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UNDERSTANDING THE CONTINUUM OF DISCRETE-TRIAL TRADITIONAL BEHAVIORAL TO SOCIAL-PRAGMATIC DEVELOPMENTAL APPROACHES IN COMMUNICATION ENHANCEMENT FOR YOUNG CHILDREN WITH AUTISM/PDD

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ABSTRACT—Clinicians are faced with the challenge of making informed decisions amidst heated debates over the most effective treatment approaches for young children with autism. This article provides a more specific focus to this debate by considering the practice of enhancing spontaneous language and related social-communicative abilities of young children with autism/pervasive developmental disorder (PPD). First, a historical perspective of the evolution of different approaches for enhancing communication and related abilities is presented, followed by a description of characteristics of the approaches. The approaches are described along a continuum from massed discrete trial, traditional behavioral to social-pragmatic, developmental. The current state of knowledge regarding the effectiveness of early services for children with autism/PDD is examined and conclusions are presented with consideration of the need for more meaningful outcome measures than are currently used for the next generation of outcome research.

KEY WORDS: communication enhancement, autism, pervasive developmental disorder

This article is being written at a time when there are passionate debates regarding the most effective ways to support the development of young children with autism/pervasive developmental disorder (PDD). These debates, involving both professionals and family members, occur in professional peer-reviewed publications and informally in the popular media, at conferences, and online. In some cases, litigation initiated by

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families and educational agencies has involved comparisons of different treatment approaches in making decisions about the most appropriate programs for children. Some professionals have proclaimed that applied behavior analysis (ABA) is the only effective method and therefore the "intervention of choice" for all children with autism/PDD (Green, 1996b; Smith, 1996). Commonly used approaches other than ABA have been deemed ineffective (e.g., speech-language therapy, sensory integration; special education), despite the fact that research on children with social-communication disorders including autism/ PDD (Dawson & Osterling, 1997; Goldstein & Hockenberger, 1991; Fallon et al., 1994; Greenspan & Wieder, 1997a; McLean & Cripe, 1997; Ozonoff & Cathcart, 1998; Schuler et al., 1990; Wolfberg & Schuler, 1993), as well as clinical and educational data for countless children across the country, supports the effectiveness of approaches other than ABA.

Claims that ABA, in general, is the only effective approach do not address the tremendous diversity in philosophy and practice within the field of ABA. Therefore, we believe that it is essential at the outset to make a distinction between traditional behavioral approaches, characterized by a primary reliance on massed, discrete trial training (Lovaas, 1981) based on earlier tenets of practice in ABA, and contemporary behavioral approaches, which have been greatly influenced by the social-pragmatic and developmental literature over the past 10 to 15 years (see Bricker, 1993; Carr & Durand, 1986; and Warren, 1993 for detailed reviews of the evolution and mutual influence of developmental and behavioral practice in childhood communication disorders). In other words, we believe that "lumping" traditional and more contemporary behavioral approaches under the same "ABA" label is misleading in discussing issues of efficacy, especially when making comparisons with social-pragmatic developmentally based approaches that have helped to shape contemporary ABA approaches in both philosophy and practice.

Furthermore, the relative effectiveness of ABA methods in changing particular abilities or skills (e.g., social-communication versus motor skills versus adaptive skills) has not been addressed. Proponents claim that ABA can be used successfully to teach "everything, from learning not to scream and throw tantrums to learning to sleep through the night, to play appropriately with toys, to use communicative language, and to learn age-appropriate social interaction, along with many other skills" (Maurice et al., 1996, p. 8). A lack of consideration of the very different requirements of acquiring different abilities (e.g., acquisition of spontaneous, communicative language versus motor skills), and how some ABA methods may be a better "fit" for some abilities than for others, renders global arguments of efficacy weak and unfocused.

In this article, we provide a more specific focus to this debate by considering the practice of enhancing spontaneous language and related social–communicative abilities of young children with autism/ PDD. We begin by presenting a historical perspective of the evolution of different approaches for enhancing communication and related abilities that are currently available, followed by a description of characteristics of the approaches. We describe these approaches along a continuum from massed discrete-trial, traditional behavioral (DT-TB), which places much emphasis on behavioral teaching technology and which relies primarily on repetitive practice of isolated skills using a discrete-trial format, to social-pragmatic, developmental (SP-D), which relies on more naturally occurring events and activities and places greater emphasis on reciprocal interpersonal interaction as the primary context for enhancing social-communicative competence. We then examine the current state of knowledge regarding the effectiveness of early services for children with autism/PDD and conclude with consideration of the need for more meaningful outcome measures than are currently used for the next generation of outcome research.

A HISTORICAL PERSPECTIVE

For many years, approaches to enhancing language and communication abilities for young children with autism/PDD have varied greatly in content and in teaching strategies. In the 1960s and 1970s, DT-TB approaches based primarily on a discrete trial teaching format (Lovaas, 1977) received much attention, primarily because such approaches were the first to demonstrate objectively that children with autism/PDD were capable of acquiring a variety of skills through systematic teaching efforts. The same teaching procedures were utilized for skills as varied as receptive and expressive speech (Lovaas, 1977) and teaching children sequences of motor behaviors, such as those involved in self-help skills (Lovaas, 1981). These teaching procedures were primarily characterized by a 1:1 massed trial drill format to train early "readiness" skills in eye contact, attention, and sitting, followed by more advanced skills in matching, verbal imitation, receptive and expressive language, play, etc. The justification for a highly repetitive 1:1 approach was the belief that children with autism were not able to learn in more natural environments due to their extreme learning and attentional difficulties and the lack of practice opportunities and systematic reinforcement in more natural circumstances (Lovaas, 1981). In these programs, less structured training focusing on "spontaneity" and child-initiated communication was not introduced until, and only if, children had met training criteria for readiness skills in prerequisite stages of discrete trial training.

In contrast to DT-TB approaches that were driven by operant behavioral explanations of language development, cognitively based developmental psychologists, psycholinguists, and speech-language pathologists rebuked operant models as valid explanations of how typical children and children with disabilities could learn to communicate spontaneously or acquire a generative and creative language system (Warren, 1993). In fact, questions were raised as to whether DT-TB approaches actually interfered with the ability to engage in spontaneous and initiated communication, a process that appeared to be antithetical to what children were being taught in the discrete trial training regimen (Fay & Schuler, 1980; Prizant, 1982).

Concerns about discrete trial approaches to "training" communication and language were fueled by the "revolution" in developmental pragmatics (i.e., the study of language and communication development in social contexts). In the late 1970s and into the 1980s, this movement dramatically shifted the study of language and communication development (Bates, 1976, 1979) and had a sudden and significant impact on the applied fields of special education and speech-language pathology (Bricker, 1993; McLean & Snyder-McLean, 1978). The study of pragmatics engendered a number of principles that guided clinical and educational practice with children with autism and other severe communication disabilities and appeared to be antithetical with DT-TB approaches in theory and practice. First, the social context of naturally occurring interactions, including routines and events that occurred in everyday life with family members and peers, was considered to be of primary importance for communication and language development. Second, the child was viewed as an active learner and social participant, rather than learning being primarily under the control of the teacher, the reinforcement schedule being used, and a variety of instructional variables. Third, the role of the caregiver was expanded based on developmental pragmatics research documenting that caregivers facilitate communication and language development in many ways, including creating motivating contexts, routines, and activities for communication; following the child's lead and attentional focus in activities; interpreting children's unconventional, preintentional, and early intentional behavior as meaningful; adjusting communicative style to best "match" a child's developmental capacities; modeling, supporting, and scaffolding for the child; and

supporting emotional regulation and expression in communicative interactions (Bruner, 1981; MacDonald, 1989; McLean, 1990; McLean & Snyder-McLean, 1978; Prizant & Meyer, 1993; Prizant & Wetherby, 1988, 1990a).

Fourth, in practice, the developmental pragmatics movement emphasized the importance of deriving individualized goals and strategies in communication based on each child's current communication abilities as well as learning strengths and needs (Prizant & Wetherby, 1989; Wetherby & Prizant, 1992). This was in contrast to programs using the same sequence of goals and teaching curriculum, as was (and is) common in DT-TB approaches, especially in early stages of training (Bricker, 1993). Finally, the pragmatics movement emphasized the need to focus on meaningful language and functional communication abilities at the outset, both preverbal and verbal, rather than building repertoires of speech sounds, words, and sentences largely devoid of conceptual understanding and social impact, other than to elicit predetermined contingent reinforcement, which may not be relevant to the child's behavior and intent. Based on the research literature in developmental pragmatics for typically developing children and children with autism/PDD (Bates, 1979; Wetherby, 1986; Wetherby & Prutting, 1984), the practice of understanding and documenting children's "communicative intentions" became central in research and in practical application when working with nonspeaking as well as speaking individuals with autism/PDD (Prizant & Duchan, 1981; Prizant & Wetherby, 1987; Wetherby, 1986; Durand, 1990), a notion inconsistent with the traditional behavioral doctrine of dealing primarily with observable behavior.

Citing the lack of generalization and communicative spontaneity in children who had nonetheless mastered speech goals in discrete trial training, practitioners with expertise in communication and language disorders in autism/PDD began to question seriously the efficacy of DT-TB procedures in enhancing true spontaneous communication and language abilities (Fay & Schuler, 1980; Prizant, 1982). Even Lovaas (1977), who has been credited with introducing discrete trial approaches for children with autism, stated "the training regime . . . its use of "unnatural" reinforcers, and the like may have been responsible for producing the very situation-specific, restricted verbal output which we observed in many of our children" (p. 170). Based on this finding, he spoke of the need for "spontaneity training," a concept that is an oxymoron in the eyes of specialists in communication development and disorders. That is, the concept of "training" implies establishing teacher or instructional control, a basic tenet of traditional behavioral approaches, whereas initiation and spontaneity in communication is viewed as affect driven, based on internal motivation and internal locus of control by development researchers and clinicians (Greenspan, 1992; Prizant & Wetherby, 1990b).

In a retrospective critique of the use of DT-TB approaches (Lovaas, 1977) in language intervention for children with autism, Koegel (1995) noted that "not only did language fail to be exhibited or generalize to other environments, but most behaviors taught in this highly controlled environment also failed to generalize" (p. 23). Coming from a contemporary ABA orientation, Koegel saw the need to abandon discrete trials in favor of more naturalistic approaches to language intervention based on the contention that "early attempts to teach language, that emphasized repetitive practice, carefully controlled instructions, consistent and artificial reinforcers, highly structured and simple training environments, and so forth might have actually retarded the efforts to achieve generalized intervention effects" (Koegel, 1995, p. 23). Interestingly, these claims are remarkably consistent with the earlier critiques of Fay and Schuler (1980), Prizant (1982), and Wetherby (1986) from an SP-D orientation.

The pragmatics "revolution" provided new methodologies and taxonomies for studying and documenting communication

and language development in natural social contexts (Lund & Duchan, 1983). Advances in behavioral technology led to functional assessment becoming recommended practice for understanding the variables that influence or motivate problem behaviors (Carr et al., 1994; Donnellan et al., 1984; Horner et al., 1990; Meyer & Evans, 1986; 1993). This confluence of factors led to the emergence of "contemporary" behavioral approaches, which drew from and incorporated behavioral techniques to promote adaptive behavior (e.g., teaching positive, functionally, equivalent alternative behaviors) (Carr & Durand, 1986; Hart, 1985; Koegel & Johnson, 1989; Dunlap et al., 1998; Schreibman & Pierce, 1993), as well as knowledge derived from developmental pragmatics to promote the use of more natural and balanced social transactions in which learning opportunities are initiated by the child. For example, Koegel and colleagues (Koegel & Koegel, 1995; Koegel, Dyer, & Bell, 1987; Schreibman & Pierce, 1993) developed a more child-centered behavioral approach, drawing heavily from social-pragmatic principles, which they refer to as the Natural Language Paradigm. It is noteworthy that some of the leaders of more contemporary behavioral approaches to language and communication in autism had studied and published extensively with Lovaas in his widely cited, early work on language training (e.g., Carr et al., 1975; Lovaas et al., 1975). This shift, along with the increasing influence of attempts to understand the communicative functions of socially unacceptable behavior using taxonomies from the pragmatic literature (Donnellan et al., 1984; Durand, 1990; Reichle & Wacker, 1993), further merged the perspectives of contemporary ABA approaches and developmentally based pragmatic approaches by the late 1980s.

However, in 1993, two publications rekindled interest in DT-TB approaches. The first, *Let Me Hear Your Voice* (Maurice, 1993), was a parental account of two siblings who "recovered" from autism using a program based on the work of Lovaas (1981) and which utilized discrete trial training as the primary strategy in initial stages of the program. Although the author clearly indicated that there were additional components to her children's program—some of which, as described, were clearly more developmental, child-centered, and social-pragmatic—what emerged from her account was the significance of the 1:1 discrete, massed trial portion of her children's training. The second influential publication (McEachin et al., 1993) was the second follow-up study of 19 children who received at least 2 years of "intensive behavioral intervention," reportedly following the programs published in *The "Me" Book* (Lovaas, 1981), although the specifics of intervention were not presented. The authors concluded that nine of the 19 children had "recovered" from autism based on a variety of follow-up measures that found them to be indistinguishable from peers. This study, along with the Maurice book, had a major impact in launching renewed interest in DT-TB approaches, largely through popular media accounts of "new hope" for a cure or recovery for children with autism and well-publicized claims that this approach was the only one that "worked" for children with autism (Maurice et al., 1996). These claims were made despite the degree of controversy surrounding the study, both within and outside the field of behavioral psychology, including criticisms of its lack of detail regarding the training used (Green, 1996b), its methodology (Gresham & MacMillan, 1997), and interpretation of results (Greenspan & Wieder, 1997b). Additionally, this study has been heralded by some as conclusive evidence of the effectiveness of this approach, despite the fact that most researchers would consider it to be no more than a pilot study due to the small number of participants, the lack of specificity in reporting crucial variables (e.g., child characteristics prior to treatment, family variables, specifics of training), and the fact that fidelity of treatment was never measured.

In riding this new enthusiasm engendered largely by the work of Lovaas and colleagues (Lovaas, 1977; McEachin et al., 1993) and the parental account written by Mau-

rice (1993), DT-TB proponents (Maurice et al., 1996) broadened their claims of the superiority of ABA treatment approaches. However, much of the discussion in both the popular and professional literature regarding the promise of "recovery" from autism clearly focused on the outcome study of Lovaas and his colleagues (McEachin et al., 1993), which was based on the application of the DT-TB model described in the *The "Me" Book* (Lovaas, 1981) and included the use of physical punishment and procedures to extinguish echolalia, practices that are no longer included in more contemporary versions of "Lovaas therapy" (Leaf, 1998). This begs the question of how communication and language training approaches popularized by Lovaas are similar to or differ from other more contemporary ABA approaches.

It is our contention that most contemporary ABA approaches to language and communication enhancement are more similar to SP-D approaches than to DT-TB approaches. Therefore, we believe that it is more constructive to focus on the specific elements that are definitive of different approaches, especially those that fall under the label ABA, rather than making global statements about treatment "types." This may provide a context for more thoughtful and reflective discussion about what actually happens in teaching interactions with young children. Ultimately, by focusing on the definitive elements of practice, efforts to determine treatment effectiveness will be more open to individualized and eclectic approaches than to comparisons of philosophically constrained and narrowly defined treatment "packages." Progress has been made recently toward this goal (Dawson & Osterling, 1997; Rogers, 1996), but much more work is needed.

DEFINING THE CONTINUUM OF APPROACHES

We believe it is best to conceptualize approaches to enhancing language and communicative abilities along a continuum with traditional behavioral approaches at one end (Lovaas, 1977, 1981) and developmental social pragmatic approaches at the other end, which include "relationship-based" approaches that are individualized and grounded in a developmental model (MacDonald, 1989; Wetherby et al., 1997; Schuler et al., 1997; Prizant, Schuler, Wetherby, & Rydell, 1997; Greenspan, 1992, 1997; Greenspan & Wieder, 1997a). Contemporary behavioral approaches fall between the extremes of this continuum and incorporate aspects of each (Warren, 1993). We first present descriptions and definitions of each end of the continuum, then offer an analysis of the crucial dimensions that position approaches along the continuum.

Discrete Trial or Traditional Behavioral Approaches

Discrete trial training has been defined as a strategy to teach new skills to children and one of "several methods that increase the likelihood that a child will give the desired response so that it can be reinforced . . ." (Anderson et al., 1996, p. 187). A trial is considered to be a "single teaching unit" (Lovaas, 1981) that begins with the presentation of a stimulus (teacher's instruction), the child's response, the consequence, and a pause (between-trial interval) before presentation of the next stimulus by the teacher (Anderson et al., 1996). Teacher instructions are given just once, and the child's response is evaluated as correct, incorrect, or no response and followed by a consequence that is based on the correctness of the child's response relative to a predetermined criterion. Correct responses are reinforced with praise or primary reinforcers (e.g., food), whereas incorrect responses are consequated with verbal feedback, such as "no" or "wrong," and followed by physically guiding the child to a correct response, which is referred to as a correction trial (Anderson et al., 1996). The purpose is to delineate each teaching episode clearly, which

also provides an opportunity for the teacher to record data on each response. Schriebman et al. (1991) offered this description of DT-TB approaches: "In discrete trial training, the therapist chooses the stimuli to be used in training and the nature of the interaction, only correct responses are reinforced, indirect reinforcers (e.g., tokens, food) are typically used, several consecutive trials on a new task are presented, and the therapist initiates trials" (p. 480).

Proponents of DT-TB indicate that it is but one strategy for teaching new skills (Lovaas, 1995; Anderson et al., 1996). In fact, Lovaas (1981) stated that it should be used only for short-term periods at the beginning of a child's program. However, the most frequently cited and recommended volumes published by proponents of DT-TB (Lovaas, 1981; Maurice, et al., 1996) focus on discrete trial programs as the initial and predominant strategy for teaching children with autism/PDD. In the DT-TB format, the role of the teacher is to initiate teaching interactions, maintain instructional control (Anderson et al., 1996; Lovaas, 1981), and reliably follow programs of instruction delineated ahead of time. The primary elements of DT-TB approaches include the following:

1. The teaching structure is highly prescribed, including choice of the stimuli presented, the responses targeted, and the consequences provided. Physical arrangements, such as seating, are often predetermined and are adhered to faithfully.
2. There is a focus on teaching discrete and objectively defined behaviors. Traditionally, speech has been the primary communicative mode, beginning with vocal imitation, followed by word imitation. Nonspeech communication systems are introduced only after a child has not succeeded in achieving criteria during training for vocal imitation.
3. The learning context involves a 1:1, child: teacher ratio, with the teacher determining the activity and focus of attention, often following a prescribed, sequenced curriculum.
4. Predetermined criteria are provided for correctness of response. Each response is evaluated as correct or incorrect, with predetermined consequences following the response. "Off-task" responses, even if communicative or relevant to some aspect of the training context, may be ignored or the child's behavior redirected.
5. Initial focus is on adult control and child compliance. In a section of *The "Me" Book* entitled "Adult is boss," Lovaas (1981) outlines his rationale for initially providing "structured and authoritative" environments, followed by a lessening of adult control.
6. Curricula used in discrete trial programs may not be informed by the literature on sequences or processes in child language and communication development unless the curriculum chosen is developmentally based.
7. There is minimal use of contextual supports by the clinician/educator, and teaching is largely organized and directed through oral language.

Proponents of DT-TB approaches cite a number of contributions that these approaches have made to the education of young children with autism/PDD: (1) an emphasis on the need for intensive services; (2) provision of strategies for breaking down activities in small steps (task analysis); (3) demonstration of the value of utilizing highly structured and routinized teaching episodes; (4) focus on early attentional skills; (5) systematic data collection; (6) and a clear prescription for teaching. However, many of these contributions need to be considered carefully, especially from the perspective of enhancing social-communication and language abilities. For example, is intensity to be defined only in reference to hours of discrete trial training per week or number of teaching trials presented? Could intensity also be defined relative to the qualities of interactions (e.g., reciprocity, contingency, affective involvement) between children and

their communicative partners? For example, proponents of an SP-D perspective advocate intensive services of a very different nature. In Greenspan's (1992) paradigm, the number of hours in his "floor-time," play-based treatment is one dimension of intensity. However, intensity of treatment is also defined by the degree to which a caregiver's expression of affect and affective range and attunement are used to support and motivate children to interact, with the goal of building relationships and supporting a child's mastery of increasingly more complex stages of socioemotional development. Prizant, Wetherby, and Schuler and colleagues (Prizant et al., 1997; Schuler et al., 1997; Wetherby et al., 1997) regard intensity from the perspective of providing multiple opportunities, natural needs, and motivations to communicate for a wide variety of purposes and to relate to others within the context of a range of experiences, with a strong preference toward the use of more natural routines and balanced interactions. The transactional and reciprocal nature of social interaction and communication is seen as the essence of enhancing social and communication abilities (Prizant, 1982; Prizant & Wetherby, 1989).

DT-TB approaches have pioneered the use of task analysis for breaking down activities into small steps; however, does this result in fragmented teaching interactions and activities that lose their meaningfulness? Training early attentional skills is also a basic tenet of DT-TB approaches; however, is it detrimental to focus solely on adult control of a child's attention rather than facilitating a shared attentional capacity by considering and following a child's attentional focus and interests? Documentation of progress is important; however, does online data collection interfere with the need to remain acutely attuned and responsive to the often subtle communicative or interactional behaviors of young children? Furthermore, do the data collected result only in quantitative information (i.e., frequency counts about correctness of responses) instead of quantitative and qualitative information about developmental shifts in communicative abilities, success in reciprocal exchange, or affective involvement with others?

Finally, having a clear prescription for teaching may be comforting and even necessary for some professionals and parents and may provide a starting place for some children; however, are there risks in following prescriptions (i.e., teaching programs) too rigidly, ignoring opportunities for building child-initiated, spontaneous interaction, communication, and play? Related to these concerns, the following limitations of DT-TB approaches relative to social-communicative abilities have been noted (Elliott et al., 1991; Prizant, 1982; Fay & Schuler, 1980; Wetherby, 1986; Wetherby et al., 1997):

1. There tends to be a narrow focus on speech and grammatical structure in lieu of multimodal communication that serves a range of communicative functions.
2. The expression of communicative intentions through unconventional communicative means may not be not acknowledged, and procedures for decreasing these behaviors without consideration of their communicative or socioemotional underpinnings may be implemented.
3. Treatment activities may be characterized by a fragmented, unnaturalistic structure, without a logical sequence of events that relate to children's everyday experiences and interactions.
4. The teacher has primary control of how learning is to proceed, with the child placed in a respondent role, which may result in passivity. Internal control involving initiation and spontaneity are not goals until later in the teaching program.
5. Children may become extremely prompt dependent or cue dependent due to inflexible teaching interactions.
6. There may be minimal inclusion of typical peers or opportunities to learn from and interact with other children until later stages of training.
7. DT-TB approaches attempt to teach clearly defined skills; however, such ap-

proaches may not address or may deemphasize the core deficits observed in autism/PDD. These include problems in shared (joint) attention, spontaneous and initiated preverbal and verbal communication, emotional expression and relatedness, and imaginative play.

SOCIAL-PRAGMATIC DEVELOPMENTAL APPROACHES

On the other end of the continuum are approaches that emphasize initiation and spontaneity from the outset and follow the child's attentional focus and motivations to the extent possible. SP-D approaches build on a child's current communicative repertoire, even if a child uses unconventional means to communicate, and use more natural activities and events as contexts to support the development of children's social-communication abilities. The elements and justifications for SP-D approaches involve a number of strategies (Wetherby et al., 1997).

Use of Interactive-Facilitative Strategies

Interactive-facilitative strategies refer to the ways in which communicative partners spontaneously interact with and respond to young children so that their social and communicative growth is supported. The importance of this dimension of intervention is underscored by the fact that (1) opportunities for communicative growth occur naturally throughout the day; therefore, primary reliance on scheduled "lessons" or "programs" do not take advantage of multiple opportunities for communication enhancement; (2) research has demonstrated that caregivers' style of interaction has an important influence on language and communication development; and (3) the transactional nature of communication development suggests that appropriate modifications of caregivers' interactive style helps children to develop a sense of efficacy and competence in communication. Their growing sense of efficacy results in greater active participation and increased motivation in social exchange, which in turn reinforces caregivers' sense of efficacy and competence (Dunst et al., 1990). The role of the partner is to build upon children's initiations and to provide models and responses that convey to the child that their behavioral responses are meaningful and accepted. The goal is to have children construct a self-generated (self-constructed) knowledge base of communicative routines and communicative means and functions. The purpose of a child's interactions and communications should be under a child's internal control, rather than under external (i.e., stimulus/instructional) control.

Interactive facilitative strategies encompass aspects of verbal as well as nonverbal behavior. Decisions are made by educators, clinicians, and caregivers about which interactive styles and strategies will best support a child's social-communicative development and enable the child to communicate intentions as independently as possible. The following non–mutually exclusive dimensions of interactive-facilitative strategies are adapted, in part, from Duchan (1989, 1986), MacDonald (1989), MacDonald and Gillette (1988), and McCormick (1990).

Degree of Acceptance of Children's Communicative Bids

Duchan (1989) noted that communicative partners provide differential feedback to young children, which may include rejection, conditional acceptance, or unqualified acceptance of communicative attempts. In general, conditional and unqualified acceptance have been found to be more facilitative of communicative success and growth in children (Chapman et al., 1986; Duchan, 1989). Conditional acceptance includes corrections that accept and acknowledge a child's attempt and provides positive corrective feedback. Conditional acceptance also may include corrections with explanations. In both cases, although corrective feedback is given, the child's meaning and intent is acknowledged, and further information is

provided in a nonjudgmental and positive manner. Unqualified or unconditional acceptance includes positive feedback, including attention, verbal and nonverbal expressions of acceptance (e.g., head nods, "yeah, uh-huh," exact imitations), and expressions of positive affect. Unconditional acceptance is characteristic of very early caregiver-child interactions, which helps young children to learn about the reciprocal nature of communicative exchange.

Degree of Directiveness

Marfo (1990) discussed the degree of directiveness or facilitativeness of a partner's style. A highly directive style, which is characteristic of DT-TB approaches, is characterized by adult-selected topics and activities, frequent use of imperatives (commands) and test questions (i.e., asking questions when the answer is known to test a child's knowledge), and intrusions on a child's behavior through a reliance on physical prompts of appropriate responses (Clark & Seifer, 1985). A directive style has been found to result in fewer child initiations, less elaborate responses, a limited range of communicative functions expressed, and conversational reticence or passivity (Duchan, 1989). A facilitative style, which is advocated by SP-D and contemporary behavioral literature, is characterized by following the child's attentional focus, offering choices and alternatives within activities, responding to and acknowledging a child's intent, modeling a variety of communicative functions including commenting on a child's activities, and expanding and elaborating upon the topic of a child's verbal and nonverbal communication. The benefits of a more facilitative style include (1) providing a child with some sense of social control and communicative power, which has been found to result in increased initiations and more elaborate communicative attempts (Mirenda & Donnellan, 1986; Peck, 1985); (2) following a child's attentional focus and motivations, which reduces problems of compliance and may result in increased learning due to motivation and affective involvement; and (3) providing elaborated information and feedback appropriate to a child's level, which supports a child's communicative and language development through modeling of vocabulary and more varied language forms and functions. Mirenda and Donnellan (1986) found that using a facilitative style resulted in higher rates of student-initiated interactions, question asking, and conversational initiation in students with autism, when compared with a directive style. Facilitative strategies have also been found to increase communicative initiation and social-affective signaling of children with autism who have limited or no language abilities (Dawson & Adams, 1984; Peck, 1985; Tiegerman & Primavera, 1981, 1984).

Appropriateness of style along a continuum from facilitative to directive is a child-specific issue that can be determined only by observing the effect of a partner's style on interactions. Relative to a child's typical abilities, a good stylistic match should result in (1) increased self-regulation of attention (i.e., ability to maintain a mutual focus of attention with minimal prompting); (2) active involvement in selecting and participating in activities; (3) frequent verbal and nonverbal communicative initiations; (4) more elaborate communicative initiations; and (5) positive affective involvement with the partner. A style is facilitative when these characteristics are observed in children's behavior. For example, for a highly active and distractible child, a style that promotes a mutual attentional focus and more active involvement, even though it may have some directive qualities (e.g., physical prompting and limit setting), must be viewed as facilitative for that child. This same style, however, may have detrimental effects for a child who has a lower activity level and greater attentional regulation. As Marfo (1990) noted, the function of adult directiveness in supporting interactions is the overriding concern, not the presence or absence of features thought to be directive. However, in SP-D approaches, educators and clinicians attempt to incorporate facilitative features

in their interactions and gradually modify their style along the facilitative–directive continuum until an optimal match is found.

Adjusting Language and Social Input

The timing and complexity of language and social input to a young child may have a dramatic impact on a child's ability to sustain attention on others, to take turns in interactions, and to comprehend others' intentions expressed through language and gestures. Features of language input that support children's communicative growth have been documented in the literature on mother-child interactions (Snow & Ferguson, 1977). The specific adjustments that have been shown to facilitate and support interactions and communicative growth include (1) simplified vocabulary and reduced sentence length; (2) exaggerated intonation, slower rate, and clear segmentation of speech; (3) contingent responding and scaffolding.

A Focus on Communicative Events

Communication enhancement efforts that follow an SP-D approach are concerned with all dimensions of communication, from enhancing communicative means or behaviors to providing a better understanding of the function of communicative behavior and of the dyadic and reciprocal nature of communicative events. This focus is seen as essential because individuals at all ability levels of autism and PDD are so challenged in their understanding of communicative events in social contexts. Communicative events are defined by two or more participants engaging in social interactions cooperatively to accomplish particular goals (e.g., sharing information, solving a problem, playing a game, etc.). The structure of such events involves reciprocal exchanges with the goal of developing an understanding on the part of all participants that each has a role and a responsibility to fulfill in achieving a shared goal. Thus, intervention must support children in "making sense" of communicative transactions (Duchan, 1986). The use of "activity-based interventions" and "joint action routines" provides the contexts for learning how to communicate meaningfully (Bricker & Cripe, 1992; Wetherby et al., 1997; Snyder-McLean et al., 1984). Efforts to enhance communication development are therefore not so much a matter of specifying desirable response topographies, but of providing motivating contexts, including the opportunities and need to communicate (McLean & Snyder-McLean, 1978).

Learning is Transactional and Affectively Based

The SP-D approach is transactional in nature, meaning that it addresses the interdependent and reciprocal influences between a child with autism/PDD, the child's social environment, and the interaction between the child and the environment (Sameroff & Fiese, 1990). Within this model, it is believed that if newly acquired skills are to be integrated within a child's current behavioral repertoire and cognitive understanding, teaching should extend current knowledge and incorporate self-generated behaviors. The focus is on helping children communicate about things they know or emotions they feel. Similarly, language should be taught as a tool to help organize experiences and plan and regulate behavior, allowing for the integration of experiences across environments and times of occurrence. Thus, language experience is used to mediate thinking and problem solving and serves to support emotional regulation (Wertsch, 1985; Prizant & Meyer, 1993).

SP-D approaches use rich, affectively charged social interactions as the contexts of language learning (Greenspan, 1992; Greenspan & Wieder, 1998; MacDonald, 1989; Prizant & Wetherby, 1990a). The natural reactions of others in reciprocal interactions refine and reinforce a child's communicative behaviors in terms of both function and structure. Through their social interactions, children experience and come to understand the impact of their commu-

nicative attempts on the environment (Snow et al., 1984). Through affective exchange and attunement, children learn to build trusting relationships with others, which provides the foundation for their social, cognitive, and communicative growth (Greenspan, 1997). This underscores the need for partners to provide consistent and clear responses in their interactions with children with autism/PDD, allowing them to form hypotheses about the behaviors and intentions of others, to perceive the structure of social interaction, and to participate in interactive "scripts" (Prizant et al., 1997; Quill, 1995). Thus, SP-D approaches include the following characteristics:

1. The focus is on teaching spontaneous social communication within a flexible structure, having varied and motivating activities.
2. There is an emphasis on building multimodal communicative repertoires (speech, gestures, augmentative and communication systems (AAC)) so that children have a range of strategies to express intentions.
3. Interactions are characterized by shared control, turn-taking, and recriprocity whenever possible.
4. Learning contexts involve meaningful activities and events, chosen for their interest, motivation, and functionality.
5. The relevance of a child's response is considered relative to the ongoing context and activities, including acknowledgment of unconventional means to communicate.
6. Use of a variety of social groupings is desirable because children's life experiences involve complex social experiences.
7. Information about the sequences and processes of child development is used to frame the sequence of treatment goals and to measure progress in a broader developmental context.
8. Contextual (visual, gestural) supports are seen as essential to help children "make sense" of activities and interactions.
9. There is a focus on helping children acquire socially acceptable means for social control (e.g., means to protest, make choices, etc.) to preclude behavioral difficulties.
10. Emotional expression and affect sharing are seen as central to the interactive and learning process.

Nevertheless, SP-D approaches may include the following limitations:

1. The intensity of learning opportunities may be inconsistent, depending on the skills of communicative partners in developing facilitative contexts and in reacting and responding in a growth-inducing manner to a child's attentional focus and communicative bids.
2. Social reinforcement (i.e., adult responsiveness) may not be consistent or strong enough for some children to maintain attention.
3. The lack of a highly repetitive, minimally distractible learning environment may be difficult for children with extreme attentional problems.
4. Documentation of progress may be inconsistent or lacking in specificity.
5. An approach may not be prescribed enough for parents or professionals who require a clear delineation of the sequence of teaching procedures used to enhance communication abilities.

It is important to note that different goals may be emphasized for different approaches at the SP-D end of the continuum, despite clear similarities in philosophy and practice. For example, Greenspan and Wieder (1997a, 1998) describe their primary goals in terms of children mastering increasingly complex levels of socioemotional growth, which they see as the foundation and impetus for communicative and language development. In contrast, Prizant and colleagues (Prizant et al., 1997; Schuler et al., 1997; Wetherby et al., 1997) focus on more specific social-communication goals in enhancing children's abilities to express communicative intentions and emotions in increasingly more conventional and sophis-