



JÖNKÖPING UNIVERSITY

*School of Education and  
Communication*

# **Teaching of Hidden Curriculum to Children with Autism Spectrum Disorder**

## **A Scoping Review**

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Interventions in Childhood

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## **ABSTRACT**

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Children with autism spectrum disorder (ASD) find it difficult to understand unspoken social rules i.e. hidden curriculum and lack the ability to read the mind of others i.e. theory of mind, due to their social deficit. This scoping literature review has explored what hidden curriculum interventions that have been used for teaching the hidden curriculum to the children with ASD in school setting where the children spend most of their time. It also looked at how effective the hidden curriculum interventions have been for the social skills development of the children with ASD. The result is a ballooning body of works with numerous recommendations from different scientists. 9 studies from 4 data bases have been included in the study among which were 5 quantitative and 4 qualitative. After rigorous thematic analysis, the results identified several hidden curriculum interventions used for the children with ASD. The results show that mostly, the hidden curriculum intervention have been useful and effective. Additionally, some of them led to more social acceptance for the children with ASD from peers.

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Keywords: Children with Autism, Hidden Curriculum, Theory of Mind

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# 1. Introduction

Children need to learn hidden curriculum that refers to unspoken social rules, social conduct and theory of mind i.e. to understand body language of others and reading their mind (Myles, Trautman, & Schelvan, 2004). Unlike regular curriculum, children learn this hidden curriculum intuitively through observation and experience without being taught about them formally. However, children with autism spectrum disorder (ASD), owing to their social deficit, find it hard to understand and learn the hidden curriculum or theory of mind. Though all children are vulnerable but children with autism are at a higher risk of vulnerability and limited understanding of their social context. Most of them do not know how to tie emotions and body language to situations or even interpret the emotions, body language or slang used by the people around them. As a result, they could be considered rude or might be bullied by other, which can be problematic not only for present life but also future life and jobs.

There are several interventions that are useful for social skills development of the children with ASD, among them are the interventions that are used to teach them hidden curriculum. Despite the abundance of available interventions that are discussed in literature, to date there is limited knowledge and understanding to what extent they have been used in real life and what is their effectiveness. This literature review aims to fill in this knowledge gap by reviewing the relevant literature.

## 2. Background

### 2.1 Children in Need of Support

Children are vulnerable in every society of the world as they cannot speak for themselves and are quite dependent upon others. Children who are in need of special support are more vulnerable, and are more dependent due to their limited abilities compared to normal children. Lygnegård, Donohue, Bornman, Granlund, and Huus (2013) adopted the definition of children with need of special support from California State (2012) which states that “(1) children with identified disability, health, or mental health conditions requiring early intervention, special education services or other specialized services and supports (diagnostic disability); or (2) children without identified conditions but requiring specialized services, support, or monitoring (functional disability)”.

One of the prevalent disabilities in children is Autism Spectrum Disorder (ASD) increases their vulnerability due to their communicative disabilities which makes them dependent upon others. According to the data of Centers for Disease Control and Prevention (CDC) about prevalence of autism in the United States, 1 in 68 children (1 in 42 boys and 1 in 189 girls) has having autism spectrum disorder (ASD). The situation does not differ much in other countries; however, in many countries' diagnosis may not be possible due to several reasons.

## 2.2 Children with Autism Spectrum Disorder (ASD)

ASD is a developmental disorder that creates problems in social interaction and communication for a person (American Psychiatric Association, 2013). It has also known as Asperger syndrome (not severe) and pervasive developmental disorder. It is a “spectrum condition” in which a person may have restricted or repetitive behaviour. Parents or doctors can notice ASD mostly at the age of two or three (Stefanatos, 2008). Children with ASD have “delayed learning of language; difficulty making eye contact or holding a conversation; difficulty with executive functioning, which relates to reasoning and planning; narrow, intense interests; poor motor skills’ and sensory sensitivities”.

Children with ASD are impaired, and this is often referred as an impairment triad. The impairment triad refers to impairment in social development, communication and imaginative flexible function (i.e.restricted and repetitive behavior and interest) (Happé & Ronald, 2008).

### 2.2.1 Social Development

The major impairment in the triad is a social deficit (White, Keonig, & Scahill, 2007) where children with ASD have problem in understanding and translating the social world (Rapin & Tuchman, 2008). Children with ASD lack social skills which include both verbal and nonverbal behaviour resulting in poor social interaction and interpersonal communication (Rao, Beidel, & Murray, 2008). These children do not have sufficient orientation to respond to social stimuli, have problem with making eye contact, turn taking or pointing at things, initiating social interaction, feeling empathetic towards others or responding emotionally (Volkmar, Paul, Klin, & Cohen, 2005; Weiss & Harris, 2001).

### 2.2.2 Communication

The second impairment in the triad for the children with ASD is communication. The communication impairment in autism represents as; delayed or lack of spoken language development, inability of initiating and sustaining conversation, stereotyped and repetitive use of language, lack of spontaneous make-believe play or social imitative play (Landa, 2007). Most of the children with ASD have communication impairment, thus do not comply with the daily communication needs (Noens, Berckelaer-Onnes, Verpoorten, & Van Duijn, 2006).

### 2.2.3 Repetitive and/or Restricted Behaviour

The third impairment in triad for the children with ASD is repetitive or restricted behaviors. Repetitive behaviors are classified into four categories; stereotyped behaviors, compulsive behaviors, sameness and ritualistic behavior (Lam & Aman, 2007). Stereotypical behaviour can be any repetitive movements such as tapping ears, repetitive blinking and snapping fingers. Compulsive behaviors can be any activity that consumes time such as arranging blocks in order and keep doing it for hours. Sameness refers to rigidity to change or being reluctant to change the arrangement in the rooms. Ritualistic behavior is also close to sameness, that may for instance demanding same food every day.

Restricted interests may include playing with only one toy, watching only one cartoon show, or listening to only one favorite song. Johnson and Myers (2007) mention that some self-injurious behaviors such as eye poking, head banging or nail biting are also included in this category of behaviors displayed by children with ASD.

## 2.3 Interventions for Social Skills Development of Children with ASD

There are some case where the children with ASD have fully recovered (Helt et al., 2008), however, generally it is believed that autism is not curable. There are however, certain treatments and interventions that can help to reduce worse outcomes resulting from autism (Bölte, 2014). Early interventions can help the children with autism with gaining self-care as well as social interaction and communication skills (Scott & Chris, 2007).

Early educational interventions are crucial for ASD and the research has showed that they have proved to be effective for young children with varying degrees (Rogers & Vismara, 2008).

White et al. (2007) notes the social deficit as the core issue for the children with ASD. Social skills development is not possible by biological and medical treatment, and only the interventions can be fruitful (Lord, 2002). Most of the time of the children is spent at school, therefore, school is an important setting to for social skills interventions. Harrower and Dunlap (2001) highlighted the importance of including children with ASD in mainstream school to recover their social deficit. There has been interventions in school for social skills development of children with ASD, however, Rao et al. (2008) were "lack of a universal definition of social skills, various levels of intensity and duration of treatment, divergent theoretical backgrounds, and variety in services provided in clinic or classroom settings". The authors recommended a roadmap based on leading Autism researchers' view for improving the situation.

There are several intervention and strategies for social skills development of children with autism. Some of these strategies/interventions are Social Stories™ and Comic Strip Conversations, Hidden Curriculum, Social Scripts, Computer and other technology and social school groups. Despite numerous strategies to try, there is lack of research on these treatments and their effectiveness (Foden & Anderson, 2011). This paper focused on hidden curriculum interventions, an intervention which apparently seems to be less researched in terms of its effectiveness.

## 2.4 What is hidden curriculum?

The researchers and practitioner emphasize on the need for teaching informal so-called hidden curriculum in the schools beside teaching the formal curriculum. The hidden curriculum refers to the set of rules or guidelines that are often not directly taught but are assumed to be known (Garnett, 1984; Hemmings, 1999; Kanpol, 1989; Lee, 2011). It includes unwritten social rules and social conduct that is taken for granted and mostly learned intuitively and automatically (Foden & Anderson, 2011). Though it is important for all the children to learn these unwritten social rules, its more crucial and challenging to learn hidden curriculum by the children with ASD since these children lack social cognition and social interaction skills (Lee, 2011). Since the children with ASD can not learn these rules by themselves, it has to be taught to them.

It is not easy to define hidden curriculum rules, rather they become more obvious when broken and become unpleasantly obvious. This is one of the useful ways to recognize hidden curriculum is by hidden curriculum errors. Breaking these hidden curriculum rules can have serious outcome for a child such as a social outcast or certainly a social misfit (Myles et al.,

2004). For instance, a hidden curriculum is not “*do not share your lunch of your peer*”, rather it is “*share the lunch if a peer offers you*”.

If children fail to follow the hidden curriculum, they can be shunned by peers, be considered as gullible, or viewed as troublemaker (Myles et al., 2004). Another example of hidden curriculum can be: When someone says, “*it slipped my mind*”, the child who unknowingly starts looking around for something actually slipped might be punished for being rude or disruptive, though in reality the child is interpreting it literally.

The hidden curriculum includes many such items which people learn through social cues and observation and may include idioms, metaphors, and slang. The hidden curriculum items have an impact on social interaction, performance in school and safety. The hidden curriculum differs across genders, age, company and culture (Lee, 2011; Myles et al., 2004).

Hidden curriculum can be understanding the body language of others and mindreading or theory of mind (Baron-Cohen, Leslie, & Frith, 1985). Body language refers to how individuals can communicate using body gestures, facial expressions, body posture, and tone of voice. Sometimes body language can be different than a person’s words, and it makes it more important to understand body language. For example, someone saying, “you are my favorite” and showing scowl may not be fond of you. Theory of mind or mindreading refers to individual’s ability to interpret other thoughts, beliefs and intention by reading their body language and environmental expectations. Unfortunately, children with ASD have innate disability to understand hidden curriculum because of challenge they face with theory of mind and also the problems they encounter with their social skills (Attwood, 2006; Baron-Cohen et al., 1985).

## 2.5 Teaching of the hidden curriculum in School

Teaching hidden curriculum is not an easy task, and there are variety of hidden curriculum interventions consisting several techniques and strategies for educators, therapists and parents (Myles et al., 2004). The foremost requirement for teaching hidden curriculum is a “safe person” who a child can turn to for seeking help and advice. “A safe person can be a parent or sibling, an understanding teacher or counselor, a paraprofessional, a job coach, mentor, or a close trusted friend who would provide accurate, clear clarification to meanings of words, phrases, situations– anything to do with the hidden curriculum” (Myles et al., 2004, p. 25). A safe person should have certain characteristics such as understanding individual and her

perspectives, respect her, be good listener without interrupting or being judgmental, know when to listen and when to advice, ask other's perspectives and solve problems, maintain suitable facial expression and understand those triggers that can cause tantrum, rage, or meltdown. It is also important the child who seeks help, also learn to respect the advice/clarification offered by the safe person without any argument (Myles et al., 2004).

### 2.5.1 Hidden Curriculum Teaching Strategies

There are four intervention strategies involved namely, SOCCSS strategy, SOLVE strategy, structured arrangement and group work, , changes in routine and social support through one-to-one aides.

#### SOCCSS Strategy

Situation-Options-Consequences-Choices-Strategies-Simulation (SOCCSS) strategy supports the children with social disabilities in understanding the social situations and based on that develop problem-solving skills. Within this strategy social and behavioral issues are put into a sequential form. SOCCSS has been directly used and proven to be the most effective in assisting children with ASD cope with their deficiency in social interactions (Lee, 2011; Myles & Simpson, 2001).

This strategy, with the directions given by teachers, enable the student to understand the cause and effect of a social situation, and they can also release what is the effect of their decision making on the outcome of several situations. It is applied as a social decision-making process for ASD children to help them cope with any social problems. The long terms impact of this strategy improving ASD children's social behavior and making them understand the consequences of not making the right decisions (Myles & Simpson, 2001). Additionally, the strategy allows peers to understand the children based on their cultural values and train them effectively on how to respond to certain situations (Lee, 2011).

#### SOLVE Strategy

The Seek-Observe-Listen-Vocalize-Educate (SOLVE) strategy is a strategy to empower the children with social-cognitive challenges. It can be considered as "a way of viewing the world, or a special mindset". It has the potential be applied in all environment and situations (Myles & Simpson, 2001). This basically means there are several new things happening around a

person, and the child should try to find and observe them, and it should be followed by listening to others and asking questions from people about it. The last step is learning and remember it.

### Structured Arrangement and Group Work

The school-based curriculum used structured arrangement and effective grouping as a strategy to help children with Autism develop socially (Safran, 2002; Wilkerson C. & Wilkerson J., 2004; Whitby, Ogilvie & Mancil, 2012). Educators are using seating arrangement to shield students with this disability from the known bullies in class. Instead, they are placed next to understanding students who in turn act as their peer and help them interpret certain social cues (Safran, 2002). While placing them in groups, teachers need to hand them roles that align with their interests or areas they are savvy about (Wilkerson & Wilkerson, 2004). Furthermore, specific roles for each team member should be clear so that overriding of tasks and subjection of ASD children to ridicule is avoided (Whitby, Ogilvie, & Mancil, 2012).

### Changes in Routine

Researchers believe that changes in routine or teaching approaches can help children with ASD to deal with their social interaction and recognition problems (Safran, 2002; Wilkerson C. & Wilkerson J., 2004). It is proven that children with ASD thrive well in clear routines and expectations. However, the changes need to be announced in advance for the benefit of the autistic students (Safran, 2002). This is based on the fact that ASD children are highly inflexible and experience high levels of anxiety and emotional stress when confronted with unexpected changes (Wilkerson C. & Wilkerson J., 2004). As a strategy, it may include changing physical education lessons to social stories, acting or cartooning (Myles & Simpson, 2001).

### Social Support

Safran (2002) argues that ASD students present a dilemma in establishing a balance between decision and appropriate actions creates a need for one-to-one aides for them. The assigned peers act as social interpreters for the students to ensure they abide by the rule of conduct. This approach also involves improving the mind theory of the students to allow them to interpret the environment they are operating from in real time (Marraffa & Araba, 2016).

## 2.5.2 Characteristics of Hidden Curriculum Interventions

The salient features of hidden curriculum interventions used to improve the social skill development of students living with Asperger Syndrome/autism are summarized in the table below.

*Table 2.1: Characteristics of hidden curriculum interventions*

<b>Author (Year)</b>	<b>Characteristic</b>	<b>Context of the characteristic</b>
Safran (2002); Lee (2011)	Protective and supportive	Interventions applied need to provide a “safe haven” for the students with ASD.  Children with Asperger Syndrome are protected from themselves through social support (Safran, 2002).  The interventions also support students understanding of different interpretations based on culture and other social constructs (Lee, 2011).
Wilkerson C. & Wilkerson J. (2004); Lee (2011); Marraffa & Araba (2016)	Comprehensive in scope	Hidden curriculum interventions not only teaches ASD children social coping skills but also equips them with mechanisms for dealing with different environments apart from school setup (Wilkerson C. & Wilkerson J., 2004).  Intervention is also modified to fit different cultural factors such as age, social economic status, ethnicity, gender, religion and sexual orientation. The educators administering hidden curriculum interventions need to understand all factors that related to the student before embarking on helping them (Lee, 2011).  While trying to understand the theory of mind for people with autism, all aspects of beliefs, feelings,

social cognition and student background (Marraffa & Araba, 2016).

Whitby, Ogilvie & Mancil (2012); Myles & Simpson (2001)

Prosocial in approach

Through the interventions used, the relationship between the teachers and ASD students in school determines how they (ASD children) would be taken socially. For such students to be accepted by others in a classroom, the educator should teach explicit social skills and that will model the entire class to think the same (Whitby, Ogilvie & Mancil, 2012).

When applying the SOCCSS strategy as an intervention, the educators use social approaches I simulations as well as while giving the students the list of options to choose from (Myles & Simpson, 2001). Basically, most interventions are guided by social constructs that are vital in ensuring that the ASD students are assisted to overcome their challenges. Particularly, they are taught that their exceptionality is not a defect but one of their good characteristics (Myles & Simpson, 2001).

Wilkerson C. & Wilkerson J. (2004)

Universal

Teaching social skills as an intervention approach of hidden curriculum is not only based on ASD children but the entire class. During class sessions, all the students are taught at once. However, the focus is always to help the ASD to improve their social cognition abilities as well as equipping others on positive social interactions (Wilkerson C. & Wilkerson J., 2004).

### 2.5.3 Resources Used to Teach Hidden Curriculum

There are multiples resources can be used to teach the hidden curriculum for students with ASD, two categories of the resources are technology and human resources.

#### Technology Resources

This category includes resources that are based on objects linked to technology other than direct human interactions at either personal or group levels.

##### *Visuals and Graphics*

The use of visual and graphics to enhance social cognition for students with ASD is appraised (Myles & Simpson, 2001; Safran, 2002). Use of visuals and graphics significantly reduce the anxiety and stress associated with interpersonal relations for Asperger's students. The visuals not only solve their anxiety problems but trains them on the interpretation of various social situations as depicted in the visuals and graphics (Safran, 2002). Visual symbols have a great impact on improving the processing abilities of students with ASD. Furthermore, it enables them to understand their environment better and relate to others in a positive approach (Myles & Simpson, 2001).

##### *Cartoons and Video Self Modeling (VSM)*

Cartoons and videos can be used to mentally and socially train Asperger's student on how to react to various situations in social gatherings (Lee, 2011; Myles & Simpson, 2001). Cartoons are used to enable Students with autism to get special cues on social interactions and any hidden rules about behaviors. Through thought and speech bubbles, such cues can be obtained. Also, students can videotape themselves in different skills and combine them to allow them to use in real situations (Lee, 2011). Through cartooning, comic strip conversations are used to allow students with ASD interpret different messages that are a natural part of the play (Myles & Simpson, 2001). In the long run, they will be able to relate the interpretation of real-life cases.

#### Human Resources

This category of resources includes those that are based on direct human interactions with the Asperger's students in a school setup.

### *Cooperative Learning Groups*

Cooperative learning groups are used by educators to help students with autism (Whitby, Ogilvie & Mancil, 2012). Formed and designed by peers, the students go ahead and assume the responsibilities of their peers and lean on their own. This improves the students' social interactions and the formation of close friendship among students with the disability thus allowing them to help each other in every situation (Whitby, Ogilvie & Mancil, 2012).

### *Counselors*

Counselors/therapists to assist ASD students with their social skill development in schools (Lee, 2011; Myles & Simpson, 2001; Safran, 2002; Wilkerson C. & Wilkerson J., 2004). Counselors are generally helpful when the group of ASD students is identified and assigned mentors. They usually conduct their social skill development lessons at separate places from the classrooms (Safran, 2002). Furthermore, the counselor serves as advisors or consultants for students with such disabilities in school setups (Lee, 2011; Myles & Simpson, 2001).

### *4.4.3 Teachers*

Teachers are a crucial resource in managing students with ASD. They design the intervention strategies, implement them and follow up on the progress of the students under the hidden curriculum (Safran, 2002). Teachers are also mandated to providing direct instruction to the students and ensuring they abide by the set of social rules within the school (Wilkerson C. & Wilkerson J., 2004).

## **2.5.4 Where Hidden Curriculum is taught in School**

Hidden curriculum can be taught in several school settings.

### **Classroom**

Classroom is a place where the hidden curriculum is primarily offered. Primarily, direct instructions are offered in classes which not only have students with Asperger but also the normal students (Lee, 2011). Furthermore, most social skills lessons are held in classrooms or blended with the existing curriculum to enhance psychosocial relationships of students with ASD as well as helping them interpret essential social cues (Marraffa & Araba, 2016; Myles & Simpson, 2001; Whitby et al., 2012). On methods used, both direct instruction and

contextualizing social skills approach in lessons are applied (Lee, 2011; Whitby, Ogilvie & Mancil, 2012). Additionally, visuals, graphics, cartoons, and storytelling are used to improve the social communication skills among the students with ASD (Myles & Simpson, 2001). These methods have been closely associated with classrooms as a primary place they are administered.

### Group Gatherings

Groups consisting of students with autism have been found to be avenues used to offer hidden curriculum lessons to enhance their social skill development (Safran, 2002; Lee, 2011; Myles & Simpson, 2001; Whitby, Ogilvie & Mancil, 2012). In an effort to provide a “safe heaven” to ASD students, they are placed in one group to enable their assigned counselor to teach them different social coping skills. This approach uses therapeutic methods to deliver the curriculum to the students (Safran, 2002).

Lee (2011) finds that offering groups are best used to teach hidden curriculum activities due to the level of modifications needed depending on the needs of the students and the severity of the autism in them. While in groups, cartooning, visuals, social stories, and counseling are the primary methods that can be employed to help the students improve their social interactions (Myles & Simpson, 2001; Whitby, Ogilvie & Mancil, 2012). Essentially, a hidden curriculum is offered in class and out of class environments depending on the method to be used.

## 2.6 Rationale of study

If the children with autism do not understand the hidden curriculum, they can be bullied, neglected, misunderstood or made fun of. This can have a negative impact in the school, home and community, and ultimately in their jobs and judicial systems in future. Despite being crucial, the research on the effectiveness of hidden curriculum intervention is limited (Foden & Anderson, 2011). This scoping literature review attempts to fill in the knowledge gap by reviewing the documented hidden curriculum interventions that are used to develop social skills to the children with ASD in school settings, and their effectiveness. The review will focus on the hidden curriculum interventions used for the social skills development of children with ASD, and also their effectiveness.

### Aim

To identify school-based hidden curriculum interventions and their effectiveness of for social skills development of the children with ASD.

## Review Research Questions

1. What school-based hidden curriculum interventions have been found to improve the social skills development of children with ASD?
2. How effective the school-based hidden curriculum interventions are?

### 2.7 Theory of Intervention

In this study theory of intervention has been used as a guiding theory in order to analyze the results. In social studies and social policy theory if intervention is used for decision making purpose to check whether an intervention should be implemented or not. Since the theory is used across different disciplines, it is also used in health and nursing research. In nursing research theory of intervention comes under practice theories. Intervention theory “direct the implementation of a specific nursing intervention and provide theoretical explanations of how and why the intervention is effective in addressing a particular patient care problem. These theories are tested through programs of research to validate the effectiveness of the intervention in addressing the problem” (Burns & Grove, 2010, p. 238). Since this review aims at looking at the effectiveness of hidden curriculum interventions, theory of intervention is relevant in this context, since intervention theory can be used to examine effectiveness of the intervention.

## 3. Method

A scoping literature review method has been adopted to address the research questions raised. A scoping review is used when to map the literature around the topic especially in the situations where the literature is nascent and not extensively researched (Mays, Roberts, & Popay, 2001). It is also useful for mapping the *volume, nature and characteristics* of the existing literature in the field of study (Arksey & O'Malley, 2005). Scoping is review is a new approach but getting popularity among researchers (Daudt, van Mossel, & Scott, 2013; Davis, Drey, & Gould, 2009; Levac, Colquhoun, & O'Brien, 2010). The scoping review has a process similar to systematic review especially in terms of method and process, however, the fundamental difference can be in the aim of study.

A systematic review aims at the best research over the topic, whereas a scoping review can be must to synthesize the available literature. A systematic literature review provides an opportunity to comprehensively cover the available literature about a particular topic or

research question (Baumeister & Leary, 1997; Cohen, Manion, & Morrison, 2011), however, due to limited research in the area, a scoping review is adopted. Arksey and O'Malley (2005) proposed an iterative six-stage process: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, (5) collating, summarizing and reporting the results, and (6) an optional consultation exercise. Since the study aims to see how hidden curriculum (intervention) can help or has helped in developing social skills of the children with ASD, therefore, a scoping review is a useful method for finding the interventions that are available (Davis, 2016) and also for checking efficacy of these interventions (Meline, 2006).

### 3.1 Search Strategy

The search strategy is made based on the research questions. Since the research aim at looking at available hidden curriculum intervention in the literature and also their efficacy if implemented for social skills development of children with ASD in school setting. For the relevant literature search 4 data bases were used from health and education; PsycInfo, Eric, CINAHL, Web of Science.

PEO is used to select key search terms based on the guidelines of for a quality literature review by Bettany-Saltikov (2012). A variety of search terms have been tried to get the relevant literature. After several attempts final search terms were selected which are presented in the following table.

Table 3.1

Search Terms Used for Data Search

	<b>Search terms for main constructs of research question</b>	<b>Alternate search terms</b>
Participants	“Children with Autism Spectrum Disorder”	“Autism” OR “Asperger” OR “ASD” OR “Pervasive Developmental Disorders”
Exposure	“hidden curriculum”	“unspoken social rule” or “covert curriculum” or “social understanding” or “social conduct” or “theory of mind”
Outcome	“Social Skills Development”	“Peer interaction” OR. “Social behaviour” OR “Social Interaction” OR “Interpersonal Competence” OR “Social Communication”

### 3.2 Selection Criteria

Some inclusion exclusion criteria were developed in order to answer the research questions. Since, the study aimed to look only at the children with ASD, therefore, only studies related to the children with ASD were selected. The studies which had discussed adults or youth with autism were excluded. Though several interventions are used for the social skills development of children with ASD, owing to the research question, only those studies were selected that have focused on hidden curriculum or theory of mind intervention.

As the purpose of the literature review was to find the interventions that are used to teach hidden curriculum, and their effectiveness, only empirical studies were included. Other than that, review or theoretical studies were excluded from the study. Those studies were selected which were FULL TEXT available in JU library. Only English language studies were included. Table 2 summarizes inclusion, exclusion criteria.

Table 3.2 *Inclusion - Exclusion Criteria*

<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
<b>Population</b>	
Children with Autism (Age 2-5, 5-12)	Youth and Adults with Autism, typically developing Children
<b>Focus</b>	
Hidden Curriculum Interventions Social Skills Development	Other interventions Focus other than social skills development
<b>Design</b>	
Qualitative, Quantitative or Mixed Methods, Theoretical	Other systematic reviews, literature reviews or meta-analysis
<b>Publication type</b>	
Articles published as full texts in peer review journals	Abstracts, conference papers, theses, books and other grey literature
Studies in English	Published in languages other than English

### 3.3 Selection Process

The search strategy based on selection criteria resulted as follows. This flowchart explains what have been found through different data bases. CINAHL (N=11), PsycInfo (N=55), ERIC (N=36), Web of Science (N=42). In addition to that based on background literature and a recent dissertation, 4 studies were added manually. A total of 149 articles were selected for the study.

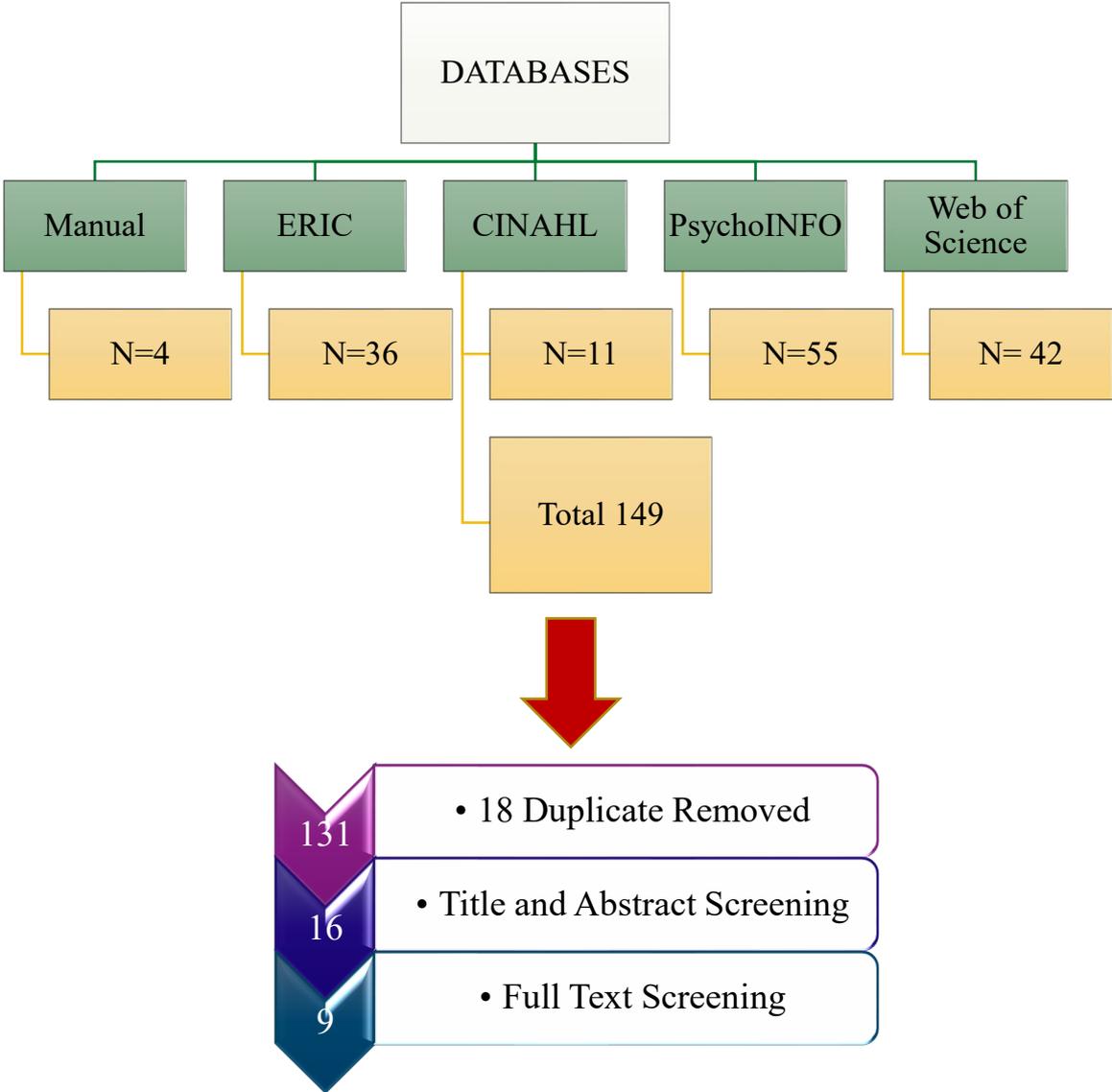
### 3.3.1 Title and Abstract Screening

In initial screening duplicated articles were excluded which were 18. Remaining 131 titles and abstracts were screened based on inclusion/ exclusion criteria. A total of 16 studies were selected for full text screening.

### 3.3.2 Full-Text

After full text screening of 16 articles only 9 studies were included the study. Out of 7 studies 1 study was had adult as a sample, 1 was a review study whereas 5 were not empirical studies, rather theoretical papers.

Figure 3.1 Flow chart of Search Strategy and Selection



### 3.4 Quality Assessment

The studies to be included in the review should be evaluated for their relevance and acceptability in order to be eligible study for review (Robey & Dalebout, 1998). The study followed the guidelines provided by Meline (2006) to assess the quality of the studies and the focus was on the relevance of the study to answer the research questions. Certain quality assessment tool are available to evaluate the quality of the research such as; Critical Review Form for Quantitative Studies (Law et al., 2010) (Appendix A), the CASP Qualitative Checklist (Appendix B) & CASP Randomized controlled trial check list (Appendix C) (Critical Appraisal Skills Programme, 2018). Based on the quality assessment tools each is article is assigned points. An article is considered high quality when it is equal to or above 75%, between 50 and 75% it was considered average and below this 50% was low quality. Out of the 9 studies 6 studies were of high quality whereas 3 studies were of medium quality. (See Appendix D for quality assessment score for each study)

### 3.5 Data Extraction

First general data was collected from the papers which consisted of title, author, publication date. In addition to that the data relevant to answer the research questions was extracted. Results of data extraction were analyzed which are written in the following section.

## 4. Results

All the 9 articles bare heterogeneous descriptions representative of hidden curriculum intervention methods in ASD children. To capture various results by multiple authors on such interventions, this s literature review examines data and information in subcategories and categories. Such interventions have suggestions that bare common thematic similarities.

### 4.1 Description of the Results

The first research questions seek to name hidden curriculum interventions that have been found to improve the social skills development of children with ASD and their effectiveness. After a thematic analysis of the primary results as presented by all the 9 articles, the following hidden curriculum interventions were found.

1. Theory of training to improve emotional understanding (Begeer et al., 2011)

2. Leveraging multimedia to improve social interaction, behavior, and communication.
  - i. Teaching Naming Facial Expression (Akmanoglu, 2015; Lin, Tsai, Li, Huang, & Chen, 2017).
  - ii. Reveal the Hidden Code (Doyle & Arnedillo-Sánchez, 2011).
3. Teaching labeling emotions to label their own (Conallen & Reed, 2016).
4. Teaching Language to enhance theory of training (Fisher, Happé, & Dunn, 2005).
5. Proximate social learning for social competence (Minne & Semrud-Clikeman, 2012; Moyse & Porter, 2015; O'Connor, 2016).

As it can be observed, leveraging multimedia to improve social interaction, behavior, and communication intervention has two subcategories. The following findings presented below seek to answer the second research asking for the characteristics of hidden curriculum interventions that are or can be used for the social skills development of children with ASD in schools.

#### 4.1.1 Theory of training to improve emotional understanding.

The article authored by researchers (Begeer et al., 2011) is predominantly about the theory of training and how it can be applied in order to improve emotional understanding of ASD children. Begeer et al. (2011) sought to test how the improvement in Theory of Mind techniques can help to advance them as functions of training children with ASD. The researchers set up a test using Theory of Mind mechanisms and examined the total score. The authors observed that the treatment group indicated a significant improvement when the Theory of Mind mechanisms were applied than the control group in the research-  $F(1, 34) = 5.01, p < .03, d = .75$ . False belief reasoning and first order as main elementary Theory of Mind tasks indicated significant improvement than any other subscale in the treatment group than the control group. Lin et al., (2017) made a primary discovery that the Theory of Mind functioned to mainly increase the quality of cognitive development in children with ASD and not the quantity. Using hierarchical regression models, the researchers analyzed results from 92 children recruited from age bracket of 4–10 years. The children were examined in various categories as formulated by the researchers when the Theory of Mind was applied. The areas examined include Child-Initiated Pretend Play, Theory of Mind Task Battery, Verbal Comprehension Index, and Autism Rating

Scale. The scores indicated that the results from the theory of mind techniques scores positively predicted ( $p < 0.001$ ) the importance of pretend play technique of symbolic and conventional imaginative play contexts.

#### 4.1.2 Leveraging multimedia to improve social interaction, behavior, and communication.

The researcher in these studies leveraged modern multimedia technologies as tools to teach children with ASD social interaction, behavior, and communication.

##### 4.1.2.1 Teaching Naming Facial Expression

Akmanoglu (2015) conducted a study to examine the potency of a teaching technique where children with ASD were required to name emotional facial expression using video modeling. The children were supposed to identify emotions such as being bored, feeling physical pain, disgusted, scared, surprised, happy, and sad. The researcher created several situations with a myriad of these facial expressions to the children with ASD. The results of the research indicated ASD children taught how to name emotional facial expressions was an effective technique in inculcating such cognitive abilities. Furthermore, such trained children were able to maintain these cognitive abilities from a variety of simulated situations. Akmanoglu (2015) findings are in tandem with the results recorded by Begeer et al., (2010) and Lin et al. (2017) both of whom discovered that repeated external stimuli using elements of the Theory of Mind positively impacted the cognitive abilities of children with ASD. In the research by Akmanoglu (2015), the researcher showed short films to children with ASD containing people with various facial expressions. All the 4 mothers who partook in this study indicated that their children responded positively video modeling. Their children exhibited social and emotional development even after the scientific research period in environments such as school.

##### 4.1.2.2 Reveal the Hidden Code

In the research done by Doyle and Arnedillo-Sánchez (2011), the researchers used an educational software as a tool to help careers of children with ASD to map adaptive teaching templated to afford a variety of media and suitable language for different children. These careers were tasked with the responsibility of creating and developing social stories in tandem with the developmental age, reading ability, learning style, special interests and reading ability of the children. The researcher observed that unlike traditional paper and pen methods, leveraging the educational software assisted in crafting an individualized learning experience

for each child. For instance, Parent 6 in the study was able to create a template which included a pictorial representation of 'time for haircut'. Progressively, child 8 was observed to improve their cognitive ability by interpreting the 'time for a haircut' template to mean it was time to visit the barbershop for a haircut. It is the same stimulation experiment performed by Lin et al., (2017) in which the researchers enacted a pretend play to refer to an expectation of a certain behavior from the children with ASD. Doyle and Arnedillo-Sánchez (2011) recorded dramatic improvement in social skills and behavior in children with ASD.

#### 4.1.3 Teaching labeling emotions to label their own

Conallen and Reed (2016) conducted a research on ten children with ASD from the age bracket of between 6.1 and 9.6 years. The researchers required the children to label the emotions of other people. One set of emotions had happy, sad, angry emotions to be matched to illustrated situations in order to learn how to label their own emotions. Before any intervention, the researchers observed that there was a recorded low mean rate in the results or respondents' correct responses. The interventions were independent match-to-sample, teaching match-to-sample, and tacting. After the teaching intervention Conallen and Reed (2016) observed that all respondents achieved a 100% percentage pass. However, this achievement dropped slightly in the independent match-to-sample where participants were required to repeat the criteria on their own. The researchers nonetheless observed that participants were able to maintain the tacting skill for five consecutive sessions.

#### 4.1.4 Teaching Language to enhance Theory of Training

Fisher et al. (2005) suggest that teaching language, and grammar to children with ASD enhances the Theory of Training. The results of the research showed that learning language and grammar impacted positively on False belief (FB) tasks that children with ASD undertook. Two tests were conducted. In one test, the children undertook the 'Sally-Anne task'. Two characters David a boy and Sally a girl formed the basis of an FB question to the participants. The participants were supposed to pass memory and reality controls and only credited if they passed both controls. In the second test, participants were given standard deceptive box task and only credited if they passed the reality control question. Results indicate that there were more passers of these tests among children with ASD than failures.

#### 4.1.5 5. Proximate social learning for social competence

The research study done by Retherford and Schreiber (2015) is another example in which technology was pertinent in imparting hidden curriculum. For 7 years, computer software and tools such as web links, Smartphones, iPads were used to plan, organize, and access various resources primarily meant to instruct adolescents and young adults exhibiting high-functioning autism on college preparation. The idea was to teach college preparation campers with ASD self-determination and help them appreciate the realm of universal design for learning which closely borders the Theory of Mind. Particularly, the researchers wanted to create an understanding of social relationships, self-advocacy, and social communication to foster an understanding of the hidden curriculum. Participants, therefore, participated in activities such as campus services, compass dining, compass living, managing finances, participating in campus recreation activities, and so on. Out of 34 parents whose children participated in the research study, 100% reported improvements in social skills in their children and 60% of the children concurred. 91% of the participants enrolled in post-secondary education and 45% went on to get full employment. Where did the 55% go?

Moyse and Porter (2015) in the descriptive results of their ethnographic case studies observed that even though children with autism respond to external hidden curriculum stimuli, teachers, parents, and caregivers often misunderstood the reactions and therefore failed to offer the needed intervention in a timely manner. O'Connor (2016) also applied proximate social learning by using peer groups. 70% of the peers of children with ASD exhibited high-acuteness of social inclusion after being sensitized on the social needs of children with ASD. The researchers wanted to improve the social competence of the children with ASD. The results indicated a significant improvement in social acceptance and skill and global self-esteem and ratings. A similar study was undertaken by Minne and Semrud-Clikeman (2012) who sought to foster social competence interventions for children with ASD. The researcher created simulated social interactions with intervention to teach social skills in overall behavioral development and also emotional development. All parents indicated their children were exhibiting high social skill competency after the intervention. The interventions included long-open communications with close relatives, refreshment sharing, demonstration of social skills learned among others.

## 5. Discussion

This research study sought to answer two research questions: The first question is what hidden curriculum interventions have been found to improve the social skills development of children with ASD. Secondly, how effective are hidden curriculum interventions that are used for the social skills development of children with ASD in schools. Applying the theory of intervention i.e. to see the effectiveness of the interventions (Burns & Grove, 2010), the results from the literature review indicated that applying hidden curriculum had a positive influence in developing the cognitive, social, and educational abilities of children with ASD.

### 5.1 Theory of training to improve emotional understanding

Theory of Mind training regimes are not necessarily novelty for children with ASD. This is particularly true considering that there is a limited body of knowledge in the area of Theory of Mind training as an effective technique in fostering emotional understanding for children with ASD. Children are noble creatures and some of the techniques devised to teach the Theory of Mind maybe irreparable dangerous to the children. Nonetheless, the researchers conducted an effective training of Theory of Mind to teach children with ASD conceptual social skills and emotions. This intervention can be regarded as SOLVE strategy where interventionist and parent were regarded as safe person (Myles et al., 2004). The effects of the treatment to the children with ASD were able to respond to mixed and complex emotions and beliefs and false beliefs, which shows that the intervention is useful and should be utilized in future (Burns & Grove, 2010). Some of the children went as far as understanding humor and second-order reasoning which indicated a level of awareness of emotions which reflects that intervention can have a positive impact on these ASD children's life.

### 5.2 Leveraging multimedia to improve social interaction, behavior, and communication

#### 5.2.1 Teaching Naming Facial Expression

Leveraging modern multimedia such as video modeling technique was an effective teaching methodology that aided in teaching children with ASD the naming of various facial expressions. The use of technological resources (Lee, 2011; Myles & Simpson, 2001) and with a combination of SOCCSS and SOLVE strategy (Myles et al., 2004) the intervention has been effective (Burns & Grove, 2010). The participants in the research could maintain the acquired skills right even after the end of the intervention. In addition, the children with ASD could still generalize the different simulation circumstances and conditions recreated by using different settings, different people, and different materials. Furthermore, teachers, mothers, as well as postgraduate students noted that children with ASD could be trained to acquire emotional facial expressions (Marraffa & Araba, 2016; Myles & Simpson, 2001; Whitby et al., 2012). It is the recalling memories actions and getting some of them right that motivates children with ASD to succeed in these

kinds of stimuli. Therefore, video modeling was effective in teaching social skills of understanding general expressions for communication, and it was signal that interventions can solve the problems of the children with ASD (Bölte, 2014).

### 5.2.2 Revealing the Hidden Code

Modern multimedia was also applied in a research where caregivers had access to technology as teaching aids (Safran, 2002). There were overwhelming indications that caregivers who leveraged Reach & Teach technology to create and teach personalized social stories encouraged flexible thinking and motivated the children with ASD (Whitby, Ogilvie & Mancil, 2012). Working with Reach & Teach technology allowed them to enhance the intervention in terms of diversifying social stories activities for the children. They were able to adopt different examples of social stories or even create new stories using the tools of multimedia authoring. Resultantly, the researchers noted the importance of a diverse selection of social stories activities to enhance and adapt to different learning styles, a child's developmental age, reading abilities, special interests, and even attention span.

### 5.3 Teaching labeling emotions to label their own

The overall results indications were that teaching tacts representing emotions and conditioned situations to children with ASD help them to develop the ability of language of emotions. The tacting training as the researchers observed could be further scaled to improve the children's ability and results of tacting each other's emotions. More importantly, tacting and skills acquired thereafter could be further generalized to other novel situations. Interestingly, the children appeared to learn how to associate different tacts of emotions not only to that of their colleagues but also to that of their own emotions. It was evident that children with ASD could learn and sustain how to differentiate between emotions.

### 5.4 Teaching Language to enhance the Theory of Training

The main interest was in determining the relationship between false belief performance and language in children with ASD. The results generally indicated that there was a huge correlation between false belief performance and several test scores related to language abilities. Language, particularly performance in false belief activities and grammar indicated a strong correlation in children with ASD. However, the research indicated that even though it was not as strong as grammar vocabulary was as important in enhancing performance in false belief activities. Therefore, teaching language in children with ASD may spur social understanding, and the interventionist must be careful about decision making of carrying this intervention out (Burns & Grove, 2010).

### 5.5 Proximate Social Learning for Social Competence

It was evident that social inclusion is very critical in enhancing the level of peer acceptance and assistance in children with ASD. Data from peer group analysis obtain post-intervention should clear positive shifts

even after the end of the study among the entire peer group (Safran, 2002; Lee, 2011; Myles & Simpson, 2001; Whitby, Ogilvie & Mancil, 2012). Apart from general acceptance, there was collective and individual empathy towards the children with ASD. Such children were able to exhibit a sense of belonging that was non-existent before within the school setting. In the course of the study, the researchers observed that there was a beginning to a formation of true friendship groups and a positive sense of self. Therefore, such results indicate there is a potential to exponentially improve the lives of children ASD. Socially isolated children who have neuro-typical conditions. The individualistic social intervention approach is very important as an addition to school curriculums. Such hidden curriculum are not included in schoolwork. Therefore, it is possible that children who are living with ASD are missing out on best opportunities to develop social experiences and relationships into adulthood (Scott & Chris, 2007). Creating empathic and supportive communities from home to school will help to foster essence acceptance, understanding, social skill for survival, and expression of positive feelings to assist children living with ASD to saliently navigate this complex social world.

## 6. Conclusion

The results of this literature review on various programs have come to a conclusion that multifaceted deficits and learning deficiencies in children with ASD are not entirely resistance to change and certainly not static. To the contrary, children living with ASD when placed in situations that foster interaction with others where they can receive frequent feedback and guidance, have shown clear evidence of minimizing the deficits and resistance to change thereby building social competence, skills, and acceptance. The review revealed in that during the intervention programs the children living with ASD generally expressed an experience of emotional positiveness. This feel-good attitude is an important motivator to enhance learning in these children. In many of the studies under review, intervention consistently led to more interconnectedness among the children, in general, forming stronger bonds with teachers and parents whilst at the same time gaining more self-confidence. Emotional development assisted children living with ASD to approach social functions and situations more confidently. They increased their social expression and verbal cues while developing a genuine interest in other children as well as adults. Parents who participated in various intervention programs felt more connected to their children since they learned various expressions and verbal cues that help them to respond to the social needs of the children. This was an important discovery in all research which underscored the importance of the involvement of parents in developing social-emotional functioning in their children.

### 6.1 Further Research

There is need for future studies to evaluate the utility and importance of incorporating more apparent sessions to promote parental involvement in the research studies. From the limited studies above, it is clear

that parental involvement in the interventions had a positive influence in fostering and teaching social skills to children living with ASD beyond the school setting. Furthermore, there needs to be a promotion of parental sessions that can form a carcass where caregivers exchange information. Additionally, close collaboration between researchers, teachers, and parents may also influence positive outcomes. Generally, such collaboration leads to a high level of maintenance as well as a generalization of lessons to result in a powerful contribution to interventions and besides targeting children with ASD.

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# Appendix A

## *Critical Review Form – Quantitative Studies*

© Law, M., Stewart, D., Pollock, N., Letts, L., Bosch, J., & Westmoreland, M., 1998  
 McMaster University

**CITATION:**


**Comments**

<p><b>STUDY PURPOSE:</b>                  Was the purpose stated clearly?  <input type="radio"/> Yes  <input type="radio"/> No</p>	<p>Outline the purpose of the study. How does the study apply to occupational therapy and/or your research question?</p>
<p><b>LITERATURE:</b>                  Was relevant background literature reviewed?  <input type="radio"/> Yes  <input type="radio"/> No</p>	<p>Describe the justification of the need for this study.</p>
<p><b>DESIGN:</b>  <input type="radio"/> randomized (RCT)  <input type="radio"/> cohort  <input type="radio"/> single case design  <input type="radio"/> before and after  <input type="radio"/> case-control  <input type="radio"/> cross-sectional  <input type="radio"/> case study</p>	<p>Describe the study design. Was the design appropriate for the study question? (e.g., for knowledge level about this issue, outcomes, ethical issues, etc.)</p> <p>Specify any biases that may have been operating and the direction of their influence on the results.</p>

<p><b>SAMPLE:</b> N=  Was the sample described in detail? o Yes o No  Was sample size justified? o Yes o No o N/A</p>	<p>Sampling (who; characteristics; how many; how was sampling done?) If more than one group, was there similarity between the groups?          Describe ethics procedures. Was informed consent obtained?</p>	
<p><b>OUTCOMES:</b>  Were the outcome measures reliable? o Yes o No o Not addressed  Were the outcome measures valid? o Yes o No</p>	<p>Specify the frequency of outcome measures (i.e., pre, post, follow-up)          Outcome areas (e.g., self care, productivity, leisure).                      List measures used.</p>	
<p><b>INTERVENTION:</b> Intervention was described in detail? o Yes o No o Not addressed  Contamination was avoided? o Yes o No o Not addressed o N/A  Cointervention was avoided? o Yes o No o Not addressed o N/A</p>	<p>Provide a short description of the intervention (focus, who delivered it, how often, setting). Could the intervention be replicated in occupational therapy practice?</p>	

-2-

Comments

<p><b>RESULTS:</b> Results were reported in terms of statistical significance? o Yes o No</p>	<p>What were the results? Were they statistically significant (i.e., p&lt;0.05)? If not statistically significant, was study big enough to show an important difference if it should occur? If there were multiple outcomes, was that taken into account for the statistical analysis?</p>
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<p> <input type="radio"/> Not addressed  <input type="radio"/> N/A </p> <p> Were the analysis method(s) appropriate?  <input type="radio"/> Yes  <input type="radio"/> No  <input type="radio"/> Not addressed </p> <p> Clinical importance was reported?  <input type="radio"/> Yes  <input type="radio"/> No  <input type="radio"/> Not addressed </p>	<p> What was the clinical importance of the results? Were differences between groups clinically meaningful? (if applicable) </p>
<p> Dropouts were reported?  <input type="radio"/> Yes  <input type="radio"/> No </p>	<p> Did any participants drop out from the study? Why? (Were reasons given and were dropouts handled appropriately?) </p>
<p> <b>CONCLUSIONS AND CLINICAL IMPLICATIONS:</b> </p> <p> Conclusions were appropriate given study methods and results  <input type="radio"/> Yes  <input type="radio"/> No </p>	<p> What did the study conclude? What are the implications of these results for occupational therapy practice? What were the main limitations or biases in the study? </p>

## Appendix B

### CASP Checklist: 10 questions to help you make sense of a Qualitative research

1. Was there a clear statement of the aim of the researcher?
2. Is the qualitative methodology appropriate?
3. Was the research design appropriate to address the aims of research?
4. Was the recruitment strategy appropriate to the aims of research?
5. Was the data collected in a way that addressed the research issue?
6. Has the relationship between researcher and participants been adequately considered?
7. Have ethical issues been taken into consideration?
8. Was the data analysis sufficiently rigorous?
9. Is there a clear statement of findings?
10. How valuable is the research?

## Appendix c

CASP Checklist: 11 questions to help you make sense of a Randomized Controlled Trial

How to use this appraisal tool: Three broad issues need to be considered when appraising a trial:

Are the results of the study valid? (Section A)

What are the results? (Section B)

Will the results help locally? (Section C)

The 11 questions on the following pages are designed to help you think about these issues systematically. The first three questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions.

Section A: Are the results of the trial valid?

1. Did the trial address a clearly focused issue?
2. Was the assignment of patients to treatments randomized?
3. Were all of the patients who entered the trial properly accounted for at its conclusion?
4. Were patients, health workers and study personnel ‘blind’ to treatment?
5. Were the groups similar at the start of the trial?
6. Aside from the experimental intervention, were the groups treated equally?

Section B: What are the results?

7. How large was the treatment effect?
8. How precise was the estimate of the treatment effect?

Section C: Will the results help locally?

9. Can the results be applied to the local population, or in your context?
10. Were all clinically important outcomes considered?
11. Are the benefits worth the harms and costs?

## Appendix D

### Main Articles Selected for the Study

S.N	Article Title	Author & Year	Country	Approach	Participants	Main findings	Quality
1	Effectiveness of Teaching Naming Facial Expression to Children with Autism Via Video Modeling	Nurgul Akmanoglu 2015	Turkey	Quantitative	20	Teaching the naming of emotional facial expressions to children with autism is effective.	8
2	A teaching procedure to help children with autistic spectrum disorder to label emotions	Kevin Conallen, Phil Reed 2015	UK	Quantitative	10	Showed an improved understanding of their own emotions and those of others	7
3	Using multimedia to reveal the hidden code of everyday behaviour to children with autistic spectrum disorders (ASDs)	Theresa Doyle and Inmaculada Arnedillo-Sánchez 2011	Ireland	Qualitative	7	Participants quickly learned the basics of the intervention and either adapted or created social stories	9
4	Theory of mind predominantly associated with the quality, not quantity, of pretend play in children with autism spectrum disorder	Shu-Kai Lin · Ching-Hong Tsai · Hsing-Jung Li · Chien-Yu Huang · Kuan-Lin Chen	Taiwan	Quantitative	92	Theory of mind has a predominant role in the quality, not the quantity, of pretend play of children with autism spectrum disorder	9
5	The relationship between vocabulary, grammar, and false belief task performance in children with autistic spectrum disorders and children with moderate learning difficulties	Naomi Fisher, Francesca Happé, and Judy Dunn 2010	UK	Quantitative	114	Language, in particular grammar, and theory of mind appear to be more strongly related in children with ASD	7
6	Theory of Mind Training in Children with Autism: A Randomized Controlled Trial 2010	Sander Begeer · Carolien Gevers · Pamela Clifford · Manja Verhoeve · Kirstin Kat · Elske Hoddenbach · Frits Boer 2016	Netherlands	Quantitative	40	Study does not indicate strong evidence for the effectiveness of a ToM treatment on the daily life mindreading skills.	9
7	A Social Competence Intervention for Young Children With High Functioning Autism and Asperger Syndrome: a Pilot Study.	Margaret Semrud-Clikeman 2011	USA	Qualitative	5	Social limitations of these children improved when provided with the necessary environmental resources.	7
8	The use of 'Circle of Friends' strategy to improve social interactions and social acceptance: a case study of a child with Asperger's Syndrome and other associated needs	EILEEN O'CONNOR 2016	USA	Qualitative	10	Child was able to understand far more easily the 'hidden curriculum' that neuro-typical children find so easy to decipher.	9
9	The experience of the hidden curriculum for autistic girls at mainstream primary schools	R. Moyse & J. Porter 2015	UK	Qualitative	3	s. Teachers need to understand how autistic girls present, and how they learn, if they are to recognise the need to illuminate the hidden curriculum.	9

