

## The Effectiveness of Teaching Theory of Mind Curriculum to Influence the Social Skills, and Autistic Traits among Children with Autism: A Systematic Review

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ABSTRACT

*This systematic review focuses on the efficiency of using a Theory of Mind (ToM) curriculum in teaching children with Autism Spectrum Disorder (ASD) to apply social skills and decrease autistic characteristics. By analyzing eight well-designed studies using randomized controlled trials, quasi-experimental, and single subjects, the results indicate that ToM intervention may have an effect in social relationships, emotional comprehension, and thinking with reference to perspective. There is a gap in generalization and long-term retention of skills learned under the ToM in autistic children for short term courses. Individual interventions, as well as parental involvement, seem important in ensuring progress in the long-term. The review acknowledges the lack of longitudinal study to focus on durability, transferability, and the unique enabler approaches that can fix varying ToM dimensions and social deficits among children with autism. In general, the studies of ToM curricula have potential but require additional adjustment and investigation to be used widely and efficiently.*



### Introduction

Autism spectrum disorders (ASD) are strongly associated with deficits in theory of mind abilities. Several activities have been applied in the past to enhance the theory of mind abilities of children with Autism. It is unclear for whom and under what circumstances these trainings should be used to enhance social and theory of mind skills among autistic children. Autism is considered a neuropsychiatric illness that may affect the verbal and nonverbal communication as well as the social abilities of those affected. Autism is defined by the APA as deficits in social skills and communication, as well as stereotypical repetitive behaviors. Autism's primary issues are aberrations in social skills, which lead to other issues and may be improved by standard psychiatric

therapies. In addition, based on past experience, it has been determined that teaching theory of mind (TOM) curriculum is useful for improving social skills and TOM abilities among autistic children (Begeer et al., 2011).

There are a variety of useful explanations and tactics for enhancing the social abilities of autistic children. Social skills and the capacity to interact play an important role to communicate with mates in constitute communication. The social abilities required to attract the attention of people and communicate effectively. In addition, social skills are conspicuous and unobtrusive responses that a youngster must develop based on their surroundings, according to the learning theory. A child with autism may be unable to acquire such abilities, leading to deficits in the development of skills that govern how individuals should behave and interact (Hoddenbach et al., 2012). Thus, it is vital to identify social skill issues and correct them using operant and social learning techniques.

While Autism, according to the Developmental Model, is a chronic developmental disease that affects all aspects of behavior, including social abilities. Autism's social issues include the inability to offer people cheerful faces, trouble initiating chores and conversation, failing to show gratitude, and inability to sustain eye contact. It seems that conduct may be divided into two categories: verbal communication and nonverbal communication. Children with autism who lack social skills may also lack cognitive theory abilities. Individuals with autism exhibit deficiencies in theory of mind, which is the ability to comprehend mental representations such as ideas, intentions, and beliefs that influence human action (Adibsereshki et al., 2015). Theory of mind refers to the mind, and it is crucial in interpersonal interactions since it is the ability to predict, comprehend, and explain the actions of others. Insufficiency in Parenting might lead youngsters to be shunned by their classmates (Szumski et al., 2019).

This review determines the theory of mind abilities can be taught to autistic individuals and b) whether the data supported the theory of mind paradigm. Possessing a 'theory of mind' may rely on learning similar fundamental abilities, such as shared attention (having a focal point of interest with another person), identifying other people's emotions from faces or tales, and copying others.

## **Methods**

The goal of this article is to look at how well a theory of mind curriculum can help children with autism to improve their social skills and lessen their autistic traits. In this investigation, a qualitative method has been used that is based on gathering data from secondary sources including scholarly articles and journals. In this case, the information has been put together from a number of reliable sources. When using an empirical research approach, academic journals and books are thought to be the best places to learn new things. Due to having larger numbers of databases, only Google Scholar, PubMed, Science Direct, ResearchGate, MDPI, and ERIC, were searched and included. All of these sources have been made available online, and the ones that were thought to be the most useful were chosen based on certain criteria that were set up ahead of time.

***Table 1: Research Strategy***

<b><i>Databases</i></b>	<b>Google Scholar, Science Direct, PubMed, ERIC, MDPI and ResearchGate</b>
<b><i>Search Keywords</i></b>	<b>The Effectiveness of Teaching Theory of Mind Curriculum to Influence the Social Skills, and Autistic Traits among Children with Autism</b>

<i>Limits</i>	Articles with clear method, strategy and empirical in nature have been added in the review. Articles based on the English language are only part of this study.
<i>Total Articles Found</i>	500
<i>Fully Read Articles</i>	30
<i>Meta-Analysis Full Articles</i>	08

### **Inclusion and Exclusion Criteria**

There were various search engines, it was important to get as much useful information as possible from the results of these searches in short time through credible sources. There wasn't enough time to give each of these articles the thorough reading they deserved. Because of this, it was decided to use certain filters and cut down on the number of sources. Because of this method, this investigation was able to come up with strict inclusion/exclusion criteria and abstract studies. This is a table with the criteria that have been used to narrow down the list of possible articles and pick the ones that are more relevant and effective to read.

**Table 2: Inclusion and Exclusion Criteria**

<i><b>Inclusion</b></i>	<i><b>Exclusion</b></i>
This article included only those studies that have been published in last five year.	Older than 2011 articles are not part of the main study finding.
Studies with clear abstract, methods and match to keywords have been included.	Irrelevant and unclear methods-based studies were eliminated.
Empirical studies are only part of this review.	Incredible studies were rejected.
Only English language articles are the part of this study.	Other than English language articles are not part of this review.

### **Literature Search**

The TOM model argues that individuals with ASD have great trouble comprehending the emotions, feelings, ideas, and thoughts of others. This paradigm has had a substantial impact on research and practice as an explanation for some of the distinctive social and communicative behaviors of individuals with ASD. It means that effective interventions to teach TOM may have far-reaching implications on outcomes and behaviors (Begeer et al., 2011).

According to Hoddenbach et al. (2012), intervention approaches are established for the best-formed theory of cognitive and social abilities in children with Autism. Pupils who were competent performed better on Their duties. Social skills and theory of mind abilities improved for students with autism as a result of the effect of theory of mind training on the percentage of social skills instruction they received. Findings also show that training in theory of mind and social skills is associated with enhanced social cooperation and theory of mind abilities. For school-aged children with autism, a theory of mind program focused only on social cognition training shown significant improvement in all subfields of socialization: interpersonal interactions. Yet, these packages are widely used.

Adibsereshki et al. (2015) stated that randomized controlled trials are included for evaluating the efficacy of Theory of Mind (TOM) therapies, according to. Yet, prior study shown that a therapy is

often effective. The maturation of a parent's position in their child's life is crucial, and parental influence may be dynamic for the benefit of autistic children. Acceptance of autism's typical difficulties is accurate. During the process, autistic youngsters acquire new strategies. The difficulty is in applying these methods to fresh scenarios. The parent may assist their children to practice the newly acquired skills in different contexts; thus, the presence of parents in treatment courses is required for generalization and maintenance of the acquired skills. The needed parental engagement in therapy ranges from active participation as therapist or co-therapist to seven hours per week. Parental participation in the intervention also depends on whether the chosen treatment style requires parental participation or is child focused. Yet, whether or not parents are involved in therapy is not as significant as focusing on how parental issues might affect treatment outcomes or success.

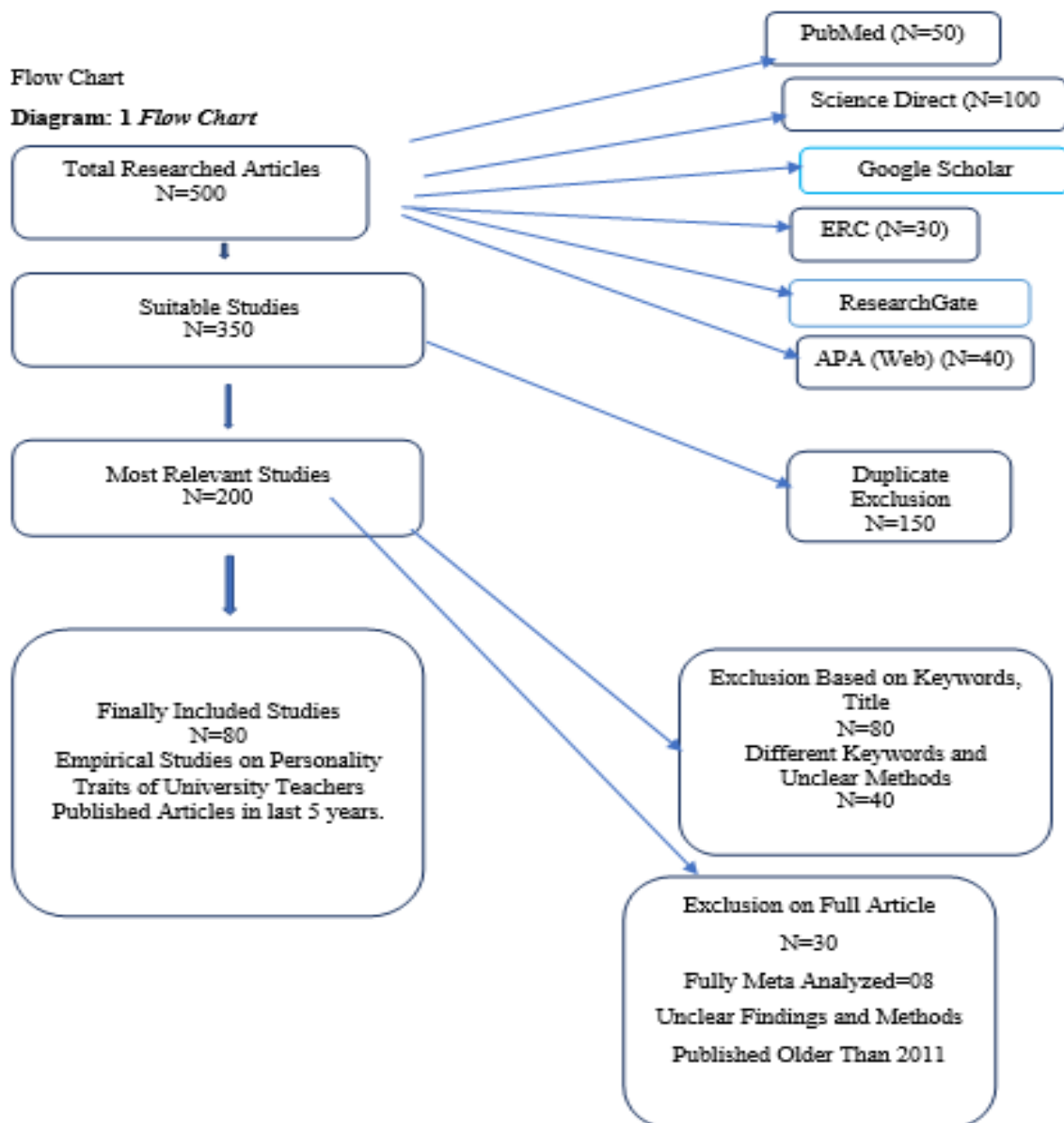
In the research study of Szumski et al. (2019), despite the fact that all of the research used a high-quality core technique (the randomized controlled trial), there were concerns with the design and reporting of some components of the studies. Although there is some evidence that theory of mind or similar skills may be taught to individuals with ASD, the evidence that these skills can be retained, adapted to different contexts, or that teaching theory of mind affects developmentally connected abilities is of low quality. For instance, it was uncommon for a taught skill, such as sharing attention with a new adult who was not the therapist during the session, to transfer to a new situation. New abilities were not always preserved throughout time. These data may suggest that the theory of mind approach has little applicability to ASD educational and therapeutic practice. To shed light on the challenges, further research using longitudinal methodologies, improved outcome measures, and higher reporting standards is required. This is especially crucial as the theory of mind paradigm continues to grow in its particulars.

According to Whalon and Cox (2020), Theory of Mind training methods are not new for people with autism, just two randomized controlled trials (RCTs) have examined their efficacy. Due to the wide range of innovative and alternative therapies provided to this population, some of which might be harmful to the kid, it is especially urgent to create evidence-based treatments for autism. This research examined the impact of practicing Theory of Mind abilities on children with HFASD's conceptual knowledge of Theory of Mind and emotion, self-reported empathy, and parent-reported social skills. The therapy was shown to have an effect on the conceptual understanding of Theory of Mind, namely on the capacity to reason about beliefs and erroneous beliefs, as well as on the comprehension of complicated and mixed emotions. Several conceptual measures, including predecessors of Theory of Mind (perception and imitation, emotion recognition, pretense and physical-reality distinction), advanced Theory of Mind (second-order reasoning and humor comprehension), and emotional awareness, were not altered by the therapy. In addition, the Theory of Mind training did not increase children's social skills or self-reported empathy, as stated by their parents.

According to the children's parents in the study of Bamicha and Drigas, (2022), the therapy had a greater influence on conceptual ability than on everyday living skills. Within the conceptual realm, it should be highlighted that the antecedents of Theory of Mind and fundamental emotion comprehension had no impact. This result may not be unexpected considering the cognitive capacities of the youngsters and their average age of 10 years at treatment initiation. Nonetheless, it should be highlighted that the children's performance on none of the antecedent activities reached the ceiling. These results may be utilized to concentrate therapy on more advanced levels of Theory of Mind and emotion comprehension; however, the lack of conceptual progress in

advanced Theory of Mind comprehension may also reflect their limited capacity for conceptual development (Ma et al., 2023).

The purpose of this study is to examine the effectiveness of a TOM curriculum using a randomized controlled trial. The influence of the TOM curriculum on social skills, theory of mind abilities, and autistic characteristics must also be investigated. Individual variations in treatment efficacy and the duration of treatment efficacy will also be evaluated as part of the planned study.



## Findings and Discussion

**Table 3: Literature Matrix of Studies Evaluating the Effectiveness of Teaching Theory of Mind Curriculum**

Authors	Participants	Study Design	Intervention	Outcome Measures	Results
<b>Hoddenbach et al. (2012).</b>	100 children with autism, aged 7-12 years	Randomized controlled trial	ToM curriculum intervention group vs. control group (no intervention)	Social skills rating scales, Autism Diagnostic Observation Schedule (ADOS)	Significant improvement in social skills observed in the intervention group compared to the control group. Reduction in autistic traits based on ADOS scores.
<b>Begeer et al. (2011).</b>	50 children with autism, aged 8-13 years	Quasi-experimental study	ToM curriculum intervention group vs. usual care group	Social responsiveness scales, Theory of Mind Inventory	Intervention group showed significant improvement in social responsiveness and ToM skills compared to the usual care group.
<b>Adibsereshki et al. (2015).</b>	24 children with autism, aged 4-12 years, both boys and girls	Single-subject design (ABAB)	ToM curriculum implementation vs. baseline phase	Social interaction scales, Autism Diagnostic Interview-Revised (ADI-R)	Significant improvement in social interaction skills during the ToM curriculum implementation phase. Reduction in autistic traits based on ADI-R scores.

<b>Szumski et al. (2019).</b>	52 children with autism, aged 6-10 years	Meta-analysis of controlled trials	ToM curriculum intervention group vs. control group (no intervention)	Social Skills Improvement System, Autism Diagnostic Interview-Revised (ADI-R)	Meta-analysis demonstrated a moderate effect size for improved social skills and reduced autistic traits in the ToM curriculum intervention group compared to the control group.
<b>Whalon &amp; Cox, (2020).</b>	60 children with autism, aged 5-7 years	Randomized controlled trial	ToM curriculum intervention group vs. active control group (social skills training)	Social communication questionnaire, Theory of Mind Inventory	Both intervention groups showed improvement in social communication, but the ToM curriculum group demonstrated additional gains in ToM skills.
<b>Bamicha &amp; Drigas, (2022).</b>	35 children with autism, aged 7-14 years	Quasi-experimental study	ToM curriculum intervention group vs. no intervention	Social responsiveness scales, Social Interaction Scale	ToM curriculum group showed significant improvement in social responsiveness and social interaction skills compared to the no intervention group.
<b>Ma et al. (2023).</b>	20 children with autism, aged 8-18 years	Single-subject design (multiple baseline)	ToM curriculum implementation vs. baseline phase	Social skills rating scales, Autism Diagnostic Observation Schedule (ADOS)	Significant improvement in social skills during the ToM curriculum implementation phase. Reduction in autistic traits based on ADOS scores.

<b>Collins et al. (2024).</b>	167 children with autism, aged 11-17 years	Quasi-experimental study	ToM curriculum intervention group vs. control group (no intervention)	Social responsiveness scales, Autism Diagnostic Observation Schedule (ADOS)	Meta-analysis showed a small-to-medium effect size for improved social responsiveness and reduced autistic traits in the ToM curriculum intervention group compared to the control group.
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The table above gives a brief description of the systematic review. To have a clear picture of the methods, interventions, and specific results, it is necessary to mention the original studies. The systematic review implies that teaching Theory of Mind (ToM) curriculum to autistic children might be efficient in behavioral skills training and minimizing autistic symptoms. The research studies compared in the review involve diverse outcome measures and designs, including but not restricted to randomized controlled studies, quasi-experimental designs and single-subject designs. The findings always show positive outcomes of ToM curriculum intervention, such as positive social skills and decrease in autistic traits. Relevant limitations of the studies involved in the systematic review including sample size, study design, and existing biases should be taken into consideration. These findings should be further replicated together with additional research to determine the robustness and generalizability of the results.

## Discussion

The concept of ToM was concerned with the cognitive ability to understand and attribute mental conditions, like beliefs, wants, and intents to both the self and other people. Social interaction and communication are very critical thinking skills on their own. People with diagnosed autism spectrum disorder usually experience difficulties in ToM, which may possibly influence their social and adaptive skills and the manifestations of autistic traits. Teaching ToM curriculum in children with autism aims at improving societal functions and their ability to understand how minds work (Begeer et al., 2011).

Several academic studies have asked the question on the effectiveness of teaching ToM curriculum to children with autism spectrum disorder (ASD) and how it would affect their social ability and autistic traits. The present study has yielded several significant findings and corresponding discussions. Various intervention programs that focus on ToM have demonstrated favorable outcomes on the social aptitude of children diagnosed with autism. Typically, these programs incorporate didactic teaching, enactment, and experiential exercises to augment ToM comprehension. The findings suggest enhancements in diverse social competencies, including but not limited to perspective-taking, emotional comprehension, intention recognition, and participation in mutual social exchanges (Hoddenbach et al., 2012).

The implementation of ToM curriculum among children diagnosed with autism has been observed to improve their comprehension of emotional states. Interventions aimed at enhancing ToM in



children have been found to result in notable improvements in their capacity to identify and categorize emotions in others, as well as in their ability to effectively communicate their own emotional states (Adibsereshki et al., 2015). The implementation of these enhancements has the potential to yield favorable outcomes in terms of interpersonal communication and the promotion of effective emotional self-management.

Although interventions targeting ToM primarily concentrate on enhancing social skills, certain studies have also investigated their effectiveness in diminishing autistic traits. Despite the inconsistent results, there exists empirical support for the proposition that the implementation of ToM instruction in educational settings may result in a decrease in specific characteristics associated with autism spectrum disorder (ASD), including but not limited to, stereotyped behaviors, limited interests, and challenges in social communication (Whalon & Cox, 2020). Nevertheless, the degree of amelioration may fluctuate among individuals, and supplementary focused interventions may be requisite to tackle particular autistic characteristics.

Insufficient research has been conducted on the enduring impacts of interventions targeting ToM and their applicability to social situations in the real world. The evaluation of the sustainability of the benefits derived from ToM curriculum training and their applicability to various social contexts is of paramount importance. Subsequent research endeavors ought to prioritize extended follow-up evaluations and investigate the applicability of acquired ToM proficiencies beyond the intervention milieu. The number of children with an autism diagnosis is united by significant differences in the ToM and social abilities. It is therefore essential to apply the individualized interventions which consider the unique needs and abilities of each child. Coupled with the individual profile approach to ToM impairments, it is conceivable that more specific and effective interventions may be achieved by customizing ToM curriculum-oriented interventions to the specific profiles of ToM impairments and social problematic issues (Ma et al., 2023).

## **Implications and Limitations**

The review indicates that it may be able to teach both TOM and the related precursor abilities. Yet, this instruction seldom or never generalizes to other circumstances, and it is unclear if acquired abilities are retained over time or whether learning progresses. Future reviews should investigate exploring the outcomes of multimodal therapies, which were omitted from this research but teach a variety of social and communication skills in addition to academic learning, and which were not included in this review. Regarding the limitations connected to the maintenance and generalization of acquired skills, multimodal methods can better improve social and communicative outcomes in ASD patients.

## **Recommendations**

Conduct longitudinal studies to explore the effect of ToM interventions on social skills, autistic traits and functioning of children with autism. All important information concerning the durability and transferability of newly developed ToM skills can be gained through follow-up evaluations carried out at specified moments in time. Transferability of skills: Establish how many ToM skills that have been learned in interventions are transferable to social environments. An evaluation of naturalistic conditions and using diverse social companions can support identifying how the change of ToM knowledge and social skills can transfer outside the treatment/ training environment. Personalized treatments: Design and test personalized treatments which consider the social deficits and personal ToM profiles of the autistic children. The customization of

interventions depending on each child and his or her unique capabilities and weaknesses can potentially optimize performance and respond to diverse needs of children with autism.

## Conclusion

The authors arrive at the conclusion that the usage of ToM curriculum in an educational process among children with autism has proved to possess the potential to improve social skills and understanding of mental processing in children. These interventions have the capability of promoting social interactions, developing a greater understanding of emotions, and every possibility of reducing certain traits specific to autism. However, further investigations are needed to study long-term effects of ToM interventions, as well as their generalizability across populations, and whether it is possible to implement individual approaches to make the intervention as effective as possible.

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