OVERCOMING CHALLENGES AND IDENTIFYING A CONSENSUS ABOUT AUTISM INTERVENTION PROGRAMMING

Carolyn E. Stephens
University of Georgia

Identifying effective interventions to help children with autism reach their potential has been a source of disagreement among professionals and parents for decades. The complexities of the challenges that face children with autism, and uncertainty about best practices, have delayed progress. This article identifies seven critical program components that address some of the challenges associated with providing effective and efficient autism intervention programs. The results for children who participate in these programs encourage belief in the ability of children with autism to respond with positive change to appropriately designed and implemented interventions.

The number of children with autism entering public school systems has increased dramatically in the last 15 years (National Research Council, 2001; Yeargin-Allsopp, et al. 2003). In response, schools are struggling to meet the demands for skilled personnel and effective program structures (Peeters & Gillberg, 1999; Simpson, 1995). Professionals have disagreed about how best to identify components necessary for appropriate programs, how to implement programs that meet a broad range of children's needs, and how to match efficient and effective services to specific characteristics of individual children (Anderson & Romancqyk, 1999; Brown & Bamberra, 1999; Cohen, 1999; Feinberg & Vacca, 2000; Pfeiffer & Nelson, 1992).

This article presents a brief historical perspective on factors that have complicated implementation of effective interventions on the large scale necessary to meet the needs of school systems in the United States. It also presents seven program components that, based on the literature, may significantly improve results of any comprehensive intervention. These seven program characteristics are supported by many professionals from multiple disciplines involved in studying needs of children with autism. In this regard, the use of the word *professionals* includes teachers as well as others, such as speech and language pathologists, psychologists, and program administrators. Changes in autism interventions are clearly moving in a positive direction in which children are demonstrating motivation to learn in programs that can address the developmental deficits that interfere with their learning (Bryan & Gast, 2000; Koegel, Koegel, & McNerney, 2001).

Multiple factors Influence Development of Effective Systems of Intervention
The literature identifies at least four factors that have contributed to the difficulty many program administrators face in trying to provide effective and sufficient services for children with autism (Conderman & Katsyannis, 1996; Feinberg & Vacca, 2000). They include the following: (a) Characteristics of autism interfere with learning, (b) Programs maintain low expectations based on historically poor long-term results, (c) Funding resources are limited and intensive programs are costly, and (d) Parents and professionals have had divergent points of view about some fundamental issues.

Characteristics of Autism Interfere with Learning
The unique learning characteristics of those diagnosed with autism vary widely from typical learners, and contribute to the complexities of determining a single best treatment (American Psychiatric Association (APA), 1994, Campbell, Schopler, Cueva, & Hallin, 1996). Atypical patterns of attending to stimuli impede children with autism from focusing on critical aspects of tasks (Koegel, Koegel, Frea, & Green-Hopkins, 2003; Smith & Lovaas, 1998). Atypical choices in reinforcement interfere with children's correct responding to tasks assigned (Heflin & Alberto, 2001). Social interactions that contribute to early learning experiences of typically developing children are often replaced with preferences for focusing on objects rather than people (Garfield, Peterson, & Perry, 2001; Pierce & Schreibman, 1995). Receptive and expressive languages develop unevenly and usually assume unique patterns, which require adaptations or specific methods of intervention to overcome (Lamers, & Hall, 2003; Koegel, 1995). When learning does occur, unless children reach a level of mastery and self-motivation in using new skills, they often fail to generalize their use in natural settings (Anderson, Taras, & Cannon, 1996). As a result, specific learning strategies and environments are necessary in order to maintain children's attention to task and their motivation for school progress.

Behavior differences in children with autism are resistant to change and often do not respond to common methods of discipline and reinforcement in schools. When interventions do not address the broad range of behaviors characteristic of children with autism, children remain isolated from their communities, disrupt their families' lives, and show poor long-term outcomes (Abelson, 1999; Norton & Drew, 1994; Sanders & Morgan, 1997). Behaviors frequently include self-injury, aggression, property destruction, odd vocalizations, sleep disturbances, or stereotypical self-stimulation. Preoccupations with aimless and repetitive behaviors add to children's isolation from meaningful social interactions with teachers and peers that are essential for emotional development and cognitive growth (Koegel, Koegel, Harrower, & Carter, 1999)..

Programs Maintain Low Expectations Based on Historically Poor Long-term Results
Low expectations for children with autism have been perpetuated in part because standardized scores, language assessments, and levels of educational placements tend to remain in a disabled range over time for most individuals (Feinberg & Beyer, 1998; Simpson, 1995). Deficits in motivation during testing, combined with weak general knowledge, cause many children with autism to perform poorly on tests that are normed on typically developing individuals (Oren & Ogletree, 2000). Children's specific problems with language can severely limit correct responding in testing situations (Schwartz, Boulware, McBride, & Sandall, 2001). Difficulties in generalizing use of learned skills further interfere with meaningful test results (Olley, 1999). With poor test scores, cycles of failure for many children with autism are perpetuated.

The bulk of past research and clinical evidence also supports low expectations for most children. Long-term outcomes for children with autism indicate that small improvements in programs do

not dramatically improve results (Rogers, 1998). Skeptical professionals dismissed rare reports about individuals with autism who tested in the normal range of intelligence or functioned independently in general education classrooms (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993). Investigators who report best outcomes in addressing the multiple areas of difficulties for children with autism often advocate full day comprehensive programs that are not easily defined using results of empirical studies (Pfeiffer & Nelson, 1992; Strain & Schwartz, 2001). Critics of the investigators claiming significant levels of higher functioning attribute optimistic reports to research weaknesses, such as inadequate outcome measures, an initially higher functioning experimental group, or nonrandomized, unmatched control groups (Gresham, Beebe-Frankenberger, & MacMillan, 1999; Gresham & MacMillan, 1998). In this research climate, administrators are reluctant to support programs that offer what they believe are false hope to families (Simpson, 1995).

After the late 1980's, research and a few remarkable autobiographical accounts by adults with autism, began to change attitudes among some professionals. The lack of clear empirically supported answers resulted in continuing conflicts among those professionals who set conservative goals and those who plan for more independent functioning (Smith & Lovaas, 1998; Wolery, 2000). Some professionals maintain what they consider is a healthy skepticism about unproven potential in children with autism. Programs target adaptive functioning in specially structured environments, with expectations that many children can function best as adults in specially designed group living and working settings (Mesibov, Adams, & Klinger, 1997). Other professionals recommend programs in which the overall goal is to enable children to function individually within natural settings, in their own families, and in their own larger communities (Maurice, 1993; Maurice, Green, & Luce, 1996; Campbell et al. 1996). Although some professionals believe greater progress for children with autism is possible with improved methods of instruction and comprehensive treatment approaches, most stop short of expecting normalization of development and learning (Donnellan, 1999).

Funding Resources are Limited and Intensive Programs are Costly
Legislative demands in the last 15 years and recent increases in numbers of children with autism in school populations present public systems with unavoidable financial and personnel demands in order to meet minimal program requirements (Charman, 2002; Dunlap, 1999; Feinberg & Vacca, 2000). Intensive and comprehensive autism intervention programs, claiming to produce the largest numbers of individuals achieving normal levels of functioning, require more direct service hours and staff than traditional school programs provide (Greenspan & Wieder, 1997; Koegel et al. 1999; Simpson, 2001; Strain & Schwartz, 2001 Smith & Lovaas, 1997). School administrators remain reluctant to support what they believe are probably unreasonable costs for questionable results (Feinberg & Vacca, 2000; Greenspan & Wieder, 1999; Koegel et al. 1999; Smith & Lovaas, 1998). For teachers already in public schools, new programs require in-service planning and broad system support for training, supervision, and hours necessary for adequate preparation and collaboration (Dunlap, 1999). In all of this, teacher training programs and practica must evolve rapidly to keep pace with the significant changes in intervention that result from current research activity and demonstration projects (Conderman & Katsiyannis, 1996).

A growing number of families and professionals expect public school programs to realize the social and intellectual potential for more children with autism. While some are reluctant to provide budget allocations for a minority population of children in their systems without sufficient evidence that short term expenses will significantly limit the amount of funding required in the future (Symon, 2001; Williamson, 1996). Others pursue resources such as private grants, university personnel, multiple public agencies, peer mentors, and parents as treatment

providers to fund and staff intensive programs (Bondy, 1996; Luiselli, Wolongevitz, Egan et al., 1999; New York State Department of Health, 1999; Ozonoff & Cathcart, 1998; Peeters & Gillberg; 1999; Pierce & Schreibman, 1995; Simpson, 2001; Smith & Lovaas, 1998;). The multiple challenges in providing appropriate interventions for children with autism present program administrators with significant difficulties to over come. Some parents still remain dissatisfied with the quality of current programs and pressures for program administrators continue (Kohler, 1999).

Parents and Professionals have had Divergent Points of View about Fundamental Issues
Even parents of young children with autism seeking intervention for the first time, are often aware of well-publicized attitudes expressed by some professionals towards parents that do not facilitate collaborative team efforts. These include issues related to professionals' attitudes about parental roles in contributing to their children's disabilities, parents interfering in reasonable school placement decisions, and parents setting unreasonable goals for interventions (Donnelly, Bovee, Donnelly et al., 2000; Folstein, 1999). Parents, for their part, are less likely than they were in the past to accept expert professional advice about program planning without questioning the knowledge or capabilities of those who offer the advice (Feinberg & Vacca, 2000). As a result of their concerns about adequacy of programs available for their children, some parents request services that have little empirical evidence of effectiveness.

Parents today perceive that there is legislative support for public systems to prepare children to function in settings where they would participate normally if they had not been disabled (Council for Exceptional Children, 2000; Stowe & Turnbull, 2001; Roper & Dunst, 2003). Parents compare poor effects of traditional school programs of the past with global and significant changes some children with autism reportedly experience in intensive, comprehensive, and financially costly nontraditional programs (Campbell et al. 1996; Greenspan & Wieder, 1997; Maurice et al., 1996; MacEachin et al., 1993; Rogers, 1998; Symon, 2001). Disagreements within parent-professional teams about what are adequate services, at times, result in abbreviated programs with few necessary elements of appropriate intervention approaches (Schwartz et al. 2001; Smith & Lovaas, 1997; Woods & Wetherby, 2003). Although both groups try to fulfill their responsibilities to children with autism, their differences in interpreting the literature limit program effectiveness.

Seven Critical Program Components are Described in the Autism Literature
The literature identifies significant challenges facing intervention decision makers as they develop new programs and strengthen old ones. The literature also serves as a source for empirically supported critical program components that strengthen interventions (Campbell, 2003; Dunlap, 1999; National Research Council, 2001; Pfeiffer & Nelson, 1992; Rogers, 1998). The critical components address communication, social, and behavioral areas of functioning that form the triad of diagnosing criteria for autism (APA, 1994). The program components target a wide range of deficit areas in order to enable children with autism to act more independently, have real choices in natural contexts, and appropriately communicate socially and academically. The seven critical program components that represent a consensus among professionals are identified as:
1. Autism interventions that are supported by empirical evidence should begin as early as possible.
2. Parents should be teachers and decision makers in collaborative teams with professionals with autism expertise.
3. Families and professionals should individualize communication strategies using a broad range of scaffolding approaches.

4. Professionals should individualize instructional strategies to enable children to demonstrate regular cognitive growth.

5. Programs should provide multiple opportunities for social engagement supported by scaffolding from adults and peers.

6. Adults should teach children pivotal behaviors, including behaviors for initiating, maintaining, and generalizing skills across natural settings and motivate children to function capably in all settings.

7. Children should be given multiple opportunities to learn the social-cognitive skills related to theory of mind concepts about other people's thinking.

A diversity of theoretical approaches, empirical methods of investigation, and professional disciplines support the seven program components that form a consensus among many professionals studying autism intervention. The program components discussed below are not sufficient to change inadequate, unsuccessful programs that have weak theoretical underpinnings into successful ones. However, children with autism in programs without these seven components, are not likely to reach high levels of meaningful, life enhancing functioning.

Early and Evidence-based Intervention

Evidence is strong and undisputed in support of the first program component. Autism interventions that are supported by empirical evidence should begin as soon as toddlers and preschoolers can be identified (Klinger & Renner, 2000; New York State Department of Health, 1999; Osterling, Dawson, & Munson, 2002; Rogers, 1998, Simpson, 2001; Wolery, 2000; Woods & Wetherby, 2003). With the help of reliable screening and diagnostic instruments for young children with autism developed in recent years, children can begin intervention at younger ages than was possible in the past (Lord, Risi, Lambrecht, Cook, Leventhal, DiLavore et al., 2000; Stone, Coonrod, and Ousley, 2000).Courchesne, Karns, David et al., (2001) provide evidence that children with autism may be born with brain sizes within a normal range at birth but deviate from average patterns of growth in the first few years of their lives.

Empirical evidence from programs representing varied intervention approaches, supports the long-term positive effects for children with autism when interventions begin as soon as children at risk are identified (Greenspan & Wieder, 1997; 1999; Lovaas, 1987). McEachin et al. (1993) described the lasting effects for almost 50 % of the children in their intensive intervention group who began treatment when they were preschoolers. McGee, Morrier, and Daly (1999) describe the necessity of providing adequate programs for young children with autism when they can benefit most in preschool inclusion. Identifying children early and beginning intervention programs during critical first years is a major step in improving results for children with autism.

Collaborative Teams

The second critical program component is that parents should be teachers and decision makers in teams that include professionals with specific expertise in autism theory and practice (Anderson & Romancyzk, 1999; Greenspan & Wieder, 1999; Lovaas, 2003; Mahoney & Perales, 2003; Ozonoff & Cathcart, 1998; Sheinkopf & Siegel, 1998 Smith, 2001). Studies demonstrate the capability and positive effects of parents participating as teachers for their children with autism (Greenspan & Wieder, 1997; Ozonoff & Cathcart, 1998; Sheinkopf & Siegel, 1998). Parents' successes depend, not only on their own motivation and maternal styles of relating but, on adequate professional support.

Studies also show the variety of functional areas that can be affected when parents are trained to implement intervention strategies. Siller and Sigman (2002) studied synchronization of mothers' behaviors with the behaviors of their children with autism. Children of mothers who were better

at synchronizing their behaviors with their children's behaviors had higher levels of communicative functioning at 1, 10, and 12 years of age compared to children participating in less synchronized interactions. Lovaas (1987) found that children maintained and generalized skills better when parents were trained to implement intervention strategies. Drew and colleagues (2002) taught mothers strategies for increasing their interactions with their preschool children with autism (Drew, Baird, Baron-Cohen et al. 2002). Mahoney and Perales (2003) taught 20 mothers a Responsive Teaching curriculum in one hour weekly sessions for eight to fourteen months. Young children with autism significantly improved social-emotional functioning after mothers implemented the relationship-focused strategies.

Marshall and Mirenda (2002) found that parents of a four year old with autism were highly motivated to participate in a program addressing his problem behaviors. The boy's parents were taught to use positive behavioral supports at home. The parents learned the strategies and continued to use them after their training ended. Another study addressed challenging behaviors in three young boys with autism (Moes & Frea, 2002). Consultants and parents jointly conducted functional assessments in the natural settings where problem behaviors occurred. The boys responded with dramatic decreases in tantrum behaviors and the families continued interventions after the collaborative phase ended. Multiple studies using varied techniques demonstrate the important roles parents can play in intervention for children with autism when professionals support them adequately.

Individualized Communication
The third important component for autism intervention programming involves the use of individualized techniques that enable children to effectively communicate with others. (Bondy & Frost, 1994; Greenspan & Wieder, 1999; Koegel et al. 2001; Marshall & Mirenda, 2002; Sheinkopf & Siegel, 1998; Olley, 1999; Smith, 2001; Symon, 2001; Woods & Wetherby, 2003). Individualizing communication methods for children involves both teaching them ways to communicate effectively to others as well as presenting information using strategies that enable children to comprehend communications. McCathren (2000) found that a preschooler with severe communication and cognitive delays dramatically increased her frequency and clarity of communication when her teacher implemented prelinguistic milieu training strategies. Ross and Greer (2003) found that five elementary school children increased efforts to communicate with vocal speech sounds after learning through motor imitation and mand training procedures. Whittaker and Reynolds (2000) taught four boys with severe autism and learning disabilities to use hand signaling using dyadic proximal communication strategies. All boys showed more hand signaling with an adult during experimental sessions (mean 35.5) than they showed during classroom interactions (mean 7).

Uses of technology in intervention programs have resulted in dramatic improvements in comprehension and responding behaviors for some children with autism (Blischak & Schlosser, 2003). Kimball, Kinney, Taylor, and Stromer (2003) taught two children to follow activity schedules using a PowerPoint program on desktop computers. Children improved in areas of independence and in predicting, preparing for, and transitioning between activities. Children improved targeted skills and they also increased efforts to communicate with others. Wert and Neisworth (2003) measured effects on four children's spontaneous requesting behaviors at home after they watched video self-modeling examples. Children increased spontaneous social engagement and requesting behaviors at home and generalized the new behaviors to school settings. Given the primary difficulty children with autism have in initiating and participating in interactions using nonverbal gestures and verbal language, productive teaching strategies and

technological techniques are important options for children to improve communicative functioning with others.

Cognitive Progress
The fourth critical program component for autism intervention relates to the need to adequately prepare professionals to overcome learning differences of children so they can achieve and demonstrate regular cognitive progress (Scheuermann, Webber, Boutot, & Goodwin, 2003). When professionals receive adequate and specific autism intervention training, evidence indicates that they are able to help children make meaningful progress in cognitive skills (Anderson & Romancsyk, 1999; Charlop-Christy, & Daneshvar, 2003; Dunlap, Kern, & Worcester, 2001; Mirenda, 2001; Olley, 1999; Oren & Ogletree, 2000; Smith 2001; Wolery, 2000). Professionals need broad knowledge bases and specific expertise to make good choices in both assessment methods and instructional strategies. In order to accurately measure progress, school personnel must learn formative and summative evaluation methods that are practical, reliable, and valid for children with autism (Oren & Ogletree, 2000).

Teachers must choose appropriate instructional methods based on individual differences in form and function of children's behaviors. Koegel et al. (2003) described successful intervention strategies for two boys with autism whose behaviors were disruptive in their inclusive classrooms. Priming techniques, in which school assignments were presented to children the day before they were presented in class, resulted in improvements in the boys' behaviors and in their correct academic responding. Appropriate and salient techniques for modeling behaviors help children with autism succeed academically. A young girl with autism learned generative spelling skills by watching her teacher's model on videotape. The girl maintained spelling gains for most words after a four-week follow-up period (Kinney, Vedora, & Stromer, 2003). Charlop-Christy, Le, and Freeman (2002) measured children's language and play behaviors following video and in-vivo modeling conditions. Both forms of modeling resulted in increases in the children's use of expressive labels, independent play, spontaneous greeting, oral comprehension, conversational speech, cooperative and social play, and self-help skills. However, generalization of new skills only occurred in the video modeling condition. Intervention programming must provide varied opportunities for learning that are scaffolded by adequately trained teachers in order for children to benefit in cognitive functioning.

Social Engagement
The fifth critical program component is provision of scaffolding support from others during multiple daily interactions with peers in order to teach children the reinforcing qualities of social engagement (Lovaas, 2003; McGee et al., 1999; Pfeiffer & Nelson 1992; Strain & Schwartz, 2001). Direct instruction in classrooms, which is supported by sound research, remains important for children with autism, but in addition, child-driven, positively affective, social engagement should be a part of daily activities (Campbell, 2003; Dunham & Dunham, 1990; 1995; Rogers, 1998). In a study by Robertson, Chamberlain, and Kasari (2003), positive social interactions of children with autism with their general education teachers in inclusive settings affected children's social acceptance by other students. Saxon, Colombo, Robinson, and Frick (2003) found a correlation between high levels of joint attention social interactions and positive cognitive, adaptive, and language outcomes.

An integrated play group involving twin autistic boys and three sisters from another family demonstrated the positive effects of teaching peers to scaffold play interactions in children with autism (Zercher, Hunt, Schuler, & Webster, 2001). The boys increased the frequency of responding to joint attention bids from the sisters, although they did not increase their initiation of

joint attention engagement. The effects of positive social engagement on a range of social and academic behaviors are promising topics for further research.

Pivotal Behaviors

 A number of behaviors that are typically difficult for children with autism to master are pivotal to intervention success (Koegel et al. 1999; Koegel, Koegel, Shoshan, & McNerney, 1999). The sixth critical program component addresses pivotal skills deficits, with emphasis on improving children's motivation, initiation, maintenance, and generalization of new skills in all natural settings (Burack, Charman, Yirmiya, & Zelazo, 2001; Greenspan & Wieder, 1999; Koegel et al. 2001; Rogers, 1998; Strain & Schwartz, 2001; Symon 2001; Wolery, 2000). Koegel et al. (1999) trained adults who regularly interacted with six young children with autism to teach children a series of self-initiation skills designed to promote interactions in their daily lives. The results indicated that three of the six children in the study had good pragmatics on postintervention measures while three had poor pragmatic use of language. The three children with good outcomes had significantly higher levels of self-initiations at intake than the children with poor outcomes. Researchers concluded that self-initiations may represent a pivotal skill that should be taught to children with autism who do not initiate social interactions when they enter intervention programs.

Milieu intervention strategies are commonly used to teach pivotal skills to children with autism who have difficulty generalizing learning to novel settings. In milieu interventions, children learn in the context of the daily settings where skills are needed. Yoder and colleagues conducted a number of studies to measure effects of prelinquistic milieu teaching on communication of young children with developmental delays (Yoder, Kaiser, Goldstein et al., 1995; Yoder & Warren, 1998). In the recent study by Yoder and Warren (2002), 39 children less than 24 months old with developmental delays of unknown etiologies were randomly assigned with their primary caregivers to two comparison groups. Children who participated with parents trained in prelinguistic milieu teaching increased the frequency of initiating comments, requesting, and lexical density. Preschool programs specifically designed for inclusion of children with autism provide further evidence for effectiveness of milieu intervention strategies. In the Walden Toddler Program, children are provided with multiple repetitions of learning trials by careful structuring of daily activities and objects to teach children to respond appropriately to naturally occurring stimuli (McGee et al., 1999). For children with autism, learning pivotal skills during naturally occurring interactions, helps children gain mastery and better generalize learning to natural settings.

Theory of Mind

The final critical program component for autism intervention is that children with autism should participate in social interactions that help them learn social-cognitive skills related to concepts about others' minds (Burack et al. 2001; Greenspan, 2001; Klinger & Renner, 2000). The theory of mind hypothesis identifies a failure in children with autism to understand that other persons do not share the same relationship to, or thoughts about, objects and events in their environment (Garfield, et al. 2001). This deficit, in theory, significantly influences children's social and cognitive functioning. There is sufficient empirical evidence in the literature to include theory of mind as an important program goal, especially for older children with autism (Frith & Happe, 1999; Skuse, 2003; Tager-Flusberg, 1992; Tomasello, 1995).

Some studies provide evidence that children with autism may understand precursor behaviors that may facilitate learning the more complex aspects of theory of mind thinking. Carpenter, Pennington, and Rogers (2001) tested the responses of preschoolers with autism to others'

unfulfilled intentions. The authors found that children with autism were not significantly different from a control group of children in understanding of others' intentions. They concluded that deficits in understanding intentions might not be as severe as deficits in completing traditional theory of mind tests for children with autism.

Nadel, Croue, Mattlinger, Canet, Hudelot, LeCuyer, and Martini (2002) conducted a study to measure whether low functioning children with autism would form social expectancies for an adult interacting with them during still face paradigm conditions. The authors found that children moved closer to the adult and touched the adult more frequently after the conditions in which the adult first remained still before repeatedly imitating the child. The authors interpreted children's increases in social behaviors as evidence that children could integrate previous social experiences with a current situation to form a social expectancy for an interactive partner. Charlop-Christy and Daneshvar (2003) showed three boys with autism video models for perspective-taking tasks. The children with autism improved understanding about another person's mental states after watching the videotape on perspective taking. In these studies, children with autism showed potential for understanding some aspects about others' thinking. Researchers interpreted children's behaviors as distinguishing others' thoughts from their own. To fully understand the theory of mind concepts, however, children with autism are likely to need specific adult scaffolding and multiple opportunities before they gain the higher levels of social-cognitive functioning.

Discussion
A literature review about autism intervention across theory and practice approaches results in two major conclusions. First, professionals should achieve proficiency in multiple theories and interventions for children with autism. Evidence does not support a single theory base or one intervention approach for all children with autism. Until children can be matched with appropriate interventions, trials of different approaches may be necessary in order to identify a best intervention for an individual child. Second, once effective and efficient interventions are established in programs, regular availability of expert supervision or consultation is needed to maintain the quality of interventions. As research efforts continue to elaborate on intervention characteristics that address the needs of children with autism, experts will be needed to interpret results and implement appropriate modified or new program components.

Positive changes in autism intervention are evident in the literature describing programs for children with autism. Families and professionals are beginning to function as teams to determine and implement appropriate services for individual children. Professionals are providing consultation and supervision services that extend program strategies beyond school hours and into children's homes. School systems are intensifying efforts to provide effective services to larger numbers of children with autism. Pertinent topics in the autism literature represent ongoing discussion and empirical study about how to effectively and efficiently a) match individuals with appropriate interventions based on clusters of characteristics, b) provide pre-service and in-service training for teachers about theory and implementation of programs, c) offer multiple options within systems to ensure that parent-professional teams have adequate choices for individualizing instruction; and d) give children sufficient and supported opportunities to participate in communication and social interactions that are reinforcing.

Many of the challenges faced by program planners remain in a field where children's characteristics and needs vary greatly from typically developing children. Necessary components for adequate autism intervention programs become more clearly defined through ongoing research and clinical evidence. Few professionals and parents question the need for well-trained

staff, empirically supported application of learning theories, and cooperative team efforts in educating children with autism effectively. The consensus among professionals, however, provides a direction for program planning rather than definitive answers. Further investigations can be expected to elaborate on current knowledge as more and better programs become implemented.

References
Abelson, A. G. (1999). Respite care needs of parents of children with development disabilities. *Focus on Autism and Other Developmental Disabilities, 14* (2), 96-100, 109.

American Psychiatric Association, (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Anderson, S. R., & Romanczyk, R. G. (1999). Early intervention for young children with autism: Continuum-based behavioral models. *Journal of the Association for Persons with Severe Handicaps, 24* (3), 162-173.

Anderson, S. R., Taras, M., & Cannon, B. D. (1996). Teaching new skills to young children with autism. In C. Maurice, G. Green, & S. Luce (Eds.), *Behavioral intervention for young children with autism: A manual for parents and professionals* (pp. 181-194)*.* Austin, TX: PRO-ED.

Blischak, D. M. & Schlosser, R. W. (2003). Use of technology to support independent spelling by students with autism. *Topics in Language Disorders, 23* (4), 293-304.

Bondy, A. S. (1996). What parents can expect from public school programs. In C.Maurice, G. Green, & S. C. Luce. *Behavioral intervention for young children with autism. A manual for parents and professionals (*pp. 323-330). Austin, TX:PRO-ED.

Bondy, A. S., & Frost, L. A. (1994). The picture exchange communication system. *Focus on Autistic Behavior, 9,* 1-19.

Brown, G., & Bambera, L. M. (1999). Introduction to the special series on interventions for young children with autism: An evolving integrated knowledge base. *Journal of the Association for Persons with Severe Handicaps, 24* (3), 131-132.

Bryan, L. C., & Gast, D. L. (2000). Teaching on-task and on-schedule behaviors to high-functioning children with autism via picture activity schedules. *Journal of Autism & Developmental Disorders, 30* (6), 553-567.

Burack, J. A., Charman, T., Yirmiya, N., & Zelazo, P. R. (Eds.) (2001). Development and autism: Messages from developmental psychopathology. *The development of autism: Perspectives from theory and research (pp. 107-123).* Mahwah, NJ:Lawrence Erlbaum Associates, Publishers.

Campbell, J. M. (2003). Efficacy of behavioral interventions for reducing problem behavior in persons with autism: A quantitative synthesis of single-subject research. *Research in Developmental Disabilities, 24*, 120-138.

Campbell, M., Schopler, D., Cueva, J. E., & Hallin, A. (1996). Treatment of autistic disorder. *Journal of American Academy of Child and Adolescent Psychiatry, 35* (2) 134-143.

Carpenter, M., Pennington, B. F., & Rogers, S. J. (2002). Interrelations among social-cognitive skills in young children with autism. *Journal of Autism and Developmental Disorders, 32* (2), 91-106.

Charlop-Christy, M. H., & Daneshvar, S. (2003). Using video modeling to teach perspective taking to children with autism. *Journal of Positive Behavior Interventions, 5* 12-21.

Charlop-Christy, M. H., Le, L., & Freeman, K. A. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism and Developmental Disorders, 30* (2), 537-552.

Charman, T. (2002). The prevalence of autism spectrum disorders: Recent evidence and future challenges. *European Child & Adolescent Psychiatry, 11,* 249-256.

Cohen, S. (1999). Zeroing in on autism in young children *Journal of the Association for Persons with Severe Handicaps, 24* (3), 209-212.

Conderman, G. & Katsiyannis, A. (1996). State practices in serving individuals with Autism. *Focus on Autism and Other Developmental Disabilities, 11,* 29-36.

Council for Exceptional Children, Division of Early Childhood, (2000). Natural environments and inclusion. In S. Sandall & M. Ostrosky (Eds.), *Young Exceptional Children. [Monograph Series No. 2]* Longmont, CO: Sopris West.

Courchesne, E., Karns, C. M., David, H. R., Ziccardi, R., Carper, R. A., Tigue, Z. D. et al. (2001). Unusual brain growth patterns in early life in patients with autistic disorder: An MRI study. *Neurology, 57*, 245-254.

Donnellan, A. M. (1999). Invented knowledge and autism. Highlighting our strengths and expanding the conversation. *Journal of the Association for Persons with Severe Handicaps, 24* (3), 230-236.

Donnelly, J.A., Bovee, J-P. Donnelly, S. J., Donnelly, L. K., Donnelly, J. R., Donnelly, M. F. et al. (2000). A family account of autism: Life with Jean-Paul. *Focus on Autism and Other Developmental Disabilities, 15* (4), 196-202.

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

Dunham, P., & Dunham, F. (1990). Effects of mother-infant social interactions on infants' subsequent contingency task performance. *Child Development, 61*, 785-793.

Dunham, P., & Dunham, F. (1995). Developmental antecedents of taxonomic and thematic strategies at 3 years of age. *Developmental Psychology, 31* (3), 483-493.

Dunlap, G. (1999). Consensus, engagement, and family involvement for young children with autism. *Journal of the Association for Persons with Severe Handicaps, 24*(3), 222-225.

Dunlap, G., Kern, L., & Worcester, J. (2001). ABA and academic instruction. *Focus on Autism & Other Developmental Disabilities, 16* (2), 129-137.

Feinberg, E., & Beyer, J. (1998). Creating public policy in a climate of clinical indeterminancy: Lovaas as the case example du jour. *Infants and Young Children, 10* (3), 54-66.

Feinberg, E., & Vacca, J. (2000). The drama and trauma of creating policies on autism: Critical Issues to consider in the new millennium. *Focus on Autism and Other Developmental Disabilities, 15* (3), 130-137.

Folstein, S. E., (1999). Autism. *International Review of Psychiatry, 11* (4), 269-278.

Frith, U., & Happe, F. (1999). Theory of mind and self-consciousness: What is it like to be autistic? *Mind & Language, 14*, 1-22.

Garfield, J. L., Peterson, C., & Perry, T. (2001). Social cognition, language acquisition and the development of the theory of mind. *Mind & Language, 16I* (5), 494-541.

Greenspan, S. I. (2001). The affect diathesis hypothesis: The role of emotions in the core deficit in autism and in the development of intelligence and social skills. *Interdisciplinary Council on Developmental and Learning Disorders' Clinical Practice Guidelines: Redefining the Standards of Care for Infants, Children, and Families with Special Needs (pp. 1-45).* Bethesda, MD: Interdisciplinary Council on Developmental and Learning Disorders.

Greenspan, S. I., & Wieder, S. (1997). Developmental patterns and outcomes in infants and children with disorders in relating and communication: A chart review of 200 cases of children with autistic spectrum disorders. *The Journal of Developmental and Learning Disorders, 1,* 87-141.

Greenspan, S. I. & Wieder, S. (1999). A functional developmental approach to autism spectrum disorders. *Journal of the Association for Persons with Severe, Handicaps, 24* (3), 147-161.

Gresham, F. M., Beebe-Frankenberger, M. E., & MacMillan, D. L. (1999). A selective review of treatments for children with autism: Description and methodological considerations. *School Psychology Review, 28* (4), 559-576.

Gresham, F. M., & MacMillan, D. L. (1998). Early intervention project: Can its claims be substantiated and its effects replicated? *Journal of Autism and Developmental Disorders, 28* , 5-13.

Heflin, L. J., & Alberto, P. A. (2001). Establishing a behavioral context for learning for students with autism. *Focus on Autism and Other Developmental Disabilities,16* (2), 93-101.

Kimball, J. W., Kinney, E. M., Taylor, B. A., & Stromer, R. (2003). Lights, camera, action! Using engaging computer-cued activity schedules. *Teaching Exceptional Children, 36*, 40-45.

Kinney, E. M., Vedora, J., & Stromer, R. (2003). Computer-presented video models to teach generative spelling to a child with an autism spectrum disorder. *Journal of Positive Behavior Interventions, 5,* 22-29.

Klinger, L. G., & Renner, P. (2000). Performance-based measures in autism: Implications for diagnosis, early detection, and identification of cognitive profiles. *Journal of Clinical Child Psychology, 29* (4), 479-492.

Koegel, L. K. (1995). Communication and language intervention. In L. K. Koegel & R. L. Koegel (Eds.)*Teaching children with autism*(4th ed., pp.17-32).Baltimore:Paul H. Brookes Publishing Co.

Koegel, L. K., Koegel, R. L., Frea, W., & Green-Hopkins, I. (2003). Priming as a method of coordinating educational services for students with autism. *Language Speech, and Hearing Services in Schools, 34*, 228-235

Koegel, L. K., Koegel, R. L., Harrower, J. K. & Carter, C. M. (1999). Pivotal response intervention I: Overview of approach. *The Journal of the Association for Persons with Severe Handicaps, 24,* 174-185.

Koegel, R. L., Koegel, L. K., & McNerney, E. K. (2001). Pivotal areas in intervention for autism. *Journal of Clinical Child Psychology, 30, 19-32.*

Koegel, L. K., Koegel, R. L., Shoshan, Y., & McNerney, E. K. (1999). Pivotal response intervention   II: Preliminary long-term outcome data. *The Journal of the Association for Persons with Severe Handicaps, 24,* 186-198.

Kohler, F. W. (1999). Examining the services received by young children with autism and their families: A survey of parent responses. Focus on autism and other developmental disabilities, 14 (3), 150-158.

Lamers, K. & Hall, L. J. (2003). The response of children with autism to preferred prosody during instruction. *Focus on Autism & Other Developmental Disabilities, 18* (2), 93-103.

Lord, C., Risi, S., Lambrecht, L., Cook, E. H., Leventhal, B. L., DiLavore, P. C. et al.(2000). The autism diagnostic observation schedule-generic: A standard measure of social and communication deficits associated with the spectrum of autism. *Journal of Autism and Developmental Disorders, 30 (3), 205-223.*

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Clinical and Consulting Psychology, 55*, 3-9.

Lovaas, I. O. (2003). *Teaching individuals with developmental delays: Basic intervention techniques.* Austin, TX: PRO-ED.

Luiselli, J. K., Wolongevicz, J., Egan, P., Amirault, D., Sciaraffa, N., & Treml, T. (1999). The family support program: Description of a preventive, community-based behavioral intervention for children with pervasive developmental disorders. *Child and Family Behavior Therapy, 21,* 1-18.

Mahoney, G., & Perales, F. (2003). Using relationship-focused intervention to enhance the social-emotional functioning of young children with autism spectrum disorders. *Topics in Early Childhood Special Education, 23* (2), 77-90.

Maurice, C. (1993). *Let me hear your voice: A family's triumph over autism.* New York: Ballantine Books.

Maurice, C., Green, G., & Luce, S. C. (Eds.) (1996). *Behavioral intervention for young children with autism.* Austin, TX: PRO-ED.

Marshall, J. K. & Mirenda, P. (2002). Parent-professionals collaboration for positive behavior support in the home. *Focus on Autism & Other Developmental Disabilities, 17* (4), 216-228.

McCathren, R. B. (2000). Teacher-implemented prelinguistic communicative intervention. *Focus on Autism and Other Developmental Disabilities, 15, 21-29.*

McEachin, J. J., Smith, T., & Lovaas, O. I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal on Mental Retardation, 97* (4), 359-372.

McGee, G. G., Morrier, M. J., & Daly, T. (1999). An incidental teaching approach to early intervention for toddlers with autism. *Journal of the Association for Persons with Severe Handicaps, 24* (3), 133-146.

Mesibov, G. B., Adams, L. W., & Klinger, L. G. (1997). *Autism: Understanding the disorder.* New York: Plenum Press.

Mirenda, P. (2001). Autism, augmentative communication, and assistive technology: What do we really know? *Focus on autism and other developmental disabilities, 16* (3), 141-162.

Moes, D. R., & Frea, W. D. (2002). Contextualized behavioral support in early intervention for children with autism and their families. *Journal of Autism and Developmental Disorders, 32 (*6), 519-533.

Nadel, J., Croue, S., Mattlinger, M-J., Canet, P., Hudelot, C., Lecuyer, C., & Martini, M. (2000). Do children with autism have expectancies about the social behavior of unfamiliar people? *Autism: The International Journal of Research and Practice, 4* (2), 133-145.

National Research Council (2001). *Educating children with autism.* Committee on Educational Interventions for Children with Autism, Catherine Lord and James P. McGee, eds. Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

New York State Department of Health, Early Intervention Program (1999). *Clinical Practice Guideline: The Guideline Technical Report: Autism/ PervasiveDevelopmental Disorders: Assessment and Intervention for Young Children (Age 0-3 years).* Albany, NY: Health Education Services Publication No. 4215.

Norton, P. & Drew, C. (1994). Autism and potential family stressors. *The American Journal of Family Therapy, 22* (1), 67-76.

Olley, J. G. (1999). Curriculum for students with autism. *School psychology review, 28*(4),595-608.

Oren, T., & Ogletree, B. T. (2000). Program evaluation in classrooms for students with autism: Student outcomes and program processes. *Focus on Autism and Other Developmental Disabilities, 15* (3), 170-175.

Osterling, J. A., Dawson, G., & Munson, J. A. (2002). Early recognition of 1-year-old infants with autism spectrum disorder versus mental retardation. *Development and Psychopathology, 14 239-251.*

Ozonoff, S., & Cathcart, K. (1998). Effectiveness of a home program intervention for young children with autism. *Journal of Autism and Developmental Disorders, 28*, 25-32.

Peeters, T., & Gillberg, C. (Eds.) (1999). *Autism: Medical and educational aspects*, (2nd ed.) London: Whurr Publishers.

Pfeiffer, S. L., & Nelson, D. D. (1992). The cutting edge in services for people with autism. *Journal of Autism and Developmental Disorders, 22,* 95-105.

Pierce, K. & Schreibman, L. (1995). Increasing complex social behaviors in children with autism: Effects of peer-implemented pivotal response training. *Journal of Applied Behavior Analysis, 28* (3), 285-295.

Robertson, K., Chamberlain, B., & Kasari, C. (2003). General education teachers' relationships with included students with autism. *Journal of Autism and Developmental Disorders, 33* (2), 123-130.

Rogers, S. J. (1998). Empirically supported comprehensive treatments for young Children with autism. *Journal of Clinical Child Psychology, 27* (6), 168-179.

Roper, N., & Dunst, C. J. (2003). Communication interventions in natural learning environments: Guidelines for practice. *Infants and Young Children, 16* (3), 215-226.

Ross, D. E., & Greer, R. D. (2003). Generalized imitation and the mand: Inducing first instances of speech in young children with autism. *Research in Developmental Disabilities, 24, 58-74.*

Sanders, J. L., & Morgan, S. B. (1997). Family stress and adjustment as perceived by parents of children with autism or Down syndrome: Implications for intervention. *Child and Family Behavior Therapy, 19* (4), 15-32.

Saxon, T. F., Colombo, J., Robinson, E. L., & Frick, J. E. (2000). Dyadic interaction profiles in infancy and preschool intelligence. *Journal of School Psychology, 38,* 9-25.

Scheuermannm, B., Webber, J., Boutot, E. A., & Goodwin, M. (2003). Problems with personnel preparation in autism spectrum disorders. *Focus on Autism & Other Developmental Disabilities, 18* (3), 197-207.

Schwartz, I. S., Boulware, G. L., McBride, B. J., & Sandall, S. R. (2001). Functional Assessment strategies for young children with autism. *Focus on Autism and Other Developmental Disabilities, 16* (4), 223-229.

Sheinkopf, S. J., & Siegel, B. (1998). Home-based behavioral treatment of young children with autism. *Journal of Autism and Developmental Disorders, 28*, 15-23.

Siller, M. & Sigman, M. (2002). The behaviors of parents of children with autism predict the subsequent development of their children's communication. *Journal of Autism and Developmental Disorders, 32* (2), 77-89.

Simpson, R. L. (1995). Children and youth with autism in an age of reform: A perspective on current issues. *Behavioral Disorders, 21*, 7-20.

Simpson, R. L. (2001). ABA and students with autism spectrum disorders: Issues and considerations for effective practice. *Focus on Autism and Other Developmental Disabilities, 16* (2), 68-71.

Skuse, D. (2003). Fear recognition and the neural basis of social cognition. *Child and Adolescent Mental Health, 8* (2), 50-60.

Smith, T. (2001). Discrete trial training in the treatment of autism. *Focus on Autism and Other Developmental Disabilities, 16* (2), 86-92.

Smith, T. & Lovaas, I. O. (1997). The UCLA Autism Project: A reply to Gresham and MacMillan. *Behavioral Disorders, 22* (4). 202-218.

Smith, T. & Lovaas, I. O. (1998). Intensive and early behavioral intervention with autism. The UCLA Young Autism Project. *Infants and Young Children, 10* (3), 67-78.

Stone, W. L., Coonrod, E. E., & Ousley, O. Y. (2000). Brief report: Screening tool for autism in two-year-olds (STAT): Development and preliminary data. *Journal of autism and developmental disorders, 30* (6), 607-612.

Stowe, M. J., & Turnbull, H. R. (2001). Legal considerations of inclusion for infants and toddlers and for preschool-age children. *Early Childhood Inclusion: Focuson Change* (pp. 69-100). Baltimore: Paul H. Brookes Publishing Co.

Strain, P. S., & Schwartz, I. (2001). ABA and the development of meaningful social relations for young children with autism. *Focus on Autism and Other Developmental Disabilities, 16* (2), 120-128.

Symon, J. B. (2001). Parent education for autism: Issues in providing services at a distance. *Journal of Positive Behavior Interventions, 3* (3) 160-175.

Tager-Flusberg, H. (1992). Autistic children's talk about psychological states: Deficits in the early acquisition of a theory of mind. *Child Development, 63*, 161-172.

Tomasello, M. (1995). Joint attention as social cognition. In P. J. Dunham & C. Moore (Eds.), *Joint attention: Its origins and role in development.* (pp. 103-130). Hillsdale, NJ: Lawrence Erlbaum Associates.

Wert, B. Y., & Neisworth, J. T. (2002). Effects of video self-modeling on spontaneous requesting in children with autism. *Journal of Positive Behavior Interventions, 5,* 30-34.

Williamson, M. (1996). Funding the behavioral program in behavioral intervention for young children with autism. In C. Maurice, G. Luce, & S. C. Luce (Eds.) *Behavioral intervention for young children with autism: A manual for parents and professionals* (pp. 267-278). Austin, TX: PRO-ED.

Whittaker, C. A., & Reynolds, J. (2000). Hand signaling in dyadic proximal communication: Social strengths of children with autism who do not speak. *Child Language Teaching and Therapy,* 43-57.

Wolery, M. (2000). Commentary: The environment as a source of variability: Implications for research with individuals who have autism. *Journal of Autism and Developmental Disorders, 30* (5), 379-381.

Woods, J. J., & Wetherby, A. M. (2003). Early identification of and intervention for infants and toddlers who are at risk for autism spectrum disorder. *Language, Speech, and Hearing Services in Schools, 34* 180-193.

Yeargin-Allsopp, M., Rice, C., Karapurkar, T., Doernberg, N., Boyles, C., & Murphy, C. (2003). Prevalence of autism in a US metropolitan areas. *Journal of theAmerican Medical Association, 289*, 49-55.

Yoder, P. J., Kaiser, A. P., Goldstein, H., Alpert, C., Mousetis, L., Kaczmarek, L., & Fischer, R. (1995). An exploratory comparison of milieu teaching and responsive interaction in classroom applications. *Journal of Early Intervention,19* (3), 218-242.

Yoder, P. J., & Warren, S. F. (1998). Maternal responsivity predicts the prelinguistic communication intervention that facilitates generalized intentional communication. *Journal of Speech, Language, and Hearing Research, 41,* 1207-1219.

Yoder, P. J., & Warren, S. F. (2002). Effects of prelinguistic milieu teaching and parent responsivity education on dyads involving children with intellectual disabilities. *Journal of Speech, Language, & Hearing Research, 45,* 1158-1174.

Zercher, C., Hunt, P. Schuler, A., & Webster, J. (2001). Increasing joint attention play and language through peer supported play. *Autism, 5* (4), 374-398.