



RESEARCH ARTICLE 

Autism and Modeling: A Theoretical Approach to Understanding Therapeutic Interventions

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Abstract

Autism Spectrum Disorder (ASD) is considered one of the most debated developmental disorders due to the complexity of its behavioral and cognitive manifestations. It is described as a “spectrum” because symptoms, abilities, and behavioral patterns vary greatly from one case to another. There are several therapeutic interventions directed at children with ASD, among which modeling in its various forms is considered a fundamental tool for understanding their behavior and developing their social and adaptive skills. This article aims to provide a theoretical overview of the concept of modeling in relation to ASD by analyzing its explanatory and interventional dimensions. The findings indicate that modeling represents an effective and beneficial training tool ; however, it does not constitute an independent alternative to other interventions. Its maximum effectiveness is achieved when integrated with diverse strategies that take into account the child’s individual characteristics, developmental level, and visual and social learning style. Neurodevelopmental disorders are a group of neurological conditions that affect the growth and development of the nervous system. They cause difficulties in behavior, learning, social interaction, and communication, and they usually appear in early childhood.

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Introduction:

“They are a group of conditions associated with the onset of the developmental stage, usually appearing early in development, and often beginning in the child before entering primary school. They are characterized by developmental deficits that lead to impairments in personal, social, academic, and occupational functioning. The range of developmental impairment varies from limited deficits, such as difficulty in learning or controlling bodily functions, to profound disabilities in intelligence and social skills.” (Al-Oudah & Faqiri, 2016)

Autism Spectrum Disorder (ASD) is considered one of the most prevalent, complex, and ambiguous of these disorders. Numerous studies and research have sought to explain it, identify its causes, and explore methods and approaches for its treatment. In this context, modeling emerges as one of the fundamental concepts in psychology, derived from Albert

Bandura's Social Learning Theory, which is based on learning through observation and imitation. Modeling has proven to be an effective therapeutic intervention for modifying behavior and developing various skills. Accordingly, how can modeling contribute to understanding autism spectrum disorder and to developing appropriate therapeutic strategies?

In this study, based on a theoretical approach, we will analyze the concept of modeling and its applications in the field of autism, then discuss its limitations and potentials.

1. The Concept of Autism: Autism Spectrum Disorder (ASD) is defined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), as a neurodevelopmental disorder that appears in early childhood. It is characterized by deficits in communication and social interaction, as well as repetitive behaviors and restricted interests. The severity of its symptoms ranges from mild to moderate to severe.

“A child with autism can be defined as one who suffers from a developmental disorder before the age of three, which manifests as a constant and excessive preoccupation with oneself rather than with others, deep absorption in thinking, weak attention, and poor communication. The child is also characterized by hyperactivity, slow language development, weak response to external sensory stimuli, and resistance to changes in the environment, which makes them more dependent on and attached to others.” (Al-Muqabila, 2016)

“Autism Spectrum Disorder is characterized by persistent deficits in social communication and interaction across multiple contexts and situations. These deficits include impairments in social reciprocity, nonverbal communicative behaviors used for social interaction, and the skills needed to develop, understand, and maintain relationships, in addition to deficits in social communication.” (Al-Oudah & Faqiri, 2016)

Individuals with Autism Spectrum Disorder experience difficulties in processing sensory information, which negatively affects their senses and results in many learning and behavioral problems. It also prevents them from integrating sensory information to form an accurate understanding of their environment. (Abdul-Hamid, 2015)

2. The Concept of Modeling: Modeling is one of the central concepts in psychology and represents the practical application of Social Learning Theory. Albert Bandura defined it as a learning process that occurs through observing and imitating the behavior of others. It is based on presenting a behavioral model that is intended to be taught to the individual, followed by encouraging the person to imitate and repeat it.

Modeling can be **direct and live**, through the direct imitation of a real person in front of the child; **symbolic**, using virtual characters or media; **computer-based**, through building simulated models of human behavior; or **self-modeling**, where the child watches themselves in a recorded video performing the desired behavior.

Modeling helps explain learning mechanisms, design therapeutic interventions, and build theories to understand human behavior.

“Modeling has been used in treating many behavioral problems such as aggression, anxiety, compulsive behavior, social isolation, anger, phobias, and in teaching language to the deaf, as well as in developing social and life skills.” (Shash, 2017)

Autism and Modeling: Theoretical Intersections

- **Modeling as an Intervention Tool:** Modeling is considered one of the most suitable methods for children with autism spectrum disorder (ASD), as it helps them understand social and communicative behaviors and enables them to acquire new skills through observation and imitation, even when verbal communication is weak—provided that the model is clear and visual, and that reinforcement is direct and positive.

Modeling is used to teach children with ASD daily living skills, emotion regulation, greetings, social interaction, and simple social skills. It is particularly effective for those who face language difficulties. It enhances visual and practical learning, increases the speed of acquiring new skills, improves communication and social interaction, strengthens the child's self-confidence, and simplifies the teaching of complex behaviors such as waiting for one's turn or expressing emotions (Heartlinks ABA, 2023).

Several modeling-based interventions have demonstrated effectiveness in training children with Autism Spectrum Disorder in various daily life skills. Researchers Abeer Hassan Ahmed Ali and Sarnabas Rabee' Abdel Nabi Whedan conducted a study in 2015 in Taif City on the effectiveness of a modeling-based program in improving some social skills in children with ASD. The program proved effective in enhancing emotional expression, emotional sensitivity, emotional regulation, social expression, social sensitivity, and social regulation (Ali & Whedan, 2015).

In another study aimed at developing a program using video modeling based on Bandura's Social Learning Theory to develop certain life skills in children with autism, applying and testing it, and examining its results using a single-case study design over six months in 2018, researcher Mahmoud Gaber Mahmoud Abdel-Ghany confirmed the program's effectiveness. The child with ASD acquired all targeted life skills—personal hygiene, dressing skills, and eating skills—and mastered them at a rate of 100% (Abdel-Ghany, 2018).

In 2020, Tamer Al-Sharbasi Mohammed Al-Rajhi conducted a study titled “The Effectiveness of a Training Program Using Behavioral Modeling Techniques in Developing Social Skills in Groups of Children with Autism Disorder.” The study demonstrated the effectiveness of a behavioral modeling-based training program in developing some social skills in children with ASD, specifically communication, social interaction, and participation (Al-Rajhi, 2020).

Researcher Haifa Ahmed Hussein conducted a study in 2024 in Saudi Arabia titled “*The Effectiveness of a Video Modeling-Based Program in Developing Positive Social Behaviors among Children with Autism Spectrum Disorder.*” The study showed that video modeling is effective in developing positive behaviors in children with ASD. The researcher recommended encouraging teachers and trainers working with this group of children to use video modeling to develop their life and social skills (Haifa, 2025).

Digital modeling also contributes to simulating social situations that help the child interact in a safe and gradual manner. In this regard, Afnan Maatouq Al-Talhi conducted a 2019 study titled “*Developing an iPad Application Based on Video Modeling to Enhance Self-Protection Skills in Children with Autism Spectrum Disorder in Jeddah.*” The study demonstrated the effectiveness of the proposed video modeling-based application in developing self-protection skills in this group of children, and the researcher recommended the use of video modeling applications in their education (Al-Talhi, 2019).

- **The Potential of Modeling:** Modeling aligns well with the sensory and cognitive characteristics of individuals with autism spectrum disorder, as they understand and distinguish information they **see** more than what they **hear**. They have a strong interest in images, colors, and symbols. Modeling, in its applications, relies heavily on visual stimuli, which are considered highly effective in intervention.

Visual stimuli are recommended in the clinical guidelines for Autism Spectrum Disorder, as they reduce anxiety, increase predictability, support communication, and improve participation (Hong & Han, 2019).

Visual strategies help children with Autism Spectrum Disorder perform basic movements within the school environment and form friendships with their peers. They also develop their verbal expressive abilities and prepare them to cope with changes and successfully complete tasks (Abdullah, 2015).

In addition, learning through modeling does not require communication skills, as it relies solely on observation and imitation. Therefore, it is easy to use with children with ASD, who already suffer from communication difficulties. They experience deficits in communicative behaviors used in social interaction, such as verbal and nonverbal communication, inability to maintain eye contact, and deficits in body language, gestures, and facial expressions (DSM-5).

Moreover, Autism Spectrum Disorder is a complex condition; every case is unique and has characteristics that differ from others. Modeling enables us to design individualized programs and provide appropriate models for each case, which increases its effectiveness. The more the model resembles the child—such as in age, gender, or personality—the stronger the child's connection with the model becomes, and consequently, the greater their ability to successfully imitate the targeted behavior.

Finally, modeling helps with **generalization of behavior**, as it enables the child to reapply the learned behavior in different situations and settings.

- **Limitations of Modeling:** Despite the effectiveness of modeling in improving social, communicative, and behavioral skills in children with Autism Spectrum Disorder (ASD), its application faces several limitations:

1. **Individual Differences:** The wide variability among ASD cases makes it difficult to design appropriate models for every case and every behavior. This requires a great deal of effort, time, and expertise, and it also limits the generalization of results.

2. **Weak Imitation Skills:** Children with ASD imitate less than their peers, and when they do imitate, their responses are less accurate. Social cognition and executive functions also weaken their imitation abilities (Williams et al., 2014).

Most children with ASD suffer from deficits in motor and social imitation skills; therefore, modeling cannot be effective unless children are first trained in this skill.

3. Poor Attention: Modeling relies on observing and paying attention to the model. However, children with ASD often have attention deficits and difficulty maintaining visual focus, which may limit their benefit from modeling.

4. The Need to Combine Modeling with Other Methods: The literature indicates that, despite its effectiveness in improving social behaviors, modeling cannot be relied upon alone. It must be supported by direct interaction and positive reinforcement to achieve generalization of the acquired behavior. “Observation alone is not sufficient to learn the modeled behavior; the process of observation and interaction with the model must be supported by positive reinforcement and repeated practical training, so that the child acquires the behavior effectively and sustainably.” (Early Intervention Strategies Website, 2023)

Conclusion : This article concludes that modeling is not merely a teaching technique but a fundamental explanatory and intervention tool in the field of autism. It provides a basis for understanding how children with Autism Spectrum Disorder learn from their environment and enables the design of more realistic interventions to develop various social and communicative skills in a natural and gradual manner. This enhances the child’s chances of integration into the social environment and improves their quality of life.

However, relying on modeling alone is insufficient, given the diversity and complexity of autism manifestations. Its effectiveness remains dependent on how well it fits the characteristics of each case and its ability to be integrated into comprehensive therapeutic programs.

Therefore, it is necessary to encourage research on modeling—especially **digital modeling** as a modern therapeutic tool—reinforce integrated theoretical models that combine behavioral and cognitive dimensions, and develop training programs for therapists on the optimal use of modeling.

Ethical Considerations

This study is theoretical in nature and is based exclusively on the analysis, interpretation, and synthesis of previously published literature. No primary data were collected, and no experiments, surveys, or direct interactions with human participants or animals were conducted. Therefore, ethical approval from an institutional review board was not required. The authors confirm that all sources were appropriately cited and that the study was conducted in accordance with principles of academic integrity, responsible scholarship, and respect for ethical standards in research.

Author Contributions

Both authors contributed equally to the conception and development of this manuscript.

- **Remil Khadidja** contributed to the conceptual framework of the study, the theoretical analysis of autism spectrum disorder, and the interpretation of modeling as a therapeutic approach.
- **Touhami Soufyane** contributed to the literature review, the analytical discussion of modeling strategies, and the integration of findings within neurodevelopmental and therapeutic perspectives.

Both authors reviewed, revised, and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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