austrian pediatrician Hans Asperger was making a breakthrough in the discovery of the same condition. Two things that explain why Asperger’s work was overshadowed for years and surfaced only posthumously are the war that wrought havoc on Germany⁶ and the lack of translation from the German language into English⁷. Some even speculate that Asperger’s living in the Nazi era, which was characterized by the spread of eugenics⁸, was the reason why he kept his experiments secret in an attempt to shield his “little professors” from any harm perpetrated by the government.

Asperger (1991)⁹ believed that he came upon a unique syndrome that sets itself apart from current mental disorders and named it “autistic psychopathy”. Though Asperger contradicted Kanner in thinking that the condition was endogenous and not caused by outside factors, he stated, in the same vein, that these kids displayed “peculiarities” cuing to the presence of different intelligence.

However, Asperger argued that the shortcomings of autistic intelligence become more pronounced when weighted against normative ways of thinking, especially during school assessment tests, a fact that made many autistic children drop out of school and be called academic failures.

In a retrospective study of records of children examined by Asperger, Hippler and Klicpera (2003) affirmed that, even if autistic kids possessed above-average cognition, most of them had some kind of learning disabilities and did not benefit from classical pedagogical methods, on the contrary, they made them worse, especially when it came to issues of behavior management.

Both pioneers, Kanner and Asperger, advanced that autistic children were untestable using conventional IQ tests because their special gifts and their autism-related limitations were intricately intermingled.

Asperger will later focus on the high functioning autism sub-category¹⁰ to the extent that this sub-group will be named after him in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) before merging all categories in the DSM V under the same heading: “autism spectrum disorder” or ASD.

3. Autism shift to behaviorism

3.1. O. Ivar Lovaas

Psychoanalysis dominated much of the autism narrative until the advent of O. Ivar Lovaas, who claimed that autism should be tackled using a pure behaviorist approach. The psychologist deemed that the use of “operant conditioning” by radical behaviorist B.F. Skinner was the only feasible way to teach autistic kids. He focused only on observable and measurable behavior and

⁴ A ten-piece board to place the most common shapes: square, circle, cross, triangle, rectangle...

⁵ The refrigerator mother theory was endorsed by many psychiatrists such as Bruni Bettelheim.

⁶ Most Asperger’s documents dating 1944-1960 were missing.

⁷ Lorna Wing introduced Asperger to the international scientific community in 1981, but it was not until 1991 that Asperger’s ‘Autistic psychopathy’ in childhood was translated into English by Utah Frith.

⁸ A belief that a race should be kept pure by eliminating non-conforming groups such as people with disabilities.

⁹ The paper was published in 1944 and translated in 1991.

¹⁰ This term is pejorative for advocates of neurodiversity.

experimented with forms of punishment to modify and decrease “undesirable” demeanor. He even administered electric shocks to his subjects, claiming that this increased socially-acceptable comportment, such as eye contact (Lovaas and Simmons, 1969).

In subsequent research, the researcher pushed for Skinner’s linguistic behaviorism by exposing his preverbal subjects to an intensive speech program. He even made food and meals dependent on verbal requests and succeeded in scoring some points with some minimally-speaking autistic kids but not all of them, resulting in a noticeable heterogeneity regarding the degree of improvement (Lovaas et al., 1973).

Even if Lovaas failed in randomizing assignments to control and experimental groups and used inconsistent measures to document progress, most scholars concurred that behaviors could be altered by manipulating the physical environment of the person and approved of the new behaviorism-based therapy (Sallows & Graupner, 1999).

3.1.1. Applied Behavior Analysis or ABA

Lovaas’ therapy, using Discrete Trial Training (DTT)¹¹ and known more generally as Applied Behavior Analysis (ABA), shaped many behavioral interventions based on the same premise: autistic children should be taught from scratch, in a repetitive incremental way and via reinforcement, to hit the same developmental milestones as their neuro-typical peers.

ABA is the primary therapy pushed by the American Speech-Language-Hearing Association (ASHA), one of the oldest bodies bringing together speech pathologists and therapists in the United States. A robust body of peer-reviewed articles backing the behaviorism-inspired method is posted on the organization’s website. However, ASHA admits that there is not enough evidence to say that therapies based on applied behavioral analysis are more effective than alternative interventions.

3.1.2. Picture Exchange Communication System or PECS

The PECS is a mode of alternative and augmentative communication using pictures to express a person’s needs and wants. The 6-stage system is also inspired by Skinner’s verbal behavior and is used to teach a child how to initiate a request, how to respond to questions, and how to make social comments (Charlop-Christy et al., 2002).

The method, which focuses on the pre-requisites of eye contact, joint attention, and collaborative play, is sometimes turned down by parents who fear that the dependence on pictures would block or inhibit their kids’ functional communication.

3.1.3. Treatment and Education of Autistic and Related Communication Handicapped Children or TEACCH

TEACCH, which is an educational and training program devised specifically for children with autism and similar disorders, also draws on behaviorism, though it slightly differs in some aspects from ABA in the sense that it does comprise some cognitive elements.

The program builds on the strengths of the child to help with the emergence of new skills in a somehow individualized manner. Like any behavioral method which believes that the kid’s environment should be under control 24/7, the method places the bulk of the work on parents to whom the implementation of the program is delegated under the supervision of the therapist.

3.1.4. Sonrise

The Sonrise is a bit controversial method as it was developed by the parents of an autistic kid. Its tenets run counter to everything the ABA stands for, as it calls for imitating behaviors to motivate reciprocity instead of interrupting them. Its inventors describe it as a relational approach that helps build bridges between the autistic kid and the surrounding world. However, the method has some similarities with ABA as isolating the child to control his environment and manipulating his responses and behaviors in a ludic way.

3.1.5. Makaton

The Makaton is a system inspired by sign language and adopts the same principle wherein each hand gesture or movement becomes semantically meaningful. Though it is a smart, alternative way of communication that worked miracles for the deaf, it still has many shortcomings when applied to autistics, mainly because it presupposes that the subjects are visual and have good control of their gross and fine motor skills.

3.1.6. Gemllni

The Gemllni program is a video modelling intervention developed by two parents to engage autistic kids, teach them word identification, and eventually enhance their speech output. The program, which spans many levels ranging from letter pronunciation to initiating requests, uses video clips that should be screened discreetly multiple times a day.

The Gemllni videos always zoom on the speaker to clearly show how the tongue and the lips move to articulate any specific letter. Though the intervention is criticized for encouraging parents to let their autistic children spend prolonged periods of time glued

¹¹ DTT breaks down tasks into components that are taught to kids repeatedly in short, one-on-one sessions until they master them.

in front of TVs and electronic devices such as tablets, some researchers do, in fact, argue in favor of the novel program that replaces regular speech therapy (Gilmour, 2015).

4. Autism and cognitive psychology

One of the authorities in the field of autism and its relation to cognitive psychology and cognitive neuro-psychology is French researcher Laurent Mottron.

Mottron (2017) believed that the behaviorist viewpoint lacks depth and does, in fact, overlook the existence of a completely different mode of learning which is “implicit learning” accompanied by a “non-communicative” language. He maintained that autistic kids could remain unresponsive to classical methods of imparting knowledge because they follow a different developmental curve.

Mottron theorized that even if expressive language is delayed in autism, receptive linguistic competence is present and intact among autistic children. He categorically dismissed outdated psychoanalytical and behavioral methods and proposed what he called “lateral tutorship”, which consists of satisfying the information-seeking behavior by exposing the child to an array of cognition-stimulation material as well as to holistic, finalized action instead of bits of information as in DTT sessions.

In the same vein, other researchers corroborated Mottron’s theories by stating that eye contact is by no means evidence of joint attention and that the repetitive movements, known as stims, do not affect the learning process (Chen et al., 2012), a finding that slams Lovaas’ assumptions that eye contact is a pre-requisite for learning and that kids engaging in self-stimulatory behavior are unteachable.

5. The neuroscientific approach to autism

Of late, neuroscientific research has made a quantum leap in deciphering the autistic mind.

In a study using event-related potentials (ERP), a biomarker that gauges the cerebral response to a specific stimulus, a cognitive one, in this case, Distefano et al. (2019) tested 20 minimally speaking and verbal autistic kids, along with their neurotypical counterparts, and proved the existence of robust semantic processing in both sub-categories of autism.

In addition to event-related potentials (ERP), other scholars used eye-movement monitoring and pupillary dilation as implicit measures to test the cognition of autistic individuals who are unable to make overt behavioral responses and found out that these measures, if tailored to each individual, could indicate the vocabulary knowledge of autistic subjects (Coderre et al., 2019).

In another research, Petit et al. (2020) used EEG and fMRI to examine language processing in the brain, circumventing the need for overt physical or verbal responses. The researchers found solid proof of “intact semantic processing”, paving the way for devising a “neural test of language comprehension”.

The neuro-imaging techniques, which used the neural component N400 as a neurolinguistic marker to detect cognition and language processing when hearing semantically or grammatically correct and incorrect sentences, are currently being tested on non-speaking autistics, and the forthcoming findings might help shed light on this neuro-developmental disorder.

Scientists like Laurent Mottron, Alexandra Woolgar, and Elizabeth Torres are venturing into uncharted territory and providing cutting-edge data and a fertile ground for autism advocacy groups to grow stronger.

6. The neurodiversity movement

Neurodiversity is an emerging movement akin to the disability rights movement, which was spearheaded by Judith Heumann and drew on the experiences and views of autistic self-advocates. Leadbitter et al. (2021) traced back the neurodiversity movement to the nineties, with autistic groups coming to light and promoting autism as a valid way of being, arguing that the autism phenotype adds value and enriches the human experience.

The neurodiversity movement, led by ASAN¹², does not consider autism as a pathology but as a disability and calls for equal rights and access to all autistics, regardless of the condition’s severity. The movement, driven mainly by autistic adults, clashes directly with organizations led by parents of autistic children, like Autism Speaks¹³, which believes that this enthusiastic mindset does not reflect the experiences of those with the most challenging and debilitating forms of autism.

The movement opposes early intervention methods aimed at molding autistic toddlers into the desired neurotypical role model and rejects any curative or behavior standardization techniques. According to the advocacy group, effective therapy should build self-esteem and self-awareness and encourage society and peers to interact with autistic individuals in a supportive and respectful

¹² The Autistic Self Advocacy Network (ASAN) is a non-profit organization created in 2006 and run by autistic members.

¹³ The largest autism organization in the United States, known for funding research into the genes causing autism.

manner, not only through scaffolding and accommodating their needs but also by depathologizing some autistic traits such as stimming, monotone voice, eye contact, and solitude.

Like any new movement that does not embrace the mainstream, the neurodiversity movement had proponents but also opponents who disagree either with the totality of its ideology or with some of its problematic manifestations. Hughes (2020) castigated the movement's claim that autism is not a disorder that needs a cure but is simply a different way of being, arguing that this represents a narrow conception of neurodiversity given that some autism traits are inherently harmful and pathological. He explained that adopting an overzealous view on autism does, in fact, divert attention and services from the severely affected group in the autism community.

On a different note, Hughes also highlighted the lexicon used by the said movement, which is trying to forge an autistic identity by using an identity-first language instead of a person-first language (ex: an autistic child instead of a child with autism), underlining, again, that the heterogeneity of the autism community makes it that some of the autistic people do not identify with the neurodiversity movement and might want to be cured.

Other scholars affirmed that there is an ongoing shift in autism conceptualization, operated mainly by autistic advocates and insiders who published their personal accounts and autobiographies, in addition to efforts made by some parent-led organizations that urged non-autistic experts to collaborate with autistic adults. Such collaboration should be the basis of a participatory research mode and should be used in designing methods and interpreting results (Happé and Frith, 2020).

7. Conclusion

In this review paper, I tried to encompass and survey all salient aspects of autism since its discovery in the forties. Various theories and approaches were applied to this condition in an attempt to comprehend it and measure its variables such as IQ, behaviors, psyche, and even parenting style.

These theories ranged from psychoanalysis, which conceptualized autism as a mental condition and advocated the medical model of disability to manage it, to behaviorism which believed that controlling the environment and offering rewards and punishments could mold autistic behaviors into more typical ones, based on the principle that behaviors are contingent on their consequences.

The very recent strides that were made in the neuroscientific field prove that the human brain is yet to unfold all its secrets. Groundbreaking technology measuring brain waves and other hidden metrics hint at the existence of an internal, invisible intelligence in speaking and non-speaking autistics. The existing preliminary findings expand the notions of humanity and intelligence, which can sometimes be multi-layered, complex, and resistant to cursory observations done in a clinic.

This review paper sheds light on the neuroscientific findings made recently or underway and their contribution to reconceptualizing autism and moving it away from the prevailing reductive and simplistic psychoanalytical and behavioral approaches. It also laid emphasis on the emergence of the neurodiversity movement, which advocates that an autism phenotype is a valid form of being.

However, the surveyed research papers have some limitations, such as the small cohorts of autistics, a fact that makes the replication of the findings difficult. Future research should focus on increasing the number of autistic participants and recruiting them from across the spectrum.

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