



JÖNKÖPING UNIVERSITY

*School of Education and
Communication*

BEHAVIOR MANAGEMENT INTERVENTIONS FOR STUDENTS WITH ASD IN INCLUSIVE CLASSROOMS

A Systematic Literature Review

Evangelia Ioannou

One year master thesis 15 credits
Interventions in Childhood

Supervisor
Johan Malmqvist

Spring Semester 2016

Examinator
Mats Granlund

ABSTRACT

Author: Evangelia Ioannou

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Pages: 41

During the last decade, the number of children diagnosed with Autism Spectrum Disorders (ASD) has increased and more and more children with ASD are educated in inclusive classrooms. Although their inclusion can have several benefits, teachers face some challenges. The main reason is these students' problem behavior or lack of a desirable behavior. The aim of this systematic literature review was to analyze interventions for behavior management of students with ASD, since the ratification of Salamanca Statement and Framework for Action (UNESCO, 1994), in inclusive preschool and primary school classrooms. The aim was also to examine the outcomes of these interventions. Four databases were searched and nine articles were included for data extraction. Results indicated the implementation of different interventions such as function-based interventions, peer support, visual cue cards, structured teaching with graduated guidance, social stories and social scripts. The target behavior was principally assessed through Functional Behavioral Assessment (FBA) or it was not assessed at all. Some interventions were provided by the researcher or the teacher only, some were provided by different people in different phases and some were provided by two or more people together. Interventions' goals were to decrease problem behavior, to increase desirable behavior and both to decrease problem behavior and to increase desirable behavior. It was observed that all interventions reached their goals, even though at a low level in some cases. In conclusion, this literature review provided a summary of interventions and their outcomes for behavior management of students with ASD in inclusive classrooms with a further purpose to help the teachers identify the strategies most useful for their classroom.

Keywords: Autism Spectrum Disorders (ASD), behavior management, inclusive classroom, interventions, preschool, primary school

Postal address

Högskolan för lärande
och kommunikation (HLK)
Box 1026
551 11 JÖNKÖPING

Street address

Gjuterigatan 5

Telephone

036-101000

Fax

036162585

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1 Introduction

During the last decade, there has been a remarkable increase of children diagnosed with Autism Spectrum Disorders (ASD). In combination with the movement in the field of education towards including students with various disabilities in mainstream classrooms, this has led to more and more students with ASD attending mainstream education (Syriopoulou-Delli, Cassimos, Tripsianis & Polychronopoulou, 2012). However, this imposes certain challenges for teachers in managing their behavior and there is a need for relevant interventions in inclusive classrooms. In addition, teachers need to be informed about what relevant interventions have been implemented and what difference they have made for the students' with ASD behavior. For these reasons, the present systematic review intends to identify interventions for behavior management of students with ASD as well as to present their outcomes on the students' behavior.

1.1 Autism Spectrum Disorders (ASD)

1.1.1 Definition

A commonly used definition of autism in research is the one by the American Psychiatric Association. The term "Autism Spectrum Disorders (ASD)" was established in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM V) to be used as a "single umbrella disorder" (APA, 2013, pp. 1). In the previous version of DSM, DSM-IV, the term used instead of ASD was pervasive developmental disorders (PDD) which include "autistic disorder, Asperger's disorder, childhood disintegrative disorder, or the catch-all diagnosis of pervasive developmental disorder not otherwise specified" (APA, 2013, pp. 1). Different types of diagnoses related to ASD are not specified, due to considering these conditions as a spectrum rather than separate disorders as in the past. This was decided principally for reasons of clinical diagnosis and to point out the individual differences in terms of symptoms and behaviors among people diagnosed with this disorder (APA, 2013). The new criteria describe in a better way the basic features and the nature of autism, they offer an umbrella term for diagnosis, and they involve assessing each individual's support needs, which helps in providing clinical services (Lai, Lombardo, & Baron-Cohen, 2014). Adapting the latest definition of the American Psychiatric Association, the term ASD will be used in the present systematic review to refer to the disorders also known as PDD.

1.1.2 Characteristics of ASD

There are great variations in the severity of symptoms among individuals diagnosed with ASD, as well as within the same individual over time (Committee on Educational Interventions for Children with Autism, 2001). Despite these variations, some common characteristics are deficits in communication, dependence on routines, sensitivity to changes in the surrounding, and intense focus on inappropriate items (APA, 2013). Another important area where many individuals with ASD present deficits is the area of socialization (Committee on Educational Interventions for Children with Autism, 2001; Falkmer, Granlund, Nilholm & Falkmer, 2012; Falkmer, Oehlers, Granlund, & Falkmer, 2013). Having deficits in socialization means, for

example, having difficulties in initiating social interactions, in responding to others' initiations, and in maintaining social interactions (Watkins et al., 2015).

ASD are disorders with a neurobiological basis, which means that they reflect “the operation of factors in the developing brain” (Committee on Educational Interventions for Children with Autism, 2001, pp.11). The risk for ASD is connected to environmental factors early in development (Lai et al., 2014). For instance, Stampoltzis, Papatrecha, Polychronopoulou and Mavronas (2012) mention that various studies have proved a strong association of the risk for ASD with prenatal and postnatal conditions including preterm birth, advanced parental age and birth after assisted conception. As for the prevalence of ASD, research has noted that it is higher in males than in females (Lai et al., 2014; Stampoltzis et al., 2012). Furthermore, ASD is associated to co-morbid disorders, like anxiety disorders, phobias, ADHD and dyslexia, as well as to epilepsy and various other syndromes (Stampoltzis et al., 2012). Individuals diagnosed with ASD may also have reduced basic functional and learning skills (Syriopoulou-Delli et al., 2012). More specifically, they often present deficits in language and, thus, in understanding verbal and written instructions (Lytle & Todd, 2009), impairment in executive functions and in recognizing emotions (Falkmer et al., 2013), in addition to decreased ability of adapting behavior and expression of emotions in a specific situation (Falkmer et al., 2012).

1.2 Preschool and Primary School settings

Early Childhood Education, including the settings referred to as preschool, daycare, kindergarten and nursery school, usually starts for children at the age of 3 years, and even earlier in some cases such as the Nordic countries. Therefore, variations exist around the world about what is an Early Childhood Education setting and what is the age of children educated there (Moss, 2013). The term Preschool will be used in this literature review meaning the setting where children from 2 to 5 years old are educated. The movement to Compulsory Education, meaning primary or elementary school settings, happens usually at 5 or 6 years, with some exceptions where it starts at 7 years of age (Moss, 2013). In this literature review, school settings belonging to compulsory education will be mentioned as Primary School only and they will refer to children from 5 to 12 years old. Taking these age ranges into account, the target group of children will be from 2 to 12 years old that attend an inclusive Preschool or Primary School classroom.

1.3 Inclusive education

The most important framework that introduced the concept of inclusion in education is the Salamanca Statement and Framework for Action on Special Educational Needs (UNESCO, 1994). In the Framework for Action it is declared that “there is an emerging consensus that children and youth with special educational needs should be included in the educational arrangements made for the majority of children. This has led to the concept of the inclusive school” (paragraph 3). Similarly, Mitchell (2008) states that a simple basic definition of inclusive education is the placement of students with special educational needs in regular education settings. Therefore, one aspect of inclusion is educating children with special needs in a mainstream setting, which is referred to as integration (Maxwell, Alves, & Granlund, 2012). In other words, integration has been mainly related to

trying to move students with special needs from special to ordinary schools and “help them up to the existing curriculum” (Reindal, 2015, p.1). However, simply integrating students with special needs in a mainstream setting is not enough for achieving inclusion (Falkmer et al., 2013; Nilholm & Alm, 2010).

At this point, it should be clarified that inclusion and integration are considered two different concepts, but their distinction can be challenging. As Nilholm and Alm (2010) point out, referring to inclusion often implies simply applying practices of special education in a general classroom, but without really changing teaching methods. Even though currently there is not a commonly accepted definition of inclusion in research, it has been described as actions to adapt ordinary schools to meet the diverse needs of students and, hence, modify the school system (Reindal, 2015). In the second paragraph of the Salamanca Statement (UNESCO, 1994) it is stated that “those with special educational needs must have access to regular schools which should accommodate them within a child centered pedagogy capable of meeting these needs”. Thus, this definition of inclusion involves adjusting the school environment, in addition to educating the child along with his or her typically developing peers. As Maxwell et al. (2012) state, inclusion involves changes in all contexts surrounding the child, from distant (such as policies and laws) to close ones (the level of the classroom). It requires adaptations of curriculum, of teaching and assessment methods, and of arrangements for accessibility (Mitchell, 2008). Thus, the concept of inclusion is more complex than integration.

Other terms are sometimes used to talk about inclusive education. For example, Mitchell (2008) notes that the term mainstreaming is occasionally used instead of inclusive education. In the present systematic review, it is decided not to use the concept educational setting because it refers to the whole school setting, whereas the focus of the review is specifically on the classroom. In order to cover other concepts like mainstream, general or regular classroom, the term inclusive classroom(s) will be used for the purpose of this systematic review. This will mean a classroom in an inclusive school where the student is educated with his or her typically developing peers and where interventions are implemented without isolating the student with ASD.

1.4 Inclusive education for students with ASD: benefits and challenges

Inclusive education has been proved to bring about benefits for students with ASD. More specifically, the inclusion of students with ASD in an inclusive classroom can result in higher frequency and involvement in social interactions and increased social support and networks (Lindsay, Proulx, Scott & Thomson, 2014). This is because their inclusion can provide significant social opportunities with typically developing peers (Falkmer et al., 2013; Lindsay et al., 2014). In addition, they can achieve superior academic objectives than students of the same age and diagnosis educated in separate settings (Lindsay et al., 2014).

In spite of such possible benefits, fully including children with ASD in the inclusive classroom presents certain challenges for teachers (Lindsay, Proulx, Thomson & Scott, 2013). Crosland and Dunlap (2012) emphasize that one frequently reported barrier to inclusion is that students exhibit problem behaviors, which results in decreased possibility for them to be educated in an inclusive education setting. Behavioral aspects are often considered by teachers as important as increasing academic skills for students with disabilities in general to succeed in the inclusive education setting (Carpenter & McKee-Higgins, 1996).

Research has highlighted that schools often make great efforts to successfully meet the needs of students with ASD. Especially teachers frequently cope with substantial barriers in managing their needs (Lindsay et al., 2013). As Lindsay et al. (2013) and Wood, Ferro, Umbreit and Liaupsin (2011) report, one of the challenges teachers face in including the students with ASD is understanding and managing their behavior. They often consider they are unprepared for it, especially when they have to deal with these students' behavioral outbursts or stress caused by unstructured activities (Lindsay et al., 2013). Syriopoulou-Delli et al. (2012) also reported in their study that teachers' limited working experience with students with ASD, lack of appropriate qualifications and lack of education in this area lead to stress when dealing with these students' behavioral difficulties. Moreover, confusion and contradictions about autism exist among teachers, concerning mostly the nature of the disorder and the most effective approaches to manage behavior of students with ASD. This may result in an even greater difficulty to serve these students' needs (Syriopoulou-Delli et al., 2012).

1.5 Behavior management

1.5.1 Definitions of behavior management

Behavior management seems to be associated with classroom management. As mentioned by Emmer and Sabornie (2015), one definition of classroom management includes the construct of behavior management described as the intended attempts aiming to avoid misbehavior, on one hand, and the ways a teacher responds to misbehavior, on the other hand. Accordingly, Martella et al. (2012) translate behavior management as how one manages the student's behavior and it is associated not only with reactive approaches, but also with proactive ones. Salkovsky, Romi, and Lewis (2015) also point out that the term classroom management is related to the strategies teachers use to manage student behavior, interactions and learning.

Emmer and Sabornie (2015) provide a definition that shows the relation between management of behavior and management of the classroom: "Classroom management is clearly about establishing and maintaining order in a group-based educational system whose goals include student learning as well as social and emotional growth. It also includes actions and strategies that prevent, correct, and redirect inappropriate student behavior" (pp.8).

Classroom management involves teachers' actions that aim to establish in the classroom an atmosphere which supports and promotes academic achievement, social and emotional learning. Therefore, maintaining order, including teachers' actions and strategies for solving the problem of order in the classroom, is only one part of classroom management. More importantly, it intends to support students in academic learning, as well as to enhance social and emotional development. Managing the classroom is considered a significant teaching skill. In that sense, a teacher is effective when he or she is able to decrease disturbance, having as primary goal to establish a learning environment supportive to students' intellectual and emotional development (Emmer & Sabornie, 2015).

From these definitions it can be deduced that one basic goal of classroom management is to establish order in the classroom, but more important is the goal of students' social and emotional growth, in addition to their academic achievement.

With all the above definitions in mind, the present systematic literature review focused on two types of intervention. First, the study reviewed interventions that intended to correct problem behavior. Second, it reviewed interventions aiming to increase desirable behaviors and social interactions of the students with ASD within the inclusive classroom. “Behavior management” in this systematic review is defined as the reactive and proactive interventions implemented to manage the students’ with ASD behavior with the intention to establish an orderly environment in the classroom and, more importantly, to create a positive atmosphere that will enhance social, emotional and academic development.

1.5.2 Applied Behavior Analysis (ABA)

A significant behavioral approach is Applied Behavior Analysis (ABA). This became known during the mid-twentieth century as a result of applying the behavioral theory to the behavior of human beings in natural contexts, outside of the laboratory. This behavioral theory originates from Skinner’s experimental study of human behavior (Wolery, 2000). Skinner and other behaviorists claimed that behavior is the outcome of the individual’s functioning, history of learning experiences, and present conditions. More specifically, the child’s actions produce some consequences in the environment and these consequences affect the possibility for his behavior recurring. However, these consequences may not only affect the child’s behavior, but also the behavior of adults in his or her environment. Therefore, interactions between the child and people, like professionals or caregivers, in his or her environment are bidirectional and constant (Wolery, 2000).

ABA is based on the knowledge that the environment is the reason why a great part of our behaviors occur. In other words, ABA focuses on how environmental aspects influence our behavior and how we can modify behavior by changing these environmental characteristics. Therefore, a basic assumption of such a behavioral approach is that every behavior is caused by outer and physical causes (Martella, Nelson, Marchand-Martella & O’Reilly, 2012).

ABA is the origin of the acknowledged paradigm of A-B-C, which stands for Antecedents-Behavior-Consequences. Antecedents are the incidents that take place shortly prior to the behavior, and appear to be the cause of it. Consequences are the events that occur right after the behavior and appear to maintain it. (Martella et al., 2012; Mitchell, 2008). There is a cause-and-effect relationship between behavior and consequences, also called a “functional relationship” between these two elements (Martella et al., 2012, pp.114). This means that there is a connection between behavior and consequences, as certain consequences maintain or decrease the probability of a behavior. However, in order to understand the reasons behind the individuals’ behavior we need, in addition, to identify not only the consequences, but also the antecedents of the behavior (Martella et al., 2012).

According to the behavioral perspective, a behavior takes place in a specific context and its consequence affects the possibility for its reoccurrence in the same context. A consequence can be of two types: adding or presenting a new stimulus and removing a present stimulus. Accordingly, the likelihood of the behavior appearing again can be either increased or decreased. This can happen through four different relationships, which basically include punishment and reinforcement (Wolery, 2000).

The four relationships that affect the likelihood of the behavior recurring are positive and negative reinforcement, and punishment of type I and type II. Positive reinforcement means adding a new stimulus, while negative reinforcement means removing an existing one, but both types of reinforcement result in increasing the likelihood of the behavior recurring (Wolery, 2000). In more simple words, positive reinforcement is about providing the child with something positive (material or not) so that the desirable behavior will occur again. Negative reinforcement is about eliminating something negative or unpleasant for the child (Mitchell, 2008). On the other hand, punishment type I and punishment type II result in decreased likelihood of the behavior recurring. The first type of punishment involves presenting a new stimulus, whereas the second type involves removing an existing stimulus, with the intention to decrease the occurrence of a behavior in both cases. In general, reinforcement increases the possibility of a behavior occurring again while punishment decreases it (Wolery, 2000).

1.5.3 Functional Behavioral Assessment (FBA)

Assessments are used to recognize what is the relationship between a specific behavior and different consequences (Martella et al., 2012). Recently there has been a movement in research and teaching towards a specific type of assessment, the Functional Behavioral Assessment (FBA) (Stahr, Cushing, Lane, & Fox, 2006), which is considered to be a part or component of ABA (Mitchell, 2008). FBA is a problem-solving process (Koegel, Matos-Freden, Lang, & Koegel, 2012) that consists of procedures to determine the function of a student's repeated problem behavior (Mitchell, 2008; Stahr et al., 2006). It seeks to identify why the student behaves in a certain way, and what he or she tries to gain or avoid with this behavior (Mitchell, 2008). Thus, it goes further than simply describing the form and characteristics of the behavior. More in concrete, FBA is an assessment whose purpose is to examine the contextual factors that cause and maintain the child's problem behavior (Koegel et al., 2012). The central concept of FBA is that a problem behavior is the result of specific antecedents that cause it and/or specific consequences that maintain it. As soon as antecedents and consequences are identified, interventions are planned to decrease the problem behavior (Mitchell, 2008). In other words, identifying what is the function of the behavior (i.e. why it occurs) serves as the basis to plan interventions (Stahr et al., 2006). More specifically, the information collected through the FBA is used as a basis for replacing the problem behavior with a more desirable one. First, the goal is to alter antecedents or consequences for that behavior, and second to replace it with a more desirable behavior (Mitchell, 2008).

There are three basic types of FBA (Martella et al., 2012). The first type is indirect assessments, where information is obtained in ways other than examining directly the contextual events. This means gathering information from the teachers or other professionals that meet the child and from caregivers. Children themselves can and should also be interviewed. Examples of indirect assessments are interviews, rating scales and checklists. The second type of FBA is descriptive analyses involving direct observation in the student's natural context. This kind of analyses includes, among others, A-B-C (Antecedent-Behavior-Consequence) analyses, observation forms and scatter plots. The third type is functional analyses. These are characterized as "quantitative direct observation of behavior under preselected and controlled conditions" (Martella et al., 2012, pp. 134).

1.6 Interventions

The basis of early childhood intervention is the idea that human intervention can be the way to change and manage aspects of development (Bornman & Granlund, 2007). According to Bornman and Granlund (2007) interventions can be divided in two general categories. The first category is broad based interventions with a complex design and with the aim to influence development as a whole. The second category is focused interventions that target single developmental areas. Interventions are the actions that people around the child with disability and the professionals take with the intention of helping this child to achieve a preferred outcome. These actions involve what people around the child do, as well as adapting the physical environment and providing assistive technology (Björck-Åkesson, Granlund, & Olsson, 1996). When considering interventions in the classroom context, different people may be the intervention providers. It can be the experts, i.e. a researcher or a researchers' team, or people who work regularly with the child, including the general or special education teachers, an assistant or other school staff. However, as noted by Crosland and Dunlap (2012), there is a decreasing number of studies carried out in the classroom context during natural conditions, with the teacher as the main intervention provider. Members of the family and caregivers can also participate in intervention implementation, either directly or indirectly, through home-school communication.

Intervention providers may also collaborate when implementing interventions. Collaborative problem solving is essential during the intervention process. Professionals, who have expert knowledge, are the ones who give significant information about the most important components of the intervention, whereas people who belong in the child's close environment should give their opinion about the way and the time of implementation (Björck-Åkesson et al., 1996). Especially in children with ASD research has been pointed out that collaboration among professionals, such as the researcher, and people from the child's close environment, such as teachers and family, is necessary in order to implement the intervention with consistency across settings where the child participates and school staff he or she meets (Koegel et al, 2012; Guldberg et al., 2011).

Bearing in mind the definition by Björck-Åkesson et al. (1996) and the categories of interventions noted by Bornman and Granlund (2007), the present literature review will consider interventions as the intended actions taken by people around the child with ASD in order to achieve a desired outcome related to his or her behavior. Emphasis will be on focused interventions that target a specific area of development, that is a specific behavior of the child.

2 Rationale

To sum up, the number of students with ASD in inclusive classrooms keeps rising. While it has been discussed how their inclusion can have several benefits, it also imposes challenges for teachers. The main reason for that is problem behavior or lack of a desirable behavior. Previous research has reviewed interventions for including students with ASD, but without focusing on behavior management (Crosland & Dunlap, 2012; Harrower & Dunlap, 2001; Koegel et al., 2012). Previous research has also reviewed interventions to decrease challenging behavior, but without focusing also on interventions to increase desirable behavior, such as the

study by Machalicek, O'Reilly, Beretvas, Sigafoos, and Lancioni (2007). Thus, it would be useful for teachers and other professionals involved in educating children with ASD to know what interventions have been applied in inclusive classrooms targeting to manage behavior of these students, and what were their outcomes for the students. Therefore, this study intends to identify such interventions and their outcomes on students' behavior.

3 Aim

The aim of this systematic literature review was to analyze interventions for behavior management of students with ASD, since the ratification of Salamanca Statement and Framework for Action (UNESCO, 1994), in inclusive preschool and primary school classrooms. The aim was also to examine the outcomes of these interventions

4 Research questions

Two research questions were addressed in order to answer the aim:

- 1) What implemented interventions for behavior management of students with ASD in inclusive classrooms of preschool and primary school have been reported in research since 1995?
- 2) What were the outcomes of these interventions on the behavior of students with ASD?

5 Method

5.1 Search strategy

In order to answer the research questions, a systematic literature review was carried out through investigating four databases: ERIC, Academic Search Elite, PsycARTICLES, and PsycINFO. The search was done in March, 2016. Inclusion and exclusion criteria for articles are presented in section 5.2 ("Selection criteria").

The search words initially intended to be used were "Autism Spectrum Disorders AND Behavior management AND Inclusive education". Thesaurus on ERIC database was used to get alternative versions of this search word combination.

More specifically, instead of "Autism Spectrum Disorders" Thesaurus proposed "Pervasive Developmental Disorders", which was selected. It included other related terms, from which "Asperger Syndrome" and "Autism" were considered relevant to this study. These three terms were selected to be searched linked with "OR" for broader results. "Behavior management" was not identified in Thesaurus, thus it proposed to use "Behavior modification". After selecting this term, other related ones were suggested from which "Intervention" was considered relevant. These terms were selected to be used linked with "OR" as well. Finally, "Inclusive education" was replaced by "Inclusion" and, following the same procedure as for the above mentioned terms, "Inclusion" and "Mainstreaming" were linked with "OR".

The final combination of words was ("Pervasive Developmental Disorders" OR "Asperger Syndrome" OR "Autism") AND ("Behavior Modification" OR "Intervention") AND ("Inclusion" OR "Mainstreaming"), using

“OR” to broaden the search and “AND” to narrow it down. The same combination of search words was used in all four databases searched through.

However, in the databases PsycINFO and PsycARTICLES, there was also the option of excluding age groups that were not of focus for the study, i.e. younger than two and older than twelve years old, before reading the abstracts by selecting the appropriate boxes. Therefore, the age groups "Adulthood (18 yrs & older)", "Adolescence (13-17 yrs)", "Young Adulthood (18-29 yrs)", "Thirties (30-39 yrs)", "Middle Age (40-64 yrs)", "Infancy (2-23 mo)", "Aged (65 yrs & older)" and "Neonatal (birth-1 mo)" were excluded in PsycINFO, in addition to "Very Old (85 yrs & older)" in PsycARTICLES.

The search procedure consisted of two basic steps. First, articles not published in peer-reviewed journals, and published before 1995 were removed in each database. Second, the articles remaining were reviewed on title and abstract level. At this point, duplicates (i.e. articles already found in one of the other databases) were removed. If the article was considered relevant for the study, but participants and setting of intervention were not mentioned in the abstract, the method section was reviewed. This was to check if the participants' age and diagnosis, as well as the setting of intervention, met the inclusion criteria. Therefore, at this point a part of the full text review was conducted. A protocol was developed (Appendix A) based on the inclusion and exclusion criteria to review studies at this level. Some articles found in the four databases were considered appropriate for full text review, but they were not available through Jönköping University. These articles were also searched through Google Scholar for full text form.

5.2 Selection criteria

The inclusion and exclusion criteria described below were used both for abstract and for full text review. These criteria are presented in table 5.1.

Inclusion criteria involved empirical studies (qualitative, quantitative or combined methods), which should describe interventions for behavior management of students with ASD. Thus, their goal should be either to increase a desirable behavior or to decrease a problem behavior. Even if the goal of intervention was not stated clearly but it was evident, then the study was considered for full text review, as long as it met the rest of the inclusion criteria. Participants in the study should be children between 2 and 12 years old with a diagnosis of ASD and they should also be students in an inclusive classroom of preschool or primary school. Both age and student identity of participants were mentioned in the studies. If the intervention included other groups of participants, such as typically developing peers or peers with other diagnoses, the study was included, if the intervention's outcomes were specifically mentioned for each category. The intervention must be implemented in an inclusive classroom of preschool or primary school. When the intervention was implemented in the inclusive classroom, but part of the training (e.g. brief sessions to demonstrate the material, training of other participants) was outside this setting, the study was still considered for full text review. Articles should be in English, Greek, or Spanish, and published in a peer-reviewed journal to be included. Another inclusion criteria was that publishing date should be after January 1995, taking into consideration that the Salamanca Statement was declared in July 1994.

Exclusion criteria consisted of participants with multiple diagnoses or a diagnosis other than ASD. In addition, when the intervention’s goal was not clear through the abstract and method or if it focused on areas not of interest for this review (such as academic achievement or medical treatment), then the study was excluded due to the intervention’s goal. Studies describing interventions which were implemented exclusively in a location other than the inclusive classroom (e.g. special school, clinic, home, a separate room in the inclusive school) were excluded due to the intervention setting. In addition, publication types such as literature reviews and book chapters were excluded.

Table 5.1 *Selection criteria for abstract and full text level*

Inclusion criteria	Exclusion criteria
Population Participants 2 – 12 years old Participants diagnosed with ASD Participants students in an inclusive classroom (pre-school or primary school)	Participants with diagnosis other than ASD Participants with multiple diagnosis Participants without a diagnosis Participants younger than 2 or older than 12 years Participants students in a special school or not attending school at all
Empirical study (quantitative, qualitative, or mixed)	Literature reviews, book chapters
Studies that describe the implementation of an intervention Intervention’s goal either to reduce problem behavior of students with ASD or to increase a desirable behavior	Studies that do not describe an intervention Studies that describe a medical treatment for ASD Studies where the intervention’s goal is not clear Studies where the intervention’s goal is academic achievement
Intervention implemented in an inclusive classroom of preschool or primary school	Interventions implemented in settings other than the inclusive classroom (e.g. clinics, home setting, special education schools)
Articles published in peer – reviewed journals	Articles not published in peer – reviewed journals
Articles in English, Greek or Spanish	Articles in language other than English, Greek or Spanish
Published since 1.1.1995	Published before 1.1.1995

5.3 Data extraction

Data extraction was done by one reviewer. Data about interventions was collected by reading the selected studies in detail (full text) with the use of a data extraction form (Appendix B). This was created based on the TIDieR checklist for reviewing interventions and the protocols provided during the course “Introduction to Interventions in childhood”. Having in mind the two research questions of this literature review, focus was on identifying the intervention used in each study, what was its goal, what assessment of the target behavior

was carried out, who was the intervention provider and what outcomes were reported by the researchers on the student's with ASD behavior.

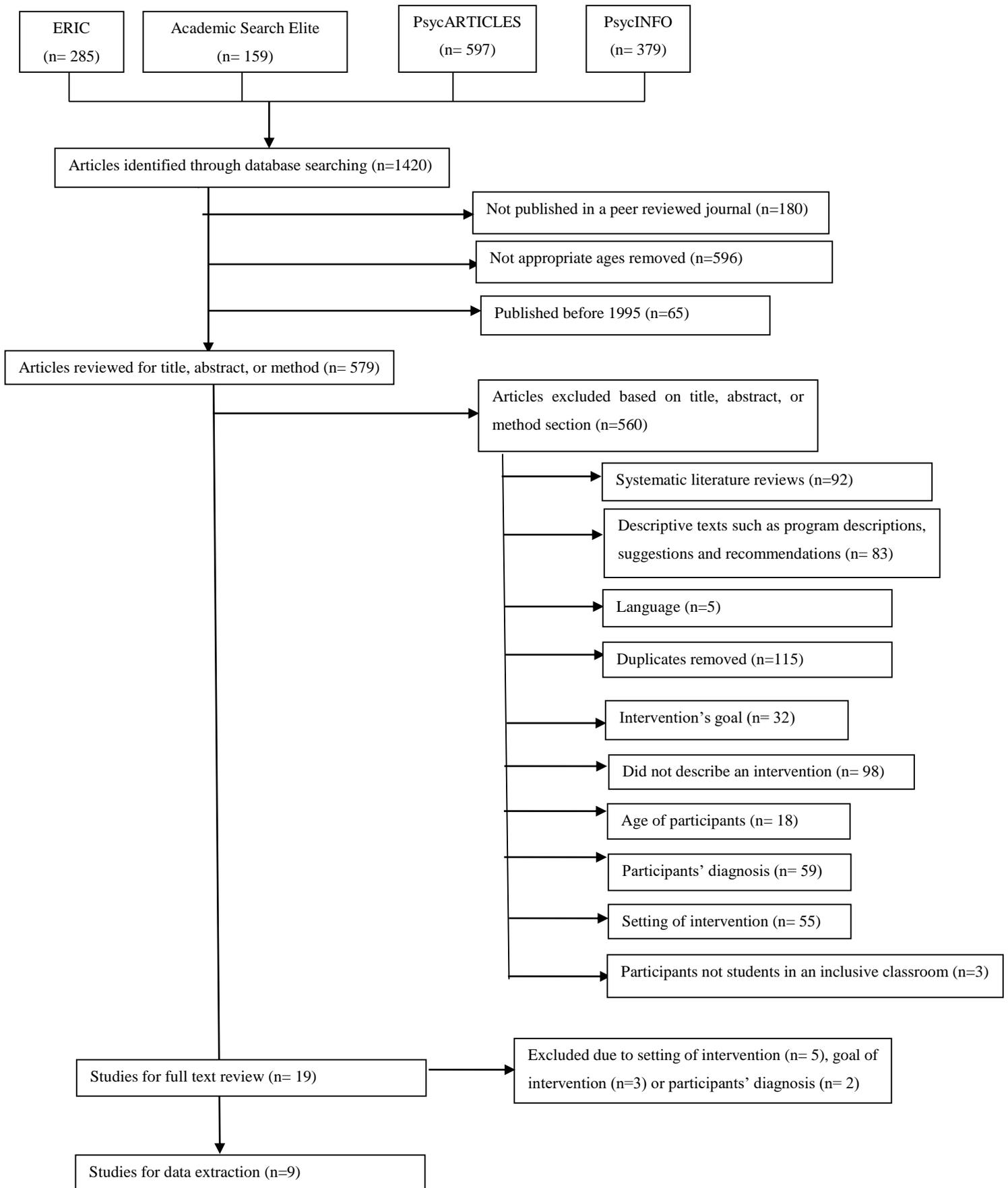
5.4 Quality assessment

The quality of the included studies was assessed on full-text level. Based on the form for data extraction (Appendix B) a protocol of ten items for quality assessment was created. This protocol is presented completed in the results section, paragraph 6.4. Eight of the items were only checked if identified in the study. These items were clear statement of aim, research questions and conclusion, explanation of theories and concepts used, detailed description of intervention procedures (when, how much, how often, where), mention of limitations and measurement of interobserver agreement and treatment fidelity. Two items (average rate of interobserver agreement and of treatment fidelity) were completed as high, medium or low, given that interobserver agreement and treatment fidelity had been measured in the study reviewed. The average rate was considered as high if it was 80% or higher, as medium if it was 50% - 79%, and as low if it was lower than 49%. The quality of the studies was considered as high, medium or low depending on certain factors. Namely, studies were not considered of high quality if they did not measure interobserver agreement and treatment fidelity and if they did not describe in detail the intervention procedures. It was the same case if studies reported a low average rate of interobserver agreement or treatment fidelity. Apart from that, the fewer items checked for a study, the lower was considered its quality. More specifically, taking into account that the items to be checked were eight, a study having checked less than four was directly considered of low quality. If four or five items were checked, it could be considered whether as medium or as low quality, depending on the measurement of interobserver agreement or treatment fidelity. If six, seven or eight items were checked, the study was considered of high quality, given again the measurement of interobserver agreement or treatment fidelity.

6 Results

First, the search results are going to be presented in this section. Second, the results of the data extraction will be described. The results of the data extraction are presented in relation to the two research questions of the present study, in order to answer its aim. The first research question intended to identify interventions for behavior management that have been implemented for students with ASD in inclusive classrooms since 1995, the year after the ratification of the Salamanca Statement. For this research question, the types of intervention were examined, but also what were their goals, how behavior was assessed prior to intervention and who was the intervention provider. The second research question intended to look into the observed outcomes of each intervention. Third, the results of the studies' quality assessment will be presented.

Figure 6.1. Flow chart illustrating the search procedure



6.1 Interventions for behavior management of students with ASD in inclusive classrooms of pre-school and primary school

The first research question aimed to identify interventions for behavior management of students with ASD in inclusive classrooms. In order to answer this question, results focused first on what types of interventions have been implemented. In addition, it was examined what was their goal, that is what behavior they aimed to manage, how they assessed the behavior prior to intervention, and who provided the intervention, because these three parts were considered significant for the implementation of the intervention. The names of the interventions identified, their goals, outcomes and intervention providers are presented in Appendix D. A basic description of the interventions is presented in Appendix E.

6.1.1 Types and basic steps of interventions

Various types of interventions were identified through reviewing the studies. Two interventions were antecedent-based using visual cue cards (Conroy, Asmus, Sellers, & Ladwig, 2005; Haley, Heick, & Luiselli, 2010) and consisted of similar procedures. Specifically, there were pre-instructional sessions with the students to explain them the cards, what they meant and how they would be used. One card meant it was inappropriate to engage in the stereotypic behavior, whereas the other meant it was acceptable to engage in that behavior. At the intervention sessions during the target instructional time, each of the cue cards was presented to the students. When the presented card was the one indicating that stereotypic behavior was acceptable, there were no consequences for that behavior. When the presented card was the one indicating that stereotypic behavior was unacceptable but the student still engaged in it, the responsible adult pointed out the card to remind the student that it was inappropriate to display this behavior. In one case, the adult also reminded of that verbally (Conroy et al., 2005), but in the other case there were not verbal reminders or other repercussions (Haley et al., 2010).

Two other interventions mainly involved typically developing peers as supporters or buddies of the child with ASD. The first one was a simple peer-support intervention (McCurdy & Cole, 2014). Before training of peers, the researcher interviewed the peer supporter about his perspectives of the student with ASD. The peer training involved explaining to the peer supporter what off-task behavior is, as well as training him or her to identify it, to prompt desirable behavior and to give verbal feedback. During the peer support intervention, peer supporter and child with ASD were sitting close. At the beginning of class, the peer reminded the student of the desirable behaviors and gave him verbal encouragement. When the student with ASD displayed off-task behaviors, the peer prompted as he was taught to do at the training sessions. When the student with ASD displayed on-task behaviors, the peer encouraged him through nonverbal forms. At the end of each intervention session, the peer provided feedback and encouraged the student.

The second one was a peer buddies intervention combined with social scripts (Hundert, Rowe, & Harrison, 2014). The Training sessions involved the social script intervention, the peer buddies program and a combination of these two. During the social script intervention, the play script was presented to the class through a video. After that, a volunteer was chosen to play the script with the student with ASD. This consisted of eight steps

and for each one a correct response from the play partner and from the student with ASD was defined. In addition, a token was given to the students for each step of the social script implemented correctly. Regarding the peer buddies program, the teacher and the play leader (an undergraduate student) first presented verbally and demonstrated how to start playing with a peer, how to accept an invitation to play and how to keep up a play behavior. At the beginning of each peer buddies training session, the class had to pay attention to a schedule and a list of the three rules of peer buddies in the classroom, which also presented the pairs of peer buddies for that session. During the session, teacher and play leader reinforced verbally the pairs of students who were following the peer buddies rules. At the end of each session, there was a brief discussion period when each student in the pair received a sticker from the teacher. The students who did not get a sticker were told what they needed to do next time. When the social script training was combined with the peer buddies program, the social script procedures were the same, except that peer partners were decided through the peer buddies procedures. This intervention also included generalization sessions which were the same as the training sessions, but play material related to a social script was unavailable and no new interventions were introduced.

One intervention applied the Structured Teaching System in combination with Graduated Guidance for one student with ASD who displayed stereotypic behavior (Bennett, Reichow, & Wolery, 2011). One puzzle was available at a time (three puzzles in total) and the girl was given three minutes to complete it. The structured work system involved checking a visual activity schedule, identifying the activity to be completed, completing the puzzle, putting the completed puzzle in a special basket, and rechecking the visual activity schedule to determine what to do next. When the girl needed help to use this system, the researcher indicated the steps using Graduated Guidance and pointing. However, help in completing the activity was not provided. Graduated guidance was faded gradually.

Conroy, Boyd, Asmus and Madera (2007) described an intervention using social stories and specific adult prompts. First, the teacher asked the student to select one of his classmates to read the social story with. Then, the two students acted out the scenario throughout free play time. However, the research team and the teacher decided to stop the social stories after one week, because they considered it did not offer enough benefits but rather hindered the intervention process. Therefore, only specific prompts by the teacher were used from that time on and results in this study were obtained and presented only for this part of the intervention. Specifically, the teacher provided three prompts to the student with ASD. The student was prompted to select the peer and then the material to play with, as well as how to ask his peer to play with him. The intention was to make the student independent in his social interactions and gradually diminish the prompts.

One intervention used the Prevent-Teach-Reinforce (PTR) model of behavior support for two students with ASD (Strain, Wilson, & Dunlap, 2011). For one student, the Prevent element included clear behavioral expectations by the teacher in consultation with the student, and a card was given to him listing four expectations. The Teach element was about self-management, thus the student had to look at his card and remind himself of what he needed to do. Student and teacher reviewed the expectations multiple times per day. The Reinforce element included specific verbal praise and comments by the teacher, hits on the student's card that could be exchanged for items (reinforcers) and the possibility for the student to take his cards home to show his mother.

This was done in order to create a more positive atmosphere in the school-home communication, instead of communicating with the mother only when problems occurred (Strain et al., 2011). The teacher ignored the student's problem behaviors and redirected his behavior using only visual cues. For the other participant in this study the intervention had two goals and, hence, two components. For the first component, a written schedule was developed which indicated the student what to do (Prevent), then he was taught a specific academic skill (Teach), and he was reinforced with access to a bucket with items he liked (seashells and insects) when he wrote a specific amount of words (Reinforce). For the second component, a buddy time was scheduled during large group activities (Prevent). Moreover, the PTR team developed three social phrases for the student (also put on cards attached to key ring which was given to him) he could practice during buddy time and at home (Teach). The student was reinforced for using the social phrases and for communicating verbally with peers by earning stickers which led to his access to the same bucket with items as in the first component (Reinforce). When this student displayed problem behavior, adults used visual cues to redirect him.

Finally, Reeves, Umbreit, Ferro and Liaupsin (2013) described a comprehensive function-based intervention that had three components. The first was to teach the replacement behavior to the three students with ASD. They were taught to use visual instructions to complete activities independently, to raise their hands when they needed assistance, and to use the "taking time area" (pp. 384) (a table in the back of the classroom) when they needed to calm down. The second component was the reinforcement of replacement behavior. A token economy system was established (i.e. collecting items that could be exchanged with a reinforcer) and, when the students displayed that behavior, the teaching assistants praised them verbally. The third component was an extinction procedure for the occurrence of the problem behaviors. On one hand, this meant that adults ignored the problem behaviors (attention extinction) and, on the other hand, it meant that the students with ASD had to complete the assignment during lunch recess, if it was not completed by then due to the problem behaviors (escape extinction).

6.1.2 Intervention's goal

Three basic categories of interventions' goals were identified through reviewing the studies. First, five interventions' goal was to decrease problem behavior displayed by the student with ASD, which was principally of two types. Some of the interventions aimed to decrease stereotypic behavior, either related to body movements that did not serve a function (Bennett et al., 2011; Conroy et al., 2005) or related to vocal stereotypy (Haley et al., 2010). Others targeted disruptive behavior, that is either off-task behavior (McCurdy & Cole, 2014) or disruptive vocalizations (Banda et al., 2012). It should be noted that two of these studies (Bennett et al., 2011; Conroy et al., 2005) also aimed to increase engagement, but this construct is not of interest for the present thesis' aim, thus, the results about participants' engagement are not presented here.

Second, two interventions' goal was merely to increase desirable behavior of the students with ASD, with a focus on interactions with peers. More in concrete, one goal was to increase the child's interactions with peers, and thus, to improve his social behaviors (Conroy et al., 2007). The other intervention aimed more specifically to increase interactive play of the students with ASD with their peers and, thus, to improve play

behavior (Hundert et al., 2014).

Third, there were two interventions which aimed both to decrease problem behavior and to increase desirable behavior. The first one intended to decrease off-task behavior of three students with ASD, on one hand, and to replace this behavior by increasing on-task behavior on the other hand (Reeves et al., 2013). The second one involved different individualized plans, one for each of the two participants (Strain et al., 2011). For one participant, the objective was to decrease obsessive behavior, property destruction, and aggression towards others, and to increase his self-management. For the other participant, the intervention consisted of two parts: 1) to decrease shutting down and walking away, while increasing on-task behavior, and 2) to decrease walking away and outburst during group activities or interactions with peers, while increasing specific social skills and improving pro social behavior.

6.1.3 Assessment of target behaviors

As for assessment of target behaviors prior to the intervention, most studies completed a Functional Behavioral Assessment (FBA), as it was stated by the researchers themselves (Banda et al., 2012; Conroy et al., 2005; Haley et al., 2010; Reeves et al., 2013; Strain et al., 2011). In one study the researchers used the Social Skills Interview (SSI), a tool to interview the child's teachers, as well as the Snapshot Assessment Tool (SAT) for direct observations (Conroy et al., 2007). Another study also assessed the child's target behavior through direct observations, this time using the Behavioral Observation of School Students (McCurdy & Cole, 2014). Two studies did not involve assessment of the target behavior prior to implementing the intervention (Bennett et al., 2011; Hundert et al., 2014).

6.1.4 Intervention provider

The people who provided the intervention differed among the studies reviewed. In some cases, either the researcher or the teacher(s) alone provided the intervention. The structured teaching system and graduated guidance (Bennett et al., 2011) were implemented only by the researcher, while the interventions of specific prompts (Conroy et al., 2007) and of NCA (Banda et al., 2012) were implemented by the classroom teacher(s).

In three of the studies, interventions consisted of two different phases which were implemented by different people. During the intervention which used visual cue cards to reduce stereotypic behavior of the student with ASD (Conroy et al., 2005), there were a treatment and a replication phase. The treatment phase was conducted by the research assistant, whereas the replication phase was conducted by the teacher's assistant. The intervention which used visual cue cards to reduce vocal stereotypy of the student with ASD (Haley et al., 2010) consisted of pre-instructional and intervention sessions. Pre-instructional sessions were carried out either by the researcher or by the special education paraprofessional under the supervision of the researcher, while the main intervention sessions were carried out by the special education paraprofessional. During the first three days of the comprehensive function-based intervention (Reeves et al., 2013), one of the researchers and an instructional specialist demonstrated the correct implementation. After that, the two teaching assistants responsible for the three students with ASD together with the classroom teacher implemented the intervention.

In three of the studies, the intervention was provided by more than one people. Regarding the peer support intervention (McCurdy & Cole, 2014), the investigator (researcher) together with an instructional assistant part of the school staff were the providers, and the classroom teacher was responsible for monitoring the peer intervention. In the PTR intervention (Strain et al., 2011) there was a team responsible for providing it to each of the two participants. For one of them, the team included the classroom teacher and the PTR consultant. For the other one, it also included the classroom teacher and the PTR consultant, in addition to the student's paraeducator and his primary caregiver. The social script combined with the peer buddies intervention (Hundert et al., 2014) was provided by the researchers who developed individual scripts for each child, an undergraduate student who was the play leader and offered prompts to student with ASD, and the classroom teacher.

6.2 Interventions' outcomes on the behavior of students with ASD

The outcomes of the interventions on the behavior of the students with ASD are presented according to the interventions' goals.

Interventions with goal to decrease problem behavior: Both antecedent-based interventions that used visual cue cards (Conroy et al., 2005; Haley et al., 2010), resulted in decrease of the stereotypic behavior, when the card indicating that this behavior was unacceptable was present. For one participant, the authors clearly stated that there was an overall decrease of vocal stereotypy (Haley et al., 2010). During the peer-support intervention, off-task behavior decreased for both participants, reaching levels lower than that of their typical classmates (McCurdy & Cole, 2014). The results of the non-contingent attention (NCA) intervention showed a decrease of the participant's level and variation of disruptive vocalizations (Banda et al., 2012). Finally, as soon as the structured work system was introduced for one participant, the level and variability of her stereotypic behavior decreased immediately (Bennett et al., 2011).

Interventions with goal to increase desirable behavior: The intervention that used specific adult prompts had as a result increased interactions between the child with ASD and his peers, but his initiations to peers increased slightly (Conroy et al., 2007). In the case of the social script and peer buddies intervention, the social script training alone increased the peer interactions for all three participants with ASD. There was no increase in interactive play during the generalization sessions when the intervention material and adult assistance were not available. However, children's with ASD interactive play increased during the generalization sessions when the social script training was combined with the peer buddies program (Hundert et al., 2014).

Interventions with goal both to decrease problem behavior and to increase desirable behavior: The comprehensive function-based intervention that was implemented for three participants had as a result the increase of on-task behavior during the intervention and the follow-up period (Reeves et al, 2013). Regarding the PTR intervention, results for both participants indicated that problem behavior decreased during the intervention and the follow-up period (Strain et al., 2011).

6.3 Quality assessment

A quality assessment was realized during full text review having in mind the criteria described in paragraph 5.4. The quality assessment of the studies is presented in table 6.1. In total, four studies were considered of high quality (Haley et al., 2010, Hundert et al., 2014, Reeves et al., 2013, Strain et al., 2011) because they included the items of interobserver agreement and treatment fidelity which were rated as high, as well as a detailed description of the intervention procedures. Three were considered of medium quality (Bennett et al., 2011; Conroy et al., 2005; McCurdy & Cole, 2014), due to not measuring treatment fidelity. Two were considered of low quality (Banda et al., 2012; Conroy et al., 2007) because they did not measure treatment fidelity and they did not describe in detail the intervention procedures, whereas one of them (Conroy et al., 2007) also did not measure interobserver agreement.

Table 6.1 *Quality assessment of included studies*

Study	Conroy et al., 2007	Conroy et al., 2005	Haley et al., 2010	McCurdy & Cole, 2014	Hundert et al., 2014	Reeves et al., 2013	Banda et al., 2012	Bennett et al., 2011	Strain et al., 2011
Aim stated clearly	X	X	X	X	X	X	X	X	X
Specific research questions									
Explanation of theories and concepts used	X	X	X	X	X	X	X	X	X
Detailed description of intervention procedures		X	X	X	X	X			X
Treatment fidelity rated			X		X	X		X	X
Average rate of treatment fidelity			High		High	High		High	High
Interobserver agreement rated		X	X	X	X	X	X	X	X
Average rate of interobserver agreement		High	High	High	High	High	High	High	High
Limitations mentioned	X	X	X	X	X	X	X		X
Conclusions stated clearly	X							X	

7 Discussion

7.1 Discussion of results

The results of this systematic literature review are going to be discussed in this section and presented in the same order as in the results section. The intention is to identify common themes, to point out benefits and challenges of the interventions, and to highlight some interesting points for reflection regarding goals, assessment of behavior, intervention provider and outcomes.

7.1.1 Interventions' benefits and challenges

Regarding the interventions reviewed, first some common themes identified will be discussed, in addition to potential benefits and challenges of using these interventions.

Two of the interventions were peer-mediated, as they involved the typically developing peers of the students with ASD (Hundert et al., 2014; McCurdy & Cole, 2014). Due to common deficiencies in children's with ASD socialization, involving peers as supporters in interventions for students with ASD is considered quite useful (Harrower & Dunlap, 2001; Koegel et al., 2012). Peer mediated interventions have been proved to reduce dependence of students with ASD on adult attention, thus increasing autonomy, and to provide opportunities for social learning and social interactions. They are also effective on improving on-task behavior (Crosland & Dunlap, 2012; Harrower & Dunlap, 2001). Thus, including typically developing peers as supporters can offer various benefits, especially for improvement of social behavior, for on-task behavior and autonomy of the students with ASD. Therefore, they can be beneficial for the student and they can be easily adapted in the classroom's daily activities, which was evident in the two peer-mediated interventions (Hundert et al., 2014; McCurdy & Cole, 2014) identified in this review. Nevertheless, peers' relationships with each other, whether a positive atmosphere dominates and whether the student with ASD is socially accepted in the classroom may play an important role and possibly impose challenges when implementing peer-mediated interventions.

In order to indicate and, in this way, increase desirable social behavior, two different strategies were basically identified. On one hand, the intention was to directly teach the student with ASD the desirable behavior, either through social stories (Conroy et al., 2007) or through social scripts (Hundert et al., 2014), and, on the other hand, the teacher would prompt the target social behavior to the student (Conroy et al., 2007).

Benefits of social stories, in general, include improvement of desirable behavior and of learning for students with ASD (Spencer, Simpson, & Lynch, 2008). They can lead to reduction of stereotypic and disruptive behavior, increase of appropriate play, on-task behavior and social interactions (Sansosti, 2009). However, in the study by Conroy et al. (2007) it was early decided to remove the social stories intervention from the process because, according to the teacher and the research team, it was time consuming and did not produce any significant outcomes. This shows that, in spite of its potential benefits, an intervention also has to find its place in the natural context where it is implemented (in this case the inclusive classroom) and in daily activities in order to

have a significant impact, as it has been also noted by Bernheimer and Weisner (2007). However, another viable option would have been to replace the social stories intervention instead of just removing it.

In another intervention, social scripts were used to teach the desirable social behavior (Hundert et al., 2014). Social scripts are a method for directly teaching the child the desirable social behavior, and further helping him or her to initiate interactions with peers, with gradually less dependence on adult prompts (Koegel et al. 2012). Therefore, even though they are different than social stories at some points, they serve the same main purpose of teaching the student to interact with peers requiring less and less guidance from adults. Prompting was identified in one intervention in the form of teacher's verbal prompts (indications) for interaction with peers (Conroy et al., 2007). Research about prompting has shown that it is often necessary with students with ASD in order to provoke the appropriate behavioral response (Crosland and Dunlap, 2012). Even though Conroy et al. (2007) mention that the use of specific prompts would fade gradually to make the student more independent in social interactions, the procedure for increasing independence was not described in detail.

In long term, it may be more useful to teach the student how to initiate and maintain interactions with peers on his or her own, for example through social stories or social scripts, so as to decrease dependence on adults as much as possible. In general, it is important to help students with ASD become independent from adults, not only in terms of social behavior, but also in terms of on-task behavior, which was the intention of graduated guidance (Bennett et al., 2011).

Visual aids were used in different forms. They included cue cards to clearly indicate desirable behavior (Conroy et al., 2005; Haley et al., 2010) or teacher's expectations (Strain et al., 2011), visual schedules (Bennett et al., 2011; Strain et al., 2011) and visual instructions (Reeves et al., 2013). As Lytle and Todd (2009) point out, teachers' expectations from the student need to be clear and so need to be their instructions. This is the reason why, during the PTR intervention (Strain et al., 2011), it was decided to provide one of the participants with a card where behavioral expectations from him were clearly described. Since children with ASD often present deficits in language, written or verbal instructions alone may not be completely understood by the student with ASD (Lytle & Todd, 2009) and a visual representation of the instructions or of the activities is often required. Furthermore, visual schedules particularly have been proved to be useful in the inclusive classroom. They increase predictability of the routine because they illustrate clearly what has been completed and what follows (Crosland & Dunlap, 2012; Goodman & Williams, 2007; Harrower & Dunlap, 2001), thus it is also possible that on-task behavior will increase. For example, the structured teaching system used a visual schedule (Bennett et al., 2011), as this system served the purpose of providing the student with ASD a structured plan of her activities.

In general, it seems that different interventions can have different benefits and challenges. Therefore, their usefulness in a classroom context depends on different factors. One important factor is the student, since individual needs and characteristics affect both what intervention is appropriate and its effectiveness. This is also evident from the fact that different interventions were implemented in the studies reviewed, even though the students that participated in the studies were all diagnosed with ASD. It also depends on the teacher, as he or she will be the one implementing the intervention for a long time period. In addition, the classroom environment

in general, such as the other students' characteristics and their relationships, can determine which intervention is more useful in a specific context.

To conclude this section of the results discussion, it was apparent through reviewing the studies that most of them used some kind of reinforcement, principally verbal praise (McCurdy & Cole, 2014; Reeves et al., 2013; Strain et al., 2011) and token economy system (Reeves et al., 2013; Strain et al., 2011), whereas only one used a form of punishment (Reeves et al., 2013). Nevertheless, in this case also the authors expressed their doubts about if this is the right way in order to extinct a problem behavior. This is a noteworthy finding, as it may indicate that interventions are moving towards proactive methods of behavior management for students with ASD, rather than punitive ones. Therefore, this means that the problem behavior or the lack of desirable behavior is not punished to be decreased, but focus is rather on building skills (Wolery, 2000), on increasing a desirable behavior.

7.1.2 Interventions' goals

The interventions identified in this review targeted significant deficits of children with ASD. More than half of the interventions reviewed aimed to decrease stereotypic, off-task and disruptive behavior (Banda et al., 2012; Bennett et al., 2011; Conroy et al., 2005; Haley et al., 2010; McCurdy & Cole, 2014; Reeves et al., 2013; Strain et al., 2011), hence to manage a problem behavior that mainly interrupted order in the classroom. It is important to note that two of these interventions (Reeves et al., 2013; Strain et al., 2011) further aimed to increase a desirable behavior (on-task, self-management, specific social skills/ pro social behavior) in order to replace the problem one. Two interventions aimed only to increase social initiations towards peers and interactions with them, thus to manage students' with ASD social behavior (Conroy et al., 2007; Hundert et al., 2014). However, in this case also the reason to start an intervention was deficits in social skills spotted by the children's teachers. It was observed that most of the interventions focused on a problem behavior (stereotypic, off-task, or disruptive) that interrupts order and interferes with the student's with ASD and the peers' learning. Few interventions focused on improving a social behavior.

On one hand, this is not a surprise considering that stereotypy is a quite common characteristic of children ASD (Leekam, Prior & Uljarevic, 2011) who are also often reported to present challenging behavior (Koegel et al., 2012; Wood et al., 2011). Especially challenging behavior may even lead to the students' exclusion from inclusive settings (Wood et al., 2011). As Emmer and Sabornie (2015) indicate, one part of classroom management, and hence of behavior management, is to keep order in the classroom. Thus, a lot of effort is put on decreasing problem behavior, in order to establish an orderly environment and achieve optimal learning for all students.

On the other hand, socialization is another area where children with ASD present significant deficits (Falkmer et al., 2012; Falkmer et al., 2013; Jones & Frederickson, 2010). Therefore, it would be expected to identify more interventions aiming to improve social behavior of the students with ASD within an inclusive classroom. This expectation is also supported by the fact that classroom and behavior management have a clear purpose of

enhancing social and emotional learning, not only academic learning (Emmer & Sabornie, 2015). On the contrary, keeping order in the classroom is considered only a part of managing the classroom and the students' behavior, thus it is not considered a goal itself (Emmer & Sabornie, 2015).

As for the PTR intervention (Strain et al., 2011) and the comprehensive function-based intervention (Reeves et al., 2013), it is important that the goal of decreasing a problem behavior was completed by the goal of replacing this behavior with a desirable one. This is in accordance with the principles of FBA, which serves as the basis for planning interventions with the intention to replace the problem behavior with a desirable one (Mitchell, 2008; Stahr et al., 2006). It is also interesting that these two interventions principally tried to teach the desirable or replacement behavior. Thus, they focused on the goal to increase a desirable behavior and in this way to decrease the problem behavior.

7.1.3 Assessment of target behavior

Regarding assessment of the intervention's target behavior, more than half of the studies (five studies) clearly carried out some type of FBA (Banda et al., 2012; Conroy et al., 2005; Haley et al., 2010; Reeves et al., 2013; Strain et al., 2011). Two of the studies completed, prior to intervention, an assessment that was not mentioned as FBA. In one of them the researchers used two tools developed by them, the Social Skills Interview (SSI), a tool to interview the child's teachers, together with the Snapshot Assessment Tool (SAT) for direct observations (Conroy et al., 2007). Even though they are not exactly mentioned as FBA, both these tools belong to two types of FBA, indirect assessments and descriptive analyses. This is the same case as the Behavioral Observation of School Students (McCurdy & Cole, 2014), which belongs to descriptive analyses, as it is about directly observing the students in a natural context. Consequently, it can be said that although the assessment sometimes is not named FBA, it still serves the same function as an FBA, which is to understand the antecedents that cause its presence (the reason why a behavior occurs) instead of focusing on the type or characteristics of such a behavior (Koegel et al., 2012; Stahr et al., 2006). Considering all this together, it is observed that, in fact, seven out of the nine studies reviewed, realized at least one type of FBA before the intervention. This shows that there is actually a trend towards using FBA, as it has been noted by Stahr et al. (2006).

On the other hand, two studies (Bennett et al., 2011; Hundert et al., 2014) involved no assessment of the target behavior. The reason why the researchers chose not to carry out an assessment was not stated in the studies. In both cases, the motivation to start the intervention was some problem in the child's behavior, either isolation and deficits in interacting with peers (Hundert et al., 2014) or stereotypic behavior (Bennett et al., 2011). Therefore, conducting FBA would have been probably useful in both cases, since it examines in detail antecedents causing and consequences maintaining the problem behavior (Mitchell, 2008).

Interventions based on FBA have been proved to be more effective than the ones that do not involve such an assessment (Koegel et al., 2012). They have been also proved to present benefits such as less focus on punishment and more focus on building skills, in addition to increased likelihood of positive, lasting and meaningful outcomes (Stahr et al., 2006). Therefore, the fact that FBA was identified, obviously or not, in almost all the

studies probably indicates how useful it is starting to be considered in inclusive classrooms with students with ASD that present a problem behavior.

7.1.4 Intervention provider

The person or the people who provide the intervention in an inclusive classroom are also of interest for this literature review. In only one study the researcher was the single person to implement the intervention (Bennett et al., 2011). In contrast, general education and special education teachers were actively involved in the implementation in six of the studies (Banda et al., 2012; Conroy et al., 2007; Conroy et al., 2005; Haley et al., 2010; Reeves et al., 2013; Strain et al., 2011) and somewhat less actively involved in one study (McCurdy & Cole, 2014), where the teacher simply monitored the peer supporter. The classroom teacher also participated in the social script and peer buddies intervention (Hundert et al., 2014), but his or her role was not specified. At this point, it can be highlighted that, according to Crosland and Dunlap (2012), there is a decreasing number of studies carried out in the classroom context during natural conditions, where “natural intervention agents” (pp. 253), e.g. the teacher, are the main responsible people of conducting an intervention for behavior management. Thus, it is interesting that in six of the studies reviewed the teachers or school staff were the main intervention providers, and the teacher also participated in a way in other two, whereas the researcher alone was the intervention provider in only one case. This finding probably indicates that natural intervention agents are considered important in the intervention process. They work regularly with the student with ASD, hence, on one hand, they know him or her better than the researcher. On the other hand, they will be the ones implementing the intervention after the researcher leaves the classroom, therefore they need to be trained in it, in order to offer the best outcomes for the student. Nevertheless, the researchers’ team is also important in the intervention process because they are the experts in the specific intervention, either having developed it or having studied a lot about it. Consequently, they can provide it with higher fidelity, which can be quite useful when the aim is to measure the effectiveness of a specific intervention.

Another interesting aspect of the results is that only three interventions involved more than one person in a single phase of implementation (McCurdy & Cole, 2014; Hundert et al., 2014; Strain et al., 2011). Out of these, only the PTR intervention (Strain et al., 2011) involved a team that was responsible both for assessment of problem behavior and for implementation of the intervention. The basic characteristic of PTR in general is forming a collaborative team who conducts the process under the guidance of a consultant expert in behavioral theories and concepts (Crosland & Dunlap, 2012; Strain et al., 2011). In the other two cases (McCurdy & Cole, 2014; Hundert et al., 2014), although more than one person implemented the intervention, it was not obvious that a similar collaborative teaming process was followed.

Results about intervention providers in the reviewed studies possibly point out that it is not so often that researchers, professionals and other significant people around the child form a collaborative team to conduct an intervention. However, collaboration during problem-solving processes is important. In order to plan and carry out effective interventions, both the expert knowledge of professionals, such as researchers, and the opinion of people in the child’s environment, such as teachers and family, are necessary (Björck-Åkesson et al., 1996).

Especially in the case of students with ASD, Guldberg et al. (2011) mention that literature has pointed out the need for coordination within a multidisciplinary team, where professionals of the clinical area can collaborate with teachers, school staff and any other people that work or live around the child. The need for collaboration of a team around the child with ASD is also stressed by Koegel et al. (2012), who furthermore emphasize its importance for implementing the intervention with consistency across settings where the child participates and school staff he or she meets. This was the case in the PTR where different professionals, and for one student also the primary caregiver, worked together to decrease the students' problem behavior.

7.1.5 Interventions' outcomes

As for the specific interventions' outcomes, it is essential to discuss what difference they can make especially for the child with ASD. To begin with, it was observed that interactions with peers increased (Conroy et al., 2007; Hundert et al., 2014), on-task behavior also increased (Reeves et al., 2013), while off-task, disruptive and stereotypic behaviors decreased (Banda et al., 2012; Bennett et al., 2011; Conroy et al., 2005, Haley et al., 2010; McCurdy & Cole, 2014; Strain et al., 2011). Therefore, all interventions reached their goals at some level, others higher and others lower. However, student's social initiations to peers in one study increased slightly, almost not at all (Conroy et al., 2007).

The first thing to note at this point is that six interventions achieved to decrease the child's with ASD problem behavior (stereotypic, off-task or disruptive behavior) (Banda et al., 2012; Bennett et al., 2011; Conroy et al., 2005, Haley et al., 2010; McCurdy & Cole, 2014; Strain et al., 2011) and one achieved to increase on-task behavior, thus it decreased off-task behavior (Reeves et al., 2013). This is a significant outcome because such problem behaviors interfere with academic learning, both student's with ASD and of his or her peers, and may put into risk the student's placement in the inclusive setting (Wood et al., 2011). Through such an outcome, order may also be established in the classroom, which is the basis for supporting students' academic, social and emotional learning (Emmer & Sabornie, 2015). However, it is not clear if merely decreasing problem behavior enhances true inclusion or simply integration in the inclusive setting. More specifically, inclusion requires adapting the whole system (in this case the classroom environment) to the child's needs (Maxwell et al., 2012; UNESCO, 1994), whereas integration is related to physical placement in an inclusive setting without necessarily adapting the environment to enhance the child's learning and development (Falkmer et al., 2012; Maxwell et al., 2012). In that sense, teaching the student to behave appropriately in the classroom (Banda et al., 2012; Bennett et al., 2011; Conroy et al., 2005, Haley et al., 2010; McCurdy & Cole, 2014; Strain et al., 2011) or to remain on-task during activities (McCurdy & Cole, 2014; Reeves et al., 2013), does not automatically mean he or she is socially and educationally included in the classroom.

On the other hand, two interventions intended and managed to increase interactions of the student with his or her peers (Conroy et al., 2007; Hundert et al., 2014). This is important because deficits in socialization are a common characteristic of children with ASD (Falkmer et al., 2013; Falkmer et al., 2012; Jones & Frederickson, 2010; Syriopoulou-Delli, et al., 2012). This can constitute a barrier to their social inclusion in a classroom with

typically developing peers, who often reject them (Jones & Frederickson, 2010; Wood et al., 2011). Therefore, teaching the student with ASD to interact with peers will possibly provide more opportunities to develop social relationships with peers and to be accepted, thus enhancing the student's with ASD social inclusion in the classroom (Jones & Frederickson, 2010). Social initiations of students with ASD to their peers are another area of socialization where they present difficulties (Koegel et al., 2012) and the intervention of specific prompts (Conroy et al., 2007) did not prove effective to improve this area of socialization for a student with ASD. Therefore, alternative interventions are probably needed in this area of socialization for students with ASD.

7.2 Methodological discussion

The reasons for using the four databases ERIC, Academic Search Elite, PsycARTICLES, and PsycINFO were to get a wide range of results, to get an educational and psychological perspective and to exclude articles from a medical perspective, like medical treatment of children with ASD. Even though initially the search words intended to be used were different, thesaurus on ERIC database was used to search with the most appropriate alternative versions and combinations of the search words.

The Salamanca Statement and Framework for Action on Special Educational Needs (UNESCO, 1994) was decided as a starting point for this systematic review because it gave rise to the concept of inclusion, thus it was expected to find more studies focusing on inclusive practices rather than integrative ones. However, a study was considered for full-text review and data extraction if it mentioned the terms general, mainstream, regular or inclusive classroom. Therefore, it cannot be concluded simply from the choice of the words inclusive classroom used in this systematic review that the studies reviewed actually presented inclusive and not integrative practices. Additionally, it was not within the selection criteria that studies should mention their definition of the inclusive classroom, which could have helped to recognize if the classroom is inclusive. On the other hand, the focus of this literature review was not to identify to what extent a classroom is inclusive. Data indicating how inclusive a classroom is could be to what extent differences among students are viewed as normal and to what extent students with disabilities are part of the social and educational community of the classroom (Nilholm & Alm, 2010). Structural aspects like teacher-student ratio, class size and number of students with disabilities might also indicate how inclusive the classroom is.

It was decided to include only peer-reviewed articles to look for articles of possibly higher quality. The protocol used for abstract and title level and the data extraction form were based on existing protocols and checklists for increased validity, but they were adapted to the needs of this literature review. A quality assessment of the studies was carried out, but articles were not excluded due to quality because of an already limited number of studies included. Even though two of them were assessed as low quality articles, the majority was either of high or of medium quality.

It should be noted that each article describes a different situation and interventions are implemented for different students. First of all, it is important to consider whether an intervention is implemented in a preschool or in a primary school classroom, as well as the students' age. For example, an intervention for improving on-

task behavior for a four-year old student might not work for a ten-year old. Furthermore, each country has a different educational system that should be taken into account when reviewing studies, which, after all, was not an issue in this literature review since most studies were from USA and one was from Canada. Another interesting finding of this review was that all studies were carried out in 2005 or later, despite the fact that search focused on interventions implemented from 1995. Although few articles before 2000 were reviewed on abstract level, they were excluded due to selection criteria other than date of publication.

Limitations

Certain limitations should be mentioned for this systematic literature review. Regarding the search procedure, only one combination of search words was used. Although this was decided in an intention to get similar results, it may have led to a limited number of articles or to missing some relevant articles. In addition, words were selected with the use of the Thesaurus tool on ERIC database and only peer-reviewed articles were included, which may have had the same result of missing information. A different combination of search words could have been used and different combinations could have been used for each database. A limited number of articles (nine) was included in data extraction and they all represent the North American perspective, which does not allow generalization of the results in other cultural contexts. Furthermore, through the quality assessment carried out, most of the articles included were not considered of high quality. There is also a risk of research bias, since there was not a second reviewer for the articles included. In addition, the quality assessment protocol was developed by the researcher and, in general, the risk of research bias was not thoroughly assessed.

7.3 Implications for future research

The studies reviewed included only one, two or three participants. Therefore, studies with more participants should be conducted in the future to get a more general picture about behavior management of students with ASD in inclusive classrooms. In addition, most studies intended to manage a problem behavior that actually disrupts the classroom order. More interventions should be implemented on social interactions and initiations of the student with his or her peers, since it is a significant aspect for the students' inclusion, especially in the case of students with ASD. Furthermore, more collaborative problem-solving is needed in implementing the interventions, as the present literature review identified only one study using this kind of intervention implementation. Future literature reviews on the same subject should look for studies from a different country and cultural perspective since in this review only the North American perspective was represented. This means also looking in databases that include more results in other languages. Additionally, future literature reviews can move further into comparing interventions and their outcomes in order to identify the most useful strategies. In order to make sure that studies represent a truly inclusive classroom, the reviewer can look into how differences are viewed (by teachers and peers), if the child with ASD is part of the classroom's social community and what adaptations have been applied in the classroom (e.g. physical environment structure, teaching methods) to accommodate the student. If structural aspects are found to indicate the extent of the classroom's inclusiveness,

they can also be taken into account when reviewing the studies. Furthermore, according to Nilholm and Alm (2010) it is necessary to ask for the children's opinion, both of those with disability and of their peers, in order to decide if a classroom is really inclusive, which is something future literature reviews can consider when reviewing the included studies.

8 Conclusion

The number of students with ASD in inclusive classrooms has increased during the last decade, bringing about benefits and challenges, both for the students themselves and for their teachers. Behavior management of students with ASD is an aspect that teachers feel most unprepared to deal with. Different types of interventions were identified in this literature review that tried to decrease a problem behavior, to increase a desirable behavior or both. Most interventions resulted in remarkable decrease of problem or increase of desirable behavior, with the exception of social initiations to peers. Although it is necessary to react to a problem behavior, it is equally important to improve desirable behaviors without having to identify a problem first. This means that reactive approaches may be necessary in some cases, but proactive approaches might make the difference. In the case of problem behavior, carrying out an FBA can be useful for identifying its causes and plan more effective interventions. In addition, moving towards inclusion rather than integration of the students in the inclusive classroom should be kept in mind when implementing interventions for behavior management. For this reason, apart from managing off-task, disruptive and stereotypic behavior, focus should also be on improving social interactions of the student with ASD with his or her peers. In conclusion, this literature review provided a summary of behavior management interventions for students with ASD in inclusive classrooms of preschool and primary school, in addition to their outcomes. Although this literature review did not compare interventions, its usefulness can be seen in the fact that it informs teachers and other interested professionals about different interventions that have been implemented for behavior management of students with ASD. Thus, it gives them the opportunity to look into the strategies and decide which ones will be most appropriate and useful for their classroom and for the specific student's needs.

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Appendices

Appendix A: Protocol used for review on title, abstract and method section level

Study for review	
Empirical study (Quantitative, Qualitative, Combined)	
Participants: Children diagnosed only with ASD	
Participants: Students in inclusive preschool or primary school	
Participants' age: 2-12 years	
Description of the implementation of an intervention	
Intervention's goal: to increase desirable behavior or to decrease problem behavior of students with ASD	
Intervention's outcomes stated clearly	
Implementation of the intervention in an inclusive classroom of preschool or primary school	
Article published in peer-reviewed journals	
Article in English, Greek or Spanish	
Article published from January 1995 to January 2016	

Appendix B: Data extraction form

Study for review:	
Authors:	
Context (country):	
Purpose and Research questions	
Was the purpose stated clearly? () Yes () No Was the research question(s) stated clearly? () Yes () No	What was the purpose of the study? What were the research questions?
BRIEF NAME	
Provide the name or phrase that describes the intervention.	
WHY	
Describe any rationale, theory, or goal of the elements essential to the intervention.	
GOAL	
What was the intervention's goal? To increase desirable behavior () To decrease problem behavior ()	What was the intervention's specific goal?
PARTICIPANTS – STUDENTS WITH ASD	
Number: Age: Diagnosis (specific):	
OTHER PARTICIPANTS	
WHAT	
<u>Assessment:</u> how it was done, by whom, how many assessments etc.	
<u>Materials:</u> Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be assessed.	
<u>Procedures:</u> Describe each of the procedure, activities, and / or processes used in the intervention, including any enabling or support activities.	
WHO PROVIDED	
1. The regular teacher (through in-service training etc.), school staff (e.g. psychologist) or a project employee (researcher, research leader etc.).	
HOW	
2. Describe the models of delivery (e.g. face – to – face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	

WHERE
3. Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or other relevant features.
WHEN and HOW MUCH
4. Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.
TAILORING
5. If the intervention was planned to be personalized, titrated or adapted, then describe what, why, when and how.
MODIFICATIONS
6. If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).
HOW WELL
7. Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.
8. Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.
OUTCOMES
What were the intervention's outcomes on the students' (with ASD) behavior?
CONCLUSIONS AND IMPLICATIONS
Were the conclusions stated clearly? () Yes () No
What did the study conclude?
What are the implications of the study's results?

Appendix C: Characteristics of included studies

Article	Authors	Context (country)	Type of study	Number of participants with ASD	Age of participants	Preschool classroom	Primary school classroom
“Decreasing Disruptive Vocalizations of a Student With High-Functioning Autism Across Three General Education Classrooms”	Banda et al., 2012	USA	Case study	One	8 years		X
“The Use of an Antecedent-Based Intervention to Decrease Stereotypic Behavior in a General Education Classroom: A Case Study”	Conroy et al., 2005	USA	Case study	One	6 years	X	
“Prevent-Teach-Reinforce: Addressing Problem Behaviors of Students with Autism in General Education Classrooms”	Strain et al., 2011	USA	Case study	Two	5 years 8 years	X (one participant)	X (one participant)
“Use of an Antecedent Intervention to Decrease Vocal Stereotypy of a Student With Autism in the General Education Classroom”	Haley et al., 2010	USA	Case study	One	8 years		X
“The Combined Effects of Social Script Training and Peer Buddies on Generalized Peer Interaction of Children With ASD in Inclusive Classrooms”	Hundert et al., 2014	Canada	Case study	Three	5y 10m 5y 11m 4y 8 m	X	
“Use of a Peer Support Intervention for Promoting Academic Engagement of Students with Autism in General Education Settings”	McCurdy & Cole, 2014	USA	Case study	Two	7 years 8 years		X

“Effects of Structured Teaching on the Behavior of Young Children With Disabilities”	Bennett et al., 2011	USA	Case study	One	3y 8m	X	
“Function-Based Intervention to Support the Inclusion of Students with Autism”	Reeves et al., 2013	USA	Case study	Three	7 years		X
“A Functional Approach for Ameliorating Social Skills Deficits in Young Children With Autism Spectrum Disorders”	Conroy et al., 2007	USA	Case study	One	4 years	X	

Appendix D: Intervention, goal, outcome, intervention provider, assessment of the target behavior and article reviewed

Intervention	A social stories intervention + use of specific prompts	An antecedent – based intervention using visual cue cards.	An antecedent – based intervention using visual cue cards.	A simple peer – support intervention.	Social script and “peer buddies” interventions.
Goal	To increase a student’s with ASD social interactions with peers/ to improve his social behaviors.	To decrease stereotypic behavior of the student with ASD.	To reduce vocal stereotypy of the student with ASD.	To reduce disruptive, off – task behavior of the student with ASD.	To increase interactive play of students with ASD with their typically developing peers / to improve their play behavior
Outcome	Increased interactions with peers. Slightly increased initiations towards peers.	Decreased stereotypic behavior when the card indicating that this behavior was unacceptable was present.	Overall decreased stereotypic behavior (especially when the card indicating that this behavior was unacceptable was present).	Decreased off – task behavior.	Increased peer interactions during social script training alone. No increase in interactive play during generalization sessions. Increased interactive play during generalization sessions when the social script training was combined with the peer buddies program.
Intervention provider	The classroom teacher	Treatment phase: research assistant Replication phase: teacher’s assistant	Pre – instructional sessions: researcher or special education paraprofessional under supervision of the researcher Intervention sessions: special education paraprofessional	Researcher, an assistant (school staff) and classroom teacher (monitoring the intervention)	The researchers (developed individual scripts for each child), an undergraduate student (play leader and offered prompts to student with ASD), and the classroom teacher.
Assessment of the target behavior prior to intervention	Social Skills Interview (SSI), a tool to interview the child’s teachers, and Snapshot Assessment Tool (SAT) for direct observations	FBA	FBA	“Behavioral Observation of School Students” (a tool to assess behavior through direct observations)	No assessment
Article	Conroy et al., 2007	Conroy et al., 2005	Haley et al., 2010	McCurdy & Cole, 2014	Hundert et al., 2014

Intervention	A comprehensive function-based intervention	Non – contingent attention (NCA)	Structured Teaching system and Graduated Guidance	Prevent–Teach–Reinforce (PTR)
Goal	To decrease off-task behavior. To increase on-task behavior (replace the off-task behavior).	To decrease disruptive vocalizations of the student with ASD	To decrease stereotypic behavior of the student with ASD	1st participant: to decrease obsessive behavior, property destruction, and aggression towards others, to increase self-management
				2nd participant: 1) to decrease shutting down and walking away, to increase on – task behavior, 2) to decrease walking away and outburst during group activities or interactions with peers, to increase specific social skills and improve pro social behavior
Outcome	Increased on-task behavior during intervention and follow-up period.	Decreased level and variations of disruptive vocalizations.	Decreased level and variability of stereotypic behavior	For both participants: Decreased problem behavior during intervention and follow-up period
Intervention provider	First three days of intervention: one of the researchers and an instructional specialist After that: the two teaching assistants and the classroom teacher	The classroom teacher	The researcher	A PTR team for each participant
Assessment of the target behavior prior to intervention	FBA	FBA	No assessment	FBA
Article	Reeves et al., 2013	Banda et al., 2012	Bennett et al., 2011	Strain et al., 2011

Appendix E: Description of interventions (as provided in the studies)

Intervention	Social stories	Specific prompts	An antecedent-based intervention using visual cue cards.	
Description of intervention	“Social Stories are written scenarios that provide children with ASD social cues to facilitate their interactions with others, or specific alternative prosocial behaviors to engage in during particular social situations” (pp.249).	“The teacher provided 3 specific prompts to Allen to encourage his social interactions with classroom peers: (a) to select “who” to play with (to increase social initiations to peers), (b) to choose “what” to play with (to provide access to a tangible item), and (c) to decide “how” to ask the peer to play (to help structure his initiation attempts)” (pp.250).	Antecedent-based interventions: interventions focusing on manipulating antecedents. Visual cue cards were created to teach the students when it was acceptable to engage in the stereotypic behavior and when it was not. One card indicated the time when this behavior was acceptable and one card indicated the time when this behavior was not acceptable.	
Study	Conroy et al., 2007		Conroy et al., 2005	Haley et al., 2010

Intervention	A simple peer – support intervention.	Non – contingent attention (NCA)	A comprehensive function – based intervention
Description of intervention	The peer and the child with ASD were sitting close. <u>Beginning of class:</u> Peer reminded the student of the desirable behaviors and gave him verbal encouragement. <u>Off – task behaviors by the student with ASD:</u> Peer prompted as he/she had been taught in training. <u>On-task behaviors:</u> peer provided nonverbal forms of encouragement. <u>End of each intervention session:</u> peer delivered feedback and encouragement to student with ASD.	NCA is “an attention-related intervention” where “reinforcement is delivered independent of the occurrence of behavior” (pp.105).	First, FBA was conducted. Then, baseline data were obtained and the intervention started for the three participants. 1) Participants were taught the replacement behavior (using visual instruction to complete activities independently, raising their hand for help, using the “taking time area”). Before each activity, the children’s assistants reminded them the steps of the activity, the replacement behavior and what reinforcement would be given for the replacement behavior. 2) <u>Reinforcement of replacement behavior:</u> participants would be verbally praised and a token reinforcement system was used 3) <u>Extinction procedure for occurrences of the target behavior:</u> attention extinction: teacher and assistants were taught to ignore participants’ off – task behaviors (not to ignore them when they raised their hand for assistance or to go to break area). Escape extinction: If off - task behavior prevented finishing an assignment, students were required to complete it during lunch recess.
Study	McCurdy & Cole, 2014	Banda et al., 2012	Reeves et al., 2013

Intervention	Social script	Peer buddies	Prevent – Teach – Reinforce (PTR)
Description of intervention	<p>“Social script training consists of constructing a specific play sequence that (a) has theme-related play materials available, (b) involves reciprocal exchanges in play, (c) taps the interests and/or compulsions of the child with ASD, (d) is at the ability level for the child with ASD, and (e) is of interest to potential play mates” (pp. 207)</p>	<p>Teacher posted in the classroom a schedule and a printed list of the three rules of peer buddies: “stay with,” “play with,” “talk to your buddy” (pp. 209) at the beginning of each training session. This list also indicated the pairs of peer buddies. Before each training session, the teacher pointed out the schedule and rules for the whole class. Pairs who followed the rules were praised and given stickers.</p>	<p><u>Step 1:</u> Establishing a school-based team. <u>Step 2:</u> Setting goals. <u>Step 3:</u> PTR Assessment (a type of FBA). Identifying “antecedent variables (Prevent), function and replacement variables (Teach), and consequence variables (Reinforce)” (pp. 163) <u>Step 4:</u> Intervention planning and implementation. <u>Step 5:</u> Evaluation of the intervention’s effectiveness.</p>
Study	Hundert et al., 2014		Strain et al., 2011

Intervention	Structured Teaching System	Graduated Guidance
Description of intervention	<p>Elements: “(1) organizing the physical environment, (2) a predictable sequence of activities, (3) visual schedules, (4) flexible routines, (5) work and activity systems for providing materials allowing independent performance, and (6) visually structured activities to clarify expectations (pp. 143)”</p>	<p>“Graduated guidance was defined as the researcher providing physical assistance. Gestural prompts also were provided to assist the child in using the structured work system. Helping the child get an activity from the shelf if it was stuck on the shelf, picking up dropped pieces, and standing behind the child were not coded as graduated guidance” (pp. 145).</p>
Study	Bennett et al., 2011	