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Early Communication Intervention for Children with Autism Spectrum Disorders

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http://dx.doi.org/10.5772/54881

1. Introduction

The main purpose of this chapter is to present the results of a review of communication interventions for children aged 0-6 years with autism spectrum disorders and to formulate recommendations for an evidence-based practice. The study, including 20 reviews and 27 primary studies, specifically focus interventions targeting children with diagnosis within the autism spectrum being on an early communicative level.

2. Communication in children with Autism Spectrum Disorders (ASD)

2.1. Difficulties with communication and language as part of the spectrum

Major advances have been made over the two past decades in understanding the social-communication difficulties of children with ASD, resulting in greater emphasis on early social-communication features in the diagnostic criteria. Most parents of children with autism first begin to be concerned that something is not quite right in their child's development because of early delays or regressions in the development of speech [1]. Problems with communication, in terms of both understanding and expression, are often said to be one of the main causes of the severe behaviour problems that are common among persons with severe autism and mental retardation [2]. The lack of meaningful, spontaneous speech by age five has been associated with poor adult outcomes [3,4,5,6]. Certainly, communication and communication problems are at the heart of what ASD is all about.

Although all persons diagnosed with autism have problems with communication, their type and degree vary a lot and the work of identifying different subgroups has just begun. It has

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been estimated that between one-third [7] and one-half [8] of children and adults with autism have no speech. However, more recent research results indicate that the proportion of non-speaking children with ASD is much smaller, approximately 14% to 20%, among those who received very early intervention [9].

Two phenotypes of speaking children with ASD were identified by Tager-Flusberg and Joseph [10]: children with normal linguistic abilities (phonological skills, vocabulary, syntax, and morphology) and children with impaired language that is similar to the phenotype found in specific language impairment. Another potential subgroup may experience verbal dyspraxia or dyspraxia of speech [11; 12; 13]. Voluntary motor control is disturbed in children with dyspraxia, which also affects their ability to imitate. The new research on the role of the 'mirror neurons' in the parietal and frontal lobes may provide some answers on the relationships between motor control and imitation but also on the possible link with the development of intersubjectivity [11].

In spite of the heterogeneity of language abilities in children with ASD, social-communication or pragmatic impairments are universal across all ages and ability levels [14]. According to Wetherby [15], the social-communication deficits in children with ASD can be organized into two major areas: (1) the capacity for joint attention and (2) the capacity for symbol use. Since joint attention emerges before words, this deficit may be more fundamental and a number of longitudinal studies provide evidence of a relationship between joint attention and language outcomes [16, 17]. According to Wetherby [15] p. 11, 'deficits in initiating and responding to joint attention have a cascading effect on language development since language learning occurs within the context of the modelling by the caregiver of words that refer to objects and words that are jointly regarded'. Wetherby [15] states that deficits in imitation and observational learning are other main causes of the problems with symbol use experienced by children with ASD. Learning shared meanings, imitating and using conventional behaviours, and being able to decontextualize meaning from the context constitute the symbolic deficits in children with ASD [13].

2.2. Development of communication and language in children with ASD

Because autism is usually not diagnosed until age three or four, there is relatively little information about language in very young children with autism [10]. Retrospective studies using parent reports and/or videotapes collected during infancy, together with studies of children considered likely to develop autism, show severely delayed language acquisition with respect to both receptive and expressive skills [18, 19, 20]. Another typical phenomenon described by 25% of parents of children with ASD is language loss after initially developing some words [21]. Lord, Schulman, and DiLavore [22] found that this language regression is unique to autism and does not occur in other children with developmental delays. Chawarska et al. [21] hypothesize that these early-acquired speech-like productions are lost by children with ASD because the link between these expressions and a network of symbolic communication fails. There is significant variability in the rate at which language progresses among children with ASD who do acquire speech.

http://dx.doi.org/10.5772/54881

The few longitudinal studies of language acquisition in children with ASD suggest that progress within each domain of language follows similar pathways as it does in typically developing children [9, 12]. However, the speech of children with ASD is also characterized by some typical deviations. One of the most salient aspects is the occurrence of echolalia, which can be either immediate or delayed. Although some echolalia seems to be self-stimulating, both types of echolalia can serve communicative purposes for the speaker [12]. At an early stage of language development, this may be the only way in which the child can actually produce speech. Tager-Flusberg et al. (1990) found that, over the course of development, echolalia rapidly declined for all the children with ASD and Down's syndrome in their study. Another prominent feature of language in children with ASD is general problems with deixis, which are most often manifested as pronoun confusion [10]. Features such as vocal quality, intonation and stress patterns often result in problems for persons with ASD, although there is a lack of research in this field. Taken together, the findings suggest that the difficulties are due not only to problems in social intent but also to problems affecting a more basic aspect of vocalization [12].

Less research attention has focused on the comprehension skills of individuals with ASD although deviations in response to language and comprehension have been found to be strong indicators of ASD [18]. According to Tager-Flusberg et al. [14], it seems that ASD children 'not only may have limited ability to integrate linguistic input with real-world knowledge but also may lack knowledge about social events used by normally developing children to buttress emerging language skills and to acquire increasingly advanced linguistic structures' [12, p. 350].

The pragmatic aspects of language have been studied in numerous ways. Children with autism share important similarities across different language levels [12]. The speech acts that are missing or rarely used in the conversations of children with autism often concern social, rather than regulatory, uses of language [22]. Ramberg, Ehlers, Nydén, Johansson, and Gillberg [24] found that children with ASD were impaired in taking turns during dyadic conversations. A higher proportion of initiations rather than responses was found in a study [25]. Although the basic intention to communicate often exists, the person with autism has impaired skill in participating in communicative activities involving joint reference or shared topics [12, p. 354].

3. Interventions to support communication and language development in children with ASD

3.1. History and different theoretical approaches

The first reports on language interventions were published in the mid-1960s. The intervention at that time built on the operant tradition developed by Skinner during the 1950s. The teaching sessions in this method, referred to as discrete trial teaching or didactic teaching, are marked by a high level of adult control and direction, massed-practice periods for preselected tasks,

and precise antecedent, teaching, and reinforcement practices. The learner is in a responder role, and the teacher has a directive role [11]. The strength of the didactic behavioural approach is primarily that it has demonstrated efficacy in many studies, using a variety of treatment settings and treatment deliverers, with both single-subject and group designs [11]. Limitations on this approach as a language-training method were recognized early on, with the children's lack of generalization being a core problem [26].

The pragmatic understanding of communication was fully developed after the operant teaching methods were first developed [11]. The current scientific understanding of communication and language development stems from the 1970s and 1980s, when it was demonstrated that language develops from the preverbal social exchanges of infants with important others (Bates, 1976). According to Rogers [11 p. 149], 'current research, building primarily on the work of Wetherby [13, 15, 23], Prizant [13], and Mundy, Sigman and Kasari [17], has demonstrated that young children with autism lacked these early building blocks of communication, involving social initiative, joint attention, social and emotional reciprocity, and the use of gestures to co-ordinate social exchanges.

In 1968, an important study was published by Hart and Risley [27]. Very positive results were obtained with an intervention in which the principles of operant teaching were applied in the child's natural environment. The term 'incidental teaching' was used for this approach, in which the natural environment is deliberately structured to highlight the function of the targeted language form. This intervention produced much better results with respect to maintenance and generalization and stimulated development and research in the field [11]. According to Rogers [11, p. 153], the effectiveness of this approach results from four factors: (1) child language functions to achieve child-chosen goals and child-chosen reinforcers, which strengthen their power; (2) the focus is on child communication skills that are functional in all settings; (3) the social functions of language are highlighted; (4) emphasis on child motivation and natural reinforcers adds a positive element to the interactions, which may enhance memory for learning.

The third major approach in the field of communication intervention for children with ASD is the developmental pragmatic approach. The most elaborated programme for treatment, the SCERTS (Social-Communication, Emotional Regulation, Transactional Support) model [28] focuses on functional communication. This approach bears many resemblances to the behavioural naturalistic teaching methods. More emphasis is, however, placed on developing nonverbal behaviours prior to verbal communication and on the use of Augmentative and Alternative Communication (AAC) systems to assist in the development of verbal communication [11]. Today many models combine behavioural techniques and social-interactionist approaches, such as Enhanced Milieu Teaching, developed by Kaiser and colleagues [29], The Denver Early Start [30], Caregiver Mediated Joint Engagement Intervention for Toddlers with Autism [31], Focus parent training for toddlers with autism [32]. The strength of the developmental model is its strong basis in the science of communication development. Its weaknesses include the lack of treatment manuals and the fact that it requires considerable knowledge on the part of the therapist [11].

http://dx.doi.org/10.5772/54881

3.2. Early communication intervention

3.2.1. Why early communication intervention?

Several new research findings point to the importance of an early start of communication intervention. The most essential of these are:

- Difficulties in understanding and expressing communication is very closely linked to the development of challenging behaviors in individuals with autism [2].
- Communication and language are pivotal for the development of several other cognitive constructs or competencies, such as:
  - Reading and writing.
  - Theory of Mind [33].
- Communication ability predicts outcome with respect to functioning and quality of life in adults with autism spectrum disorders [3].
- The severity of communication difficulties in preschool-aged children is correlated to the perceived level of stress in their parents [34].
- Communication is one of the most important factors for the participation in daily activities of young disabled children [35].
- According to several guidelines, among these NRC (National Research Council) in the United States, functional communication and social interaction should be prioritized in early intervention programs given to children with ASD.

Furthermore, interactional research done on children with communicative impairments and their parents has shown that the responsive communication style that characterizes parents of typically developing children is often replaced by a more directive style in parents of children with communicative impairments. Besides this impact on quality, quantity is also affected, in that the rate of communication occasions in these families tend to decrease. This adds a cumulative negative effect on the communication development due to less stimulation and experience [36]. Research has also shown that children with ASD whose parents used a responsive style during preschool years in general had better communication and languages skills when they were followed up as teen-agers [37].

3.2.2. Early communication intervention methods or programs

There are many intervention programs for children with ASD that focus on communication. Some of these are more specifically aimed at communication whilst others include communication and language as a part of a comprehensive early intervention program. Some programs (indirect interventions) focus on the parent or partner usually by guiding and teaching parents, individually or in groups (courses). Other intervention programs focus more on the training of the child (direct interventions). Today it is common

that early intervention programs include both indirect and direct aspects: education and tutoring of parents and training of the child.

Another dimension of great importance in early communication intervention concerns the degree of child focus. To have a child focus means that the motivation of the child and the developmental level is decisive in what is done during intervention. The adult follows the lead of the child and the place for training is where the child is, often the floor. In this way it's not necessary to use reinforcements or rewards since the child is already interested and motivated. To get the child to train and focus the intended skills or functions different behavioural techniques are often used. At the other end of this dimension we find the more traditional didactic training situation where the adult trainer or therapist follows and uses a predefined set of activities and materials during a training session. The specific behavioural techniques; prompts and reinforcements used during the session are often also specified or planned. The child is expected to follow the lead of the adult and it is typical that the training is held the child and the adult sitting face-to-face at a table. It is more typical that child-focused interventions are provided during daily activities in the natural environment of the child; at home and/or in preeschool, whilst didactic training is provided at a clinic, at least during the introduction of new materials and training activities.

Still another difference between programs that might be seen as a dimension is the degree to which augmentative and alternative communication (AAC) is included. In some programs these strategies, in the form of manual signs, symbols and pictures and speech-generating devices (SGDs, today often Apps used on an iPad, smartphone or other platform), are included already from the start to promote communication and build language, whilst in other programs AAC strategies are not included, but instead seen as a last resort when training of speech has failed.

3.2.2.1. Education and tutoring of parents and staff

The most common intervention of this type is parental education. The internationally most wide-spread parental education programs most probably are the courses developed by the Canadian Hanen Centre [38]. The course being developed for children within the autism spectrum is called More Than Words and includes eight group sessions for the parents and three "home-visits" by the Speech-language pathologist. During these visits the interaction between the child and the parent is videotaped and the parents are given feed-back and further guidance how to improve communication and use of the strategies being taught during the course. The Hanen courses is a developmental approach and teaches responsive strategies to the parents adding some behavioural techniques to stimulate communication learning within the frames of child-focused natural interaction in the home [38]. A new parental course called ComAlong has been developed in Sweden and now is spreading in northern Europe [39]. ComAlong include eight group sessions focusing on responsive strategies and environmental teaching but also puts a large focus on the use of augmentative communication strategies in

the home setting [39]. The parents are provided with picture boards so they can use aided language modeling in their homes [39, 40].

3.2.2.2. Comprehensive intervention programs

Training of communication, language and speech is most often an important part in the different comprehensive programs, addressing different skills and problems, that has been developed for young children within the autism spectrum. Some of these are built on behavioural theories, others on developmental pragmatic approaches. There seems to be a trend that the programs being developed and researched during the last decade, specifically for young children with autism, are more eclectic. The background theories are often described as developmental pragmatic whilst ABA (Applied Behavior Analysis) techniques are used to strengthen the teaching practices. Most often these comprehensive programs include both direct training to the child and indirect intervention parts in that parents and/or staff in the close network of the child are given education, training and/or guidance.

3.2.2.3. Augmentative and Alternative Communication — AAC

AAC comprises different methods and modes of communication such as body communication, concrete objects, manual signs, graphic symbols or speech-generating devices. Historically, the first studies describing AAC techniques being used for individuals with autism appeared in the 1970s; they reported on the use of sign language to improve communication [41]. These studies appeared at the same time as the unsatisfactory results of spoken-language-training programmes were being published. Studies by, for example, Lovaas et al. [26] reported little change after many hours of intensive treatment, and the results were particularly poor for the children whose comprehension and vocal skills were most impaired [41]. Initially, most signing programmes were built on formal sign language systems, but it became evident that these were often too complex and abstract, and so specially adapted systems were developed and implemented. Sign-based programmes spread rapidly in schools for children with autism in many countries.

During the 80's and the 90's a gradual change in AAC intervention for persons with autism, was seen, as visual-graphic communication was more in focus. Mirenda and Erickson [42] explain that the shift away from the use of signing to visual-graphic communication occurred as a result of research findings in three main areas: imitation, iconicity, and intelligibility. In addition to the evidence of a generalized imitation deficit in autism, there were also studies showing that some children with ASD had extremely poor sign imitation skills [43] due to difficulties with motor planning, control and execution [44]. According to Howlin [41], the shift from the use of manual signs to visual methods was also due to the fact that visual methods had proven to be effective in enhancing general skill acquisition, mainly within the TEACCH programme (Treatment of Education of Autistic and related Communication-handicapped CHildren; [45]) developed during the 1970s. A variety of symbol systems were also developed, beginning with Blissymbolics and Rebus followed by Pictogram and Picture Communication Symbols. The improvements in computer technology made these symbol sets easily available in the form of practical software packages. The development of digital cameras

during the 1990s also increased the possibility of including personal photos in AAC systems, which, according to clinical reports, seemed to increase motivation and facilitate understanding of pictures, particularly for individuals with ASD [46].

There are, however, also reports of problems in teaching symbols to children with ASD, mainly in teaching them to use the pictures spontaneously and for communicative functions other than requesting [41]. It was precisely these problems that led Bondy and Frost [47] to develop the method called Picture Exchange Communication System (PECS). PECS is a systematic approach to communication training specifically developed for children with autism. The elements that make PECS different from other visual-graphic techniques are the use of the concrete hand-to-hand exchange of the picture and also the highly prescriptive user manual with its six levels to follow in sequence.

Historically, the use of speech output technologies with individuals with ASD has not been a matter of course [48]. Computer technology was introduced into educational settings for children with autism late, not only in North America, but also in other countries. Professionals feared that people with ASD would become even more aloof if they were encouraged to sit in front of a computer screen. Concerning speech-generating devices (SGDs), a common view was that they would only stimulate echolalia in children with ASD, and that there would be too much noise in the classroom. By the end of the 1990s, scepticism had decreased. This was probably due to reports of some studies of successful computer-assisted instruction (CAI) carried out. The introduction of "app technology "has meant a revolution to the field of speech-generating devices and the first studies of the effects of apps are now being published.

4. Evidence-Based Practice — EBP

The term evidence-based used as a prefix and a denominator of interventions and methods comes from medicine. The term evidence based means that the choices of interventions and assessments are based on a research literature not simply professional experience or previous practice. Evidence-based practice has been important within the area of early communication intervention. The behavioural intervention tradition with its roots in the research clinic has produced a lot of high-quality research during the years. Other types of interventions has been less researched and sometimes have used methods and produced data that are different so that comparisons of effects are hard or impossible to do. This has also led to an interesting discussion of how to do EPB within the field of communication intervention. Ralph W. Schlosser, professor at NorthEastern University, USA, has been of great importance in this respect. Partly because he is spreading knowledge about evidence-based practise (EBP) and due to the many thorough compilations of research that he has done, but also in demonstrating the problems and shortcomings using EBP in relation to the field of augmentative communication intervention [49]. One of these problems concerns the use of the Randomized Controlled Trial or Study (RCT) as the golden standard, as RCTs are almost non-existent within the AAC field. There are many reasons to this but the main ones are that (1) children with communicative disabilities are so heterogeneous and (2) that randomization is extremely difficult to put through due to ethical reasons.

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Schlosser has therefore suggested an alternative evidence hierarchy placing the meta-analysis on top [49, 50]. Schlosser and several other prominent authors within the field of communication intervention research designs recommend the use of well-controlled single-subject research designs that can form the base for systematic meta-analyses.

5. Method

5.1. EBP-group

The review of research within the field of early communication intervention that is presented in this study was initiated by the Swedish association of Habilitation directors as part of a project concerning EBP that was started 2002. Within the frames of this project several reports have been produced with respect to interventions for children and adults with disability. The author of this chapter was appointed scientific leader for a group of five speech-language pathologists and one special educator in Sweden, that applied for taking part in the project. The group has worked together during recurrent two-day-sessions and in between, work has also been done separately and in pairs.

5.2. EBP-method and search question

The group decided to use the EBP-model of Ralph Schlosser [49]. As mentioned above the hierarchy of evidence of Schlosser is a bit different compared to the traditional ones, in that it places the meta-analysis on top of the hierarchy beside the RCT-study. Schlosser also includes perspectives of the stakeholder and the influence of environment into his model of EBP and defines EBP as follows: "The integration of best and current research evidence with clinical/educational expertise and relevant stakeholder perspectives to facilitate decisions for assessment and intervention that are deemed effective and efficient for a given stakeholder". The classical model of formulation of a evidence question shortened PICO - Problem, Intervention, Comparison, Outcome - has accordingly been revised into PESICO - Problem, Environment, Stakeholders, Intervention, Comparison, Outcome [49]. The question that was formulated in this review was: A young child with severe communicative disability, living with his/her parents and being placed in a pree-school group: which intervention is most effective; indirect or direct interventions.

5.3. Procedure

When the clinical question had been formulated the group identified search terms to use. These were: Early Intervention, Communication, Communication Disability/ies, Direct intervention, Indirect intervention, Early childhood, Kindergarten, Pree-school, AAC, Augmentative Communication, Alternative Communication, Early Communication, Language, Meta-analysis, Review. The terms were searched separately and in combinations using four scientific data bases: PubMed, PsycInfo, CINAHL and ERIC. It was seen that CINAHL generated significantly more results than the other three. All abstract were browsed and the studies considered as relevant were downloaded. The reference lists of these studies led to some new findings. A few

studies and book chapters were found through the group's different contacts and readings of literature. The studies were read and reviewed using a protocol and a manual that was developed. The factors that were examined in each study were: Research methods, participants, environment, intervention, results, evidence grading and a final category called notes. This column included judgements of (a) ICF domain/s that the study involved, (b) validity: internal, external, social and ecological, (c) importance of discussion and suggestions of future studies.

Each study was first reviewed by two group members separately and then discussed and graded by the group altogether. The group graded the studies according to three systems: Schlosser [49], Nordenström [51] and Golper [52]. Schlosser's system was seen as the most important for this study due to the fact that it was developed for the field of communication intervention for people with disability. Nordenström represent the classical medical evidence hierarchy whilst the Golper was included for its ambition to catch or grade the level or depth of evaluation that the study represents.

System	Level	Definition
Schlosser	1	Meta-analyses of SSRD /RCT
	2	Well designed non-RCT group study SSRD – one intervention SSRD – several interventions Subgroups to/variants of the types above
	3	Narrative quantitative reviews (except of meta-analyses)
	4	Narrative reviews
	5	Pre- experimental group studies (i.e. before-after) and case studies
	6	Expertise: educational books, journals, expert opinion
Nordenström	A	Strong scientific evidence (meta-analysis, well-done and large RCT)
	B	Moderate evidence (smaller or non-randomized studies, cross-sectional studies, case studies, cohort studies)
	C	Week evidence (expert opinion, concensus reports, case studies and other descriptive reports)
	D	Non-existent scientific evidence (No studies of sufficient quality exists).
Golper	Phase I	Hypotheses about treatment efficacy are being developed for later testing. Often this involves experimental manipulations to test potential benefits or activity of a particular treatment.
	Phase II	The goals are to formulate and standardize protocols, validate measurement instruments, optimise dosage of treatment, and so on. Includes case reports and small group studies with no control groups or treatment comparisons.
	Phase III	Treatment efficacy of a specified protocol is formally tested either with SSRD or group studies with controls such as control groups or treatment comparisons.

Table 1. Systems for evidence-grading being used in this study. SSRD=Singel Subject Research Design, RCT=Randomized Controlled Study

Author&year	Study design	Intervention	Evidence grading
Aldred, Green & Adams, 2004 [54]	RCT	Education and guidance of parents in the use of responsive strategies	Schlosser: 1 Nordenström Golper. III
Callenberg och Ganebratt, 2009 [56]	Pre-experimental group-study	ComAlong parental education; responsive strategies and AAC	Schlosser: 5 Nordenström: B Golper. II
Drew, Baird, Baron-Cohen, Cox, Slonims, Wheelwright, Swettenham, Berry & Charman, 2002 [32]	Pilot RCT	Focus parent training; joint attention	Schlosser: 1 Nordenström: A Golper. III
Elder, Valcante, Yarandi, White & Elder, 2005 [57]	Large-scale SSRD	Education and guidance of fathers: imitation and responsive strategies	Schlosser: 2 Nordenström: B Golper. III
Ferm, Andersson, Broberg, Liljegren & Thunberg, 2011 [55]	Group study; mixed methods	Parents and course leaders' experiences of the ComAlong augmentative and alternative communication early intervention course	Schlosser: 5 Nordenström: B Golper. II
Girolametto, Sussman & Weitzmann, 2007 [58]	Case study, Interaction analyses	Hanen More than Words parental education and guidance: responsive strategies	Schlosser: 5 Nordenström: C Golper. III
Howlin, Gordon, Pascoe, Wade & Charman, 2007 [59]	RCT	PECS – training of pree-school teachers (and also some older children)	Schlosser: 1 Nordenström: A Golper. III
Jonsson, Kristoffersson, Ferm & Thunberg, 2011 [40]	Pre-experimental group study; mixed methods	ComAlong parental education; responsive strategies and AAC	Schlosser: 5 Nordenström: B Golper. II
Karlsson & Melltorp, 2006 [62]	Pilot group study, mixed methods	ComAlong parental education; responsive strategies and AAC	Schlosser: 5 Nordenström: B Golper. I
Lennartsson och Sörensson, 2010 [60]	Group study, small control group	ComAlong parental education; responsive strategies and AAC	Schlosser: 5 Nordenström: B Golper. II
McConachie, Randle, Hammal & LeCouteur, 2005 [61]	Controlled group study	Hanen More than Words parental education and guidance: responsive strategies	Schlosser: 2 Nordenström: B Golper: III
Oosterling et al., 2010 [63]	RCT	Focus parent training; joint attention	Schlosser: 1 Nordenström: A Golper. III
Seung, Ashwell, Elder & Valcante, 2006 [64]	Group study	Verbal outcomes after training of fathers as analyzed by video interactions	Schlosser: 2 Nordenström: B Golper. III
Sharry, Guerin, Griffin & Drumm, 2005 [65]	Group study	Evaluation of the parental plus progam including responsive strategies	Schlosser: 5 Nordenström: B Golper. II

Table 2. Studies of education and guidance to parents or staff

The results were analysed and grouped primarily according to the formulated search question but also according to the identified areas of intervention and methods being evaluated in the studies. Building on these results, recommendations and a model for early communicative intervention was suggested. These results were documented in a report being published on the website of the Association of Swedish Habilitation directors [53]. A new literature search using the same procedure as described above led to some revision of results and recommendations in a new version of the report that was recently published [53].

The results that will be shared in this book chapter concerns the studies that specifically involved children on the autism spectrum, which in total involved about half of the studies, or exactly 47 studies. The data from both literature searches was used: 30 studies from the review published in 2011 and 16 studies from the updated version of 2012.

6. Results

The number of studies that were included in the review totalled 106. Of these, 39 were reviews, while the other 67 were primary studies. 46 of the studies involved children diagnosed within the autism spectrum. This means that about half the research on interventions for children with communicative disabilities have focused children with ASD. 31 of the studies were included in the report published 2011 while 14 were added in the review done 2012. 20 of the publications were reviews while 27 were primary studies. There were comparatively more primary studies, often of high research quality, to be found in the more recent search (2012). Only publications where the children were clearly described as having ASD were included in this review. There were most probably even more studies of the 106 that included children with ASD since sometimes participants were described according to type and/or severity of disability (such as severe communicative disability), and not diagnose..

6.1. Indirect interventions — Education and guidance to parents

14 primary studies were found. The evidence is moderately to strong since there are also some studies with a high level of scientific control. Many of the studies were noted as showing high validity with respect to external validity as well as social and ecological validity. In several studies the parents were involved in the evaluation procedure and measures of natural interactions were included.

In general the results of education and guidance to parents and staff are very positive although this review shows that there seems to be a lack of research when it comes to education and guidance of staff. Only one study was found where pree-school teachers were educated and guided how to use the PECS-method [32]. The results of the parental interventions indicate that they are effective in that positive results can be seen very quickly with respect to different areas and with comparatively little amount of intervention. This is also probably one of the reasons behind the trend that parental education seems to be included as a part of the more recently developed intervention programs. In the second literature search in this study more interventions were found that included

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guidance of parents (for example 31, 63, 74, 75, 81). Several of these interventions included education that was combined with home-visits when the therapist interacted with and trained the child during natural play situations. The parents observed these play activities and the therapist's use of behavioural strategies, which were then discussed an practiced during the sessions. The results of these comprehensive programs are included in the section of direct interventions below (table 3), but it is important to also recognize the fairly large amount of indirect instruction in these programs.

In several studies of the interventions more specifically aimed at parental education, it was seen that the parent's use of responsive strategies increased [54, 58, 60, 61, 62] and some studies showed that interaction between the parent and the child was positively affected [57, 58, 62, 65]. Some studies report that the development of communication and language in the child seems to be increased when the parents are provided with education and guidance [32, 54, 56, 61, 62, 64]. Several studies have tried to measure parental stress and other family related parameters that are expected to be affected, also out from parental interviews [54, 55, 56, 61, 65]. Most studies failed in proving effects in this respect, at least on a level of statistical significance. In some studies the researchers speculate that the questionnaires given before and after an intervention seems to fail in catching an effect. In qualitative studies parents report that they can see the problems of the child more clearly after the course and can be more open about the family problems [55]. This means that items related to family issues even might "get worse" comparing questionnaires filled in blindly before-after intervention.

So far very little is known of the long-term effects of indirect intervention. The few studies with this focus show that the effects seem to fade over time. Both clinicians and researchers hypothesize that there probably is a need to do follow-ups and/or provide booster interventions to maintain the intervention effects over time. There are also indications that the effects of a parental education on the development of the child seems to be further enhanced when the education is complemented with direct intervention to the child.

6.2. Direct interventions — Provision of training of the child

19 studies were found of which 10 were reviews (1 meta-analysis) and the rest primary studies. The scientific level of evidence varies, but the recently published primary studies being of high quality certainly strengthen evidence in the area of direct communication intervention.

Direct interventions or training of the child has proved to have a positive impact on the development of the child with ASD as is stated in most, but not so sure in all, of the studies in the table. Exactly what is described to be affected differs in different studies, depending on the focus of the study, but to a large extent also on what have been measured in a particular study. It is more common that classical didactic programs report outcomes within the function- or activity-domain, often by the use of measures of intelligence (IQ) or language (different language tests). The child-directed naturalistic interventions more often describe outcomes in terms of activity or participation and use data of communication or interaction from video analyses, parental questionnaires and interviews.

Author&year	Study design	Intervention	Evidence grading
Charman, 2010 [76]	Review	Review of developmental approaches to understanding and treating autism	Schlosser: 4 Nordenström: C Golper. I
Corsello, 2005 [66]	Review	Review and discussion of interventions 0-3 years	Schlosser: 4 Nordenström: C Golper. I
Dawson et al, 2010 [30]	RCT	Study of the effects of : The Early Start Denver Model for toddlers with ASD	Schlosser: 1 Nordenström: A Golper. III
Delprato, 2001 [67]	Review	Comparison of discrete trial interventions and naturalistic language interventions	Schlosser: 4 Nordenström: B Golper. II
Diggle & McConachie, 2009 [68]	Review Cochrane-report	Review of parent-mediated intervention/ training of children with ASD	Schlosser: 3 Nordenström: B Golper. III
Fernell et al, 2011 [77]	Comparative group study	Comparison of effects of 1) intensity and form of intervention 2) intelligence on adaptive behaviour on children with ASD	Schlosser: 2 Nordenström: B Golper. II-III
Goldstein, 2002 [69]	Review	Review and comparison of communication intervention to children with ASD	Schlosser: 4 Nordenström: B Golper. II
Kasari et al (2010) [31]	RCT	Study of the outcomes of an intervention for joint attention	Schlosser: 1 Nordenström: A Golper: III
Kasari, Paparella & Freeman, 2008 [70]	Randomized group study	Comparison of interventions for play and joint attention in children with ASD	Schlosser: 2 Nordenström: A Golper. III
McConkey et al, (2010) [74]	Controlled group study	Evaluation of the impact of home-based intervention to promote communication	Schlosser: 2 Nordenström: B Golper. III
McConnell, 2002 [71]	Review	Review of interventions to promote social interaction in young children in educational settings	Schlosser: 4 Nordenström: B Golper. I
Paul & Roth , 2011 [78]	Narrative review/ expertise	Characterizing and Predicting Outcomes of Communication Delays in Infants and Toddlers: Implications for Clinical Practice.	Schlosser: 6 Nordenström: C Golper. I
Rogers, 2006 [11]	Review	Review of and historic description of communication intervention to young children with ASD	Schlosser: 6 Nordenström: C Golper. I
Schuit et al, 2011 [79]	Controlled group study (small groups)	Evaluation of a program aimed at stimulate language learning in disabled children	Schlosser: 5 Nordenström: B Golper. III
Spreckley & Boyd, 2009 [80]	Meta-analysis	Meta-analysis of discrete-trial-interventions for children with ASD	Schlosser: 1 Nordenström: A Golper. III

Author&year	Study design	Intervention	Evidence grading
Vismara et al, 2009 [81]	Group study Non-concurrent multiple baseline design	Evaluation of the effects of "start-kit" of 12 individual sessions teaching parents communicative strategies	Schlosser: 2 Nordenström: B Golper. I
Wong & Kwang, 2010 [75]	RCT (small groups)	Evaluation of Autism 1-2-3-progam	Schlosser: 1 Nordenström: B Golper. III
Woods & Wetherby, 2003 [72]	Review, clinical report	Review of methods of identification and intervention for young children at risk of ACD	Schlosser: 4 Nordenström: C Golper. II
Yoder & Stone, 2006 [73]	Randomized comparison	Comparison of RPMT and PECS on spoken communication	Schlosser: 2 Nordenström: B Golper. III

Table 3. Studies of direct interventions and comprehensive programs

As mentioned in earlier paragraphs generalization and maintenance has been a big issue within the field of communication and language intervention for years. Generally the child-focused interventions show better generalization and maintenance in younger children with ASD [67, 72, 76]. These studies discuss that the use of the inborn motivation of the child and the use of natural context and natural play context make the difference – all according to current theories of development of cognition and communication. Proponents of didactic training hold that the use of learned words and phrases might be a start of a positive social spiral where the child gets more response and is treated differently. Some reviews come to the conclusion that we still do not have enough evidence to tell which type of program is best, didactic or child-focused, but that the important factors seem to be early start and intensity [66, 69]. According to the meta-analysis of six RCT studies of didactic interventions [80] these however fail in reporting better outcomes than the control groups when it comes to cognition, language and adaptive functioning. Generally the children in didactic training programs also were older [68]. Didactic training in its intensive and comprehensive form seems less effective on younger children and children at early communicative levels [77]. The involvement of the parents in recurrent didactic training activities in the home is also questioned in some studies [68]. There are indications of a high degree of stress in these parents and a comparative study showed that parental stress was lowered when the training was done by others and furthermore that the results with respect to communication development was enhanced [68].

Several recent studies report outcomes from eclectic comprehensive interventions [30, 31, 74]. These programs are built upon current theories of cognitive, communicative and neurophysiological development but also adds knowledge from the behaviourist tradition or rather Applied Behavior Analysis (ABA) in optimizing the learning situation. More concretely this means that these programs are child-focused in that it makes use of the child's motivation and interests and focus the communication between the parent and the child and are often implemented in the home setting, sometimes after some introductory sessions on a clinic. An analysis of the child's communication development forms the decision of what is going to be focused during interaction. Prelinguistic competencies such as imitation, joint attention and

use of symbol play and symbols are seen as basic and pivotal. The behavioural techniques are used to arrange the environment and chose strategies to refine and enhance learning in the natural interaction. The trainer serve as model to the parent and then guide and coach the parent, often in the home.

The majority of the primary studies in the table above report excellent outcomes [30, 31 70, 73, 74, 75, 81]. In general the research quality of evaluations of these interventions were high since many were of RCT type or Randomized Group studies. External, social and ecological validity was also considered as generally high partly due to the use of more interactional data and information from the stakeholders. The studies show that these interventions seem to be very effective in proving positive outcomes with respect to interaction, parental communication style and child development. Some of these intervention programs are of comparatively low intensity and short, which is interesting and important, as high intensity traditionally have been said to be essential to success in children with autism

Some articles compare interventions and discuss recommendations with respect to different needs of the child or family. A comparison of the AAC-method PECS and RPMT (a comprehenesive program containing parental education in the use of responsive strategies and training of the child and guidance to parents in their home) showed interesting results with respect to communication outcomes in the children [73]. The children at the earliest communicative stage, not yet being interested in objects, seem to develop more with RPMT. At the next communicative stage when the children has an interest of objects, an understanding of cause and effect and some emergent understanding of joint attention PECS is more effective. When joint attention is more established the Prelinguistic Mileu Teching strategies (behavioral techniques implemented in natural interaction) in the RPMT seems to be more operant. It was also seen that the PMT-training had better effect for those children whose mothers used a responsive communication style. The focus on development of joint attention is emphasized as the primary goal in this study with a successive introduction of symbol play as joint attention is being established [73].

Finally, one review studies the effect of different types of interventions to promote social interaction in pree-school settings and conclude that there is good evidence that it is important to work both with the child with disability as well as with his/her friends in the school environment [71].

6.3. AAC intervention

The field of AAC is a fairly new field of knowledge that has gradually grown as there is a increasing interest in functional communication and in ensuring the communicative rights of individuals with disability. There has also been an explosion of available communication technologies and methods that can support and improve communication for individuals with autism. We have probably and hopefully only seen the dawn of these new options. It is also possible to see that we are moving from using one technique or approach at the time to working with multimodal techniques or approaches where different tools and methods combined with an understanding of communication and use of interactional strategies build a total system of communication.

Author&year	Study design	Intervention	Evidence grading
Binger, Berens, Kent-Walsh &Taylor, 2008 [82]	Review	The impact of AAC-intervention on use of AAC, symbolic gestures and speech	Schlosser: 4 Nordenström: B Golper. II
Bopp, Brown & Mirenda, 2004 [83]	Review	Review of FCT and use of visual strategies and discussion of the role of speech-language pathologist in working with challenging behaviors	Schlosser: 4 Nordenström: B Golper. I
Brady, 2000 [84]	Case study	Study of the impact of use of SGDs on the understanding of speech	Schlosser: 5 Nordenström: C Golper. I
Branson & Demcak, 2009 [85]	Meta-analysis	Evaluation of AAC interventions for toddlers and infants with disability	Schlosser: 1 Nordenström: A Golper. III
Ganz, Simpson & Corbin-Newsome, 2008 [86]	SSRD – Multiple baseline	Impact of PECS on requesting and speech	Schlosser: 2 Nordenström: B Golper. III
Mancil et al(2009) [95]	SSRD – multiple baseline	Study of the effects of a picture-exhange-intervention using milieu teaching in the home	Schlosser: 2 Nordenström: B Golper. III
Millar, Light & Schlosser 2006 [87]	Meta-analysis	The impact of AAC-interventions on speech development	Schlosser: 1 Nordenström: B Golper. I
Papparella & Kasari, 2004 [88]	Review	Study of the relationship between joint attention and language – manual signing	Schlosser:4 Nordenström: C Golper. I
Preston & Carter, 2009 [89]	Meta-analysis	Study of the effects of PECS	Schlosser: 1 Nordenström: B Golper. III
Schlosser &, 2006 [90]	Quantitative review	The impact of AAC on children with developmental disabilites	Schlosser: 4 Nordenström: B Golper. II
Schlosser & Wendt, 2008 [91]	Meta-analysis	Effects of different types of AAC on speech in children with ASD	Schlosser: 1 Nordenström: B Golper: II
Sigafoos, Drasgow, Reichle, O´Reilly & Tait, 2004 [92]	Review	Study of the effectiveness of training of rejecting using AAC	Schlosser: 4 Nordenström: B Golper. I
Snell, Chen, Lih-Huan & Hoover, 2006 [94]	Review	Review of AAC-interventions to children with severe communicative disabilities	Schlosser: 4 Nordenström: B Golper. I
van der Meer et al, 2011 [93]	Controlled group study	Evaluation of a program using AAC (not further described)	Schlosser: 5 Nordenström: B Golper. II

Table 4. Studies of education and guidance to parents

The research base with respect to AAC used by young children with autism has grown in recent years. This research mostly consists of singe-subject-design studies and case studies, with very few controlled group studies being done. On the other hand there are some well-done meta-analyses published that compile results from singe-subject research studies. Due to the difficulties of conducting RCT studies within the field of AAC-intervention the meta-anlyses are important and can be seen as the golden standard. In total 14 studies were identified as focusing the use of AAC and of these 10 were reviews or meta-analyses.

In conclusion, meta-analyses and other studies show that AAC-interventions are cost-effective and give fast results and furthermore tend to stimulate speech development [82, 84, 85, 86, 87, 91]. The best results seem to be reached when the social network surrounding a child is given support and resources, to be able to use responsive strategies and provide communication opportunities and direct training using AAC in natural daily interactions. AAC intervention should be started as soon as communication difficulties are displayed or suspected since AAC promotes communication, language and speech. AAC-intervention has also been proved to effectively decrease challenging behaviour [83]. There is today no mode of AAC that is known to be better than any other for young children with autism. Instead multimodal approaches seem to be the most effective [93]. However, graphic AAC seem to be acquired at a faster rate and also easier to generalize to other situations [90]. PECS has been proved to be an effective AAC method, specifically at early stages of communication and with respect to the first three phases of the method [89].

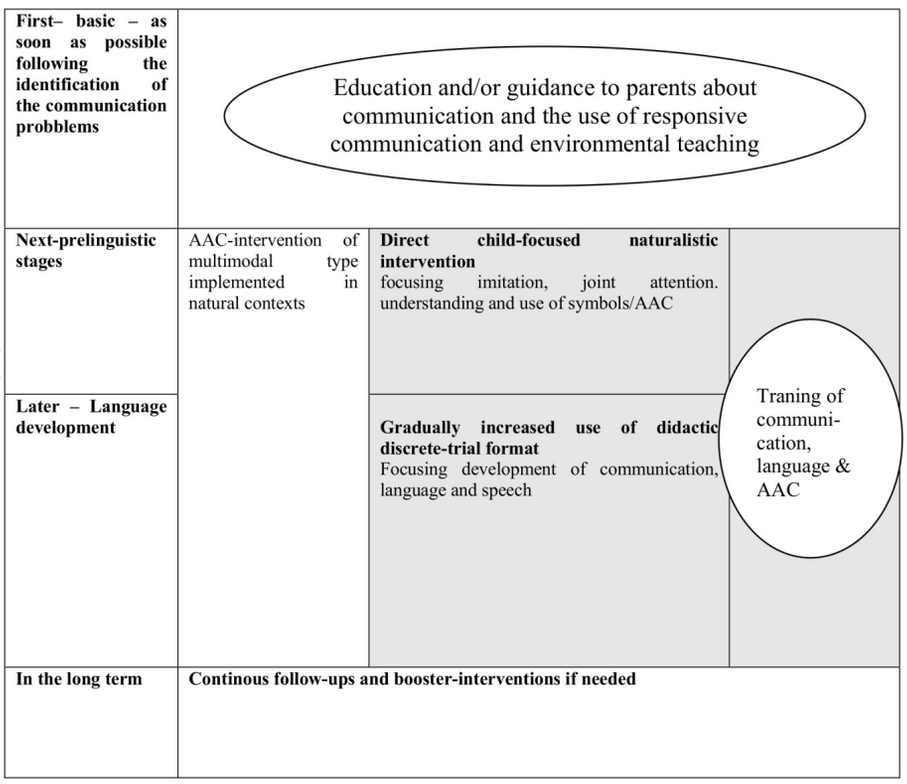


Figure 1. Model for early communication intervention

http://dx.doi.org/10.5772/54881

7. Conclusion

The conclusion of this chapter is presented in the form of eight recommendations and of a model for early communication intervention answering the question that was initially formulated in this study: **"A young child with autism and severe communicative disability, living with his/her parents and being placed in a pree-school group: which intervention is most effective; indirect or direct interventions?"**

1. **A combination of indirect and direct interventions.** There is strong evidence that the combination of education and guidance to the parents and direct child-focused intervention to the child in a naturalistic context leads to good outcomes with respect to several parameters such as: development of communication and language, interaction between the parent and the child where the parent uses a responsive communication pattern,

2. **Parental education should include knowledge of and training in the use of responsive strategies and behavioural/environmental teaching techniques within the frames of natural interaction in the home.** Several studies show that parents change their communicative style after a few education sessions and that this positively affect the interaction pattern with the child and enhance language development in the child. **Guidance or coaching of the parents in natural interactions in the home environment** is included in most of the recently presented studies and show very good results in short time.

3. **Direct interventions provided to children on early communicative stage should be child-focused and implemented in daily natural interactions. The intervention should focus imitation, joint attention and symbol use** (speech, symbols, manual signs). Didactic intervention is not effective for young children since maintenance and generalization of training is low.

4. **Interventions need to be continuous and include follow-ups and possibilities of booster-intervention.** The few long-term follow up-studies all show that interventions (of different type) tend to wear off by time. The recent published studies show that low-intensity interventions also could yield good results. The engagement of the parent also might be an important success factor.

5. **Children at early communicative stages should be provided with AAC as early as possible.** There is no age-limit or prerequisites that need to met before AAC is introduced. There is strong evidence that AAC decreases challenging behaviour. There is moderate to strong evidence that AAC facilitates development of speech.

6. **AAC-intervention should ideally be multimodal.** All modes of AAC are effective. There is some evidence that symbols (specifically combined with speech output) are learned faster than manual signs and that iconic symbols are learned faster.

7. **PECS (Picture Exchange Communication System) is an effective AAC-method for children at early communicative stages.** There is strong evidence that PECS has a positive effect on interaction and behaviour and that functional communication is increased.

8. **The AAC-modes should be used and modelled by the child's communication partners** (aided language stimulation or modelling) to promote learning and spontaneous use of the symbols.

These recommendations means that the child in our formulated question should be provided with intervention according to the model below.

Acknowledgements

Parts of chapter two, three and four was first published in the author's thesis [96]. Thanks to my collegues in the ebp-group: Lena Nilsson, Maria Nolemo, Barbara Eberhart, Jessica Forsberg, Ruth Breivik and Anna Fäldt.

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References

[1] Short C, Schopler E. Factors relating to age of onset in autism. Journal of Autism and Developmental Disorders 1988 ;18 207–216.

[2] Carr EG, Levin L, McConnachie G, Carlson JI, Kemp DC, Smith CE. Communication-based intervention for problem behavior. Baltimore, MD: Paul H. Brookes Publishing; 1997.

[3] Billstedt E. Children with autism grow up: Use of the DISCO (Diagnostic Interview for Social and COmmunication disorders) in population cohorts. Göteborg: Göteborg University; 2007.

[4] Billstedt E, Gillberg IC, Gillberg C. Autism after adolescence: Population-based 13-22-year follow-up study of 120 individuals with autism diagnosed in childhood. Journal of Autism and Developmental Disorders 2005 ; 35, 351–360.

[5] Howlin P, Goode S, Hutton J, Rutter M. Adult outcomes for children with autism. Journal of Child Psychology and Psychiatry, 2004; 45, 212–229.

[6] Shea V, Mesibov G. Adolescents and adults with autism. In F. Volkmar, R. Paul, A. Klin & D. Cohen (Eds.), Handbook of autism and pervasive developmental disorders (pp. 288–311). Hoboken, NJ: John Wiley & Sons; 2005.

[7] Bryson S. Brief report: Epidemiology of autism. Journal of Autism and Developmental Disorders 1996; 26, 165–167.

[8] Bryson S, Clark BS, Smith TM. First report of a Canadian epidemiological study of autistic syndromes. Journal of Child Psychology and Psychiatry 1988; 29, 433–445.

[9] Lord C, Risi S, Pickles. Trajectory of language development in autism spectrum disorders. In R. M & S. Warren (Eds.), Developmental language disorders: From phenotypes to etiologies (pp. 7–29). Mahwah, NJ: Lawrence Erlbaum; 2004.

[10] Tager-Flusberg H., Joseph RM. Identifying neurocognitive phenotypes in autism. Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences 2003; 358, 303–314.

[11] Rogers S. Evidence-based interventions for language development in young children with autism. In T. Charman & W. Stone (Eds.) Social and communication development in autism spectrum disorders (pp. 143–179). New York: The Guildford Press ; 2006.

[12] Tager-Flusberg H, Paul R, Lord C. Language and communication in autism. In F. Volkmar, R. Paul, A. Klin & D. Cohen (Eds.) Handbook of autism and pervasive developmental disorders (Vol. 1, pp. 335–364). Hoboken, NJ: John Wiley & Sons ; 2005.

[13] Wetherby A M, Prizant BM, Schuler AL. Understanding the nature of communication and language impairments. In AM Wetherby & BM Prizant (Eds.), Autism spectrum disorders: A transactional developmental perspective pp. 109–141. Baltimore, MD: Paul H. Brookes Publishing; 2000.

[14] Tager-Flusberg H, Joseph R, Folstein S. Current directions in research on autism. Mental Retardation and Developmental Disabilities Research Reviews 2001; 7, 21–29.

[15] Wetherby AM. Understanding and measuring social communication in children with autism spectrum disorders. In T. Charman & W. Stone (Eds*.), Social and communication development in autism spectrum disorders* (pp. 3–34). New York: The Guildford Press: 2006.

[16] Charman T, Baron-Cohen S, Swettenham J, Baird G, Drew A, Cox A. Predicting language outcome in infants with autism and pervasive developmental disorder. International Journal of Language and Communication Disorders 2003; 38, 265–285.

[17] Mundy P, Sigman M, Kasari C. A longitudinal study of joint attention and language development in autistic children. Journal of Speech and Hearing Research 1990; 38, 157–167.

[18] Dahlgren SO, Gillberg C. Symptoms in the first two years of life: A preliminary population study of infantile autism. European Archives of Psychiatric and Neurological Science 1989; 283, 169–174.

[19] Osterling J, Dawson G. Early recognition of children with autism: A study of first birthday home videotapes. Journal of Autism and Developmental Disorders 1994; 24, 247–258.

[20] Watson LR, Baranek GT, Crais ER, Reznick SJ, Dykstra J, Perryman T. The first year inventory: Retrospective parent responses to a questionnaire designed to identify one-year olds at risk for autism. Journal of Autism and Developmental Disorders 2007: 37, 49–61.

[21] Chawarska K, Paul R, Klin A, Hannigen S, Dichtel L E, Volkmar F. Parental recognition of developmental problems in toddlers with autism spectrum disorders. Journal of Autism and Developmental Disorders 2007; 37, 62–72.

[22] Lord C, Schulman C, DiLavore P. Regression and word loss in autistic spectrum disorders. Journal of Child Psychology and Psychiatry 2004; 45, 936–955.

[23] Wetherby AM. Ontogeny of communicative functions in autism. Journal of Autism and Developmental Disorders 1986; 16, 295–316.

[24] Ramberg C, Ehlers S, Nydén A, Johansson M, Gillberg C. Language and pragmatic functions in school-age children on the autism spectrum. European Journal of Disorders of Communication 1996; 31, 387–413.

[25] Bishop D, Hartley J, Weir F. Why and when do some language-impaired children seem talkative? A study of initiation in conversation of children with semantic-pragmatic disorders. Journal of Autism and Developmental Disorders 1994 ; 24, 177–197.

[26] Lovaas OI, Koegel RL, Simmons JQ, Long JS. Some generalization and follow-up measures on autistic children in behaviour therapy. Journal of Applied Behavior Analysis 1973; 6, 131–166.

[27] Hart BM, Risley TR. Establishing use of descriptive adjectives in the spontaneous speech of disadvantaged preschool children. Journal of Applied Behavior Analysis 1968; 1, 109–120.

[28] Prizant BM, Wetherby AM, Rydell P. Communication intervention issues for children with autism spectrum disorders. In A. M. Wetherby & B. M. Prizant (Eds.), Autism spectrum disorders: A transactional developmental perspective. Baltimore, MD: Paul H. Brookes Publishing; 2000.

[29] Hancock TB, Kaiser AP. The effects of trainer-implemented enhanced milieu-teaching on the social communication of children with autism. Topics in Early Childhood Special Education 2002; 22, 29–54.

[30] Dawson G, Rogers S, Munson J, Smith M, Winter J, Greenson J, Donaldson A, Varley J. Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model. Pediatrics 2010; 125; e17.

[31] Kasari C, Gulsrud AC, Wong C, Kwon S, Locke J. Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. Journal of Autism and Developmental disorders 2010; 40, 1045-1056.

[32] Drew A, Baird G, Baron-Cohen S, Cox A, Slonims V, Wheelwright S, Swettenham J, Berry B, Charman T. A pilot randomised control trial of a parent training intervention for pre-school children with autism: preliminary findings and methodological challenges. European Child & Adolescent Psychiatry 2002; 11(6) s. 266-272.

[33] Dahlgren S, Dahlgren-Sandberg A. The non-specificity of theory of mind deficits: Evidence from children with communicative disabilities. European Journal of Cognitive psychology 2004; 15, 129-155.

[34] Ello LM, Donovan SJ. Assessment of the relationship between parenting stress and a child's ability to functionally communicate. Research on Social Work Practice 2005;15(6), 531-544.

[35] Wilder J, Granlund M. Behaviour style and interaction between seven children with multiple disabilities and their caregivers. Child: care, health and development 2003; 29, 559-567.

[36] Warren S, Brady N, Sterling A, Fleming K, Marquis J. Maternal responsivity predicts language development in young children with fragile X syndrome. American Journal on Intellectual Disabilities 2010;115 (1), 54-75.

[37] Siller M, Sigman M. The behaviors of parents of children with autism predict the subsequent development of their children's communication. Journal of Autism and Developmental Disorders 2002; 32, 77-89.

[38] Hanen centre. http://www.hanen.org (accessed 23 October 2012).

[39] AKKtiv. http://www.akktiv.se (accessed 23 October 2012).

[40] Jonsson A, Kristoffersson L, Ferm U, Thunberg G. The ComAlong communication boards: Parents' use and experiences of aided language stimulation. Augmentative and Alternative Communication 2011; 27 (2), 103–116.

[41] Howlin P. Augmentative and alternative communication systems for children with autism. InT. Charman & W. Stone (Eds.), Social and communication development in autism spectrum disorders (pp. 236–266). New York: The Guildford Press: 2006.

[42] Mirenda P, Erickson KA. Augmentative communication and literacy. In B. M. Prizant & A. M. Wetherby (Eds.), Autism spectrum disorders: A transactional developmental perspective (pp. 369–394). Baltimore, MD: Paul H. Brookes Publishing. 2000.

[43] Yoder PJ, Layton TL. Speech following sign language training in autistic children with minimal verbal language. Journal of Autism and Developmental Disorders 1988: 18, 217–230.

[44] Seal BC, Bonvillian JD. Sign language and motor functioning in students with autistic disorders. Journal of Autism and Developmental Disorders 1997; 27, 437–466.

[45] Schopler E, Reichler R, Lansing M. Teaching strategies for parents and professionals. Austin, TX: PRO-ED Inc: 1980.

[46] Danielsson H, Jönsson, B. Pictures as language. Paper presented at the International Conference on Language and Visualisation, Stockholm: 2001.

[47] Bondy A, Frost L. The Picture Exchange Communication System. Focus on Autistic Behavior, 1994: 9, 1–19.

[48] Schlosser RW, Blischak DM. Is there a role for speech output in interventions for persons with autism. Focus on Autism and Other Developmental Disabilities 2001;16, 170–176.

[49] Schlosser RW. The Efficacy of Augmentative and Alternative Communication: Towards Evidence-Based Practice. Baltimore: Paul Brookes: 2003.

[50] Schlosser RW, Raghavendra P. Evidence-Based Practice in Augmentative andAlternative Communication. Augmentative and Alternative Communication 2004; 20, 1-21.

[51] Nordenström J. Evidensbaserad medicin: I Sherlock Holmes fotspår. Stockholm: Karolinska University Press; 2006.

[52] Golper LAC, Wertz RT, Frattali CM, Yorkston K, Myers P, Katz.R, Beeson P, Kennedy MRT, Bayles K, Wambaugh J. Evidence-based practice guidelines for the management of communication disorders inneurologically impaired individuals: Project introduction. ANCDS: 2001.

[53] Sveriges habiliteringschefer [Swedish habilitation directors]. http://www.sverigeshabiliteringschefer.se (accessed 23 october 2012).

[54] Aldred C, Green J, Adams C. A new social intervention for children with autism: pilot randomised controlled treatment study suggesting effectiveness. Journal of Child Psychology and Psychiatry 2004;45(1) 1420-1430.

[55] Ferm U, Andersson M, Broberg M, Liljegren T, Thunberg G. Parents and course leaders' experiences of the ComAlong augmentative and alternative communication early intervention course. Disability Studies Quarterly: Mediated Communication 2011; 31(4) http://dsq-sds.org

[56] Callenberg A, Ganebratt P. Utvärdering av AKKtiv föräldrautbildning: föräldrars bedömningar av barnens kommunikativa utveckling. [Evaluation of ComAlong parental course: parents' views and development in children]. Unpublished masters' thesis in Speech-language Pathology, University of Gothenburg: Department of Neuroscience and Physiology, Gothenburg: 2009.

[57] Elder JH, Valcante G, Yarandi H, White D, Elder TH. Evaluating In-Home Training for Fathers of Children With Autism Using Single-Subject Experimentation and Group Analysis Methods. Nursing Research 2009; vol 54 no 1.

[58] Girolametto L, Sussman F, Weitzmann E. Using case study methods to investigate the effects of interactive intervention for children with autism spectrum disorders. Journal of Communication Disorders 2007; 40, 470-492.

[59] Howlin P, Gordon K, Pasco G, Wade A, Charman T. The effectiveness of Picture Exchange Communication System (PECS) training for teachers of children with autism: a pragmatic, group randomised controlled trial. J Child Psychol Psychiatry. 2007; 48(5):473-81.

[60] Lennartsson E, Sörensson K. Föräldrars sätt att kommunicera med sina barn före och efter KomIgång kommunikationskurs. [Parental communication style before and after ComAlong parental course]. Unpublished masters' thesis in Speech-language Pathology, University of Gothenburg: Department of Neuroscience and Physiology, Gothenburg: 2010.

[61] McConachie H, Randle V, Hammal D, Le Couteur A. A controlled trial of training course for parents of children with suspected autism spectrum disorders. The Journal of Pediatrics 2005; 14, 335-40.

[62] Karlsson E, Melltorp M. Utvärdering av AKKtiv: Tidig intervention till föräldrar som har barn med omfattande kommunikationssvårigheter. [Evaluation of ComAlong: Early intervention to parents of children with communicative disability]. Unpublished masters' thesis in Speech-language Pathology, University of Gothenburg: Department of Neuroscience and Physiology, Gothenburg: 2006.

[63] Oosterling I, Visser J, Swinkels S, Rommelse N, Donders, R, Woudenberg T, Roos S, van der Gaag RJ, Biotelaar J. Randomized controlled trial of the Focus parent training for toddlers with autism: 1-year outcome. Journal of Autism and Developmental Disorders 2010; 40, 1447-1458.

[64] Seung HK, Ashwell S, Elder JH, Valcante G. (2006). Verbal communication outcomes in children with autism after in-home father training. Journal of Intellectual Disability Research, 2, (50), 139-150.

[65] Sharry J, Guerin S, Griffin C, Drumm, M. (2005). An evaluation of the Parents Plus Early Years Programme: A video-based early intervention for parents of pre-school children with behavioural and developmental difficulties. Clinical Child Psychology and Psychiatry, 10, 319.

[66] Corsello CM. Early Intervention in Autism. Infants & Young Children 2005; 18(2) 74-85.

[67] Delprato, D. J., (2001) Comparisons of Discrete-Trial and Normalized Behavioral Language Intervention for Young Children with Autism. Journal of Autism and Developmental Disorders, 31, 315-325.

[68] Diggle TTJ, McConachie HHR. Parent-mediated early intervention for young children with autism spectrum disorder (Review). The Cochrane Library 2009, Issue 4.

[69] Goldstein H. Communication Intervention for Children with Autism: A Review of Treatment Efficacy. Journal of Autism and Development Disorders 2002; 32(5), 373-396.

[70] Kasari C, Papparella T, Freeman S. Language Outcome in Autism: Randomized Comparison of Joint Attention and Play Interventions. Journal of Consulting and Clinical Psychology 2008; 76(1) 125-137.

[71] McConnell S. Intervention to Facilitate Social Interaction for Young Children with Autism: Review of Available Research and Recommendations for Educational Intervention and Future Research. Journal of Autism and Developmental Disorders 2002; 32(5) 351-372.

[72] Woods J, Wetherby A. Early Indentification of and Intervention for Infant and Toddlers Who Are at Risk for Autism Spectrum Disorder, Language, Speech and Hearing in Schools, 2003; 34 180-193.

[73] Yoder P. Stone WL. A Randomized Comparison of the Effect of Two Prelinguistic Communication Interventions on the Acquisition of Spoken Communication in Preschoolers With ASD. Journal of Speech, Language and Hearing Research 2006; 49 698-771.

[74] McConkey R, Truesdale-Kennedy M, Crawford H, McGreevy E, Reavey M, Cassidy A. Preeschoolers with autism spectrum disorders: evaluating the impact of home-based intervention to promote their communication. Early Child Development and Care 2010; 180(3) 299-315.

[75] Wong VCN, Kwan QK. Randomized Controlled Trial for Early Intervention for Autism: A Pilot Study of the Autism 1-2-3 Project. Journal of Developmental Disorder 2010; 40 677-688.

[76] Charman, T. (2010). Developmental Approaches to Understanding and Treating Autism. Folia Phoniatrica et Logopaedica, 62, 166-177.

[77] Fernell E, Hedvall Å, Westerlund J, Höglund Carlsson L, Eriksson M, Barnevik Olsson M, Holm A, Norrelgen F, Kjellmer L, Gillberg C. Early Intervention in 208 Swedish preschoolers with autism spectrum disorder. A prospective naturalistic study Research in developmental Disabilities 2011; 32 2092-2101.

[78] Paul R, Roth FP. Characterizing and Predicting Outcomes of Communication Delays in Infants and Toddlers: Implications for Clinical Practice. Language, Speech, and Hearing Services in Schools, 42, 331-340.

[79] Van der Schuit M, Segers E, Van Balkom H. Verhoeven L. Early language intervention for children with intellectual disabilities: A neurocognitive perspective. Research in Developmental Disabilities 2011; 32 705-712.

[80] Spreckley M, Boyd R. Efficacy of Applied Behavioural intervention in preschool children with autism for improving cognitive, language and adaptive behaviour. A systematic review and meta-analysis. J Pediatr 2009; 154 338-344.

[81] Vismara LA, Colombi C, Rogers SJ. Can one hour per week of therapy lead to lasting changes in young children with autism? Autism 2009; 13(1) 93-115.

[82] Binger C, Berens J, Kent-Walsh J, Taylor S. The Effects of Aided AAC Interventions on AAC Use, Speech, and Symbolic Gestures. Seminars och Speech and language 2008; 29 101-111.

[83] Bopp K, Brown K. Mirenda P. Speech-Language Pathologists' Roles in the Delivery of Positive Behaviour Support for Individuals With Developmental Disabilities. American Journal of Speech-Language Pathology 2004; 13 5-19.

[84] Brady NC. (2000). Improved Comprehension of Object Names Following Voice Output Communication Aid Use: Two case Studies. Augmentative and Alternative Communication, 16, 197-204.

[85] Branson D Demchak M. The use of Augmentative and Alternative Communication Methods with Infants and Toddlers with Disabilities: A Research Review. Augmentative and Alternative Communication 2009; 25 274-286.

[86] Ganz JB, Simpson RL, Corbin-Newsome J. The impact of the Picture Excange Communication System om requesting and speech development in preschoolers with autism spectrum disorders and similar characteristics. Research in Autism Spectrum Disorders 2008; 2 157-169.

[87] Millar DC, Light JC Schlosser RW. The Impact of Augmentative and Alternative Communication Intervention on the Speech Production of Individuals with Developmental Disabilities: A Research Review. Journal of Speech, Language and Hearing Research 2006; 49 248-264.

[88] Papparella T. Kasari C. Joint Attention Skills and Language Development in Special Needs Populations Translating Research to Practice. Infants and Young Children 2004; 17(3) 269–280.

[89] Preston D. Carter M. A Review of the Efficacy of the Picture Exchange Communication System Intervention. Journal of Autism and Developmental Disorders 2009; 39 1471-1486.

[90] Schlosser R. Sigafoos J. Augmentative and Alternative communication interventions for persons with developmental disabilities: narrative review of comparative single-subject experimental studies Research in Developmental Disabilities 2006; 27 1-29.

[91] Schlosser R. Wendt O. Effects of Augmentative and Alternative Communication Intervention on Speech Production in Children With Autism: A Systematic Review. American Journal of Speech-Language Pathology 2008; 17 212-223.

[92] Sigafoos J, Drasgow E, Reichle J, O'Reilly M, Green V, Tait K. Forum on Intervention Strategies for Severe Disabilities Tutorial: Teaching Communicative Rejecting to Children With Severe Disabilities. American Journal of Speech-Language Pathology 2004; 13 31-42

[93] van der Meer L, Sigafoos J, O'Reilly M. Lancioni, G. Assessing preferences for AAC options in communication interventions for individuals with developmental disabilities: A review of the literature. Research in Developmental Disabilities 2011; 32 1422–1431.

[94] Snell M, Chen L-Y & Hoover K. Teaching Augmentative and Alternative Communication to Students With Severe Disabilities: A Review of Intervention Research 1997-2003. Research and Practice for Persons with Severe Disabilities 2006; 3, 203-214.

[95] Mancil RG, Conroy AC, Haydon TF. Effects of a Modified Milieu Therapy Intervention on the Social Communicative Behaviours of Young Children with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders 2009; 39 149-163.

[96] Thunberg, G. Using speech-generating devices at home. A study of children with autism spectrum disorders at different stages of communication development. Gothenburg Monographs in Linguistics 34. Göteborg, Sweden: Göteborg University: 2007.

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