

Medicine

# Cognitive Development and Language Acquisition in Autistic Children

Jan Mostek\*

Başkent University Ankara Hospital, Yukarı Bahçelievler, Mareşal Fevzi Çakmak Cd. No:45, 06490 Çankaya/Ankara, Turkey

\*: All correspondence should be sent to: Dr. Jan Mostek

Author's Contact: Jan Mostek, MD, E-mail: [jan.mostek8101@gmail.com](mailto:jan.mostek8101@gmail.com)

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**Autism spectrum disorder (ASD) is typically perceived as a social communication and behavioral disability. However, it is a neurodevelopmental or brain-based condition with widespread consequences on cognitive and social-emotional development caused by genetic events that begin before birth. Cognitive functions of a higher level or those requiring integrative processing are disproportionately hampered in ASD. Normal children can learn any existing language based on their environment; however autistic youngsters find it difficult. The exploration of autistic children's cognitive and language features has been greatly influenced by theoretical models and research approaches.**

**Keywords:** Autism Spectrum Disorder; Cognition; Language; Model and Research; Emotions

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**T**HE roles of cognitive impairment and language impairment in the concept of “autism syndrome” have been contested ever since Leo Kanner published the first 11 cases of autism over the world in 1943 (1). One opinion holds that the language barrier is not the fundamental issue with autism, but rather a problem that results from other fundamental issues. Another opinion holds that the language barrier is the fundamental issue with autism, and that it is the part or continuous performance. Both these two points of view create an antagonistic position.

Researchers now agree that language and cognitive impairment are the two main signs of autism, but there are still differing views on the basis of this autistic developmental condition. Three issues are involved: (i) Language difficulties in autistic children are both a developmental delay and a “variation”

state? What degree of “variation”, if any, exists? It is distinct from other forms of childhood developmental disorders. What distinguishes language barriers from one another? (ii) Whether autistic children's developmental “trajectories” are the same as or different from normal children's linguistic cognitive development trajectories after receiving treatment and schooling. (iii) Is the language barrier faced by children with autism a primary obstacle or a “secondary barrier” resulting from social-emotional obstacles?

This review examined the cognitive and linguistic traits of kids with autism from the viewpoints of cognitive psychology and developmental psycholinguistics.

**Cognitive and Linguistic Development Theory of Autism**

Children with autism typically experience severe difficulties in their capacity to form and maintain relationships with others, as well as specific deficiencies in areas including cognition, language, and play (2). The answer to the psychological puzzle of autism is in determining whether the latter weaknesses are merely coincident with the prior impairments or are causally related to them. It was considered that autistic children's cognitive and linguistic difficulties are caused by a lack of "personal relatedness" (3).

Hobson claimed that this "interpersonal relationship" relates to the use of "signal qualities" such as shared human abilities for language and cognition as well as the cooperative interpersonal coordination process (4). The absence of this capacity is the primary cause of autism since it serves as the common foundation for the development of interpersonal relationships, cognition, and language.

The "interpersonal inadequacy" of autism, however, is primarily manifested in problems with emotional and social development. The term "emotional contact disorder of autism" was first proposed in 1943 by Leo Kanner, who is regarded as the father of autism (1). However, prior to the 1980s, many researchers continued to hold that the autism spectrum condition is primarily a problem with perception-motor and sensory integration-psychopathology (5). No one has considered focusing on the "emotional difficulties" of autistic children, despite the fact that everyone will have an amazing, great, and singular "feeling" when they come into touch with autistic children.

Since the 1980s, researchers have just lately been investigating the emotional deficits of autistic children. Evidence showed that a lack of social dependency skills or fundamental barriers to emotional and social development is the main causes of the majority of cognitive and linguistic developmental issues in autistic people (6). These are the symptoms of this defect,

- i. Many cases in the clinical psychology demonstrated how self-emotional performance or response is abnormal in children with autism. Accordingly, children with autism have voices that are very distinctive in four situations: when they need something, when they wake up and say hello, when they want to be dissatisfied, and when they are happy and surprised. These vocalizations are completely different from those of mentally handicapped and typical kids. The results of Kasari et al. research demonstrated how poorly autistic kids communicate happiness and despair (7). These anomalies are consistent with the basic cognitive traits shared by all autistic children and have nothing to do with age or intelligence quotient (IQ) (8).
- ii. Children with autism also have issues with how they perceive, comprehend, and react to the emotions of others. The outcomes of Langdell's experiment, in which he challenged autistic children to discern between "mild" and "sad" face images with various expressions, were highly disappointing (9). Children with autism and children with mental disabilities were split into two groups by Dawson in order to conduct an experiment. The aim was to classify photographs to determine whether they were categorized based on the facial expression in the shot or based on the design of the hat on the subject's head. The results of the experiment demonstrated that all non-autistic children

were identified based on facial expressions (without any experimental cues), while only six autistic children were identified based on facial expressions, but those autistic children who prioritized "hat" as the method of identification. Additionally, five of the autistic youngsters (who had to be classified from "expression") were given experimental suggestions, but the outcomes were still ineffective. The findings of this study demonstrated that most autistic children do not yet have a cognitive system in place that allows them to comprehend other people's emotions. As a result, they are unable to recognize the "signal qualities" that other people send and, naturally, respond to those signals (10). It is impossible to determine how one's self-social behavior should change.

- iii. Children with autism also exhibit inappropriate behavior in their mimicking skills. In their experimental research from 1984, Dawson and Adams noted that autistic youngsters performed poorly on the U-HGIS imitation test (11). These psychological tests assess a range of imitation skills in youngsters, including making faces, imitating wrinkling noses, and knocking on the head. These imitation techniques are tough for autistic children. However, several psychologists noted that autistic children's imitation skills might be significantly enhanced with attentive instruction and coaching (12).

### **Features of Autistic Children's Cognitive Abilities**

Clinical studies and observations have revealed that children with autism have very little experience with interpersonal interactions, and it is particularly challenging to enhance emotional communication through physical contact (13). This challenge is closely linked to their fundamental abstract and symbolic cognitive talents, which means it is integral to the process of how they think.

The condition of autistic persons "working hard" on the topic of "recognizing and comprehending others" first and foremost, according to many psychological clinical observation reports, greatly impresses people. Autistic patients are extremely upset over other people's ability to "mindread" them, and they have no idea what a "friend" is, and how other people interact with the outside world (14).

Therefore, from the standpoint of clinical psychology, it is important to understand the characteristics of autistic children's cognition and comprehension of others, particularly what is simple and what is challenging for them to understand. From a scientific perspective, it is crucial and facilitates our ability to do research on the educational psychotherapy process for autistic children.

The primary challenge faced by autistic youngsters is their impaired capacity to create tokens in response to relevant stimuli (15). Regardless of whether the information is ordered or disordered, meaningful or meta-meaningful, they process the information supplied from the outside world in accordance with their own innate, simple, and mechanical cognitive kinds. The ability to think abstractly is one of the key traits. The verbal sequencing and abstract ability scores of autistic children's intelligence test results are the least satisfactory (16).

Children with autism have extremely poor judgment and reasoning skills, and they clearly struggle to apply their own linguistic and cognitive abilities to the situation. For instance, the autistic child responded, “Tell this person to the hospital,” in response to the question, “What would you do if you were hit by someone?” The issues faced by individuals with brain damage share traits with this loss in resilience, or the capacity to deal with change. Autism-related children find it challenging to understand the abstract semantics of words like “single,” “difficult,” and “future.” When asked to draw comparisons for the aforementioned abstract terms, they find it difficult to get started. In terms of question judgment, the autistic youngster instantly worriedly agitated his tongue, checking for the existence of the tongue in his mouth, demonstrating a highly uncommon level of understanding when the experimenter questioned, “What if you lose your tongue?” (17).

On the other hand, autistic youngsters have better mechanical memory. The first case of the 11 autistic children Kanner documented in 1943 involved a 2-year-old autistic boy named “T” who was able to memorize the images and names of American presidents and can fluently recalled 25 beliefs of the Presbyterian Church and can memorize hymns from the Bible (1). One of the odd behaviors shown in certain autistic toddlers is the ability to make “calendar calculations,” or the ability to answer a question about the day of the week in a specific year, month, and day and get the answer right away. Inadvertently solving the problem swiftly and even faster than the calculation formula that the best mathematicians had studied for many years, these autistic children did not realize that they had mastered the rules and formulae for computing the calendar (18). Some autistic kids can possess exceptional artistic and musical talent. Some autistic children exhibit unique painting abilities that show up in their accurate and in-depth descriptions of real-world objects—a talent not shared by children without autism (19). Additionally, children with autism may instinctively and accurately understand music, regardless of how intricate and tortuous the melody is or how diverse the rhythm and pulse of the music are, and some of them can even play well and command their abilities.

### **Autism-Related Language Traits in Children**

Autism-affected children also exhibit distinctive abnormalities in their understanding and use of language. Generally speaking, in order to measure language proficiency, it is not only important to examine language proficiency but also the level of comprehension of social relationships. The ability to comprehend social relationships necessitates an understanding of language’s meaning in a particular setting and context (social relations). Language will evolve to reflect how the social environment and context have altered. However, the aforementioned “resilience ability” of children with autism has significant flaws, making it extremely difficult for them to understand their surroundings and context (20). For instance, when asked what to do when their fingers were injured, autistic youngsters responded, “bleeding.”

One of the most obvious linguistic characteristics of children with autism is prosody impairment (21). Children with autism have been diagnosed with abnormally high-pitched screams, odd voice intonation, loss of rhythmic balance, and

weird speech patterns. Typically, the aberration of this type of conversational rhythm does not significantly improve until puberty. The hemispheres of the human brain are thought to be related to the rhythm of language. In general, the left hemisphere of the brain controls the rhythm of the grammatical structure of words and sentences, whereas the right hemisphere of the brain controls the social and emotional structure of language. Children with autism who have linguistic prosody disorders have neurological abnormalities. The prosody of language is a crucial indicator of the nature of autistic problems (22).

Children with autism are not less capable of comprehending words and their meanings than kids with mental disabilities are of picking up concepts. Although children with autism had a high degree of information processing for linguistic concepts (such as abstract ability) and can employ concepts in a variety of ways, this did not suffice to overcome their challenges (23). There are serious issues. Youngsters with mild to moderate mental disabilities learn concepts and comprehend words more slowly than autistic children (24). While language development in autistic children displays a distinct development path, it might slowly approach the typical development path in terms of use. For instance, children with autism rarely use words and phrases that communicate information or call for information in language, and frequently use some terms that defy social norms or the linguistic environment (25). This is a puzzle that autism researchers from across the world are working to unravel. Use a diction or conversational style that is independent of the speaker-listener dynamic. Additionally, the beginning and development of their conversations are frequently marked by illogicity or a lack of consistency.

The most notable irregularity in autistic children is that they have a lot of trouble utilizing “personal pronouns.” They frequently mix up the pronouns “I,” “you,” and “he (she),” and they frequently use a pronoun (like “you”) repeatedly and persistently, but completely heedless of context or grammatical relationships (26). This was noted in Kanner’s research report from 1946 onwards (1). Later, he referred to it as “reversal of personal pronouns” and named it “fixation of personal pronouns” (pronominal fixation) (pronominal reversal). Children with various disabilities and those who are mentally impaired do not experience this occurrence.

### **Studying How Children with Autism Develop Cognitively and Linguistically**

In the past decades, theoretical research on the social cognitive development of normal children has become more important for the education and guiding of kids with autism and language problems (27, 28). They suggested utilizing the findings of the normal child development theory, particularly the findings of the cognitive development theory, in a flexible manner for the treatment and instruction of autism. The two main hypotheses in the contemporary theory of language acquisition are the theory of vocabulary learning according to the theory of constraints and the theory of general language knowledge according to the theory of universal grammar, which give the theoretical study of autism hope.

The “potential capacity theory” that a kid can use his language learning ability within a limited range under the control of

an internal cognitive mechanism in the early stages of language acquisition is referred to as conditioning theory. Young children lack foundational introduction knowledge when they begin learning a language. To master each vocabulary word individually requires a lot of time and effort (29). However, in real life, kids pick up lots of vocabulary fast and without much “trial and error,” indicating that there is a proper learning and cognitive system in kids that serves as a compass and determines the course of language acquisition. This process and control are known as “restriction” by researchers, and they disagree as to whether this “restriction” ability is innate to children or an inherent factor in a particular area of human cognitive ability.

Do kids with autism possess a “limitation” mechanism? What kind of “restriction”, if any, exists? The study of cognitive development and the notion of language acquisition in autistic children are greatly affected by this.

The Universal Grammar (UG) theory, also known as Syntactic theory, is a remarkable internal cognitive mechanism and learning ability that states that children around the age of two, in the early stages of life without basic knowledge of grammar, acquire a large number of vocabulary and rapidly acquire various grammatical structures (30). Many people might not take seriously this remarkable capacity of young toddlers. However, someone who has studied a foreign language is aware that learning grammatical structure (common language knowledge) is more challenging than learning vocabulary.

From the standpoint of cognitive development theory and language acquisition theory, whether the acquisition mechanism of vocabulary and common language knowledge in children with autism is abnormal in a specific part (i.e., the problem of “domain inherentness”), or is it an overall essential obstacle, or it may be a fundamentally different acquisition mechanism that needs further research to confirm (31). Additionally, “language rhythm and common language knowledge” of children with intellectual disabilities belongs to the field of self-discipline

calculus, which is distinct from general cognitive functions and solely depends on language cognitive functions, such as vocabulary, word meaning, and pragmatics (32). This is not yet evident. There has to be more research and analysis done on the connection between autistic children’s cognitive and linguistic abilities.

It was suggested that “pragmatics” and “social and emotional interaction” should be considered when examining the cognitive and linguistic growth of children with autism (33). The following are the important points,

- i. From the viewpoint of cognitive development research, it is necessary to make use of theoretical information regarding the nature of the problem and the pathological symptoms of autism.
- ii. A thorough comprehension of the naturally odd actions and emotional manifestations of autistic children is essential.
- iii. More research should be done on the linguistic traits and language learning processes of autistic children.
- iv. Use the cognitive capabilities of autistic children (such as mechanical memory, visual information processing priority, etc.) to the fullest extent to enhance their general cognitive ability.
- v. Investigate actively how to establish a “development model” for the brains of autistic kids.

In sum, since the 1990s, numerous theoretical models and research techniques have had a significant impact on the investigation of the cognitive and linguistic traits of autistic children. They stand in striking and stark contrast to the theoretical models that were investigated using conventional behaviorist approaches during the 1970s’. The gathering of fresh clinical data and the creation of empirical research will be necessary to determine the extent to which these new theoretical insights and research findings can direct and apply the treatment and education of children with autism.■

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