Communication Intervention for Children with Autism: A Literature Review

by

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ABSTRACT

Autism, and the broader category of autistic spectrum disorder (ASD), affects children and their learning in a variety of ways. Autism is a developmental disorder that is marked by profound deficits in social, language, and cognitive abilities. The manifestations of autism vary considerably among children and within an individual child over time. Because children with autism have language deficits, educationally they face obstacles in their ability to learn and interact with others. Poor communication skills may be the most problematic because they are necessary for socialization and cognitive development. In addition, children with delayed or disordered language are at increased risk for social, emotional, and behavioral problems. Therefore, identifying the most effective intervention approaches for promoting language acquisition and supporting the development of communication skills in young children with autism is important.

This research reviews the existing literature in communication interventions and approaches commonly used to promote language acquisition and the development of communication skills in children with autism. Strategies for teaching language are examined in relation to communication interventions based on behavioral and interactive theoretical models of language development. Behavioral and interactive approaches are examined to identify recommended programs and communication intervention techniques. While many communication interventions exist to increase their language and communication skills, it would appear that using several techniques and strategies in a combined approach might have greater utility than using a solitary intervention strategy. A critical analysis of the relevant literature includes directions for future research and practice.

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Chapter I: Introduction

Autism, or the broader category of autistic spectrum disorder (ASD), impacts children in a variety of ways. Autism is a developmental disorder that is marked by profound deficits in social, language, and cognitive abilities. The manifestations of autism vary considerably among children and within an individual child over time. There is no single behavior that is always typical of autism and no behavior that would automatically exclude an individual child from a diagnosis of autism, even though there are strong commonalities, especially in social deficits. In general terms, children within the autistic spectrum display a highly unusual pattern of deficits and skills.

Children with autistic characteristics may be classified as having autism spectrum disorder, also known as pervasive developmental disorder (PDD). Pervasive developmental disorder includes several differentiated disorders, including autistic disorder, but all are characterized by "severe and pervasive impairment in several areas of development: reciprocal social interaction skills, communication skills, or the presence of stereotyped behavior, interests, and activities" (American Psychiatric Association, 1994, p. 65). Autism has been defined by deficits in social reciprocity, communication, and repetitive behaviors or interests and these can each occur at different levels of severity. These early deficits in social responsiveness and communication have a seriously negative effect on the development of subsequent important behaviors. A child who is not socially engaged and does not learn to communicate effectively is at a definite disadvantage in learning more complex and subtle social and communicative skills.

Autism prevalence rates currently range from 10 to 15 cases per 10,000. It is not clear if the actual prevalence of autism is increasing, or if the increased frequency of

diagnosis has resulted from wider recognition of the disorder and especially recognition of the full range of pervasive developmental disorders. Either way, autism is no longer considered rare, occurring more commonly than Downs's syndrome, cystic fibrosis, and several childhood cancers (Schreibman, 2000).

The degree of impairment associated with autism varies widely, with approximately 75% of autistic individuals also meeting criteria for mental retardation (American Psychiatric Association [APA], 1994). Autism also occurs three to four times more frequently in males than females. Although recent advances have been made with respect to possible causal factors, the exact etiology of autism remains unknown. Additionally, although certain behavioral, educational, and pharmacological interventions have been demonstrated to be helpful for many individuals with autism, there is currently no cure for the disorder.

A feature of children with autism is deviant or delayed speech and language skills (Charlop & Haymes, 1994). Some individuals with autism have no language at all. Most do have the ability to speak and use language, but they do not appropriately integrate their language abilities into social interaction or emotional attachment. Approximately half of children with autism fail to develop functional speech, but only a small percentage are completely nonverbal. This inability to communicate in a functional manner may be the most handicapping of any of the symptoms of the disorder (Schreibman, 2000). Deficits in language and communication skills have been cited as the most significant behavioral deviation for children with autism. Among the deficits in behavior of children with autism, poor communication skills may be the most problematic because they are necessary for social and play skills. Therefore, developing communication skills,

especially verbal competence is extremely important. The level of communicative competence attained by children with autism has been found to be an important predictor of more positive outcomes (McEachin, Smith, & Lovaas, 1993; Stahmer, 1995).

Teaching children with autism language skills at a young age, and investigating procedures to teach these skills is a research area that has been fairly neglected in literature and practice. The Autism Society of America (1999) has stated that children with autism have severe deficits in communication skills that interfere with their development of verbal competence as well as their social and play skills. These children often display rigid adherence to structure and schedules, a general lack of social interactions, and ritualistic preservations on objects and/or topics. It is therefore extremely important to understand the deficits in vocal ability for children with autism and the relationships that exist between their lack of social interactions and other maladaptive behaviors pertinent to autism. Research suggests a strong benefit of early treatment on language development in children with autism (Sundberg & Partington, 1998). It is important to consider developmental appropriateness, language, and motivational factors when establishing interventions and treatments for young children with autism (Michael, 1982; Sundberg & Partington, 1999).

Controversy with interventions for teaching language and communication skills to children with autism continues to date. The reason for disagreement about effective instructional approaches and best practice is directly related to the variation among language development theories. Practioners' theoretical perspectives and how they believe people acquire language dictates what they believe is the most successful treatment. Those who take a facilitative stance would advocate an indirect approach,

allowing language to unfold. Those who advocate a more direct approach believe that language is acquired through reinforcement and imitation (Scheuermann & Webber, 2002).

There are a variety of techniques, strategies, and interventions used to treat these speech and language deficits in children with autism. Many treatment approaches have been developed to address the range of social, language, sensory, and behavioral difficulties. Some of the instructional strategies for teaching language and communication skills to children with autism take a behavioral approach and others take an interactive approach. Both models have been shown to be effective with individuals with autism (Kaiser, 1993; Lovaas, 1977, 1987; Prizant & Wetherby, 1998). Therefore, various strategies have been based on a combination of these models.

The interactive model is based on Bruner's (1977) view that language is learned through social interactions. Brunner (1977) explained language development, and particularly the mastery of pragmatics, as a function of the dialogue and frequent social interaction that occurs between parents and children. According to the interactive orientation of language development, this dialogue and interaction allows children to understand the nature of language and its rules of application. Examples of interactive strategies for language training include incidental teaching, peer mediated intervention, pivotal response training (PRT), and milieu teaching.

The behavioral model, on the other hand, is based on Skinner's (1957) view that language needs to be directly shaped and reinforced. Skinner (1957) presented his view of language development as a result of reinforced responses, first motivated by approval for verbalizations and later by natural consequences for the appropriate use of language.

Discrete Trial Training and the Picture Exchange Communication System (PECS) are two behaviorally based language interventions. The purpose of discrete trial training is to train specific skills as identified through analysis of deficits in a child's functioning. The purpose of PECS intervention is a functional non-verbal communication system that is based on initiation of communicative interactions (Lovaas, 1987; Bondy & Frost, 1994).

Statement of the Problem

Given the prevalence of autism is increasing, it is important to study the effectiveness of interventions to treat this ever-growing population. In addition, given that children with autism face language delays, interventions focusing on language skills are necessary. The purpose of this literature review is to examine the research on language interventions commonly used for children with autism and to examine the efficacy of procedures and training based on empirical studies.

Research Questions

1. To identify, through a literature review, what are the recommended interventions for supporting the development of communication skills in children with autism?
2. What is the efficacy of these intervention strategies?

Definition of Terms

Autism - Autism is a neurobiological developmental disorder that typically appears during the first 3 years of life. Autism is referred to as a spectrum disorder, meaning that the symptoms can occur in any combination and with varying degrees of severity. Autism falls under the pervasive developmental disorders (PDD) category in the Diagnostic and Statistical Manual of Mental Disorders (diagnostic criteria 299.00). Under the PDD or autism spectrum, there are a variety of subtypes.

According to the DSM-IV, three core features of autism must be present for a diagnosis to be made: social impairment, verbal or nonverbal impairment, and repetitive patterns of behavior. Indent the entire definition like this.

Articulation – The act of vocal expression; utterance or enunciation; the act or manner of producing a speed sound (American Heritage Dictionary)

Communication. Any set of interactions that transmits information.

Discrete Trial Training (DTT) - Discrete Trial Training involves the intensive application of ABA principles within a structured teaching environment in order to teach specific skills. DTT programs generally involve several hours of direct one-to-one instruction per day (including high rates of discrete trials) over an extended period.

Discrete trial instruction - A method of teaching specific skills. The instruction is made up of very specific units or "discrete trials." To use discrete trials, determine the appropriate wording of the instruction form of the response you want to teach, present that instruction, and reinforce correct responding. Discrete trials may occur in any setting, with groups or individuals, and with almost any skill.

Language - Composed of several complex elements but has basically been defined as the use of arbitrary symbols, with accepted referents, that can be arranged in different sequences to convey different meanings.

Receptive language - The elements of language that require a complex set of abilities and skills that allow people to understand what others are communicating.

Expressive language - The elements of language also require skills and the ability to produce these communicative behaviors in a way that others can understand.

Pragmatics - Situational context of language including speaker-listener interaction and determining who says what to whom, how they say it, why and when they say it.

Pragmatics is knowing how to use language appropriately in social settings (Scheuermann & Webber, 2002).

Echolalia - Refers to the repetition of utterances, words, or phrases heard in the immediate or distant past, often in place of normal, responsive language

Imitative repetition - A natural part of typically developing children's language, it's persistence past the first few years of language training is used as one of the diagnostic criteria for autism.

Speech – The faculty or act of expressing thoughts, feelings, or perceptions by the articulation of words (Scheuermann & Webber, 2002).

Chapter II: Literature Review

This chapter will review the literature relevant to the different behavioral and interactive language-based interventions currently in the literature. It will also purport the efficacy of these interventions based on empirical studies. Continued research has provided a clearer understanding of the disorder of autism and has led to better treatments and therapies. Studies have shown that appropriate educational intervention can lead to better outcomes for children with autism. Early intervention can significantly improve the quality of life for individuals with autism, however, the majority of individuals with autism will continue to exhibit some symptoms in varying degrees throughout their lives, and they may require lifelong care and supervision. The most effective programs share an emphasis on early, appropriate, and intensive intervention. To accommodate the diverse needs of individuals with autism, effective approaches should be flexible, re-evaluated regularly, and provide the child with opportunities for generalization. Parents should investigate any, and all treatments thoroughly and use caution before committing to any particular treatment.

In 1973, the work of Rutter and Bartak indicated that children with autism benefit from a more structured approach to teaching, which provided a basis for a range of interventions developed to support the social interaction, communication, and education of individuals with autism. Early intervention can influence social, communicative and imaginative abilities in a child with autism. In addition, this can help with enabling social integration, friendships, self-esteem, well-being and access to education and employment. It is important to stress that approaches differ in their theoretical basis and consequent intervention methods. The differences range from behavioral approaches, which shape and modify behaviors, to developmental-interactive approaches, which aim

to develop social and communicative processes through naturalistic interaction and cognitive approaches. There are different communication interventions and approaches that come from traditional Applied Behavior Analysis (ABA) procedures that combine behavioral and developmental principles to increase social and communication skills in children with autism. Some approaches have been modified to include developmental, more child-centered principles. An example of this modification includes viewing the child as an active learner and social participant, rather than as a learner who is primarily under the control of the teacher. In addition, developmental social-pragmatic approaches have also included some elements of traditional ABA techniques. For example, in addition to the ABA elements in this approach, the social context of naturally occurring interactions may be considered to be of primary importance for communication and language development (Prizant, Wetherby, & Rydell, 2000).

For the purpose of this review, language and communication interventions will be discussed and categorized according to the theoretical model and approach they have been developed from. Researchers have categorized language and communication interventions according to 1) behavioral approaches, 2) developmental/interactive approaches, and 3) a combination of the two. Different approaches have different principles and use different techniques and methods to encourage the development of communication and social skills. Each works differently for different individuals and therefore it is suggested that there is no single approach that works well for everyone. In addition, there is still significant debate among researchers regarding the most effective interventions for young children with autism. A variety of models and intervention strategies have been advanced as effective interventions for young children, however the

focus of supporting research has primarily focused on children ages three to eight (NAS, 2001). The acquisition of effective communicative and social skills for children with autism is extremely important. The significance of structure, early and intense intervention and collaborative working in educational settings, as well as the need to address core deficits of social emotional development, pragmatic aspects of communication, play skills and comprehension should be emphasized. The following is a discussion of some of the most frequently cited interventions for developing language skills in children with autism and the research regarding their effectiveness.

Behavioral Approaches

Behavioral approaches are based on the theory of Skinner (1957) who believed learning is development, and all behavior is learned. Using associative learning and operant conditioning, behavioral responses can be modified by positive and negative reinforcement. This approach was developed on the theoretical basis that individuals with autism were thought to be incapable of responding to the typical environment, because they had not learned the behaviors of typically developing children. Therefore, it was necessary for the environmental input to be altered to condition behavioral responses (Lovaas, 1987). There are many favored instructional strategies for children with autism that are founded in behavioral theory, which includes teacher-directed learning with clear, repetitive presentations of small chunks of information, practice, feedback, and data collection. Lovaas and colleagues use a particular behavioral approach, Applied Behavior Analysis (ABA), which involves breaking a skill into small steps and teaching each step a discrete trial technique (Lovaas, 1981).

Applied Behavior Analysis (ABA) is a systematic approach for increasing desired behaviors and decreasing undesired behaviors, which is grounded upon the principles of learning theory. It is based upon the premise that behavior is influenced by environmental events. This understanding leads to structured interventions focused on measurable units of behavior. Using this type of approach, data is gathered regularly for the purposes of assessment, monitoring of progress and guiding adjustments in intervention. ABA has a significant research base, which supports its effectiveness in addressing a wide range of behaviors and skills for individuals with disabilities, including autism. Applied behavior analysis has proven to be successful in establishing and implementing language intervention programs, and teaching a variety of other skills. Some programs based on learning principles, which are available to parents, have been shown to be effective in helping children who are delayed in their language development catch up to their peers. Specifically, among children with autism, Lovaas (1987; Lovaas & Smith, 1988) demonstrated the usefulness of imitation and reinforcement principles in at least partially overcoming speech problems (McEachin, Smith, & Lovaas, 1993; Sundberg & Partington, 1998).

There are a range of intervention strategies that fall under the ABA approach, including discrete trial training; verbal behavior training; pivotal response training; structured teaching; visual schedules; incidental teaching; peer-mediated instruction; video modeling; and Picture Exchange Communication System (PECS). In addition, a variety of national model programs for children with autism are based on an ABA framework. Research supports the positive gains from these approaches and models in various areas such as social skills, communication and measured IQ. Because there are

differences in the approaches and model programs based on ABA, general statements cannot be made about the effectiveness of ABA as a treatment for autism. The research does support specific gains for specific interventions. In addition, while many children have made significant progress with interventions and model programs based upon ABA, not all children have benefited to the same degree and not in the same areas of functioning. At this point, the research does not reveal which interventions will work for which children. Despite these limitations in the current research, ABA has a strong research base supporting its effectiveness for addressing a wide range of areas affected by autism spectrum disorders (National Research Council, 2001; Herbert, et al., 2002; Simpson, 2005). Behaviorally based interventions include Discrete Trial Training and Picture Exchange Communication Systems (PECS) programs.

Discrete Trial Training

The purpose of discrete trial training is to train specific skills as identified through analysis of deficits in a child's functioning. Discrete trial training is one method, within the ABA framework, of teaching new skills. Each trial includes the presentation of a stimulus or teacher's instruction, the child's response, and the consequence. The consequence is based upon whether the child's response was correct or not. A correct response is reinforced with praise or a tangible reinforcer, while incorrect responses result in correction such as verbal feedback or physical guidance. The discrete trial format generally includes multiple trials teaching a specific behavior. Discrete trial training has been effective in initial teaching of a variety of skills. However, skills need to be quickly expanded to more natural environments to promote generalization. This is a teacher directed approach where the adult initiates the activity, determines the expected response and provides the reinforcement (Prizant & Wetherby, 1998).

Many researchers have used applied behavior analysis and discrete trial training to teach skills; Lovaas (1987) suggested that his particular version of discrete trial training could lead to a recovery from autism. Maurice (1993;1996) furthered the idea. In terms of the method, discrete trial training consists of giving a command, waiting for a response, and recording data during an intertrial interval. Variations in the procedures are advocated by different authors who modify prompts used, consequences applied, trial presentation (massed vs. distributed), and individual vs. collective implementation.

Research generally supports efficacy of this approach, but there are some critics. Early research established the efficacy of discrete trial training to teach speech to children with autism. The discrete trial approach generally consisted of a work area that had been designated to allow prearranged sessions in which a specially trained therapist and child sat face-to-face and worked on a one-to-one basis. The therapist leads the child to a specific task, which is considered a discrete task or behavior that has a clear discriminative stimulus and clear consequence . This sets up a situation with firm stimulus control. This has helped to facilitate rapid acquisition, with trials of the target behavior typically massed. The child's speech is prompted and shaped with the use of a tangible reinforcer, such as food, to increase the target response or responses (Charlop-Christy & Carpenter, 2000; Lovaas, 1977; Lovaas & Taubman, 1981).

Discrete Trial Training is supported by research with abundant empirical evidence supporting the use of applied behavior analysis and discrete trial training for developing skills. However, the use of the Lovaas version has not been replicated as valid for promoting recovery from autism (Gresham & MacMillan, 1997).

Support for discrete trial training comes from the Young Autism Program at UCLA. This program was initiated by Ivar Lovaas in 1970. Discrete trial training is a

major component of the Young Autism Program. It is implemented by parents and trained therapists in a child's home during the first year, progressing to community and school settings. The focus is on developing language and early cognitive skills and addressing behavior issues. During the second year, more advanced skills are taught. The program involves at least 40 hours a week of intensive instruction. Research for this approach includes a study of 19 children who received this program for two years. There were two control groups, one with 19 children who received 10 hours a week or less of the ABA program and another in which 21 children received unspecified community interventions, but no ABA. In 1987, Lovaas reported results for his method of Applied Behavior Analysis used in his Young Autism Project with a group of subjects over the previous two decades and involving the use of rewards and aversives with the experimental group. This study reported that 47% of the children in the experimental group, i.e. nine out of nineteen, achieved normal intellectual and educational functioning, and only one child from either of the control groups demonstrated similar gains. This gave rise to much optimism about the effectiveness of this approach, but the methodology used has since been criticized (Schopler, Short, & Mesibov, 1989; Gresham & MacMillan, 1998; Shea, 2004).

In a relevant study, Shea (2004) listed over 12 areas of methodological difficulties for this work including, lack of random assignment of subjects to control and experimental groups, experimental and control groups that were not equivalent (with aversives used in earlier stages with the experimental group), reliance on parental report measures and use of an unusual statistic. In addition, Shea reported that other studies using an ABA approach over the past three decades have consistently shown results with

lower improvement rates, a point also made by Smith (1999), and concluded that Lovaas's claims in the 1987 study are not sound.

Nevertheless, research has demonstrated that early intensive behavioral intervention can be useful. In a study of 16 pre-school children with pervasive developmental disorders, Luiselli and O'Malley Cannon (2000) reported overall improvement in the areas of communication and cognitive and social-emotional functioning in proportion to the duration of time (months) that a child spent in home based behavioral intervention programs. Additionally, Eikeseth and Smith (2002) studied 25 children with autism aged 4 to 7 years who were assigned to either behavioral or eclectic treatment and reported significant gains in favor of the behavioral group. In an extensive review of the literature on behavioral interventions for pre-school children with autism, McGahan (2001) concluded that cognitive and functional improvements might be gained through interventions using applied behavior analysis. However, the results were approached with caution, noting that findings were limited, that it was not clear what components of intervention were linked to positive outcomes, and that long-term benefits were uncertain. In addition, caution with the results was indicated noting that studies in this area were marked by methodological flaws, and it was not known whether the types of gain reported translated to positive changes in many settings.

A recent replication of the UCLA early intensive behavioral treatment program resulted in 48% of the children showing rapid learning, achieving average scores on measures of cognitive, language, adaptive and social skills and succeeding in regular education classrooms (Sallows & Graupner, 2005). This was a very well designed study, which adds support for the effectiveness of early intensive behavioral treatment, of which

discrete trial training is a major component. Other replication studies have showed positive, but more modest outcomes (Anderson et al., 1987; Birnbrauer & Leach, 1993; Smith, 1999); however, the treatment in these studies was less intense than that provided to children in the Lovaas study.

The research by Dr. Lovaas is the basis for using discrete trial training and intensive behavioral treatment for young children with autism. Discrete trial training is a well-established intervention for teaching a variety of skills to children with autism. The discrete trial procedures have been effective in terms of rapid acquisition of responses; however, a major limitation cited is that the high level of structure in the one-to-one setting does not promote generalization to other less structured environments (Charlo-Christy & Carpenter, 2000; Koegel, O'Dell, & Koegel, 1987; Lovaas, 1977). There has, nonetheless, been a recent resurgence in the use of discrete trial procedures (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993), despite some initial drawbacks that were reported in the literature and the success of naturalistic teaching strategies. The research available is beginning to support this approach to teaching language, suggesting that students taught using this approach seem to show overall better performance including faster learning (Charlop-Christy & Carpenter, 2000; Michael, 1988; Miguel, Carr, & Michael, 2002).

Picture Exchange Communication System

The Picture Exchange Communication System (PECS) devised by Bondy and Frost (1994) is an augmented alternative communication (AAC) system designed to teach functional communication to children with limited speech. PECS is based on behavioral principles following Skinner (1957) and the purpose of PECS is a functional non-verbal

communication system based on initiation of communicative interactions (Bondy & Frost, 2001). PECS includes a structured program that involves a child exchanging a symbol, such as a picture, for a desired item. It can be expanded to using multiple words for labeling and commenting. This intervention is based on behavioral teaching methods with an emphasis on encouraging the child to communicate spontaneously (Bondy & Frost, 1994). Behaviorally based techniques of shaping, physical prompts, backward chaining, reinforcement, and fading are used to move through six phases of the program, from simple initiation to complex comments. The child is trained to initiate communicative interactions using a desired object as a motivator. Using a system of cards that illustrate objects, concepts, and activities, PECS begins by teaching requesting. Starting with shaping and reinforcing a response behavior to become pre-requisite to achieving the reward, an initiating exchange of cards is trained. There are six phases in this system, with the first phase teaching the child a physical behavior that will be considered communicative, and the other phases training persistence, discrimination between symbols, using phrases, answering a direct question and commenting (Bondy & Frost, 1994; Schwartz, Garfinkel, & Bauer, 1998). Different practitioners (Earles, Carlson, & Brock, 1998) have replicated this program in numerous environments.

Some children using PECS later develop speech, and it has been a promising practice for enhancing communication. A number of studies show increased communication skills after two years of PECS usage (Bondy & Frost, 1994; Ganz & Simpson, 2004; Charlop-Christy et al., 2002).

Studies of the effectiveness of PECS report that children with limited communicative ability can be trained to use the system, and that independent speech also

occurs for many of these children (Bondy & Frost, 1994; Schwartz , Garfinkel & Bauer, 1998; Charlop-Christy et al., 2002). There are, however, methodological problems of sample size and lack of control groups for such studies. Charlop-Christy et al. (2002) studied the acquisition of PECS skills in three children with autism who were assessed as having no, or severely limited, communication ability. The authors found that communication skills improved, including the use of verbal communication, as did social interactions among children taught PECS. Problem behavior was found to decrease. Small sample size, however, prevented generalization of the findings. In addition, it could not be determined if the results were due to PECS or to naturally occurring developmental changes because there was not a control group used.

Kravits et al. (2002) reported on a study of a single grade-school-aged child with autism. The child was tested prior to the start of the study, and then repeatedly tested over time as each new aspect of the intervention was introduced. The child was found to show significant improvements in initiating interactions with peers and adults and in her vocabulary. These abilities were reported to generalize to outside the teaching setting. Ganz and Simpson (2004) completed a study involving three young children with an autism and developmental delay, and found that the children were able to use PECS and additionally, that word utterances increased in number of words and complexity.

A larger study was that of Magiati and Howlin (2003), who described a pilot study evaluating PECS in which teachers of 34 children with autism were trained in the approach. The children involved in the study had varying degrees of communication skills. Some children were nonverbal and others spoke in short phrases. Most participants were found to show improvements in their use of PECS, with rapid increases

found, but the authors reported that improvements in general communication skills were slower. The children with the least communication skills at the start of the study made the most gains. The children who already had some communications skills seemed to plateau and did not show as much improvement. Parents' satisfaction with the technique was high with use of behaviors like the screaming previously used by one child to achieve needs reported to lessen. Setting affected the use of the system, with more use reported in the structured school setting than the home setting.

Because PECS is a system that requires no prior engagement in joint attention, imitative ability, or apparent communicative motivation, it can be used as a means of guiding the child into initiating a behavior, which will have an effect upon the world. As with all behavioral approaches the numerous repetitions of the behavior can be difficult to sustain in a classroom environment, and the performance of trained behavior does not imply the development of interpersonal communicative motivation. In the majority of studies reported, the numbers are too small to draw conclusions in relation to the general population of people with autism. In their larger study, Magiati and Howlin (2003) reported that occurrences of general communicative improvements for the children were slower.

Developmental and Interactive Approaches

The developmental-interactive approach differs from a behaviorist approach. The developmental-interactive approach emphasizes how both genetic and environmental factors play a role in language development, and the approach focuses particularly on the role of early caretakers in a child's acquisition of language. Interactionists are concerned with the interplay between biological and environmental factors in the acquisition of

language. The developmental-interactive approach encourages interpersonal processes and opportunities thought to underpin social, communicative and cognitive outcomes in children with autism. These approaches aim to motivate a child to engage in the social settings required in typical development (Trevarthen, 2001). This type of approach has also been referred to as the social-pragmatic developmental interaction approach (Prizant, Wetherby, & Rydell, 2000; Sundberg & Partington, 1999).

Complementary to the role of socializing agents, such as parents, is a child's own active role in developing normal speech. The interactive model of language development may include a developmental approach to teaching, which generally refers to a child-centered approach, where the child leads and adult follows. Materials and tasks may be used that fit a child's developmental level. Materials are provided to the child, and the parent or teacher uses a scaffolding process, which involves organizing tasks that are known to be beyond the child's ability or using events that the child is unfamiliar with, and assisting the child in carrying out parts of the task or event that are tied to a developmental skill. Children's behavior and interaction with materials guides the teacher, while the teacher may use modeling or demonstration, prompting, or instruction. This approach may be used to increase a child's interest and motivation because children's preferences guide the selection of materials and adults provide support and encouragement. In addition, the child will be less likely to experience frustration, as a parent or teacher provides help when tasks get too difficult. Rather than adult-supplied consequences for certain behaviors, internal naturally occurring reinforcers are assumed to provide the motivation for learning. An example of an internal reinforcer is a sense of mastery and efficacy in functioning (e.g., pleasure in completing a puzzle). Recent

interest has increased with this type of approach including the use of peer support and peer mediated interventions as well as interventions addressing specific aspects of inclusive practice (Cazden, 1983; Bruner, 1977, 1981; Wood, Bruner, & Ross, 1976).

Naturalistic behavioral strategies are forms of discrete-trial teaching in which the child's own motives or behavior initiate the instruction and lead to a reinforcing event or natural reinforcer. These approaches are more child-centered than trial teaching, in that children's motivations, interests, favored activities, and choices figure strongly in the teaching and reflect an interactionist approach. Two examples of naturalistic strategies are pivotal response training and incidental teaching.

Incidental Teaching and Pivotal Response Training

Incidental teaching consists of a chain of pre-specified, child-tutor interactions. The interactions involve materials that are highly preferred by the child, prompting and shaping techniques embedded in natural contexts, and child-initiated or natural interactions. Incidental teaching has been demonstrated, with replication, to be an effective technique for increasing language learning in both typical children (Hart and Risley, 1968, 1980) and in children with autism (McGee et al., 1983, 1999).

In pivotal response training (PRT) (Koegel et al., 1999), certain behaviors are seen as central to wide areas of functioning. Changing these pivotal behaviors is thought to change other associated behaviors without specifically targeting the associated behaviors. Pivotal response techniques include child choice, reinforcement, and correcting behaviors. PRT involves teaching pivotal behaviors or those central to a child's day-to-day functioning (e.g., motivation, responsivity to multiple cues, self-initiation, empathy, self-regulation, social interaction). The ultimate goal is to facilitate

improvements across contexts. The assertion is that teaching pivotal behaviors should result in widespread positive effects on many other behaviors. PRT includes providing opportunities for a child to respond spontaneously to a clear question or instruction, interspersing maintenance tasks (those the child can do) with novel tasks (those the child will be learning), shared control or giving the child choice in selecting a learning task and structuring the environment so that the child can respond to multiple cues. It also involves use of natural consequences and reinforcers. This approach uses a behavioral approach to teaching in natural contexts, building on the interests and motivations of the child with autism (Sundberg & Partington, 1999).

An applicable study by Koegel et al.(1999) explored whether teaching self-initiations of interaction with others would result in positive outcomes for children with autism. Four children received a comprehensive program, which included a modified discrete trial format, with the PRT described above, and parent education. Parent education was provided in the home, while the other interventions were provided in regular preschool programs. Five to seven years after the early intervention, all four children were functioning very similar to their peers. They were in regular education classrooms achieving average to above average grades, involved in social activities with friends and involved in extra curricular activities. Their adaptive behavior, as measured by standardized assessment, was very similar to or above their chronological age peers. In another study, which was a comprehensive review of the research on PRT (Humphries, 2003), concluded that for young children with autism, the evidence supports the efficacy of PRT in improving their social-emotional and communicative behavior. Therefore,

PRT is recommended as an evidence-based intervention for this purpose. PRT is a promising practice for increasing skills is a variety of areas affected by autism.

Peer-Mediated Strategies

Peer-mediated strategies (Strain and Kohler, 1998) also demonstrate a naturalistic application of behavioral teaching. The typical peers of a child with an autistic spectrum disorder are instructed in a more adult-centered, mass-trial approach, while children with autistic spectrum disorders are taught by their peers in a more child-centered, naturalistic type of approach. In peer-mediated intervention, peers are taught to initiate play with children with autism through sharing, offering assistance, suggesting play ideas, and showing affection. Teachers remind peers to use their initiation strategies to facilitate play with their peers with autism. Research indicates interactions increase, stereotypic behaviors decrease, time engaged with peers increase and initiations and responses to initiations by children with autism increase (Lee & Odom, 1996; Strain et al., 1996; Rogers, 1996). Peer-mediated intervention has therefore been purported as a promising practice for increasing social and communication skills in children with autism.

Summary

In the field of autism, controversy about the best way to teach language is based on one's theory about how language develops. Strategies for teaching language and communication generally fall under behavioral approaches or developmental-interactive approaches. Straight skill training is recommended according to the behavioral approach, based on Skinner's work. Developmental-interactive approaches are based on Bruner's (1977) interactionist orientation and recommend the use of natural social interactions and social role models, which often occurs as dialogue and interaction

between parents and children. It is believed that children will learn to understand the nature of language and its rules and application in this way. Strategies classified according to the behavioral approach included discrete-trial training and the Picture Exchange Communication System (PECS). Strategies classified according to the developmental-interactive approach included peer-mediated support and interventions, as well as interventions addressing specific aspects of inclusive practice. Incidental teaching and Pivotal Response Training (PRT) are strategies that can be classified as a combination of both approaches to language training.

In reviewing the evidence of the effectiveness of the approaches and evaluation studies, the different interventions appeared to result in similar outcomes. In addition, there is not evidence to indicate that one approach has greater intervention efficacy. A combination of approaches to language training is therefore recommended in the literature based on behavioral and interactive theories (Bruner, 1981; Kaiser, 1993; Lovaas, 1977, 1987; Prizant & Wetherby, 1998; Scheuermann & Webber, 2002).

Chapter III: Conclusions and Discussion

Summary of Main Findings

Given the prevalence of autism is increasing, it is important to study the effectiveness of interventions to treat this ever-growing population. In addition, given that children with autism face language delays, interventions focusing on language skills are necessary. The purpose of this literature review was to examine the research on language interventions commonly used for children with autism and to examine the efficacy of procedures and training based on empirical studies.

Research Question #1:

What are the recommended interventions for supporting the development of communication skills in children with autism? As indicated throughout the review, there are wide ranges of approaches used to teach children with autism. These approaches differ in their theoretical basis and consequent intervention models. Interventions range from behavioral approaches, which shape and modify behaviors to developmental-interactive approaches, which aim to develop social and communicative processes through naturalistic interaction and cognitive approaches. Due to the nature of autism, techniques based in behavioral learning theory or applied behavioral analysis (ABA) have been recommended in the literature for developing communication skills. Intervention strategies with the most support include interventions based on applied behavior analysis; early, intensive behavioral treatment; discrete trial training; structured teaching; Picture Exchange Communication System; Pivotal Response Training; Incidental teaching; and peer-mediated instruction. An overview of recommended practices from the literature suggests using a combination of behavioral and interactive

models, because no single approach has been found to be optimally effective. Therefore the combination of behavioral and developmental-interactive approaches has been recommended including beneficial components of behavioral technology with developmental and interactive strategies. The particular combination of approaches selected for an individual child with autism should be determined by a number of factors related to the child, family, school district and community.

Research Question 2:

What is the efficacy of these intervention strategies? The various behavioral and developmental-interactive approaches outlined have all reported at least some evidence of effectiveness in intervening on language and communication skills in children with autism (Howlin, 1998; Jordan, Jones, & Murray, 1998). Research suggests the benefit for children with autism of an early start to treatment in order to increase effectiveness (Sundberg & Partington, 1998). However, with the differing theoretical approaches, the research literature reviewed suggests that it may be important to know which interventions are most effective at different stages in a child's development. Therefore, it is important to consider developmental appropriateness, language, and motivation factors when establishing interventions and treatments for young children with autism (Michael, 1982).

The available research indicates that intervention based upon a behavioral model has the strongest support for intervention efficacy for use with children with autism (Schreibman, 2000). Applied behavior analysts have provided an extensive technology of effective interventions for the behavioral deficits and excesses exhibited by children with autism, using behavioral principles and procedures to teach new skills and reduce

challenging behaviors. This scientific approach to behavior problems looks at the relationship between behavior and environmental factors. In addition, it has proven to be successful in establishing and implementing language intervention programs, and teaching a variety (Hart & Risley, 1980; Schreibman, 2000; Skinner, 1957). The available research strongly suggests that a substantial number of children with autism are able to make significant progress during the period that they receive intensive early intervention and almost all children appear to show some benefit. However, evaluating intervention approaches used for children with autism, as a whole has been difficult. There is actually no evidence that indicates that one approach works better than others, therefore, caution is reasonable in drawing conclusions about intervention efficacy. There is no outcome study published that supports comparative statements of the superiority of one program or approach over another. Most of the current outcome information available comes from program evaluation data or measures of children's progress when comparisons are made before and after intervention.

The research notes several common features to effective interventions. First, there has been a move away from teaching individual skills (i.e. splinter skills), for example, individual speech sounds, apart from normal use. This change is due to fact that there could be an endless number of skills to teach, so this approach may be less efficient (Strain, 2001). This type of approach is also particularly ineffective for children with autism due to the fact that they typically have difficulties with making connections, therefore connections would have to be taught specifically (Cumine, Leach, & Stevenson, 2000).

A second common feature of effective intervention is a focus on teaching skills which have high probability of being reinforced in a wide range of contexts and the larger verbal community. Learning in children with autism can be specific to particular contexts, therefore, skills learned in one context or setting often do not generalize to another setting. Language training techniques will be most effective if they are integrated within activities throughout the whole day. Teachers and parents should therefore take advantage of every opportunity to elicit, expand, motivate, and reinforce communication and language across context (Dunlop, Knott, & MacKay, 2002; McGee et al., 1983).

Third and finally, effective interventions teach communication skills across all verbal domains of language: labeling, receptive skills, vocal imitation/echoics, and conversation skills. Teaching skills across domains will allow the opportunity of evenly developed skills in both understanding and expression. Since children with autism often show uneven skills across language domains, teaching in all areas will provide the child the opportunity to learn a wide variety skills.

Limitations of Literature

There are limitations of this literature review. While this researcher attempted to be exhaustive in reviewing the literature available on communication interventions used with children with autism to develop language, some research may have been overlooked. As such, this review may present a biased view regarding the effectiveness of the behavioral and developmental-interactive intervention approaches. Further, other strategies and interventions that exist to build language were not discussed in depth.

In addition, this literature review is merely a summarization of previous research. No empirical research was conducted. Therefore, it does not add or contribute new information to the field of education.

Implications for Practice

Behavioral and developmental-interactive approaches have both provided interventions and strategies that have received preliminary support as effective in supporting language development in children with autism. These findings provide important implications for practice, intervention programming, and directions for future research for individuals with autism.

There has been a significant amount of theoretical discussion regarding the issues surrounding the deficits in vocal ability. However, there have not been enough practical intervention strategies used to address the problem. In addition, many young children diagnosed with autism have not been provided with interventions that involve intensive programs because they have been considered too young for instructional interventions that are particularly extensive. The research literature conversely suggests that early and intensive intervention is critical for language acquisition (Lovaas, 1977; Sundberg & Partington, 1998). It is therefore important not only to teach language and communication, but also to determine which treatment programs at certain ages will be most effective. If treatment is started very early, then it may be possible to avoid many of the behavioral and communication problems that are typically seen when a child with autism gets older.

Many educational interventions for individuals with autism have been developed focusing on the communication difficulties and language deficits that have a negative

effect on the development of subsequent important behaviors. Children with autism may not even be aware of the valuable role of communication in expressing their needs and wants and in being an active part of a social world. Therefore, communication intervention should be a primary goal in the education of children with autism in order to provide individuals a way to communicate their needs and desires and improve their quality of life to the extent possible. This may mean combining strategies, language systems and approaches. As previously stressed, there is agreement that early language intervention is best, however, there is not agreement upon how to best treat these language deficits.

A combination of behavioral and developmental principles to enhance communication skills has been described by different approaches used for children with autism. The rationale for using interventions that are developed combining behavioral strategies with developmental principles is based on the assumption that while all of the components may be effective when used in isolation, they may be more effective in building language and communication skills if they are combined. Quill (1995) suggested that approaches that combine beneficial components of behavioral technology with developmental and interactive strategies may be the most effective by incorporating the specificity of goals and objectives, promoting a child's level of motivation and interest, using developmental activities, using instructional cues and prompts in a systematic manner, and emphasizing meaningful interactions within the context of organized learning environments. An implication for practice may be that when planning language intervention programs, teachers will need to offer language learning in situations that allow for and support the use of various approaches.

Natural social interactions typically stimulate language development; however, many children with autism fail to participate in natural interactive contexts. Therefore, it has been recommended that teachers use a highly structured behavioral approach for teaching language. In addition, after a child masters initial skills, teachers and parents should begin to apply interactive and generalization strategies toward complex structural and functional goals. This recommended intervention approach combines the interactive and behavioral model to provide opportunities for spontaneous language and generalization (Scheuermann & Webber, 2002).

Behavioral techniques have been used successfully in applied work with children with autism for many years. Educators are typically taught to approach instruction utilizing behavioral principles, therefore these techniques are compatible with most teacher training programs and the behavioral approach has provided the best accountability system in terms of student progress. Because many educators may already be familiar with several of the specific components of combined behavioral and interactive interventions, this tool may have a wide scope for implementation in classroom settings. Therefore, teachers and school psychologists could employ specially designed plans in their classrooms for inclusion of children with autism incorporating the same techniques they used in home or clinic settings, and they should monitor the behaviors of their students with autism to determine intervention efficacy.

The fact that there are real differences in philosophy and practice of different approaches provides a range of alternatives for parents and school systems when they consider adopting various approaches. The key to any child's educational program lies in the objectives specified in their education program or plan and the ways these are

addressed. Therefore, another implication for practice is that effective intervention programs should actually vary considerably across individual children, depending on a child's age, cognitive and language levels, behavioral needs and family priorities.

There is still considerable debate over which intervention options are the most promising for individuals with autism. Due to the fact that every individual with autism is unique and may present individually in very different ways, research has not been able to indicate a single method that should be used for teaching this population that is successful for all individuals with autism. Over time, students' needs change and require changes, modifications and adaptations to interventions being used. "The list of intervention options for children and youth with autism is ever increasing, and this serves only to exacerbate the problem of professionals' and parents' abilities to choose the most efficient and effective treatment methods" (Heflin & Simpson, 1998, p. 194).

Implications for Further Research

Further research is needed regarding the use of behavioral and interactive intervention approaches to develop language and communication skills with a variety of children. The study of effective interventions needs further investigation. This research could hold great importance for children with autism. More research is needed to determine the relative effectiveness of single procedures and strategies within each approach and which combinations can be most effective. Additionally, more research is needed to further validate the overall effectiveness and utility of behavioral and interactive interventions for developing communication skills in children with autism.

Although typical children learn language without much help, children with cognitive disorders, including autism, will need systematic and comprehensive language

instruction. In addition, few studies have investigated procedures to teach specific skills to young children diagnosed with autism, such as vocal imitation, which are important components of language development. Because deficits in communication are a primary characteristic of autism, and because lack of language is severely handicapping, teaching and facilitating language development should be a priority for parents and teachers of children with autism.

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