Articles

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INTERVENTION IN SOCIAL SKILLS OF CHILDREN WITH AUTISTIC SPECTRUM DISORDER: A BIBLIOGRAPHICAL REVIEW

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Los índices de prevalencia del trastorno del espectro autista (TEA) han aumentado notablemente en los últimos años. El TEA está cada vez más presente en las escuelas y en la sociedad y es por ello que resulta imprescindible conocer más sobre este trastorno y las posibilidades de intervención. El objetivo de este trabajo es realizar una revisión bibliográfica de los artículos publicados en los últimos años en relación a distintos programas y técnicas de intervención que se han venido utilizando recientemente para trabajar con los niños con TEA una de las dificultades que en mayor medida definen el trastorno, las habilidades sociales. Las conclusiones más destacadas señalan que, aunque, por la diversidad sintomática de los niños con TEA y sus diferentes características, los resultados de las intervenciones pueden ser diversos, son muchos los programas que consiguen mejorar las habilidades sociales en estos niños y obtienen resultados destacables aquellas intervenciones que incluyen a las familias en las sesiones y que se realizan con el uso de las nuevas tecnologías, como ordenadores o robots.
Palabras clave: Intervención, Autismo, TEA, Habilidades Sociales.

The prevalence rates of autistic spectrum disorder (ASD) have increased markedly in recent years. ASD is increasingly present in schools and in society, so it is essential for us to know more about this disorder and the possibilities for intervention. The objective of this work is to carry out a bibliographic review of the articles published in recent years in relation to different intervention programs and techniques that have recently been used to work with children with ASD to train them in the difficulties that most define the disorder: social skills. The most important conclusions indicate that, despite the symptomatic diversity of children with ASD and their different characteristics which can lead to diverse results, there are many programs that improve social skills in these children and notable results are obtained by interventions that include families in the sessions and that are carried out with the use of new technologies, such as computers or robots.
Key words: Intervention, Autism, ASD, Social Skills.

Autism Spectrum Disorder (ASD) constitutes a diagnosis established in the DSM-5 (APA, 2013), within neurodevelopmental disorders, which is characterized by difficulties in communication and social interaction, as well as repetitive and restricted behavior patterns, activities and interests, that are present since childhood and that affect the daily functioning of the person (Alcantud & Alonso, 2015).

One of the defining characteristics of ASD is the difficulty that these people have in the development of social skills (SS) and communication, with the consequent limitation in understanding signs of a social nature that this involves. People with ASD have difficulties in the processing of non-literal language, that is, the understanding of double meaning, irony or metaphorical language (Rundblad & Annaz, 2010). They find it difficult to interpret facial expressions, gestures or tone of voice, and it is often difficult for them to maintain eye contact with their interlocutor (Spence, 2003). There are several explanatory

theories that attempt to account for the possible causes of these difficulties, among them, the theory of executive dysfunction (Hill, 2004) and the theory of weak central coherence (Frith & Happé, 1994). Although probably the one that is most related to the social limitations of people with ASD is the one that alludes to the difficulties in the construction of Theory of Mind (ToM) (Baron-Cohen, 1991), understood as "the ability that the human being develops to attribute thoughts to other people" (Argitas, 1999, p.121) and to interpret their actions and attitudes, taking these thoughts and beliefs into account. According to this approach, the defining difficulties of ASD, and especially those of a social nature, are explained as alterations in different aspects that make up ToM: difficulties in identifying or distinguishing emotions, the development of empathy, the understanding of pragmatic elements of language, etc. (Miguel, 2006).

At present, approximately 1% of the population has ASD and, in recent years, the prevalence of this disorder has been constantly increasing (Baio, 2012; López Méndez & Costa Cabanillas, 2014), which may be partially due to changes in the diagnostic criteria (Hsu, Chiang, Lin & Lin, 2012). ASD is increasingly present in schools and in society, and it is essential

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to understand more about this disorder and the possibilities for intervention.

Most of the psychological intervention programs that are currently carried out with children with ASD adopt a behavioral perspective (Lord et al, 2005), many of them based on modeling and reinforcement, peer mediation or the use of scripts and social stories (Matson, Matson & Rivet, 2007). All of these interventions are designed to enable subjects with ASD to improve their social skills, giving them simple guidelines on how to proceed in certain social situations and providing modeling examples for their learning. Some of the most well-known interventions (Mulas et al, 2010) are the "Lovaas program of applied behavior analysis" (Lovaas, 1987) and the TEACCH (Treatment and Education of Autistic and related Communications Handicapped Children), created in the 1970s by Eric Schopler and Gary Mesibov (Mesibov, Shea & Schopler, 2005). The "Lovaas program of applied behavior analysis" is a behavioral methodology program of high intensity early intervention that involves the use of reinforcement techniques, learning in discrimination, gradual withdrawal of support stimuli, shaping, etc. TEACCH is a clinical and psychoeducational personalized intervention program that aims to respond to the particular needs of children with ASD, presenting the information in a visual way in the context of the sessions, and enabling anticipation and structuring, to offer the child with ASD a simple organization of their space and time. Additionally, interventions in which the family participates are increasingly used, as well as those that make use of new technologies (Dekker, Nauta, Mulder, Timmerman, & de Bildt, 2014).

The investigations that have been carried out to date on the different SS intervention programs for children with ASD indicate that there are many ways of doing this, but none has been found that is capable of working for all children, since each person with ASD is different and may react differently to the intervention even when the environmental conditions are the same (De la Iglesia & Parra, 2008). The main objective of this work is to review various recently published articles that present different SS intervention programs and that have been used in recent years with children with ASD, to explore how these interventions have been carried out and what conclusions may be of most interest when working with these children in practice.

METHOD

The objective of this paper is to review and present the main conclusions of some of the SS training programs in children with ASD that have been used more recently, based on a bibliographic review of the articles published in the last three years that address this subject. To do this, a search was carried out in the PsycINFO and ERIC databases, using the following descriptors: "intervention", "autism", "ASD" and "social skills". These descriptors were combined to create a search equation that includes works that complete, validate, describe or compare one or more intervention programs to improve SS in children with ASD. A first search was carried out of articles published in the last three years, under the criterion of greater recency, whose content exposed some of the different training programs of SS in children with ASD that have been used recently and whose conclusions were of most interest. Included in this first search were journal articles published in English that could be found in the PsycINFO and ERIC databases. Duplicate items were removed from the review. From the initial number of articles obtained in this systematic search, a second selection was made, according to the following criteria: empirical studies and full text available. Finally, a manual selection was carried out and articles that did not contain the necessary information to be included in the review were rejected. This process of searching for and selecting articles is represented in the search diagram (Figure 1). The final number of articles for the review was 42. These articles are classified by type of program and in alphabetical order in Table 1. This table also includes characteristics of the programs such as the number of sessions, the duration of the sessions, whether they were carried out in groups or individually, and whether the family participated in them.

RESULTS

The different SS intervention programs for children with ASD included in the articles reviewed are carried out in group sessions, in most cases, with one or two weekly sessions, aimed at children between 4 and 13 years old, depending on the article reviewed, and with positive results, in one way or another, in all cases. These are summarized in the "Results" column of Table 1.

The PEERS program (Program of Education and Enrichment of Relational Skills) is one of those most used to work on aspects such as personal interaction, interpersonal relationship, social communication, response, and social motivation (Chang et al., 2014; Karst et al., 2015; Laugeson, Ellingsen, Sanderson, Tucci, & Bates, 2014; Schol et al., 2014; Yoo et al., 2014). Another of the intervention programs that stands out is the Superhero Social Skills Program, which works on areas similar to those of the PEERS program, with the difference of achieving longer term results, as well as their generalization (Block, Radley, Jenson, Clark, & O'Neill, 2015; Radley, Jenson, Clark, & O'Neill, 2014; Radley et al., 2014; Radley, Ford, Battaglia, & McHugh, 2014; Radley et al., 2015; Radley, Dart, Moore, Battaglia, & LaBrot, 2017). Other outstanding interventions are the Social Skills Training (SST) and the Secret Agent Society (SAS). Both programs specify the main objective of improving social functioning for everyday situations (Beaumont, Rotolone, & Sofronoff, 2015; Deckers, Muris, Roelofs, & Arntz, 2016; Dekker et al., 2014; Tan, Mazzucchelli, & Beaumont, 2015).

Several of the studies in the present review note the involvement of the family as a fundamental aspect when carrying out any type of SS intervention (Butterwort et al., 2014;

Haven, Manangan, Sparrow, & Wilson, 2014; Laugeson et al., 2014; McMahon & Solomon, 2015; Olçay-Gül & Tekin-Iftar, 2016), as well as working on the affective component. Therefore, they suggest working on concepts such as friendships, self-acceptance, self-esteem, anxiety, or depression (Butterwort et al. 2014; Demopoulos, Hopkins, & Lewine, 2016; Mandelberg, Frankel, Cunningham, Gorospe, & Laugeson, 2014; Ratcliffe, Wong, Dossetor, & Hayes, 2014; Rodríguez, Martín, Carbonero, & Ovejero, 2016; Sofronoff, Silva, & Beaumont, 2017).

Other studies talk about more specific intervention techniques such as working with social stories, which turns out to be very useful when modifying social behaviors. These studies show that although improvised stories –which have sometimes been used in the past for SS work in children with ASD– are useful, the most efficient social stories are ones that have been prepared (Malmberg, Charlop, & Gershfeld, 2015; Olçay-Gül & Tekin-Iftar, 2016). Also, two of the reviewed studies highlight training techniques for the recognition of facial expressions, fundamental in being able to communicate and understand the message, an area in which many children with ASD show deficits (Chen, Lee, & Lin, 2015; Rice, Wall, Fogel, & Shic, 2015).

Finally, two other studies talk about a SS training program that includes the use of technology. One of the objectives proposed in these studies is to demonstrate whether technology influences the increase in positive social components and to what extent the results are better due to the use of technology (Pop, Pintea, Vanderborght, & David, 2014; Rice et al.2015). The results of these studies indicate that play was more collaborative in children with ASD under the conditions in which a robot was used (Pop et al., 2014), and there was an improvement in the recognition and mentalization of affect, as well as an improvement in SS under the conditions in which a computer was used (Rice et al. 2015).
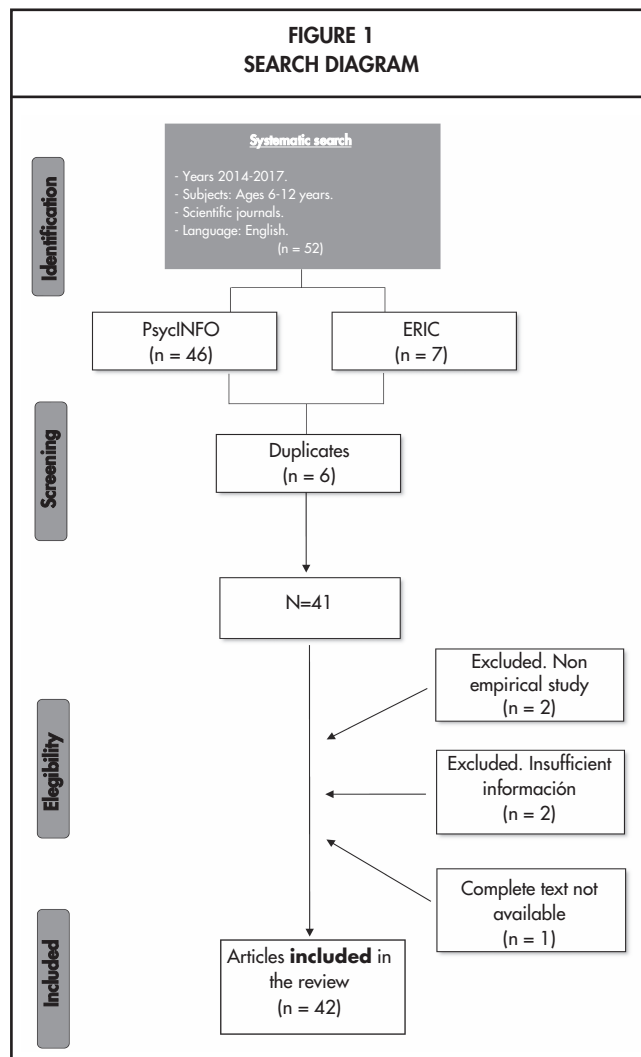

FIGURE 1
SEARCH DIAGRAM

TABLE 1
ALL OF THE STUDIES INCLUDE AN ASD GROUP IN THEIR SAMPLE AND SOME STUDIES INCLUDE PARENTS OR PEER GROUPS

Authors	Objectives EVALUATE	Participants	Instruments	Intervención	Results
Block et al. (2015)	Results of the Superheroes Social Skills program.	4 children with ASD, 3 boys and 1 girl aged 8-9 years. In a group.	WISC; VCI; ADOS; AS-SP; BIRS; CCSS	2 sesiones semanales (30 min.) - 11 semanas.	Improvements in social response and increase in social initiations.
Radley, Jenson, Clark, & O'Neill, (2014)	✔ Factibility of adapted Superheroes Social Skills Program: training for parents. ✔ Utility of the intervention in increasing social commitment.	5 children with ASD between 5 and 7 years old. In a group.	BIRS; CCSS; PSI	30 min.: padres. 1 sesión semanal: observación.	✔ Greater social commitment while playing. ✔ Success in the training of participating parents.
Radley, Ford, Battaglia & McHugh (2014)	Efficacy of the Superheroes Social Skills Program in increasing social commitment in a generalized environment.	4 children aged 8-10 years ASD in 2 groups and 3 children with typical development. In a group.	Superheroes Social Skills; POPE; The Friendship Survey; ASSP; CIRP	1 sesión semanal (30 min.) - 8 semanas.	✔ Increase in social commitments. ✔ The withdrawal of SS may have effects that are generalizable to more naturalistic adjustments.
Radley et al. (2014)	To expand the previous literature through the Social Skills Program efficacy test.	3 children with ASD between 10-14 years old, 2 boys and 1 girl.	ASSP; PSI/SF; BIRS	10 sesiones (1h 30 min/2h) - 5 semanas.	Promotion of the use of skills in training and generalization.

TABLE 1
ALL OF THE STUDIES INCLUDE AN ASD GROUP IN THEIR SAMPLE AND SOME
STUDIES INCLUDE PARENTS OR PEER GROUPS (Continuation)

Authors	Objectives EVALUATE	Participants	Instruments	Intervention	Results
Radley et al. (2015)	Use of Superheroes Social Skills Program.	2 children with ASD, 11-12 years old. In a group.	WISC; KTEA; GARS; ABAS; ASSP	Twice-weekly sessions (1h 30 min) - 5 weeks.	✔ Improved accuracy of skills in training and generalization.
Radley et al. (2017)	The effect of the normal and modified Superheroes SS Program.	5 boys with ASD between 7-10 years. In a group.	BIRS; ASSP	Twice-weekly sessions - 8 weeks.	Variability in restricted behavior after application.
Chang et al. (2014)	Predictors of the results of the positive social skills of PEERS	60 adolescents (49 boys and 11 girls) aged 12-17 years. In a group.	SSRS; Piers–Harris Self-Concept Scale; Vineland; KBIT-2	Sessions (90 min.) - 14 weeks.	The adolescents with higher SS, according to the parents, and lower social performance, showed greater improvement in HS.
Karst et al. (2015)	Impact of PEERS.	64 parents and 64 ASD children (53 boys and 11 girls). In a group.	KBIT-2; ADOS-G; KBIT; CHAOS; SIPA; PSOC	14 sessions (90 min.) - 16 weeks.	Beneficial effects for the experimental group and greater self-efficacy in parents.
Laugeson et al. (2014)	Social functioning after the implementation of PEERS.	73 adolescents with high functioning ASD aged 12-14 years with parents and teachers. In a group.	SRS; SSRS; QPQ; SAS; FQS; PHS-2; TASSK	5 sessions per week (30 min.) - 14 weeks.	✔ Improvement in social functioning. ✔ Decrease in autistic mannerisms and social anxiety.
Schol et al. (2014)	New extension of the PEERS program to improve SS and social anxiety.	58 children between 11-16 years of age with ASD. 47 boys and 11 girls. In a group.	ADOS; KBIT; Vineland; QSQ; FQS; SIAS; SRS; SSRS	Sessions (90 min.) - 14 weeks.	✔ Improvement in knowledge of PEERS concepts and friendship skills. ✔ Increase in number of encounters and decrease in social anxiety.
Yoo et al. (2014)	Korean version of PEERS: improve SS through a randomized controlled trial (RCT).	47 ASD adolescents aged 12-18 years. In a group.	ADOS; EHWA-VABS; TASSK-R; QPQ; K-SSRS; SCQ; SRS; ASDS; CDI; STAIC-T; STAIC-S; K-CBCL	1 session per week (90 min.) - 14 weeks.	✔ Improvement in social interaction and communication, interpersonal relationship and play time. ✔ Decrease in depressive symptoms. ✔ PEERS seems to be efficacious for adolescents with ASD in Korea.
Dekker et al. (2014)	✔ Compare SST with usual care. ✔ Compare improved SST (parents and teachers) with traditional SST.	120 ASD children of 10-12 years. In a group.	ADI-R; ADOS	18 sessions (90 min.)	Difference between groups, although both showed efficacy of treatment and generalization of skills learned in daily life.
Deckers et al. (2016)	Training with SST: improve social functioning in everyday life.	52 children (47 boys and 5 girls) with ASD. In a group.	LACA; SCARED-71; WSIS; ToM test-R; CSBQ	12 weekly sessions (1h): children 3 sessions (1h): parents.	Improvement of SS with maintained effects.
Beaumont et al. (2015)	Efficiency of two variants of SS program.	69 children with high functioning ASD aged 7-12 years, 64 boys and 5 girls. In a group.	WASI; SSQ-P; SSQ-T; ERSSQ-P; ERSSQ-T; SCAS-P; CAPESDD-P; CAPES-DD-T	Sessions (90 min.) - 10 weeks.	Improvements in emotional regulation, SS and behavior at school and home.
Tan et al. (2015)	SAS: improvements in socio-emotional skills.	Children with Asperger's, high functioning autism and PDD. 3 children of 11, 11 and 8 years old. In a group.	Developmental History Questionnaire; CAST; WASI-II; DASS 21; PS; SSQ ERSSQ; CASP; James and the Maths Test; PHS; Program Satisfaction; Questionnaire: Parent and teacher forms	Sessions (75 min.) – 9 weeks	✔ Improvement in measures of social competence.
Bonete et al. (2016)	Interpersonal skills through mediation.	Study 1: 22 children with ASD aged 7-13 years. Study 2: 15 children.	WISC-IV, ESCI, VABS-S, IPSPC,	10 weekly sessions (1 h)	Study 1: Significant differences in the measurements used. Study 2: There were no changes during the waiting period. Significant differences were found in socialization.
Butterworth et al. (2014)	Psychometric properties of the ERSSQ	84 children with ASD aged 7-14 years (76 boys and 8 girls). In a group.	ABS; ADOS; WASI; SCQ; ADI-R	Not specified.	Evidence of the validity of ERSSQ forms for parents and teachers.
Chen et al. (2015)	Effectiveness of an augmented reality program to read facial expressions.	3 children with ASD aged 10-13 years. In a group.	ARSFM; WISC	1 weekly session (1h 20 min)	Improvement of recognition and appropriate response to facial emotional expressions.

TABLE 1
ALL OF THE STUDIES INCLUDE AN ASD GROUP IN THEIR SAMPLE AND SOME
STUDIES INCLUDE PARENTS OR PEER GROUPS (Continuation)

Authors	Objectives EVALUATE	Participants	Instruments	Intervention	Results
Cheng et al. (2015)	Effectiveness of 3D-SU system: to learn non-verbal communication and social cognition, among other variables.	3 children with ASD, aged 10-13 years. In a group.	WASI-IV; SEC; SBS	From 3 to 5 sessions - 6 weeks.	Improvement of specific behaviors.
Demopoulos et al. (2016)	Multiple domains of social cognition.	37 children, 26 boys and 11 girls, between 6-18 years of age, with ASD. In a group.	ADOS; ADI-R; CELF-4 WISC-IV; BASC-2; DANVA-2; CASL	2 sessions.	Vocal affective comprehension must be an important component of SS interventions.
Haven et al. (2014)	Parent-child interactions and SS development.	42 children (21 with ASD and 21 of typical development with the same mental age), teachers and parents. In a group.	ABC; DAS-II; BASC-2-TRS; SCIFF	Not specified.	The emotional support of the parents and the parent-child cohesion have a positive influence on the SS of the children.
Kasari et al. (2016)	Two interventions in SS in two kindergarten schools.	137 children with ASD, divided into two groups: 80 and 57. In a group.	ADOS; SCQ; Stanford-Binet Intelligence Scale; POPE; The Friendship Survey; STRS; SSIS	Twice-weekly sessions (30-45 min.) - 8 weeks.	✔ Improvement of teacher-child social relations. ✔ ncreased peer engagement and reduced isolation at recess.
LaGasse (2014)	Effects of a group intervention of music therapy: eye contact, joint attention and communication.	17 children (13 boys and 4 girls) with ASD, aged 6-9 years. In a group.	CARS2 SRS ATEC	Twice-weekly sessions (50 min) – 5 weeks.	✔ Differences in joint attention with colleagues. ✔ No differences in communication initiation or response, or withdrawing social behaviors.
Liu et al. (2015)	Simple intervention in self-control for discrimination in SS teaching.	9 year old girl with ASD. Individual.	Treatment Fidelity Checklist, adapted from Busick and Neitzel; BIRS	Subtests (170 min.)	✔ Improvement in target behaviors. ✔ Generalization of behaviors in non-treatment contexts. ✔ Improvement in SS.
MacCormack et al. (2015)	Clinical model of LeGoff in the LEGO program.	17 children from 7 to 12 years old. 12 of them with ASD, 1 with cerebral palsy and 4 with typical development close to the previous ones. In a group.	Not specified.	1 weekly session (60 min.) - 4 weeks.	✔ Best components of the program identified. ✔ Increase in play and socialization.
Malmberg et al. (2015)	Comparison of two SS acquisition experiments.	Experiment 1: 4 children with ASD, 3 boys and one girl, 5-9 years. Experiment 2: 2 children with ASD, boys of 4-10 years. In a group.	Experiment 1: ✔ Social Story guidelines. Experiment 2: ✔ Vineland Adaptive Behavior Scale. ✔ Social Story guidelines.	Experiment 1 and 2: 2 hour session per week.	Experiment 1: ✔ Positive and fast acquisition. More effective social stories: guided stories. Experiment 2: ✔ Greater efficacy.
Mandelberg et al. (2014)	Long-term result of the formation of friendship.	66 ASD children between 6 and 11 years old and their parents. In a group.	SSRS; Social Skills and Problem Behaviors Scales; QPQ; The Conflict Scale; The Loneliness Scale; Friendships and Interventions Interview; WISC-III; ADOS ADI-R	12 weekly sessions (60 min.)	✔ More invitations to play, fewer conflicts when playing, improvements in SS and problematic behaviors. ✔ Decrease in moments of loneliness.
McMahon & Solomon (2015)	Importance of SS in adolescents.	18 participants with high functioning ASD, 14 boys and 4 girls, aged 8 to 16 years. In a group.	SSRS; ASSQ; SCQ; SRS; WASI	Not specified.	✔ Adolescents' perception: SS seen as less important. ✔ Teens: Less participation in SS than reported by parents.
Müller et al. (2016)	✔ School-based intervention: Curriculum Club. ✔ Spontaneous, meaningful and naturalistic conversation.	4 children with ASD aged 7-9 years. In a group.	WISC; One-Word Picture Vocabulary Test; Auditory Comprehension subtest of the Test of Auditory Processing Skills; CELF.	3/4 sessions per week (15/20 min.) - 9 months.	Increase in interactions, questions, vocabulary, introductions of new topics and extension of the conversation.
Neuhaus et al. (2014)	Respiratory sinus arrhythmia, social functioning and internalization-externalization of symptoms.	36 boys (18 with ASD and 18 with typical development). In a group.	SCQ; CBCL; SSIS; Vineland;WASI	1 session.	Reduced parasympathetic heart control, correlated with social behavior.

	TABLE 1 ALL OF THE STUDIES INCLUDE AN ASD GROUP IN THEIR SAMPLE AND SOME STUDIES INCLUDE PARENTS OR PEER GROUPS (Continuation)				
Authors	**Objectives EVALUATE**	**Participants**	**Instruments**	**Intervention**	**Results**
Olçay-Gül et al. (2016)	Design of social stories to teach SS to children with ASD.	Three family members, one sister and two mothers, in contact with children with ASD, and the 3 children themselves. In a group.	GARS; Scale-2; SSRS	Parents: 6h. Research: one over 2 weeks. Total: 5 weeks.	✔ Acquisition, maintenance and generalization of SS. ✔ Later, SS similar to their peers.
Olsson et al. (2016)	SS manual training. (KONTAKT): group training.	22 people, 11 children with high functioning ASD aged 8-17 years and one parent for each of them. In a group.	WISC-III; ADOS; K-SADS SRS; ABAS-II; DD-CGAS; Clinical Global Impression-Severity	1 session per week (60/90 min.)	Improvements in social communication and related skills.
Peters et al. (2016)	To expand the study by Leaf et al. (2010): effectiveness of a program to improve SS.	3 boys with ASD of 10, 10 and 8 years old and 1 girl with ASD aged 10. In a group.	IEP; SSIS	34 daily sessions (45 min.)	Increase and maintenance of SS.
Pop et al. (2014)	Commitment, social behavior and play in interaction with social robot in children with ASD.	11 boys with ASD between 4-7 years of age. In a group.	ADOS; SON-R Non-Verbal Intelligence Test	Sessions undetermined.	More collaborative play with the robot.
Ratcliffe et al. (2014)	Efficacy of the "Emotional Based Social Skills Training" (EBSST).	217 children with ASD (195 boys and 22 girls) between 7-13 years old. In a group.	SRS; ADI-R; SSIS-RS; EDQ SDQ; EBSST	16 sessions (90 min.)	Improved emotional competence, maintained during 6 months of follow-up.
Rice et al. (2015)	To expand the initial results on the efficacy of FaceSayTM: an intervention in facial recognition.	31 children with ASD between 5-11 years. 28 boys and 3 girls. In a group.	FaceSayTM; SuccessMaker; NEPSY-II; SRS	1 session per week (25 min.) - 10 weeks.	✔ Improvement in recognition, mentalization of affect and SS. ✔ Interventions with computers may produce broader cognitive and SS changes.
Rodríguez et al. (2016)	Intervention to improve social interactions.	1 child of 8 years old with ASD and 16 classmates with typical development. Individual.	BCS; POPE; CHIS	14 sessions - 9 weeks	Improvements in SS, more acceptance of classmates and increase in the frequency and duration of social interactions.
Rosenberg et al. (2015)	"Say-do" correspondence intervention: generalization of SS.	3 children with ASD, two boys and a girl of 6 and 7 years old. In a group.	Frequency of verbal exchanges.	1 or 2 times per week.	Increase in the number of social exchanges.
Shih et al. (2016)	Intervention: to inform about models of adaptive treatment before treatment ends.	92 children with ASD, 82% boys. Average age 8.14 years. In a group.	POPE; ADOS; CART	1 session (20/30 min.) - 8 weeks.	The environmental behavior: ✔ Predicts the results of the treatment. ✔ Modifies the treatment schedule to better meet the needs.
Sofronoff et al. (2017)	Multi-component social and emotional self-directed program: effect on the level of anxiety and behavior of the child.	41 children (36 boys and 5 girls) from 7 to 12 years old and 38 parents. In a group.	SAS program; ERSSQ; SCAS; CAPES-DD; SSQ-P; AQ	Treatment: 8 weeks. Follow up: 6 weeks.	✔ Improvements in SS maintained at 6 weeks. ✔ Improvement in self-efficacy of parents, and behavior and anxiety of the child.
Soorya et al. (2015).	Seaver-NETT intervention in a SS directed group.	69 children with ASD, aged 8-11. In a group.	SRS; GEM; CCC-2; DANVA2; Strange Stories Task; RMET; BASC-2	12 weekly sessions (90 min.)	✔ Improvement in social behavior (non-verbal communication, empathic response and social relationships). ✔ No significant improvement in cognitive-social aspects.
Veness et al. (2014)	To identify social communication skills in childhood linked to ASD diagnosis.	41 children with ASD, 28 with developmental delay, 41 with language impairment and 41 with typical development. All from 8 months to 7 years. In a group.	ELVS; CELF-4; WASI; SCQ CSBS; Communicative Development Inventory	Not specified.	✔ Children with ASD: lowest communication scores (from 8 months)

ABAS-II. Adaptive Behavior Assessment System II
ABC: Autism Behavior Checklist
ABS: Australian Bureau of Statistics
ADI-R: Autism Diagnostic Interview-Revised
ADOS: Autism Diagnostic Observation Schedule
ADOS-G: Autism Diagnostic Observation Schedule-General

DD-CGAS: Developmental Disabled Children's Global Assessment Scale
EBSS: Emotion-Based Social Skills Training
EDQ: Emotional Dependence Questionnaire
EHWA-VABS: Korean version of the Vineland Adaptive Behavior Scale

PSI: Parenting Stress Index
PSOC: Parenting Sense of Competence Scale
QPQ: Quality of Play Questionnaire
QSQ: Quality of Socialization Questionnaire
RMET: Reading the Mind in the Eyes Test
SAS: Social Anxiety Scale

TABLE 1
ALL OF THE STUDIES INCLUDE AN ASD GROUP IN THEIR SAMPLE AND SOME
STUDIES INCLUDE PARENTS OR PEER GROUPS (Continuation)

AQ: Autism Spectrum Quotient
ARSFM: Augmented Reality-Based Self-Facial Modeling
ASDS: Asperger Syndrome Diagnostic Scale
ASSP: Autism Social Skills Profile
ASSQ: Autism Spectrum Screening Questionnaire
ATEC: Autism Treatment Evaluation Checklist
BASC-2: Behavior Assessment System for Children, Second Edition
BASC-2-TRS: The Behavioral Assessment System for Children –
Preschool and Elementary Version 2, Teacher
BCS. Behavior Coding Scheme
BIRS: Behavior Intervention Rating Scale
CAPES-DD: Child Adjustment and Parent Efficacy Scale–
Developmental Disability
CAPES-DD-P: Child Adjustment and Parent Efficacy Scale-
Developmental Disability: Parent
CAPES-DD-T: Child Adjustment and Parent Efficacy Scale-
Developmental Disability: Teacher
CARS-2: Childhood Autism Rating Scale-2
CART: Classification and Regression Tree
CASL: Comprehensive Assessment of Spoken Language
CASP: Child and Adolescent Social Perception measure
CAST: Childhood Asperger Syndrome Test
CBCL: Child Behavior Checklist
CCC-2: Children's Communication Checklist–2
CCSS: Child Consumer Satisfaction Survey
CDI: Child Depression Inventory
CELF: Clinical Evaluation of Language Fundamentals
CHAOS: Confusion, Hubbub, and Order Scale
CHIS: Cuestionario de Habilidades de Interacción Social [Social
Interaction Skills Questionnaire]
CIRP: Children's Intervention Rating Profile
CSBQ: Children's Social Behavior Questionnaire
CSBS: Communication and Symbolic Behavior Scales
DANVA-2: Diagnostic Analysis of Nonverbal Accuracy-2
DAS-II: Differential Abilities Scale-II
DASS 21: Depression, Anxiety, Stress Scales 21

ELVS: Early Language in Victoria Study
ERSSQ: Emotion Regulation and Social Skills Questionnaire
ERSSQ-P: Emotion Regulation and Social Skills Questionnaire: Parent
ERSSQ-T: Emotion Regulation and Social Skills Questionnaire: Teacher
FQS: Friendship Qualities Scale
GARS: Gilliam Autistic Disorder Rating Scale
GEM: Griffith Empathy Measure
IEP: Individualized Education Program
KBIT: Kaufman Brief Intelligence Test
K-CBCL: Korean Version of the Child Behavior Checklist
K-SADS: Schedule of Affective Disorders and Schizophrenia for
School-Aged Children
K-SSRS: Korean Version of the Social Skills Rating System
KTEA: Kaufman Test of Educational Achievement
LACA: Loneliness and Aloneness Scale for Children and Adolescents
NEPSY-II: Evaluación Neuropsicológica Infantil-II [Children's
Neuropsychological Evaluation-II]
PHS: Piers-Harris Self-Concept Scale
POPE: Playground Observation of Peer Engagement
PS: The Parenting Scale
PSI/SF: Parenting Stress Index: Short Form

SBS: Social Behaviors Scale
SCARED-71: Screen for Child Anxiety and Related Emotional
Disorders
SCAS-P: The Spence Children's Anxiety Scale: Parent Version
SCIFF: System for Coding Interactions and Family Functioning
SCQ: Social Communication Questionnaire
SDQ: Strengths and Difficulties Questionnaire
SEC: Social Events Card
SIAS: Social Interaction Anxiety Scale
SIPA: Stress Index for Parents of Adolescents
SRS: Social Responsiveness Scale
SSIS: Social Skills Improvement System
SSQ: Social Skills Questionnaires
SSQ-P: Social Skills Questionnaire-Parent
SSQ-T: Social Skills Questionnaire-Teacher
SSRS: Social Skills Rating System
STAIC-S: State and Trait Anxiety Inventory for Children
STAIC-T: State and Trait Anxiety Inventory for Children
STRS: Student Teacher Relationship Scale
TASSK: Test of Adolescent Social Skills Knowledge
ToM test-R: The Theory of Mind test-Revised
VCI: Verbal Comprehension Index
WASI: Wechsler Abbreviated Scale of Intelligence
WISC: Wechsler Intelligence Scale for Children
WISC-R: Wechsler Intelligence Scale for Children-Revised
WSIS: The Wish for Social Interaction Scale

CONCLUSIONS

The present review shows that there are various intervention programs and techniques that have been used in recent years to work with SS in children with ASD. These children often have deficits in these areas, which causes difficulties for the social relationship and understanding of the society in which they live. It was decided to carry out this review in Spanish, since it seems that there has been a recent increase in interventions that work on the development of SS in children with ASD. Further reasons include the need that exists for it and the benefit that training in these abilities means for these children, and the fact that there are numerous reviews in English and not so many in Spanish.

Although the interventions included in the review are numerous and in many cases there is a certain consensus in choosing certain programs that are considered to be more effective, each intervention provides some results. Many of them achieve an improvement in SS, social interaction and communication, the reduction of depressive symptoms (Yoo et al., 2014), in some cases; an improvement in emotional regulation and behavioral adaptation in both school and family contexts (Beaumont et al., 2015); as well as an increase in play and socialization

(MacCormack et al., 2015; Mandelberg et al., 2015). There is even talk of an improvement in parasympathetic cardiac control, which has been correlated with social behavior (Neuhaus et al., 2014). The importance of the involvement of parents (Haven et al., 2014) and teachers (Dekker et al. (2014) in intervention programs is also highlighted in some of the conclusions of the reviewed works.

However, sometimes the different programs included in the reviewed articles lead to different conclusions. This may be due to multiple reasons such as, for example, the symptomatic diversity of children with ASD, as well as their different characteristics, the sample chosen, the intervention process, the previous interventions carried out, the training of the professionals who carry out the intervention, the duration of the sessions and how they are spaced, the organization of the process, the measurement of the results, etc. Also, it should always be borne in mind that each child with ASD is totally different from the rest, so an intervention that works for one may not be suitable for another. Therefore, we insist on special attention to each case and the achievement of the needs that each situation requires, whenever possible, adapting the programs to the characteristics of the child with ASD,

considering the characteristics of the family, the possibilities offered by the facilities available, etc.

One limitation for the present review is the heterogeneity in the characteristics that define the different programs and intervention techniques that have been included and, particularly, the differences in the number of sessions of the programs and their duration. Some of the programs were held over a number of weekly sessions, others in more than one session per week, and others had only 1 or 2 sessions. Also in some works the sample of participants was very small, which prevents the generalization of the results. In order to solve these issues, a series of proposals for future research are suggested, such as interventions aimed at achieving results that can be maintained over time, so it would be necessary for the interventions to have a follow-up later, or increase the duration of the intervention sessions, as well as to include more sessions in the intervention program and to try to bring these interventions to a greater number of participants.

CONFLICT OF INTERESTS
There is no conflict of interest.

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